



## NATIONAL INVASIVE SPECIES STRATEGY



## POLICY GAPS AND NEEDS ANALYSIS

Carried out under the project  
***Mitigating the Threats of Invasive Alien Species in  
the Insular Caribbean***

Project No. GFL / 2328 – 2713-4A86, GF-1030-09-03

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## ACRONYMS

BCSU	Biodiversity Conservation and Sustainable Use
BD	
BMW	Ballast Water Management
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of Parties
CPPC	Caribbean Plan Protection Commission
CZM	Coastal Zone Management
GAS	Giant African Snail
GEF	Global Environmental Facility
IAS	Invasive Alien Species
ICAO	International Civil Aviation organisation
IPPC	International Plant Protection Convention
LMOS	Living Modified Organisms
LUCELEC	Saint Lucia Electricity Company
MALFF	Ministry of Agriculture, Lands, Fisheries and Forestry
MARPOL	International Convention for the Prevention of Pollutions from Ships
NBSAP	National Biodiversity Strategy and Action Plan
NCCADP	National Climate Change Adaptation Plan
NEMAC	National Emergency Management Advisory Committee
NEMO	National Emergency Management Organisation
NEP & NEMS	National Environmental Policy and National Environmental Management Strategy
NIP	National Influenza Plan
NISS	National Invasive Species Strategy
OECS	Organisation of Eastern Caribbean States
PHMB	Pink Hibiscus Mealybug
PRA	Pest Risk Analyses
SLASPA	Saint Lucia Air and Sea Ports Authority
SMMA	Soufriere Marine Management Authority
SPAW	Specially Protected Areas and Wildlife
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme

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## Executive Summary

*Saint Lucia has rich levels of endemism in its diverse fauna and flora which has been impacted on by IAS introductions. Faunal introductions range from the era of the Amerindians who brought dogs, agoutis to the era of European colonization which saw unintentional introduction of the ship rat or house rat, the Norway rat and the house mouse. Some IAS introductions are plants that were introduced as species of horticultural interest or for potential agricultural economic activity. Invasive Alien Species have been formally recognized as a threat to Saint Lucian biodiversity since at least 1998.*

*In June 2010, the Government of Saint Lucia embarked on the preparation of a National Invasive Species Strategy (NISS). The aims of this Strategy are to (i) minimize the harmful effects of invasive species on the environment, economy and society through coordination of efforts at all levels of Saint Lucian society; and (ii) facilitate cooperation within the Caribbean region to prevent the movement of invasive species. The NISS will also inform coherent policies, legislation, regulation and management of invasive species in Saint Lucia. Additionally, it will provide a communications strategy that will help raise public awareness so that all sectors of Saint Lucian society actively support efforts to minimise the risk and impact of invasives on Saint Lucia.*

*A series of background papers have been prepared to inform the NISS. Two of the papers review the status of aquatic and terrestrial IAS. Yet another report reviews the different IAS Pathways in Saint Lucia. The compendium also includes a Communications, Education, Public Awareness Strategy and Actions and a Critical Situation Analysis of (IAS Status and Management). This Report on Policy Gaps and Needs Analysis reviews the aforementioned reports and sets out to review the extent to which IAS prevention, eradication and control are fully incorporated in national legislation and in biodiversity and other relevant policies, strategies and action plans, consistent with international law.*

*In Saint Lucia several departments and agencies have responsibility for some aspect of IAS prevention and management and several different laws are relevant (e.g. plant and animal health and quarantine; wildlife management; fishing, environmental management etc.). The result, for a Small Island State, is a complex situation where responsibilities, policies and laws are not very clear or may not even be compatible. This complex situation is further exacerbated by the fact that personnel in many frontline agencies and departments are not knowledgeable of IAS issues, far less the international obligations and national legislation that control IAS in Saint Lucia. Just as there are multiple agencies and persons who have responsibility for IAS management in Saint Lucia, there are an equally significant number of pathways for IAS to enter Saint Lucia.*

*All main pathways for alien harmful organisms affecting plants and animals are regulated and controlled by the Crop Protection Unit, the Fisheries Department and the Veterinary Services and Livestock Division. These pathways are mainly plants (and plant parts), plant products (including wood), wooden packaging, soil and animals. Items prohibited from import are subjected to inspection at the country's borders on entry. Imported cargo at the airports is not monitored by the public or animal and plant health personnel. Only if animal or*

*plant quarantine products are identified by Customs personnel, then the animal/plant health officers are requested to conduct examinations. Aquatic alien invasive plants or animals which may arrive into Saint Lucia on ship hulls, navigational buoys, floatation devices, anchors, chains, ropes, and flotsam or jetsam are not monitored. Neither are those invasives which may also hitch a ride on containers, pallets, crates, nets, traps, trawls, or other gear associated with the fishing industry and recreational equipment.*

*With severe resource limitations, Saint Lucia cannot effectively address invasive alien species once they have been introduced or become established. Adopting vigorous prevention measures to keep invasive alien species from being introduced in the first place is plainly the best way. The Crop Protection Unit, Veterinary and Livestock Services Unit, farmers, divers, hikers, photographers, port workers, Extension officers, Customs officers, bird watchers, etc. should therefore be trained to assist with early detection. Education and awareness programmes targeted at these groups will be important. These programmes will have to demonstrate the value of native biodiversity and instill some sense of pride in protecting it.*

*While there is no legislation specific to the management of IAS in Saint Lucia, there are a few pieces of legislation which are relevant for preventing IAS entry into the country. Noteworthy is that these legislations prevent the entry of invasives; there is no accompanying legislation for the control of the invasives once they have entered the country. Furthermore, the existing phytosanitary instruments do not address invasive alien species beyond agricultural pests and diseases.*

*Despite a number of weaknesses in the policy and legislative frameworks, it must be acknowledged that there is a sufficient platform in Saint Lucia to build a substantial framework for the management of IAS. This platform provides a very strong foundation for the development of a national strategy for the control and management of invasives in the country. Once the administrative, legal and institutional gaps are mitigated, and a NISS together with a communications strategy are in place, then Saint Lucia will be able to substantially enhance its management of IAS.*

## SAINT LUCIA INVASIVE ALIEN SPECIES POLICY GAPS AND NEEDS ANALYSES

### 1.0 BACKGROUND

Invasive alien species occur in all major taxonomic groups, including animals, plants, fungi and micro-organisms, and are considered to be a leading threat to biodiversity loss worldwide considered only second to habitat loss in terms of negative impacts<sup>1</sup>. Invasive Alien Species impose enormous costs on agriculture, forestry, fisheries, and other enterprises, on human and animal health, as well as ecosystem services. Rapidly accelerating human trade, tourism, transport, and travel – the infamous “four Ts” – over the past century have dramatically enhanced the spread of IAS, allowing them to surmount natural geographic barriers<sup>2</sup>. For an alien species to become invasive, it must arrive, survive and thrive.

**"Invasive alien species (IAS) are species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity".**

<http://www.cbd.int/invasive/WhatareIAS.shtml>

The Caribbean is recognized as one of the World's biodiversity hotspots with its exceptionally high levels of endemism in plants, mammals, reptiles, amphibians, freshwater fishes. Much of the region's invertebrate fauna is, however, yet to be identified by science. Saint Lucia, likewise, has rich levels of endemism in its diverse fauna and flora which has been impacted on by IAS introductions. Faunal introductions range from the era of the Amerindians who brought dogs, agoutis (*Dasyprocta leporina*) and the Southern Opossum (*Didelphis marsupialis*) to the era of European colonization which saw unintentional introduction of the ship rat or house rat (*Rattus rattus*), the Norway rat (*Rattus norvegicus*) and the house mouse (*Mus musculus*).



**Figure 1: cane toad (*Bufo marinus*)**

Credit: animalpicturesarchive.com



**Figure 2: A Red-rumped Agouti**

Credit: Marie Gardner

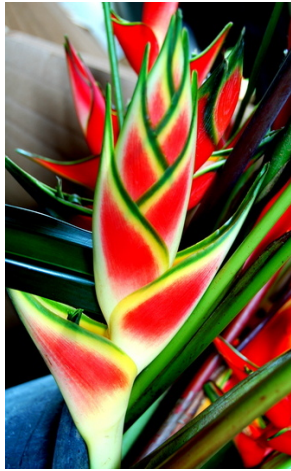
There were some noteworthy deliberate introductions which are implicated for significant biodiversity losses particularly among native birds, reptiles and amphibians.

<sup>1</sup> CBD. 2001. Status, impacts and trends of alien species that threaten ecosystems, habitats and species. Available online at: <http://www.cbd.int/doc/meetings/sbstta/sbstta-06/information/sbstta-06-inf-11-en.pdf>. Accessed on September 23 2010

<sup>2</sup> | Andrew, Gaspard Michael & Lyndon John, 2010. National Invasive Species Strategy: Terrestrial Ecosystem Analysis.



Examples include the cane toad (*Bufo marinus*) and the small Asian mongoose (*Herpestes javanicus*)<sup>3</sup>.



Some IAS introductions are plants that were introduced as species of horticultural interest (e.g. Heliconia (*Heliconia wagneriana*) or for potential agricultural economic activity (Lemon grass, (*Cymbopogon citrates*) and Leuceana (*Leuceana leucocephala*). Some of the identified floral IAS pose a potential threat to native habitats; however they have had a more demonstrable impact on disturbed habitats. Invasive Alien Species are also invertebrates. These have had far reaching impacts on public health (e.g. Tiger mosquito (*Aedes aegypti*)) with the spread of dengue fever or on economic activity particularly in the agriculture sector (e.g. Coconut mite, (*Aceria guerreronis*), African giant snail (*Achatina fulica*).

**Figure 3: Heliconia wagneriana**

Credit:: <http://www.panoramio.com/photo/7754521>



For purposes of the Saint Lucia National Invasive Species Strategy (NISS) only species introduced into Saint Lucia after colonization by Europeans (after ca 1500), will be regarded as “alien”. The NISS will concentrate on species that are both invasive and alien. Native species that turn invasive, e.g. as a result of habitat modification, are not considered. Similarly non-invasive aliens are not the centre of attention, except where potential invasiveness are viewed as a risk. Living Modified Organisms (LMOs) may be a sub-set of IAS, but will not be discussed in their own right in the NISS.

**Figure 4: Biomphalaria glabrata.**

Credit:

[http://en.wikipedia.org/wiki/Biomphalaria\\_glabrata](http://en.wikipedia.org/wiki/Biomphalaria_glabrata)

Invasive Alien Species have been formally recognized as a threat to Saint Lucian biodiversity since at least 1998<sup>4</sup>. Saint Lucia’s First Biodiversity Country Report makes reference to a number of earlier events that alerted officials to introductions, but without a unifying terminology. The Report lists thirteen IAS; all are agricultural and livestock pests. The Report also features an impressive list of organisms present in Saint Lucia, including many microbes. The native and alien species recorded in Saint Lucia in 2009 are presented in Table 1 below. The Aquatic IAS in Saint Lucia and their current status is presented in Table 2. A full listing of the Invasive Alien Species Present in Saint Lucia and Their Current Status is available under separate cover.

<sup>3</sup> Andrew and John, *ibid*

<sup>4</sup> GOSL (1998). *Biodiversity Country Study Report of Saint Lucia*. UNEP/GEF Project No. GF/1200-96-64, MALFF, Castries

**Table 1: Native and Alien Species recorded in Saint Lucia in 2009**

Taxonomic group	Indigenous		Exotic
	Total	Of which are endemic	Total
Mammals	10	1 (extinct)	7
Birds	132	5	2
Reptiles	13	7	6
Amphibian	2	1	3
Beetles	> 777	Ca. 144	> 39
Other insects	> 1000		> 160
Higher plants	945	9	289
Ferns and mosses	137		

Source: Daltry<sup>5</sup> and Morton<sup>6</sup>

**Table 2: Aquatic IAS in Saint Lucia and their Current Status**

Common name	Scientific name	Status
<b>Marine</b>		
Sea turtle virus	<i>Fibropapillomatosis (FP)</i>	Present
Mediterranean seagrass	<i>Halophila stipulacea</i>	Invasive in Dominica, Probably recent introduction to St. Lucia: present in Anse La Raye, Marigot and Labrelotte Bays; threat to native seagrasses
Mozambique tilapia	<i>Oreochromis mossambicus</i>	Invasive in fresh and brackish water; one of "World's Worst 100 IAS"
Macroalgae (brown, red, and green)	Phaeophyta, Rhodophyta, Chlorophyta	Present; environmental impact poorly documented
<b>Freshwater</b>		
<b>Animals</b>		
Marsh snail	<i>Biomphalaria glabrata</i>	Present; host/vector of <i>Schistosoma mansoni</i> ; eradication failed, impact control by focussed molluscicide treatment following survey
Giant river prawn	<i>Macrobrachium rosenbergii</i>	Probably naturalized; introduced for aquaculture form Taiwan; invasiveness unclear
Obscure swamp eel	<i>Ophisternon aenigmaticum</i>	Naturalized; native to North America; invasiveness unclear

<sup>5</sup> Daltry, J.C. ,2009. "The status and management of Saint Lucia's forest reptiles and amphibians."National Forest Demarcation and Bio-Physical Resource Inventory Project, FCG International Ltd., Government of Saint Lucia.

<sup>6</sup> Morton, Matthew, 2009."A Survey of Wildlife Use in Saint Lucia". National Forest Demarcation and Bio-Physical Resource Inventory Project, FCG International Ltd., Government of Saint Lucia.

<b>Common name</b>	<b>Scientific name</b>	<b>Status</b>
Mozambique tilapia	<i>Oreochromis mossambicus</i>	Invasive in fresh and brackish water; introduced for aquaculture in 1970s
Nile tilapia	<i>Oreochromis niloticus</i>	Probably naturalized with ecological impact; introduced for aquaculture in 1970s
Schistosoma parasite	<i>Schistosoma mansoni</i>	Present; eradication failed, impact control by focussed molluscicide treatment following survey
Red-eared slider	<i>Trachemys scripta elegans</i>	Escaped/released from captivity; May impact native terrapins as well as common prey
<b>Plants</b>		
Calathea	<i>Calathea lutea</i>	Large stands at Bexon River; potential threat to riparian habitat
Spiral ginger	<i>Costus scaber</i>	Present, potential threat to riparian habitats
Umbrella sedge	<i>Cyperus difformis</i>	Invasive of Asian origin; Detected in Cul de Sac swamp in March 2010
Water hyacinth	<i>Eichhornia crassipes</i>	Naturalized; one of "World's Worst 100 IAS"; popular ornamental clogs drainage canals
Malaysian trumpet snail	<i>Melanooides tuberculata</i>	Apparently introduced to control <i>Biomphalaria glabrata</i> ; also impacting non-target species
Woodrose	<i>Merremia tuberosa</i>	Expanding into Union River; huge vines; potential threat to riparian systems
Golden Flamboyant	<i>Peltophorum pterocarpum</i>	Few specimen in swampy spots and mangroves; potential threat to swamp forest
Java plum	<i>Syzygium cumini</i>	Common on Piaye River; potential threat to riparian systems

Source: Marie Louis Felix<sup>7</sup>

<sup>7</sup> Felix, Marie Louis, 2010. National Invasive Species Strategy for Saint Lucia Aquatic Ecosystems

## 2.0 INTRODUCTION

Saint Lucia, like all islands, with its diverse but delicate ecosystems is at risk from invasive alien species. Invasives are a major threat to the vulnerable marine, freshwater and terrestrial biodiversity and to the people depending on this biodiversity for their livelihoods and wellbeing. Globalisation through increased trade, transport, travel and tourism has inevitably also increased the intentional or accidental introduction of organisms into Saint Lucia. Furthermore, it is widely predicted that climate change will further increase the threat posed by invasive species. To this end, with support from CABI Bioscience, the Global Environment Fund (GEF) and the United Nations Environmental Programme (UNEP), have embarked on a project on “Mitigating the Threats of Invasive Alien Species in the Insular Caribbean”. Saint Lucia is one of the five participating countries. One of the five components of the project is the formulation of National Invasive Species Strategies.

In June 2010, the Government of Saint Lucia embarked on the preparation of a National Invasive Species Strategy (NISS). The aims of this Strategy are to (i) minimize the harmful effects of invasive species on the environment, *economy* and society through coordination of efforts at all levels of Saint Lucian society; and (ii) facilitate cooperation within the Caribbean region to prevent the movement of invasive species. The NISS will also inform coherent policies, legislation, regulation and management of invasive species in Saint Lucia. Additionally, it will provide a communications strategy that will help raise public awareness so that all sectors of Saint Lucian society actively support efforts to minimise the risk and impact of invasives on Saint Lucia.

In preparation of the NISS, the Government of Saint Lucia has assembled a four person team to work with the Invasive Alien Species Coordinator in the Department of Forestry. This Team and IAS Coordinator have produced a series of Reports to inform the NISS preparation:

- **Invasive Alien Species Present In Saint Lucia And Their Current Status**
- **National Invasive Species Strategy for Saint Lucia: Terrestrial Ecosystems Analysis.**
- **National Invasive Species Strategy for Saint Lucia: Aquatic Ecosystems**
- **National Invasive Species Strategy for Saint Lucia: Invasive species Pathways**
- **Invasive Alien Species (IAS) Awareness Baseline Survey, Saint Lucia, 2010**
- **National Invasive Species Strategy for Saint Lucia: Communications, education, Public Awareness Strategy and Actions**
- **Critical Situation Analysis (CSA) of Invasive Alien Species (IAS) Status and Management ( in draft)**

These documents have provided substantial information for the analyses of the effectiveness of the current policy, legal and institutional frameworks for the management of IAS in Saint Lucia. They also highlight a number of challenges to the management of IAS in Saint Lucia (refer to Box 1).

### **Box 1: CHALLENGES TO IAS MANAGEMENT IN SAINT LUCIA**

- low public awareness
- shortage and inaccessibility of scientific information (for species identification, risk analysis, detection and mitigation techniques)
- absence of clear and agreed priorities for action because of multiple agencies involved
- multiple pathways resulting in ease in introduction and movement
- highly inadequate inspection and quarantine
- very limited monitoring capacity
- lack of effective response mechanisms
- poor intersectoral and interagency coordination
- insufficient and outdated legislation

Effective mitigation efforts require a multi-dimensional approach encompassing political, economic, social and technical considerations. Thus, the development of robust policies and legislation, and appropriate institutional arrangements – as well as scientific and technological solutions – is crucial to the successful management of IAS.

To this end, the last two decades have seen a growing number of increasingly interlinked international, and, to a limited extent, regional policies and agreements that have resulted in significant outputs in terms of providing guidance relating to governance and implementation of mitigation measures. This Report seeks to assess the efficiency and efficacy of existing international, regional and national legal and policy instruments and the institutional arrangements that are in place for prevention, early detection, eradication and control of invasive alien species and their impacts in Saint Lucia.

## **2.1 The Approach**

Regional and international policies governing trans-boundary movement of plants and animals and other living organisms are of great significance to minimization of the spread of IAS; however, it is the action within national borders that will define success or failure of any programme to mitigate the impact of IAS in Saint Lucia. The formulation of a national strategy as a first step in the

development of a comprehensive effort to deal with the problem of IAS in Saint Lucia centers on a four-step hierarchical process that emphasizes: (1) prevention, (2) early detection and eradication, (3) control and management to be applied when all other options fail, and finally (4) restoration. It is envisaged that such a process would necessarily involve all critical players, including local and international local cooperation. Other applicable Guiding Principles adapted from the Convention for Biological Diversity are provided in Box 2.

### **Box 2: Guiding Principles for the Management of IAS in Saint Lucia:**

1. Precautionary approach
2. Ecosystem approach
3. Research and monitoring
4. Education and public awareness
5. Border control and quarantine measures
6. Exchange of information
7. Capacity building
8. Mitigation of impacts

The management of invasives in Saint Lucia will also be guided by a set of processes adapted from the CBD's COP 6 Decision VI/23<sup>8,9</sup>. This is summarised as follows:

- a. Identifying national needs and priorities;
- b. Creating mechanisms to coordinate national programmes;
- c. Reviewing, relevant policies, legislation and institutions to identify gaps, inconsistencies and conflicts,
- d. Adjusting or developing policies, and legislation, and identifying appropriate institutional arrangements;
- e. Establishing cooperation between the various sectors, including the private sector<sup>10</sup>, and ensure regular communication between focal points of respective relevant international instruments;
- f. Promoting awareness among policy makers at all levels of government, and in the private sector; quarantine, customs and other border officials; and the general public;
- g. Facilitating the involvement of all stakeholder groups, in the preparation of national invasive alien species strategies and action plans, and in decisions related to the use of alien species that may be invasive;
- h. Collaborating with trading partners and neighbouring countries, to address threats of invasive alien species that cross international boundaries, to migratory species, and to address matters of common interest.

Based on the foregoing principles and processes that will guide the formulation of the Saint Lucian NISS, the purpose of this Report is to review:

- a The international instruments – both legally binding treaties to non-binding technical guidance focused on particular pathways – that Saint Lucia subscribes to and has incorporated into national law;
- b The extent to which IAS prevention, eradication and control are fully incorporated in national legislation and in biodiversity and other relevant policies, strategies and action plans, consistent with international law.
- c The types of institutional arrangements that are in place for IAS prevention and mitigation and the extent to which relevant sectors, stakeholders and different levels of government are involved in.
- d Whether efficient use is made of existing structures, procedures and expertise relevant to trade, movement, holding and management of potential IAS (e.g. national plant protection unit, customs and quarantine services, CITES authorities, veterinary authorities etc.).

The reports mentioned above all point to a multiplicity of policies and legislation which together with the absence of a single IAS policy framework is hindering the effective and efficient management of IAS in Saint Lucia. Hence, it is crucial that all

<sup>8</sup> Alien species that threaten ecosystems, habitats or species

<sup>9</sup> Available at <http://www.cbd.int/decision/cop/?id=7197> Accessed on September 24 2010

<sup>10</sup> that might provide pathways or vectors for the unintended transfer of invasive alien species,

parties initiate a co-ordinated review process of their institutional and legal frameworks and their strategies, policies and approaches relevant to IAS issues in Saint Lucia. This Report is an attempt at such a coordinated review.

Regulatory and policy frameworks alone cannot solve problems related to alien invasive species. They need to be complemented by non-regulatory efforts, particularly information, education and awareness-raising campaigns. This Report will therefore also review initiatives that have been undertaken to date, geared at informing and raising awareness of the various publics to IAS in Saint Lucia.

### 3.0 POLICY AND LEGISLATIVE REVIEW

#### 3.1 Stakeholders involved in IAS Management in Saint Lucia

As already alluded to above there is a wide range of stakeholders who are involved in the management – intentionally or otherwise - of IAS in Saint Lucia. A checklist of these stakeholders is provided in Box 3.

In Saint Lucia several departments and agencies have responsibility for some aspect of IAS prevention and management and several different laws are relevant (e.g. plant and animal health and quarantine; wildlife management; fishing, environmental management etc.). The result, for a Small Island State is a complex situation where responsibilities, policies and laws are not very clear or may not even be compatible. This complex situation is further exacerbated by the fact that personnel in many frontline agencies and departments are not knowledgeable of IAS issues, far less the international obligations and national legislation that control IAS in Saint Lucia.

#### **Box 3: CHECKLIST OF MAIN STAKEHOLDERS WHO ARE INVOLVED IN OR SHOULD BE INVOLVED IN IAS MANAGEMENT IN SAINT LUCIA**

agriculture, forestry and fisheries departments	airlines and shipping agents
environmental agencies in the public sector	mail/courier companies
quarantine, border and port authorities	pet shops, aquarium shops, garden shops and other horticultural establishments
authorities in marinas	local communities
Customs and excise authorities	agricultural research agencies
solid waste management authority	Saint Lucia National Trust
public health officials	trade, transport and tourism authorities
farmers and farmer organisations	export/import companies
tour operators	hucksters

The frontline against IAS at the airports in Saint Lucia, for instance, includes the Customs and Excise Department Officers, Immigration Officers, Port Authority Workers, Public Health and Ministry of Agriculture (Plant and Animal Health) Officers. They are the personnel who are responsible for identifying the possible entry of any animal, plant or human pests or diseases and other organisms, implementing the provisions of the International Plant Protection Convention (IPPC), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Biological Diversity (CBD), the International Convention for the Prevention of Pollutions from Ships (MARPOL) and any other relevant conventions, bilateral or multilateral agreements. At a National Plant Quarantine Workshop<sup>11</sup> it was recently revealed that Customs Officers, Ports Personnel, Ministry of Agriculture and Ministry of

<sup>11</sup> National Plant Quarantine Workshop, 26<sup>th</sup> – 30<sup>th</sup> July, 2010, Castries, Saint Lucia) facilitated by a Team member of the NISS Team, Mr Guy Mathurin who authored the Pathways Report



Health personnel all needed training in the provisions, requirements and operating procedures of the above-mentioned conventions.

Another telling illustration is an interview between the Operations Manager of the Saint Lucia Air and Sea Ports Authority (SLASPA) and the Author of the Pathways Report<sup>12</sup>. The interview revealed that the Operations Manager was not aware of the IAS issue. His department had occasionally encountered both live and dead animals in imported consignments of cargo, but had not thought of them as possibly being invasive in nature. He stated that there were also possibilities of introduction of other animals via the mooring ropes on vessels. He informed the interviewer that although during their day-to-day activities they did not specifically look out for IAS, anytime they saw any dead or live plants or animals, they would halt work and call the “relevant” authorities. He was aware of the issue of ballast water, but was not sure yet what measures were being put in place to manage it. He stated that his department would be willing to work with other collaborating agencies to address the problem of IAS because of their potential threat to Saint Lucia.

Yet another interview with the Yachting Specialist at the Ministry of Tourism indicated that they were aware of the IAS problem<sup>13</sup>. He stated that during his tenure as the former general manager of the Rodney Bay Marina, he had done his best to accommodate plant and animal quarantine officers. One of the problems, he stated was the fact that none of the plant/animal health officers were based at the marina on a full-time basis. It was difficult to have passengers and crew comply with measures in the absence of those officers. He did admit that during the “day-to-day” activities of the marina and dry dock, measures had not been sufficiently put in place to mitigate against the threat of IAS through that pathway. The garbage from the yachts was placed in a communal bin and then transported to the local landfill. The scraping from the hulls of yachts was also transported to the landfill or just thrown back into the water.

•  
**The impacts of IAS are immense, insidious, and usually irreversible and they may be damaging to native species and ecosystems on a global scale as the Loss and degradation of habitats**

•  
 IUCN/SSG/ISSG 2000

### 3.2 IAS Pathways in Saint Lucia

Just as there are multiple agencies and persons who have responsibility for IAS management in Saint Lucia, there are an equally significant number of pathways<sup>14</sup> for

<sup>12</sup> Mathurin, Guy, 2010b. Invasive Species Pathways. Carried out under the project *Mitigating the Threats of Invasive Alien Species in the Insular Caribbean* Project No. GFL / 2328 – 2713-4A86, GF-1030-09-03

<sup>13</sup> Guy Mathurin, *ibid*

<sup>14</sup> “Pathways”, with reference to invasive alien species (IAS) are defined as “routes by which species move from one locale to another, either within a country or between countries”. Natural pathways include wind, sea currents and other forms of dispersal in which a specific species has developed morphological and behavioural characteristics to employ. Man-made pathways are those which are created or enhanced by human activity

IAS to enter Saint Lucia. A description of and the challenges and constraints posed by these pathways is summarised in Table 3.



**Figure 5: Major Pathways for IAS into Saint Lucia**

**Table 3: IAS Pathways in Saint Lucia<sup>15</sup>**

<b>Type of Pathway</b>	<b>Specific Pathway</b>	<b>Description</b>	<b>Constraints and Challenges</b>
Transportation related	GFL Charles Airport	Services mainly regional air transport needs and handles passengers, luggage, cargo, animals (live poultry, pets) and animal products, plants and plant products, mail and items transported by courier services	<ul style="list-style-type: none"> <li>• Customs and Excise Department Officers, Immigration Officers, Port Authority Workers, Public Health and Ministry of Agriculture (Plant and Animal Health) Officers responsible for identifying the possible entry of any animal, plant or human pests or diseases and other organisms, implementing the provisions of various international conventions</li> <li>• The holds are neither inspected nor treated for any possible human, animal, plant pests or diseases, hitchhikers or possible IAS.</li> <li>• Only if animal or plant quarantine products are identified by Customs personnel, then the animal/plant health officers are requested to conduct examinations.</li> <li>• All confiscated material is taken to an incinerator which is inland from the ports.</li> </ul>
	Hewanora International Airport	Services mainly international air routes and handles passengers, cargo and mail	
	Port Castries	Services cargo and cruise liners	<ul style="list-style-type: none"> <li>• There is only one animal/plant health inspector from the MALFF stationed at Port Castries. Her office is located at the Ferry Terminal and she is summoned to the other areas of the port by Customs officers when required. She visits the Marigot Bay marina “every other day” and also works at the General Post Office in Castries.</li> <li>• Officers are not trained to look out for aquatic alien invasive plants or animals which may enter the sea ports.</li> <li>• Sea containers are not specifically checked for IAS or plant/animal pests and diseases. In many cases, containers arriving into Saint Lucia are taken straight from the ports of entry to the premises where they are unloaded.</li> <li>• There have been instances where exotic insects other animals and storage pests have been found in containers containing non-agricultural commodities and personal effects.</li> </ul>
	Port Vieux Fort	Services cargo liners	<ul style="list-style-type: none"> <li>• There are no public, plant or animal health personnel stationed at Port Vieux-Fort. If Customs officers intercept any consignment of</li> </ul>

<sup>15</sup> Adapted from Guy Mathurin, *ibid*

Type of Pathway	Specific Pathway	Description	Constraints and Challenges
			<p>interest, it is detained and the relevant authorities summoned. Office space had formerly been allocated to plant and animal quarantine, but the area was never refurbished accordingly and was subsequently “re-possessed” by Saint Lucia Marine Terminals Ltd.</p>
	Rodney Bay Marina	Services yachts	<ul style="list-style-type: none"> <li>• Is visited by plant and animal health officers from the main Crop Protection and Quarantine Office at Union, Castries, once or twice per week.</li> <li>• Garbage from the yachts taken off the boats by the crews and then put into a local communal bin at the marina for transportation to the landfills.</li> </ul>
	Road net-works	Construction and roadworks companies from overseas	<ul style="list-style-type: none"> <li>• Plant quarantine service is not notified as a matter of routine, to arrange for the inspection of the vehicles and equipment on arrival at the seaports in Saint Lucia.</li> </ul>
	Packaging Material	Material Prohibited under Plan Protection Regulations (grass, leaves, shag, trash, soil, used bags)	<ul style="list-style-type: none"> <li>• Usually detained if intercepted by Customs officials and then referred to plant quarantine officers.</li> </ul>
		Wood Packaging material	<ul style="list-style-type: none"> <li>• Pallets and crates) leave the ports of entry for destinations island wide. There is no regulation of that movement. Pallets can be found all over the island and are usually reused for flooring makeshift bars and stands at public events. They can also be found stacked up outside local bakeries, exposed to the elements.</li> </ul>
	Mail/Courier Companies		<ul style="list-style-type: none"> <li>• For courier companies, plant and animal material arriving into Saint Lucia is normally covered by import permits. I</li> <li>• n normal mail import permits are not usually obtained and permit requirements are regularly violated.</li> <li>• Consignments include cut flowers, flowers for planting, seeds, herbs (dried and fresh), medicinal herbs, dried floral arrangements, dried herbs and handicraft items.</li> </ul>
	Transportation of Equipment and Military Vehicles	Saint Lucia has been the recipient of donor assistance from countries who sometimes deploy construction personnel, including engineers, workers and military personnel.	<ul style="list-style-type: none"> <li>• Plant and animal health personnel are not, as a matter of routine, notified so as to require the inspection of the imported items as in most cases, they are given diplomatic clearances</li> </ul>

Type of Pathway	Specific Pathway	Description	Constraints and Challenges
Living Industries	Plants	Importation of plants for research	<ul style="list-style-type: none"> <li>Some of these plants or plant parts may have been introduced against the advice of the Crop Protection Unit, MALFF</li> </ul>
	Potting Soils, growing media	Potting soils and media are regularly imported into Saint Lucia under permit from the Crop Protection and Quarantine Unit – MALFF	<ul style="list-style-type: none"> <li>Samples, however are not taken regularly to verify freedom from possible pests/diseases and IAS.</li> </ul>
	Plant Trade	Enthusiast gardeners request permits to bring exotic plants into Saint Lucia.	<ul style="list-style-type: none"> <li>Inspection by plant quarantine officials at ports of entry is required before consignments can be cleared.</li> <li>containers of plants for planting as part of landscaping projects have been imported into Saint Lucia without the required phytosanitary clearance</li> </ul>
	Cut flowers	Cut flowers are imported into Saint Lucia on a weekly basis.	<ul style="list-style-type: none"> <li>Inadequate staff at the plant quarantine service. Therefore inspection is not thorough</li> <li>Decisions are required rapidly and not enough time to undertake proper pest risk analyses</li> <li>Information not readily forthcoming from exporting country</li> </ul>
Food Pathways	Live Pathways	Live food animals normally imported are goats, sheep, rabbits, day old chicks and hatchling eggs.	
		Plants and plant parts as forage	<ul style="list-style-type: none"> <li>Forage seeds are “certified” and are sown in a “forage bank”</li> <li>Under plant quarantine regulations all grasses, except for certified seed, are prohibited entry into Saint Lucia.</li> </ul>
Non-food Animal Pathways (Transporting animals for reasons other than consumption)	Aquarium trade	Several species of fish, including swordfish ( <i>Xiphophorus helleri</i> ), goldfish ( <i>Carassius auratus</i> ), cories ( <i>Corydoras</i> spp.) and freshwater turtles – the red-eared slider ( <i>Trachemys scripta elegans</i> ), are imported into Saint Lucia as part of the aquarium trade.	<ul style="list-style-type: none"> <li>The Fisheries Department, MALFF reviews the applications for importation of aquarium species.</li> <li>Risk analyses are performed based on country of origin and disease status of that species and their relatives in the country of origin.</li> <li>On arrival at ports of entry, any approved species must be inspected by the Veterinary Services and Livestock Division prior to entry.</li> <li>no regulations exist requiring special disposal or treatment of waters used to transport fish and other imported aquatic “pet” species</li> </ul>

Type of Pathway	Specific Pathway	Description	Constraints and Challenges
	Aquaculture	Non-native shrimp <i>Macrobrachium rosenbergii</i> and black and silver tilapia <i>Oreochromis mossambicus</i> , <i>Oreochromis niloticus</i> , are examples of non-native aquaculture species that are currently in use in St. Lucia. Of these, at least one, the black tilapia, has proven to be invasive.	<ul style="list-style-type: none"> <li>if any “aquaculture” species is introduced, it would be extremely difficult to regulate the movement and transfer of those species from pond to pond and possibly, into fresh water canals, streams and rivers</li> </ul>
	Pets		<ul style="list-style-type: none"> <li>Applicants must have an import permit from the MALFF and a health certificate from the country of origin</li> <li>Apart from Veterinary and Livestock Services requirements, must also meet CITES and Forestry Department (Wildlife) specifications where applicable</li> <li>Widely believed that some pets, especially parrots, cats and dogs and lately, monkeys are imported illegally</li> </ul>
Miscellaneous Pathways	Biological Control	Saint Lucia has had the experience of importing organisms to effect biological control of a species.	<ul style="list-style-type: none"> <li>No studies have been undertaken to evaluate whether the organisms have become invasive</li> </ul>
Other Aquatic Pathways	Freshwater rivers, streams and canals		<ul style="list-style-type: none"> <li>Little or no work is presently being done with respect to monitoring the freshwater rivers, streams and canals for IAS</li> <li>There are no measures in place presently to prevent the introduction of IAS into rivers, streams and canals by the local populace.</li> </ul>
	Marine/estuarine areas and canals	<ul style="list-style-type: none"> <li>some unofficial reports of algal blooms reaching our shores and also dead fish sightings which may have been caused by such phenomena</li> <li>Occasionally, persons complain of sicknesses, rashes and earaches which may have</li> </ul>	<ul style="list-style-type: none"> <li>No water quality monitoring of coastal waters</li> </ul>

Type of Pathway	Specific Pathway	Description	Constraints and Challenges
		<p>been brought about by organisms drifting in sea currents or released in ballast water</p>	
Natural spread of Invasive Alien Species	Natural Migration	<ul style="list-style-type: none"> <li>Several introductions of plant pests and diseases into Saint Lucia which were invasive in nature and are suspected to have arrived on island by “natural” spread</li> </ul>	<ul style="list-style-type: none"> <li>No research undertaken</li> <li>The movement and spread of other IAS, including plant pests and diseases are not well documented.</li> </ul>
		<ul style="list-style-type: none"> <li>the Ivy Gourd vine (<i>Coccinia grandis</i>) and the Central American Iguana (<i>Iguana</i> spp.).</li> </ul>	<ul style="list-style-type: none"> <li>Both present challenges in terms of resources for public awareness and staffing to assist in the desired eradication attempts</li> </ul>
	Wind patterns	<p>At least one or two plant pests are suspected to have arrived into Saint Lucia and the Caribbean region via wind currents for example, the Eriophyid Mite of Coconut (<i>Aceria guerreronis</i>) – 1980. The African Desert Locust has arrived in the Caribbean on more than one occasion</p>	
Ecosystem Disturbance	Major roadworks		<ul style="list-style-type: none"> <li>Equipment brought in from overseas for these road projects was never inspected by plant health officials</li> </ul>
	LUCELEC	<p>Erected some pylons island-wide to carry high tension/voltage wires to various locations island. The vegetation under those lines was removed</p>	<ul style="list-style-type: none"> <li>Possible that plants invasive in nature have replaced the original vegetation.</li> </ul>
	Slash and Burn	<p>All vegetation, including trees is felled and when they dry up, fire is set to them.</p>	<ul style="list-style-type: none"> <li>Weeds species which favour the new habitat quickly invade exposed areas.</li> <li>Cleared land never planted and invasive weeds quickly replace the original vegetation.</li> </ul>

<b>Type of Pathway</b>	<b>Specific Pathway</b>	<b>Description</b>	<b>Constraints and Challenges</b>
	Construction Projects	Several approved projects have not been completed due to the economic downturn	<ul style="list-style-type: none"> <li>Land area that has been cleared is subject to opportunistic invasive species of plants.</li> </ul>
	Hitch hikers	<ul style="list-style-type: none"> <li>Reported that both live and dead hitchhikers, especially insects are regularly found in aircraft passenger cabins and baggage compartments. They have also been found in the holds of cargo aircraft.</li> <li>Hitchhikers are also found contaminating cruise and cargo ships' decks, quarters, holds and stores</li> <li>Shipping containers (air and sea) are found with hitchhikers (mollusks, weeds, and arthropods, including insect egg masses)</li> </ul>	<ul style="list-style-type: none"> <li>Little attention paid to hitch hikers</li> </ul>
Miscellaneous	Hosting of Major Regional/International events	The MALFF has had the experience of dealing with the importation of plant and animals, their products and associated equipment to facilitate international and regional festival and trade – related events	<ul style="list-style-type: none"> <li>Lack of collaboration between Ministries of government facilitating such events and the MALFF, has caused the delays in the ability of those plants and animals and their products to enter Saint Lucia.</li> <li>That same lack of collaboration has facilitated the entry of those items without the requisite permits and inspections at ports of entry</li> </ul>



**Box 4 : PATHWAYS**

A **pathway** is basically the route along which an alien species may be transported to a new location.

Pathways are typically described by reference to one or more of their defining features, such as the means of transport (e.g. aircraft, freshwater and marine shipping, roads), reason for the transfer of the species (e.g. farming, shipping or the pet trade) or the commodity involved (e.g. wooden packaging).

Trade can be considered as a pathway in itself because it does not always follow regular routes, yet is responsible for the movement of goods over short and long distances.

The more specific mechanism for species transfer within each pathway is referred to as a **vector**.

**Source: GISP.** A toolkit for developing legal and institutional frameworks for

The analyses of the challenges and constraints of the various IAS Pathways in Saint Lucia reveal the following:

- Increased mobility and human interaction through trade, travel and tourism are key drivers in the spread of invasive alien species into Saint Lucia.
- All main pathways for alien harmful organisms affecting plants and animals are regulated and controlled by the Crop Protection Unit, the Fisheries Department and the Veterinary Services and Livestock Division. These pathways are mainly plants (and plant parts), plant products (including wood), wooden packaging, soil and animals. Items prohibited from import are subjected to inspection at the country's borders on entry. Imported cargo at the airports is not monitored by the public or animal and plant health personnel. Only if animal or plant quarantine products are identified by Customs personnel, then the animal/plant health officers are requested to conduct examinations.
- All material intended for planting or for further cultivation have to be accompanied by a phytosanitary certificate that complies with the IPPC model. This certificate has to be issued by the Crop Protection Unit and by the national plant protection organization of the exporting countries in accordance with Saint Lucia's import regulations. Up to now, all consignments with regulated plants and plant products and animals have not only to be checked on the documentary side but also to be inspected physically by the appropriate agency. There are however instances of illegal importation. The inadequate staffing and resources for risk assessment at the agencies also means that the inspection process is not as robust as is envisaged. Other challenges faced by these agencies are how to respond to known invasive alien species and new alien species that could potentially become invasive as well as when to prevent their introduction or eradication.
- Two plant quarantine officers are stationed at the Hewanora International Airport and Port Castries, respectively, where facilities, which are under the control of SLASPA, leave room for improvement. There are, for instance, no incinerators, nor areas specifically earmarked for inspection of plant product

consignments, vessels, containers or vehicles. This applies to imports as well as exports<sup>16</sup>.

- Port Castries, Port Vieux Fort or the marinas are visited by plant and animal health officers from the main Crop Protection and Quarantine Office once or twice per week. These officers only concern themselves with phytosanitary or animal health matters. They are not trained to look out for aquatic alien invasive plants or animals which may enter the sea ports.
- Aircraft are never boarded by the quarantine officer after an international flight arrives and the passengers disembark. As it occurs now, after passengers disembark, cleaners board the aircraft to make them ready for return flights. All garbage collected by the cleaners is deposited into the local garbage stream, which ends up in the local landfill. There is no monitoring of the process by public health or animal/plant quarantine.
- At either airport, the holds of airlines are neither inspected nor treated for any possible human, animal, plant pests or diseases, hitchhikers or possible IAS.
- Cargo imported by mail or courier services is taken away from the airports and straight to the courier offices without any inspection by the public, animal or plant health personnel. Customs officers are based at those offices and if any plant or animal products show up at the time of their inspections, those personnel are then notified.
- Measures have not been sufficiently put in place to mitigate against the threat of IAS through marine craft. The handlers at the marinas and at the Ports are not knowledgeable about IAS and there are no information packages to help them become familiar with or identify possible IAS.
- Marine waste management has room for significant improvement. All organic waste from marine vessels, with the exception of cruise liners, are disposed off in communal bins in the marinas and then transported to the landfills for final disposal. Personnel at the Saint Lucia Solid Waste Management Authority are not familiar with IAS issues.
- As Saint Lucia is an important yachting destination, the use of fish gear in local waters without disinfection, the cleaning of debris from the bottom of the boats whilst inshore and failure to properly isolate from natural systems and destroy through disinfection or heat, the disposing of garbage and other organic waste via the general waste disposal mechanisms, and the permitting of visitors to exercise pets onshore are all pathways that are not being adequately monitored.

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<sup>16</sup> Mathurin, G. 2010a. *Strengthening Plant Health Services – St. Lucia*. Mission Report for FAO and EU, GCP/RLA/167/EC, SFA 2006 ST. LUCIA,

- Aquatic alien invasive plants or animals which may arrive into Saint Lucia on ship hulls, navigational buoys, floatation devices, anchors, chains, ropes, and flotsam or jetsam are not monitored. Neither are those invasives which may also hitch a ride on containers, pallets, crates, nets, traps, trawls, or other gear associated with the fishing industry and recreational equipment.
- Customs Officers, Ports Personnel, Ministry of Agriculture and Ministry of Health personnel all of whom are in the frontline of the major IAS pathways into Saint Lucia need training in the provisions, requirements and operating procedures of the various International Conventions and national laws that govern the entry of IAS into the country. The Fisheries Department is, however, willing to train plant and animal health officers based at ports of entry, in the recognition and monitoring of IAS and other CITES-related matters.
- Road networks are a “sub-pathway” for the spread of IAS plants in Saint Lucia. The spread of the pink hibiscus mealy bug and the Giant African Snail was roughly mapped and found to be closely associated with the road networks in Saint Lucia.
- Experience in Saint Lucia shows that public announcements and billboards alerting the citizenry to quarantine zones, are not sufficient to prevent people from “infecting” internal quarantine zones. Interestingly, some members of the public did check their vehicles for hitch-hiking Giant African Snails during the period just after it was reported as present in Saint Lucia.
- National quarantine and customs services have primary responsibility for preventing entry of hitchhiker and contaminant organisms, but the quarantine system in Saint Lucia has a dominant agricultural focus. On the other hand, the environment agencies lack a mandate and expertise to address biodiversity dimensions of quarantine and border control.
- The Plant Quarantine Service is under severe pressure to conduct timely pest risk analyses (PRAs) to determine whether some of these plants or their parts can be imported into Saint Lucia. Due to manpower limitations, the inspection of most of the consignments of imported plants is not thorough and few samples are taken for further analysis in the laboratory. Detection is usually based on symptoms expressed and there are many instances where plant quarantine officers could encounter symptomless hosts, or alternate host plants and plant parts. Additional parameters to be analysed now include economic impact, invasiveness and Living Modified Organisms (LMOs). Many times, official plant health information required to be obtained from countries where intended plant imports originate is not easily obtainable. The manpower and time required to conduct the appropriate diagnoses is not always feasible for perishable consignments.
- With severe resource limitations Saint Lucia cannot effectively address invasive alien species once they have been introduced or become established. Adopting vigorous prevention measures to keep invasive alien species from being

introduced in the first place is plainly the best way. The Crop Protection Unit, Veterinary and Livestock Services Unit, farmers, divers, hikers, photographers, port workers, Extension officers, Customs officers, bird watchers, etc. should therefore be trained to assist with early detection Education and awareness programmes targeted at these groups will be important. These programmes will have to demonstrate the value of native biodiversity and instil some sense of pride in protecting it.

### 3.3 National Policies Impacting on IAS in Saint Lucia

A number of policies relevant to the management of IAS have been identified in various other reports. A Summary of these is presented in Table 4 below. Not surprisingly, an assessment of the policies point to the following:

- Invasive Alien Species is a new phenomenon brought to attention by CBD and more recently CABI and UNEP which are executing the “*Mitigating the Threats of Invasive Alien Species in the Insular Caribbean*” project. As one of the participating countries, Saint Lucia has established a multi agency and multi sectoral Steering Committee. Very many of the agencies whose policies are reviewed in Table 4 are part of this Steering Committee
- Comparing the aim and scope of the policies reveals numerous similar elements which include *inter alia*:
  - ❖ Encourage and foster the participation of all stakeholders and relevant parties in planning and decision making;
  - ❖ promote participation through awareness and education;
  - ❖ the integrity of Saint Lucia’s biodiversity is maintained;
  - ❖ maintain or restore populations of native species; and
  - ❖ monitoring and surveillance.

All of these elements are necessary for an effective IAS management strategy

- Problems of invasive alien species have not yet attracted the attention they deserve in Saint Lucia. There are no specific policies that speak to IAS. Nevertheless, most of the policies – especially those relevant to biodiversity management – provide the frameworks for the future inclusion of IAS management tools. In this instance reference is made to the Biodiversity Policy and 2<sup>nd</sup> National Biodiversity Strategy and Action Plan (NBSAP); the draft Revised Fisheries Management Plan; Hazard Mitigation Policy; National Forest Policy; and National Wildlife Policy. Having said this, it is pointed out that IAS management is not seen as part of a broader suite of policies and measures to conserve biodiversity. Neither is it integrated into the broader environmental management process.

**Table 4: Policies Relevant to IAS Management in Saint Lucia<sup>17, 18, 19</sup>**

Type of Policy	Description/Objective	Sections Relevant to IAS Management
Agricultural Policy	In 2003 the Government of St Lucia refined its agricultural policy within the Agricultural Policy Framework proposed for the OECS. The measures reflected a three-pronged strategy: (i) Enhancing resource competitiveness of the banana industry (ii) Developing a diversified agricultural sector and (iii) Catalyzing the socio-economic transformation of the rural communities. In this regard, a comprehensive list of strategies was formulated to help foster growth and modernization of the agricultural sector.	Development of measures to improve natural resource management
Biodiversity Policy	Focuses on the protection of the island's biological diversity.	<ul style="list-style-type: none"> <li>• The status of biological resources is known, the people of St. Lucia and visitors to the island are all aware of the value and importance of these resources, and respect for biodiversity is integrated within the nation's culture;</li> <li>• Governmental agencies, non-governmental organizations, the private sector and communities are conscious, active and responsible participants in the management of biodiversity, and the concerns for the management of biodiversity are taken into account within policy-making processes at all levels;</li> <li>• The integrity of the country's biological diversity is maintained and, whenever possible, restored;</li> <li>• Biodiversity contributes optimally, through sustainable uses, to the social, economic and cultural development of the country, and to the physical, spiritual, and psychological well-being of all its people; and</li> <li>• National, regional and international efforts aimed at conserving biological diversity are consistent, mutually-supportive, and effective.</li> </ul>

<sup>17</sup> Adapted from Felix, Marie Louis, 2010. National Invasive Species Strategy for Saint Lucia Aquatic Ecosystems

<sup>18</sup> Adapted from Krauss, Ulrike, 2010. Critical Situation Analysis (CSA) of Invasive Alien Species (IAS) Status and Management, Saint Lucia carried out under the project *Mitigating the Threats of Invasive Alien Species in the Insular Caribbean* Project No. GFL / 2328 – 2713-4A86, GF-1030-09-03

<sup>19</sup> Adapted from Andrew, Gaspard Michael & Lyndon John, 2010. National Invasive Species Strategy: Terrestrial Ecosystem Analysis.

Type of Policy	Description/Objective	Sections Relevant to IAS Management
2 <sup>nd</sup> Biodiversity Strategy and Action Plan (2008)	Conservation and sustainable practices for use of biological diversity in Saint Lucia are effectively integrated into national development at all level	<ul style="list-style-type: none"> <li>• The expected outcomes of the goal are that: biodiversity objectives are mainstreamed into national development planning at all levels; community participation and involvement in biodiversity management are maximized; improved institutional framework and coordinating mechanisms for biodiversity management are supported by appropriate legislative and regulatory systems; and, effective monitoring and evaluation mechanisms are developed and implemented.</li> </ul>
Draft Revised Fisheries Management Plan		<ul style="list-style-type: none"> <li>• Maintain or restore populations of marine species,</li> <li>• Preserve rare or fragile ecosystems and habitats and other ecologically sensitive areas, especially coral reef ecosystems, estuaries, mangroves, sea grass beds, and other spawning and nursery areas;</li> <li>• protect and restore endangered marine and freshwater species;</li> <li>• promote relevant scientific research;</li> <li>• develop and increase the potential of living marine resources to meet human nutritional needs, as well as social, cultural, economic and development goals in a manner that would ensure sustainable use of the resources.</li> <li>• ensure effective monitoring and enforcement with respect to fishing and other aquatic resource uses</li> <li>• ensure integrated planning and a collaborative approach in terms of policies for the sector, fisheries and coastal zone management; and</li> <li>• cooperate with other nations in the management of shared, straddling and highly migratory stocks.</li> </ul>
Donations and Importation of Relief Supplies Policies and Guidelines in Saint Lucia after Disasters	Regulates national responses to a wide range of disasters and hazards, respectively.	<ul style="list-style-type: none"> <li>• Relevant to IAS management is a clear preference expressed in the former for local foodstuff, which, as stated in this policy, tends to be available for purchase and distributions somewhere on national territory, even during famines</li> </ul>
Fisheries Policy	Gives priority to the protection of the industry and to the protection of the resource base on which the industry relies.	<ul style="list-style-type: none"> <li>• Promote self sufficiency through increased marine and aquaculture production;</li> </ul>

Type of Policy	Description/Objective	Sections Relevant to IAS Management
		<ul style="list-style-type: none"> <li>• advance the social and economic status of fishers and their families;</li> <li>• improve the nutrition of the nation through the provision of increased volumes of fish.</li> </ul>
Hazard Mitigation Policy	Hazard analysis and experience have confirmed that Saint Lucia is at risk from natural, technological (man-made) and “slow onset” hazards. Some of the natural disasters given consideration include hurricanes, flooding, landslides, seismic and volcanic activity. The man-made hazards noted are dam collapse, explosions, oil and hazardous material spills, mass casualty, civil unrest, fires and information and communication technology disruptions. Additionally, the island is considered to be at risk to “slow on-set” hazards that include droughts, plagues, and the predicted effects of global climate change.	<ul style="list-style-type: none"> <li>• Minimizing risks to the environment</li> <li>• Fostering stakeholder participation, collaboration and integrity</li> <li>• Promoting public awareness and capacity building</li> <li>• Making available hazard information and data</li> </ul> <p>Recognizing that hazard mitigation is an investment in sustainable development</p>
The “Medical Waste and Other Bio-Hazardous Wastes Management Plan”	This a proposal to regulate waste streams for bio-hazardous general, industrial and medical wastes, including pesticides, condemned meats, and quarantined foods.. Gaps in current practices and weaknesses in infrastructure are presented together with partly costed solutions.	A prioritized list of hazardous organisms is also presented. To date, this remains largely a strategic wish list
National Action Programme to Combat Desertification/Land Degradation in Saint Lucia (NAPSAP) - DRAFT	To stem the continued loss of the productivity of land and reverse the declining trend in the availability and quality of the island’s water resources, to ensure a sustainable quality of life for the people of Saint Lucia.	If up-dated accordingly, it could provide a vehicle to address IAS and climate change
National Climate Change Adaptation Policy	The Aim of this policy is to foster and guide a national process of addressing the short, medium and long term effects of climate change in a co-ordinated, holistic and participatory manner in order to ensure that, to the greatest extent possible, the quality of life of the people of St. Lucia, and opportunities for sustainable development are not compromised.	There is no specific reference to IAS but a widely stated view is that climate change is likely to enhance the capacity of alien species to invade new areas, while simultaneously decreasing the resistance to invasion of natural communities by disturbing the dynamic equilibrium maintaining them.

Type of Policy	Description/Objective	Sections Relevant to IAS Management
National Communicable Disease Surveillance Manual (2006)	It offers guidance for the development or amendment of national communicable disease surveillance guidelines and includes an outline of the rationale and process for the revision of the national communicable disease surveillance system. The declared aim is to provide information for action.	While there is no specific reference to IAS the purpose of surveillance is not just to detect communicable diseases, but rather to respond to any communicable diseases with the appropriate disease control measure in a timely manner.
National Environmental Policy and National Environmental Strategy	The development of these documents was approved by the Cabinet of Ministers in St. Lucia in 2004, with the aim of improving environmental management and policy frameworks for the island. These documents are also produced as part of Saint Lucia's obligation to the St. George's Declaration of Principles for Environmental Sustainability in the OECS. The NEP sets out a broad framework for environmental management establishing links with all other relevant policies.	There is no specific reference to IAS
National Forest Policy	The Policy is directed at conserving the biodiversity of plants and animals life, while minimizing and mitigating the impacts of invasive alien species and climate change on the country's natural resources. Morton (2009c) <sup>20</sup> studied the use of native and invasive wildlife, including hunting. He recommends the establishment of a regulatory framework for the control of feral pigs as well as impact assessment of both the pigs and the control measures. Suggestions are also made to reduce resupply via escapes of domestic pigs. The report recommends an impact assessment of the opossum; in the meantime, their removal from sensitive sites is suggested, despite the species being protected under Schedule 1 of the Wildlife Protection Act.	<ul style="list-style-type: none"> <li>• Conserve and enhance the quality and productivity of the country's forest resources (natural and man-made) for ensuring a sustained flow of goods and services;</li> <li>• Encourage and foster the participation of stakeholders in planning and decision making for effective protection, management and development of the forests and wildlife;</li> <li>• Educate and maintain a high level of public consciousness regarding the functions of and benefits to be derived from appropriate forest and wildlife conservation (wise use and protection);</li> <li>• Conduct research and investigation into all aspects of the flora and fauna of the forests and the influence of forest cover on maintenance of water and soil resources, so as to provide the basis for informed management and development action.</li> <li>• Establish and maintain effective institutional arrangements and</li> </ul>

<sup>20</sup> Morton, M 2009. *A Survey of Wildlife Use on St. Lucia*. National Forest Demarcation and Bio-Physical Resource Inventory Project, FCG International & Durrell Wildlife Conservation Trust. Available at <http://www.bananatrustslu.com/index.php?link=doccentre&project=sfa2003>. Accessed on September 28 2010



Type of Policy	Description/Objective	Sections Relevant to IAS Management
		innovative financial structures
National Influenza Plan (NIP)	All responses are described in relation to the alert level, which is clearly defined. The policy also includes a ventilator policy, which, in the event of a severe pandemic, regulates the prioritization of access to ventilators.	<ul style="list-style-type: none"> <li>• The explicit provision for the destruction of all back yard birds, where the Influenza virus is confirmed. In that case, an appraisal team is to be deployed to value the birds, products and materials destroyed because of infection or exposure to avian influenza. Compensation will be given to owners, whose birds are caged or who can show proof of ownership for loose birds.</li> </ul>
National Land Policy	To guide the use, management, development and administration of land resources in Saint Lucia in order to optimise the contribution of land to sustainable development.	<ul style="list-style-type: none"> <li>• <i>Stewardship</i>: the policy seeks to instill a sense of responsibility in all stakeholders and to lead to a sharing of management costs and responsibility among the State, civil society, individuals and the private sector. All stakeholders must recognise that land ownership also comes with the responsibility to keep the land in adequate and productive condition.</li> <li>• <i>Collaboration and participation</i>: the policy seeks to promote the participation of stakeholders, to develop collaboration and partnerships among relevant actors, and to encourage community involvement in management whenever desirable and practical. Voluntary compliance will be promoted and encouraged to the maximum extent possible.</li> <li>• <i>Coordination and integration</i>: the policy will ensure that there is proper coordination among all actors, and that the policy objectives and instruments remain coherent, compatible and mutually reinforcing.</li> </ul>
National Wildlife Policy	initiative identified Invasive Alien Species (IAS) as critical	<ul style="list-style-type: none"> <li>• <i>Stakeholder participation</i>: To date consultations have largely involved traditional partners and stakeholders. There remains a need to identify and involve the non-traditional actors in the process. This should include wildlife conservation models involving the private sector</li> <li>• <i>Wildlife disease management</i>: Establish protocols regarding potential exotic pandemic diseases spread by wildlife (e.g. West Nile virus, Avian Influenza).</li> <li>• <i>Invasive Alien Species</i>: Establish protocols concerning potential IAS wildlife management issues.</li> </ul>
Tourism Policy	One of the main objectives in this draft policy is to establish tourism as a strategic economic development	There is no mention of IAS but the possibility of IAS, especially aquatic IAS impacting on tourism is recognised by the other sectors that are in the

Type of Policy	Description/Objective	Sections Relevant to IAS Management
	priority by ensuring it receives primary consideration when allocating financial, technical and physical resources. Its ultimate goal is to ensure benefits generated by tourism are as widely distributed as possible throughout the nation and among local communities	forefront of IAS management in Saint Lucia.

- Clear leadership or appropriate co-ordination is not in place for IAS prevention and mitigation. The policies remain sectoral. There is no cross-fertilisation of the policies and there is probably considerable wastage of resources resulting from the sectoral design and application of policies.
- Principle 3 of CDB's Guiding Principles recommends that measures to deal with invasive alien species should, as appropriate, be based on the ecosystem approach. This approach may be described as a strategy to protect complex and dynamic plant, animal and micro-organism communities and their non-living environment, which together interact as functional units, through integrated management of land, water and living resources<sup>21</sup>. While this approach is not clearly specified in the policies that are most relevant to IAS management in Saint Lucia, the intention for an ecosystem approach is understood.
- The policies indicate an absence of a strategic approach to IAS management with alien-related issues ignored or having low visibility in national environmental or biodiversity planning processes.
- None of the policies that impinge on IAS management call for closer coordination between competent sectoral authorities and organisations (e.g. veterinary, phytosanitary, agriculture, forestry, fisheries, environment and transport.
- There is endorsement in the policies relevant to IAS management of various versions of the precautionary approach.
- In Saint Lucia Invasive species issues often receive governmental attention on a piecemeal basis after major infestations<sup>22</sup>. Attention, unfortunately, wanes between harmful episodes. Also, as the policies indicate emphasis is on the management of individual species rather than the management of pathways. But as clearly articulated in the Pathways Report<sup>23</sup> and in the section above, Pathways rather than individual species provide the most efficient way to concentrate efforts at sites where pests are most likely to enter national boundaries and to intercept several potential invaders linked to a single pathway.
- Climate is among the most important determiners of a species ability to survive and thrive in a particular geographic area and determines in part an invasive species' viability and impact on expected, necessary ecosystem services and resources. Invasive species are symptomatic of climate change as well as environmental disturbance. The Intergovernmental Panel on Climate Change (IPCC) has confirmed that range shifts among marine flora and fauna have already began to occur in response to warming trends and include poleward

<sup>21</sup> Text of the CBD's guiding principles is available at <http://www.biodiv.org>

<sup>22</sup> Examples are the responses to pink hibiscus mealybug (*Maconellicoccus hirsutus*), the Giant African Snail (*Achatina fulica*) and the Amblyomma tick (*Amblyomma* sp.)

<sup>23</sup> Mathurin, Guy, (2010b) *ibid*

and elevational shifts<sup>24</sup>. There is then clearly much scope for reviewing and amending Saint Lucia's climate change adaptation policy so that it includes adaptation measures to combat increases in IAS invasions. While it is acknowledged that adaptation, as a risk management approach<sup>25</sup>, may become increasingly important in responding to invasive species, obtaining climate information is challenging and that downscaling global circulation models is not appropriate.

- The rapid response planning for invasive aquatic species remains very weak. That being said, preparations for probable infestation by the Lion fish will test the Fisheries Department's ability to respond to an invasive species "incident"<sup>26</sup>.
- The draft Fisheries Management Plan does not have a plan for invasive species management in marine protected areas. This is particularly important for the SMMA and the proposed West Coast Marine Management Area. Marine tourism, including recreational boating, yachting, the diving and snorkeling industry, and where allowed, fishing are activities that are likely to lead to increased risks of introducing non-indigenous marine species associated with hull fouling, ballast water (of some cruising yachts), the accidental transfer of species via anchor wells and chains, or on wetsuits as spores or microscopic phases, and bait material from recreational fishing.
- All the policies have not been assessed for likely compliance with international trade rules, taking particular account of national obligations under the WTO Agreement on the Application of Sanitary and Phytosanitary Measures. This is particularly important for Saint Lucia since most of the pathways for IAS are trade and tourism related.

A national policy provides guidance to planners, decision-makers and law-makers. It should contain clear long-term goals and objectives of invasive alien species management, which are grounded in the country's primary approach and other policy choices, and should address broadly how such goals and objectives are to be met. The proposed NISS will provide the national policy framework for IAS management in Saint Lucia.

### 3.4 National Legislation and Conventions Impacting IAS Management in Saint Lucia

#### 3.4.1 National Legislation

Several Acts are directly and highly relevant to prevention of IAS entry into Saint Lucia<sup>27</sup>. The most notable of these Acts are the Animals (National and

<sup>24</sup> Sorte, C.J.B., S.L. Williams, and J.T. Carlton. 2010. Marine range shifts and species introductions: comparative spread rates and community impacts. *Global Ecology and Biogeography*.

<sup>25</sup> Possible examples include the altering of forest management practices in threatened areas to reduce vulnerability to forest pests and redesigning public parks and green spaces to reduce exposure to disease vectors (e.g., mosquitoes).

<sup>26</sup> An incident is an isolated introduction of a species that has yet to become established in the ecosystem.

International Movement and Disease Prevention) Act and its predecessor, the somewhat outdated Control of Importation of Live Fish and the Importation of Bees Acts, the Plant Protection Act with accompanying Instruments, and the Quarantine Act.

While there is no legislation specific to the management of IAS in Saint Lucia, there are a few pieces of legislation which are relevant for preventing IAS entry into the country. Foremost are the following pieces of legislation<sup>28, 29, 30</sup> :

- **Animals (National and International Movement and Disease Prevention) Act, (1956).** Among other things this Act
  - ❖ Prevents movement of material in and out of the infected area
  - ❖ Allows for the slaughter of animals or other treatments to control disease and allows for compensation of owners
  - ❖ Prohibits the import of birds, reptiles or insects without license and requires quarantine for specified times
  - ❖ Provides the Minister with the authority to make regulations, for the purpose of preventing the introduction or spread of diseases, of animals or poultry or any specific kind thereof (e.g. carcasses, fodder, litter, dung etc.)
  
- **Plant Protection Act (1988)** with accompanying Instruments. The Act :
  - ❖ Prohibits or restrict the importation of any planting material, fruit vegetable, plant product or soil, or any other non-plant related material which may result in the entry of plant pest;
  - ❖ Makes provisions for the quarantine of materials;
  - ❖ Makes provisions for the disinfecting or destruction of plant or associated materials;
  - ❖ Makes provisions for the issuing of permits for the importation of plant material; and
  - ❖ Provides for the conditions under which such introductions may be deemed a notifiable pest, and outlines measures for control and eradication.
  - ❖

Whilst management of IAS are not specifically addressed, it does place significant regulations on the entry of plants into the country, and in so doing helps contribute to prevention and early detection of invasive species. The Plant Protection Board was established under this Act to advise on matters pertaining to plant health and quarantine. This Unit is assisted by the Customs and Excise Department, the Agriculture Extension Division and other agricultural institutions

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<sup>27</sup> Krauss, Ulrike, 2010. Critical Situation Analysis (CSA) of Invasive Alien Species (IAS) Status and Management Saint Lucia.

<sup>28</sup> Krauss, Ulrike, 2010 *ibid*

<sup>29</sup> Polar, Perry and Ulrike Krauss. National Legislative Frameworks on Invasive Alien Species in Selected Caribbean Island States. CABI

<sup>30</sup> Felix, Marie Louise, 2010. *ibid*

- **The Quarantine Act (1944) :**
  - ❖ Allows the Governor in Council to make regulations to prevent danger to public health from ships or aircraft or persons or things therein, arriving at any place or any time;
  - ❖ allows the Minister to make recommendations to prevent the spread of infection by means of ships or aircraft about to leave anyplace, or by means of any person or thing about to leave any place in any ship or aircraft;
  - ❖ allows for the Establishment of a Quarantine Authority which makes the rules for effecting and supplementing regulations; and
  - ❖ allows for the destruction of vectors of disease (e.g. mosquitoes, rats).
  
- **Control of Importation of Live Fish Act (1952)** prohibits the importation of non-indigenous fish species without a license and makes provisions for penalties and destruction of fish.
  
- **Fisheries Act, No. 10 of 1984 and Fisheries Regulations No. 9 of 1994 .** This act, *inter alia* provides for the following provisions:
  - ❖ Vessels wishing to carry out sport or recreational fishing in St. Lucia waters need to apply for permission from the Department of Fisheries;
  - ❖ If someone wishes to export or import fish they need to apply for permission from the Department of Fisheries;
  - ❖ It is illegal for someone or a company to put any poison or other pollutant into rivers or the marine waters of Saint Lucia; and
  - ❖ Any person who contravenes or fails to comply with any of these regulations shall be liable to a fine up to five thousand dollars.

Two new pieces of legislations<sup>31</sup> are of relevance to IAS management in Saint Lucia. These have not been enacted as yet:

- **Biodiversity Conservation and Sustainable Use Bill (2008).** Of all the sections of this legislation, Part III is of most significance to the management and control of IAS. This section provides the framework for the management of biological resources. It is divided into four divisions. This Part of the Bill seeks to give effect to Articles 6-11 of the Convention on Biological Diversity. In Division 1, clauses 14-16 provide for the preparation and implementation of a national biodiversity policy, strategy and plan of action. Under Division 2, by virtue of Clause 17, the Minister has the power to publish a list of species that are endangered, may become endangered or which need to be controlled to meet conservation objectives. Clause 18 provides for the preparation of a recovery plan for each species listed under Clause 17. The Minister by virtue of Clause 19 may also publish a list of activities that are prohibited from being carried out in respect of any species listed under Clause 17. Clauses 20 -22 prohibit a person from taking a listed species, from importing or voluntarily introducing non-indigenous species into native ecosystems or re-introducing indigenous and threatened species into an ecosystem unless that person is the holder of a valid

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<sup>31</sup> Felix, Marie Louise, 2010, *ibid*

permit issued by the designated officer. Offences and penalties are created in respect of contraventions of Clauses 20-22.

- **CITES Management Act (in draft).** This legislation is not yet passed but it is designed to enable effective implementation of the CITES Convention in St. Lucia. As such, it gives priority to the monitoring and regulation of all importation and exportation of wild flora and fauna. The draft legislation requires the acquisition of relevant permits CITES and national trade permits prior to transboundary movement of animals and plants. The draft Act also restricts movement, into the country, of species that are believed to be potentially harmful to local biological diversity. Under the Act the Minister of Agriculture has power to implement stricter controls than those required under the Convention. The Minister can therefore control not only the movement of species listed on the CITES Appendices but any others that may be considered a threat to biological diversity as a result of trade.

Other relevant legislation includes the Maritime Areas Act (1984), for marine space use and pollution; the Public Health Act (1975), for aspects of land-based sources of pollution; the Solid Waste Management Authority Act (1996); the Wildlife Conservation Act (1980); the Land Development Control Act (1971); and the National Conservation Act (1999), which deals with beach use, parks and protected areas. There is now a revised Physical Planning and Development Act No. 29 of 2001, which includes Environmental Impact Assessment regimes. Further, a Marine Pollution Act, and a Returnable Container's Act are also underway.

Noteworthy is that these legislations prevent the entry of invasives; there is no accompanying legislation for the control of the invasives once they have entered the country. Furthermore, the existing phytosanitary instruments do not address invasive alien species beyond agricultural pests and diseases.

Table 5 below provides a checklist of questions<sup>32</sup> that were used to assess the existing legal frameworks on IAS in Saint Lucia. A review of the Saint Lucian policies and legislation against the range of strategic options (**Prevention, Early Detection and Rapid Response, Eradication and or Containment, and Impact Mitigation**), that will be included in the NISS, was also undertaken. This review is summarised in Table 6

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<sup>32</sup> Adapted from GISP, 2008 *ibid*

**Table 5: Assessment of Legal Frameworks for IAS Management in Saint Lucia**

<b>Main Issues</b>	<b>Assessment</b>
What policies dealing directly or indirectly with invasive alien species are in place?	No policies dealing directly with IAS. Policy on IAS to be developed as part of the NISS process. There are a number of policies that deal indirectly with IAS. Refer to Table 4
How do the policies approach the issue (integrated perspective e.g. deal with all IAS concerns regardless of the pathway, vector, commodity or economic sector concerned? or sectoral perspective e.g. dealing only with threats to agricultural crops and livestock)?	The Indirect policies are sectoral, dealing primarily with threats to agricultural crops and livestock. There are no policies that deal with pathways. The Quarantine Act however allows the Minister to make recommendations to prevent the spread of infection by means of ships or aircraft about to leave anyplace, or by means of any persons or thing about to leave any place in any ship or aircraft.
Does the law establish procedures (e.g. permitting requirements) to control the intentional introduction of alien species?	The Plant Protection Act makes provisions for the issuing of permits for the importation of plant material. The importation of non-indigenous fish species requires a license. The draft CITES Management Act requires the acquisition of relevant permits CITES and national trade permits prior to transboundary movement of animals and plants.
Does the law restrict the introduction of alien species, particularly potentially invasive alien species, into protected areas and other environmentally sensitive areas?	The Biodiversity Conservation and Sustainable Use (BCSU) Bill 2008 prohibits a person from taking a listed species, from importing or voluntarily introducing non-indigenous species into native ecosystems or re-introducing indigenous and threatened species into an ecosystem unless that person is the holder of a valid permit issued by the designated officer.
Have the pathways and vectors that pose the highest risk of introducing invasive alien species into and within the country been identified?	These Pathways were identified in a report in 2010. This Report was prepared as a background document to the NISS. The document does not however identify the vectors.
What if any legal measures exist to minimise risks associated with such pathways?	None of the laws that deal with IAS, albeit indirectly, deal with pathways. There are however legal measures to govern inspections and quarantine at entry points. These entry points are important for the trade and tourism induced pathways.  The Quarantine Act (1994) aims to minimize the entry and spread of infectious human diseases. The Act allows for regulations to be passed that prevent danger to public health from ships or aircraft or persons or things therein, arriving at or intending to leave from national territory. The Act provides for the establishment of a Quarantine Authority and allows for the destruction of vectors of disease (e.g. mosquitoes, rats).
What legal measures exist to support early warning, rapid response and control of IAS?	The Plant Protection Act(No. 21 of 1988) with Statutory Instrument No. 66 of 1995 and Section Instrument (No. 71 of 1995)provides for the control of pest and diseases injurious to plants and to prevent the introduction of exotic species. The Act (i) prohibits or restrict the importation of any planting material, fruit vegetable, plant product or soil, or any other non-plant related material which may result in the entry of plant pest (ii) makes provisions for the quarantine of materials (iii) makes provisions for the disinfecting or destruction of plant or associated materials (iv) makes provisions for the issuing of permits



	<p>for the importation of plant material and (v) provides for the conditions under which such introductions may be deemed a notifiable pest, and outlines measures for control and eradication.</p> <p>The Plant Protection Act provides for the conditions under which such introductions may be deemed a notifiable pest, and outlines measures for control and eradication.</p>
Have IAS already established in the country been given an appropriate legal status (e.g. classification as “weeds”, “plant pests”, “notifiable diseases” etc) to facilitate control and eradication programmes and are these classifications regularly reviewed and updated?	There are no laws to addresses the risk of an exotic imported animal becoming invasive. The Plant Protection Act recognises the risk posed by exotic plants turning weedy. However, with “weed’ not being defined, the text remains weak. In the accompanying Regulation, a long list of plants with import restrictions is provided, almost exclusively on phytosanitary grounds. This list is not regularly reviewed or updated.
Are there any provisions in law that create incentives or impose duties (e.g. on landowners) to take measures to report, contain, eradicate or mitigate the adverse impacts of IAS?	Control of Importation of Live Fish Act (1952) prohibits the importation of non-indigenous fish species without a license and makes provisions for penalties and destruction of fish. The Wildlife Protection Act No. 9 of 1980 carries a maximum penalty of one year imprisonment or maximum fine of EC \$5,000.00 on summary conviction for any offences committed under the Act.
Are there any provisions in law that create incentives or impose duties (e.g. on landowners) to take measures to restore ecosystems damaged by IAS?	There are no such provisions in the legislation.

**Table 6: Gaps and Challenges in Addressing Strategic Policy Options in the Management of IAS In Saint Lucia<sup>33</sup>**

Types of Strategic Intervention	Aim of Intervention	Existing National Instruments		Gaps and Challenges
		Policies	Legislation	
<b>Prevention</b>	Stopping introductions	Biodiversity Fisheries, Environment, CITES, SPAW, Biosafety Protocol	Customs Act, Plant Protection Act 1988; BCSU Bill 2008	Insufficient knowledge available on species and impacts <i>(list of priority invasive species has been formulated in 2010)</i>

<sup>33</sup> Adapted from Felix, ML, 2010. *ibid*

Types of Strategic Intervention	Aim of Intervention	Existing National Instruments		Gaps and Challenges
		Policies	Legislation	
	Managing ballast water from ships	Cartagena Convention; CBD; MARPOL ; UNCLOS	Shipping (marine pollution) Act 1994	The MARPOL Convention has to be signed
	Preventing release of fouling organisms from boats, scuba gear, fishing tackle regulated	Cartagena Convention; CBD; MARPOL	Shipping (marine pollution) Act 1994; UNCLOS, Fisheries Act 1984 & Regs.1994	No controls in place to prevent introduction of fouling organisms into marinas. / Signing of the MARPOL Convention pending.
	Stopping Intentional introductions	CBD, Fisheries, CITES, SPAW, Biosafety Protocol	Plant Protection Act 1988; The Animals (Disease and Importation) Act 1994	IAS have been introduced for aquaculture and agriculture. There are no national policies on such introductions.
	Mitigating unintentional introductions: aquaria, live food industry	Fisheries, Biodiversity, Environment, MARPOL, IPPC	Plant Protection Act 1988; Fisheries Act 1984, Regs.1994	Regulations on import of aquarium fish and invertebrates are not sufficient.
	Managing solid waste from yachts and other pleasure craft	National Waste Management Strategy, MARPOL	Waste Management Act 2004; Shipping Act 1994	Waste from yachts and other pleasure craft are not sorted and/or treated before going to the landfill.
	Disposing animal waste from transit crafts	Biodiversity policy; public health,	Shipping Act 1994; Waste Management Act 2004; Animal Ordinance Act 1994	There is so special treatment of such waste now. Waste is placed in communal bins available at the marinas.
	Sensitising travelers	Biodiversity, Environment, Public Health	Most of the St. Lucia laws make provisions for information sharing	No information is provided on IAS, especially of aquatic species.
<b>Early Detection and Rapid Response</b>	Undertaking risk analysis of reported invasions	CZM, Fisheries NCCADP, BD, UNCLOS,	BCSU Bill 2008	Inadequate technical capacities and an absence of a lead agency
	Participating in regional exchanges of information and databases	NHM, Public Health,		Inadequate capacities in agencies

Types of Strategic Intervention	Aim of Intervention	Existing National Instruments		Gaps and Challenges
		Policies	Legislation	
	Education and sensitisation	Education, CZM, Fisheries, Public Health, IPPC, CBD	Education Act 1999, Fisheries Act 1984 & Regs.1994, BCSU Bill 2008,	Various Publics are unaware of IAS issues. No Communications Strategy for IAS No Lead Agency to spearhead communications and sensitisation strategies
	Formulating an Early Response Plan	Disaster Management Act 2006	NEMO and other agencies within the NEMAC	No IAS Plan available and no mechanism in place to report IAS sitings No Lead Agency
<b>Eradication and or Containment</b>	Developing species and ecosystems baselines	CBD, Biodiversity, Fisheries, CZM, SPAW	Fisheries Act 1984 & Regs.1994,	Inadequate knowledge and scientific information available
	Establishing eradication protocols	CZM, Biodiversity, Fisheries, Health,	Public Health Act 1975, Fisheries Act 1984 & Regs.1994, Quarantine Act (1994)	There are no protocols or management plan(s) for eradication and containment
<b>Impact Mitigation</b>	Reducing or eliminating negative impacts on ecosystems, health and socio-economic systems	CZM, Biodiversity, NEP & NEMS, SPAW, IPPC, Public Health,	Fisheries Regulations 1994, BCSU Bill 2008 Disaster Management Act 2006, Public Health,	Inadequate scientific information Inadequate technical capacities Inadequate laboratory equipment

### 3.4.2 Treaty Commitments

The Tematea<sup>34</sup> database was referenced to check on Saint Lucia's commitments to the various Multilateral Environmental Agreements and Conventions. A non-exhaustive checklist of key international instruments that were analysed includes:

- The Convention on Biological Diversity (CBD, 1992). This calls on States to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species” (Article 8(h)). Parties to this Convention have identified invasive alien species as a cross-cutting theme across different work programmes (e.g. inland water systems, forests, coastal and marine management). In 2002, they approved a set of 15 Guiding Principles for invasive alien species prevention and management which provide an essential checklist for the development and strengthening of national frameworks;
- Other biodiversity-related instruments that specifically address invasive alien species issues (Ramsar Convention on Wetlands 1971; Convention on International Trade in Endangered Species of Wild Fauna and Flora 1972;
- The United Nations Law of the Sea Convention (1982), regional seas conventions concluded under the United Nations Environment Programme (several of which contain general provisions on invasive alien species in the marine environment) ;
- The International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004, adopted under the auspices of the International Maritime Organisation);
- Treaties and standards focused on protecting plant health against the introduction and spread of plant pests (International Plant Protection Convention 1951, revised 1957, and its global network of nine regional plant protection organisations; International Standards for Phytosanitary Measures formally adopted within the IPPC framework).
- international codes and procedures focused on protection of animal health, developed by the World Organisation for Animal Health (OIE);
- International Health Regulations of the World Health Organisation (1969, amended 2005) that aim to prevent, control and provide a public health response to the international spread of disease in ways that avoid unnecessary interference with international traffic and trade.

Saint Lucia is a party to the following International Agreements:

- CBD
- CITES
- UNCLOS

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<sup>34</sup> TEMATEA is a guide for coherent implementation of the obligations arising from biodiversity-related agreements and other relevant agreements. It promotes strategic use of financial and human resources and reduces unnecessary overlapping by highlighting synergies of common issues across sectors and conventions.

- Agreement for the Implementation of Provisions of the Convention Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
- Cartagena Convention
- Ramsar Convention
- Cartagena Protocol
- WHO International Health Regulations
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (GloBallast)
- IPPC.
- Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction
- Convention on the Prohibition of Military or any Hostile use of Environmental Modification Techniques
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
- United Nations Framework Convention on Climate

Finally, Saint Lucia subscribes to the Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens; and is a member of the International Civil Aviation Organisation (ICAO); and Caribbean Plant Protection Commission (CPPC)

In all, Saint Lucia is a member or party to 17 of the 25 Agreements that were reviewed. Nevertheless there are gaps to Saint Lucia's obligations: Obligations and recommendations under each instrument have not been adequately transposed into the domestic legal system. These are summarised in Table 7 below.

**Table 7: Gaps in Saint Lucia's Obligations and Commitments to International Agreements and Conventions that Impact on the Management of IAS<sup>35</sup>**

Relevant Obligations and Commitments	Measures to mitigate Gaps
<a href="#">IPPC 7th ICPM, section 12.1, 148, 7a</a>	Enhance plant protection laws and policies, to include the protection of biodiversity against the impacts from IAS
<a href="#">CBD Decision VIII/27, 64</a>	Ensure that relevant laws and provisions do not inadvertently constrain the use of appropriate measures to address IAS
<a href="#">CBD Decision VI/23, 10c and CBD Decision VI/23, Annex (IAS Guiding Principles)</a>	Review policy and legislation in light of the IAS Guiding Principles
<a href="#">CBD Decision VI/23, 10d</a>	Incorporate IAS considerations into national strategies and policies on the basis of an ecosystem approach

<sup>35</sup> <http://www.tematea.org/?q=node/14> Accessed on September 29 2010.

Relevant Obligations and Commitments	Measures to mitigate Gaps
<a href="#">Ramsar Resolution VIII.18, 19</a>	Develop national strategies and responses to IAS
<a href="#">Ramsar Resolution VIII.18, 21</a>	Cooperate with national focal points for other conventions in the development of national policies and strategies to manage the threats from IAS
<a href="#">CBD Decision VI/23, 10a</a>	Identify national needs and priorities for IAS
<a href="#">CBD Decision VI/23, 10b</a>	Create mechanisms to coordinate national programmes on IAS
<a href="#">CBD Decision V/8, 6</a>	Develop IAS strategies and action plans
<a href="#">CBD Decision IV/1, 4</a>	Address IAS issues for the conservation and sustainable use of biological diversity in national strategies and action plans
<a href="#">BWM Article 2, 5</a>	Develop ballast water management standards
<a href="#">BWM Article 4, 2</a>	Develop national policies, strategies or programmes for ballast water management

### 3.5 Weaknesses in the National Policy and Legislative Frameworks

If Saint Lucia is to manage invasive alien species effectively, it needs a supportive policy, legal and institutional environment underpinned by scientific and technical baseline information. National policy and legal frameworks define agreed objectives and provide the basis for establishing principles, standards and procedures to achieve them. They assign responsibility to particular government authorities and give them the authority to carry out their mandates. They also establish the institutional mechanisms needed to develop and implement detailed regulations, ensure compliance, monitor success and failure, and promote policies for improved implementation.

- a. Policies and legislation have developed, by sectors, over a long time scale. Invasive Alien Species related provisions are distributed across agriculture, forestry and biodiversity conservation, water resources, fishing and quarantine legislation. The reasons for this sectoral approach are usually historical or administrative rather than scientific or technical.
- b. Specific legislation dealing with invasive species in Saint Lucia is lacking. Much of what is available is outdated and does not satisfy agreed-upon international conventions and treaties. There is inadequate legislation to deal with invasives once they entered Saint Lucia.
- c. The fragmented policy, legal and institutional frameworks result in:
  - Absence of a strategic approach to the problem, with alien-related issues ignored or having low visibility in national environmental or biodiversity planning processes.
  - Low levels of coordination and/or familiarity between agencies responsible for phytosanitary matters, trade, natural resource and biodiversity conservation and other sectors.

- Dispersed character of existing provisions and inconsistent legislative treatment, reflected in different institutions, definitions, criteria, standards and procedures.
- Exclusive reliance on 'command and control approaches', with little use of incentive measures or economic instruments to deter unwanted introductions or promote eradication and control.
- Enforcement deficit (low levels of compliance, poor accountability) because conventional criminal and civil law procedures in Saint Lucia are difficult to apply in the alien species context.
- Absence of legal measures to address pathways or vectors for unintentional introductions.
- Risk analysis and permit procedures are cumbersome, time-consuming and costly.
- There are no legally backed requirements for monitoring.
- Absence of clear powers and obligations for eradication, containment or control.
- Crisis management approach towards invasions.

Despite a number of weaknesses in the policy and legislative frameworks, it must be acknowledged that there is a sufficient platform in Saint Lucia to build a substantial framework for the management of IAS. This platform provides a very strong foundation for the development of a national strategy for the control and management of invasives in the country. Once the administrative, legal and institutional gaps are mitigated, and a NISS together with a communications strategy are in place, then Saint Lucia will be able to substantially enhance its management of IAS. It is however also acknowledged that there are a number of key generic issues which will continue to underpin IAS management in Saint Lucia. These include the:

- shortage and inaccessibility of scientific information on basic biology (for risk assessment and development of management strategies);
- inadequate enforcement of existing legislation;
- shortage of technically trained personnel;
- gaps in pathways coverage;
- inadequate quarantine and risk assessment infrastructure; and
- insufficient funding to develop infrastructure, train personnel and develop risk assessment and invasive species management mechanisms.

## 4.0 INSTITUTIONAL ARRANGEMENTS FOR IAS MANAGEMENT IN SAINT LUCIA

Responsibility for alien invasive species control in Saint Lucia is shared between various sectors at various levels. There is no coordinating framework to link the high number of administrations and agencies with relevant powers or duties or to ensure consistent implementation. There are also institutional and administrative conflicts of interest. Such a conflict arises where the Ministry of Agriculture, Lands, Forestry and Fisheries is legally responsible both for regulating and promoting trade. The Ministry has a statutory duty to promote agricultural, forestry and fisheries development, and to enforce quarantine controls. Practical difficulties arise when officials come under pressure from traders to release consignments from post-entry quarantine earlier than scientific caution might dictate<sup>36</sup>. It is preferable for these line responsibilities to be clearly separated.

**Box 5: Agencies involved in IAS management in Saint Lucia**

**MALFF**

- Crop Protection Unit
- Plant Propagation
- Forestry
- Fisheries
- Veterinary Division
- Biodiversity Office
- SMMA

**SLASPA**  
**MOH**

**Agencies that could potentially be involved in IAS management in Saint Lucia**

**SLSWMA**  
**NEMO**  
**SDED**

- CZMAC

Departments. The MALFF is also responsible for prevention, control and eradication of alien species.

The Crop Protection Unit is responsible for pathway management. The Unit issues plant import permits; phytosanitary certificates and pesticides import licenses. It also certifies major crops for export; undertakes import inspections at official ports of entry or on consignee premises; and conducts diagnostics of farm pests and diseases. The Unit also undertakes occasional surveys/surveillance activities for plant pests/diseases and provides farmer and extension officer training.

The Crop Protection Unit is inadequately staffed. There are no entomologists, plant pathologists, weed specialists, or nematologists. There is at this time, no scientific authority for alien species control. Risk Assessments are undertaken by the Crop Protection Unit. Their diagnostic capabilities are, however, severely compromised. The Unit has to depend on external free sources to undertake the diagnostics. Unfortunately, these free services are not timely.

The Fisheries Department issues import licenses for all aquarium fish. The aquarium trade however is inadequately monitored<sup>37</sup>. The Forestry Department issues

<sup>36</sup> Hedley, J. 1999. *The International Plant Protection Convention and Invasives*. Paper presented at the Workshop on Legal and Institutional Dimensions of Invasive Alien Species Introduction and Control, Bonn, Germany, 10-11 December 1999. Available at <http://www.iucn.org/themes/law/>. Accessed on September 30 2010.



a permit for keeping wild animals. No EIA is required as part of a permit application to introduce an alien species or organism. Neither is an EIA required prior to the import of aquatic organisms for aquaculture. Environmental Impact Assessments are solely used for “controlling” development.

Customs Authorities play an important role in the application and enforcement of border controls. They also control imports/exports and carry out surveillance activities around the island. They have powers to prohibit imports, impose restrictions on certain products, execute inspections, detain particular consignments and treat or destroy living material.

The Saint Lucia Air and Sea Ports Authority (SLASPA) is responsible for the management of air and sea ports, including marinas.

Alien species present on Saint Lucia may become invasive for the first time when moved (intentionally or unintentionally) to a new part of the island. There are however, no legal frameworks that could provide a basis for regulating intentional domestic movements of alien species and for assessing projects and activities that may create pathways for subsequent invasions. Mathurin<sup>38</sup> describes case of the *Amblyomma* tick. Actual quarantine areas were demarcated and road signs and posters displayed. It did not take officials long to recognize that, because of the “culture” of the country, it would be virtually impossible to implement such internal quarantines. At several meetings that the author attended, the thought of police assisted road-blocks set up to search for mealybugs, snails, ticks and other pests seemed very “far-fetched”. As predicted then, all of these pests/diseases spread island-wide due to human activity and movement of contaminated conveyances and articles.

The challenge for Saint Lucia is how to respond to known invasive species and new alien species that could potentially become invasive as well as when to prevent their introduction and eradication. Management of IAS is not the responsibility of one single agency. It should involve a number of Ministries, the private sector, and community based organisations. The importance of cooperation between agencies, including the Crop Protection Unit, the Fisheries and Forestry Departments, the Customs and Excise Department, SLASPA, shipping agencies and the tourism sector is critical for protecting Saint Lucia from IAS. With the exception of the Crop Protection Unit, and the Fisheries and Forestry Departments, all the other agencies involved are not informed and do not have any idea of IAS. Additionally, a clear leadership or appropriate coordination or prevention and mitigation involving all relevant sectors and different levels of government is required. The question, however, is, who leads this process?

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<sup>37</sup> (a) A checklist of approved aquarium fish does not exist; (b) inspectors at ports inadequately trained to identify fish species being imported; c) no regulations or guidelines in place to govern the disposal of water in which aquarium fish and freshwater turtles are imported. Stowaways have also been found.

<sup>38</sup> Mathurin, Guy, 2010 (b), *ibid*

In the development of appropriate legal and institutional frameworks for IAS management in Saint Lucia, updating of existing frameworks to address the subject is the preferred option. An enhancement of the role/functions of the Corp Protection Unit to deal with IAS management as a whole has much to gain for Saint Lucia faces severe constraints in the creation new institutions.

In summary in order to manage IAS effectively and efficiently in Saint Lucia the policy, legal and institutional frameworks must incorporate the following:

- a. A clear leadership or appropriate coordination for IAS prevention and mitigation involving relevant sectors and key stakeholders and by the Crop Protection Unit.
- b. Encourage efficient use of existing structures, procedures and expertise relevant to trade, movement, holding and management of potential IAS (e.g. Crop Protection, Fisheries, Forestry, Customs, Veterinary Services, quarantine services, immigration authorities).
- c. Only where gaps, inadequacies, inconsistencies are encountered should new investments in management be undertaken.
- d. Fully incorporate IAS prevention and mitigation into appropriate existing sectoral legislation and in biodiversity and other relevant policies, strategies and action plans consistent with international law.
- e. Develop specific strategies and action plans to address all aspects of IAS prevention and mitigation.

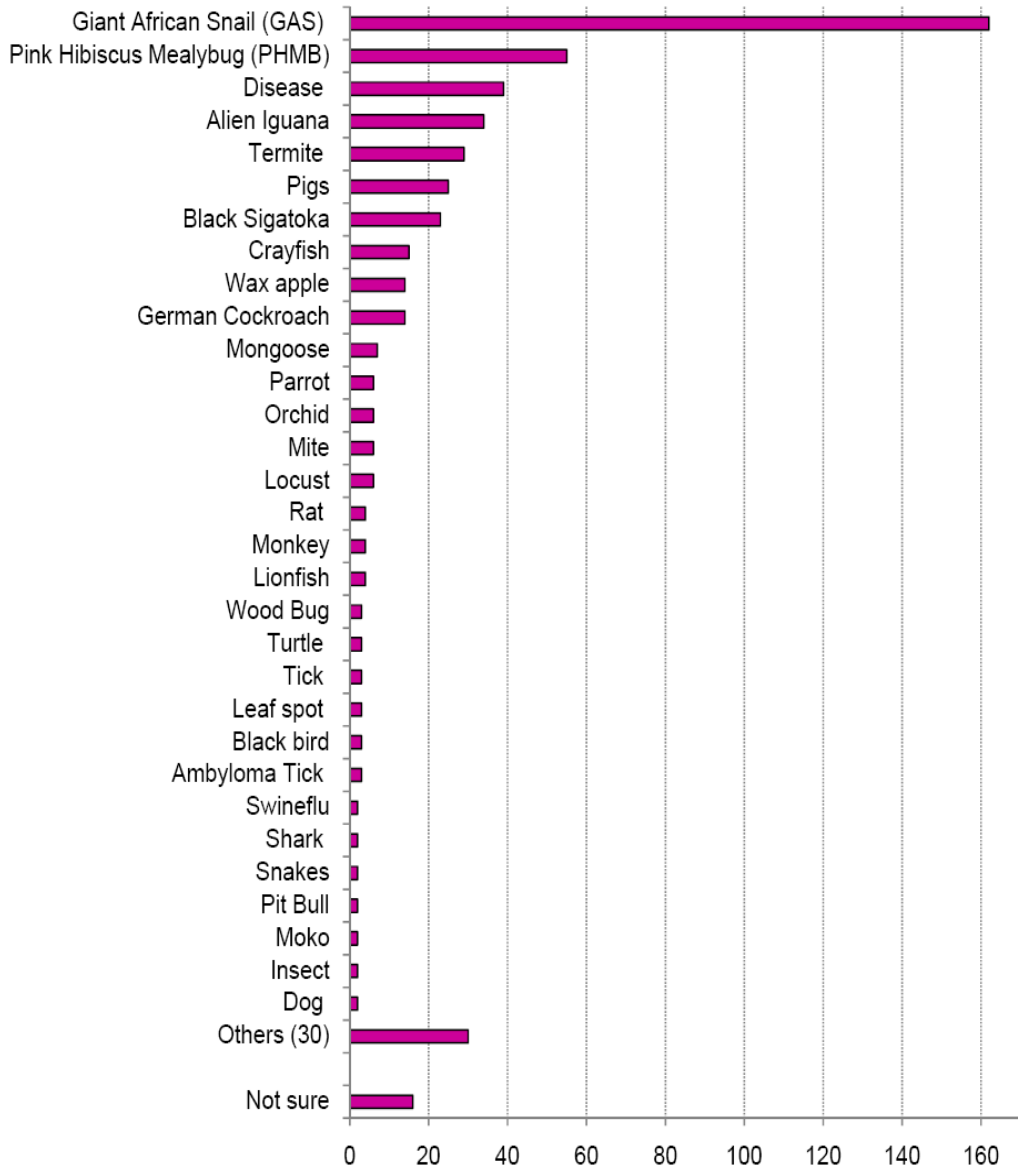
#### 4.1 Public Awareness and Communications

There is a broad lack of awareness in Saint Lucia of the threat posed by IAS in general, and often even of the dangers associated with individual species. In a Baseline Survey on IAS that was undertaken in Saint Lucia in 2010<sup>39</sup>, only 34% of respondents had ever heard the term “invasive alien species” (IAS). Generally people recognized that IAS were exotic species; their effect, however, was little known. When those respondents who did believe in the negative impact of IAS on St. Lucian biodiversity were asked to name examples of IAS that affect or threaten St. Lucian biodiversity, a total of 62 taxa were named. The most recognized were the giant African snail (GAS), the pink Hibiscus mealybug (PHMB), diseases, alien iguanas, termites, feral pigs, Black Sigatoka, crayfish, wax apple, and German cockroaches (Figure 13). The lionfish, which is not yet present, ranked 18th and was one of only two named IAS that are still absent from St. Lucia. The other one was Moko disease of banana, ranked 30th. It is not surprising that mentioned IAS tended to be those that (also) impact agriculture. Refer to Figure 6 below.

Awareness of IAS species is also a function of the sensitisation that has taken place in an area about a particular invasive. Awareness of the alien iguana, for instance, was

<sup>39</sup> Krauss, Ulrike, 2010. Invasive Alien Species (IAS) Awareness Baseline Survey, Saint Lucia carried out in support of the Critical Situation Analysis (CSA) under the project *Mitigating the Threats of Invasive Alien Species in the Insular Caribbean*. Project No. GFL / 2328 – 2713-4A86, GF-1030-09-03

clearly highest in the Soufriere area, to which this IAS is restricted, indicating an educational impact of the eradication programme started by the Forestry Department in collaboration with the Durrell Wildlife Conservation Trust there. At higher resolution, people in the Dennery area where the native iguana is found, were no more concerned about the threat posed by the alien iguana than the rest of the country excluding Soufriere.

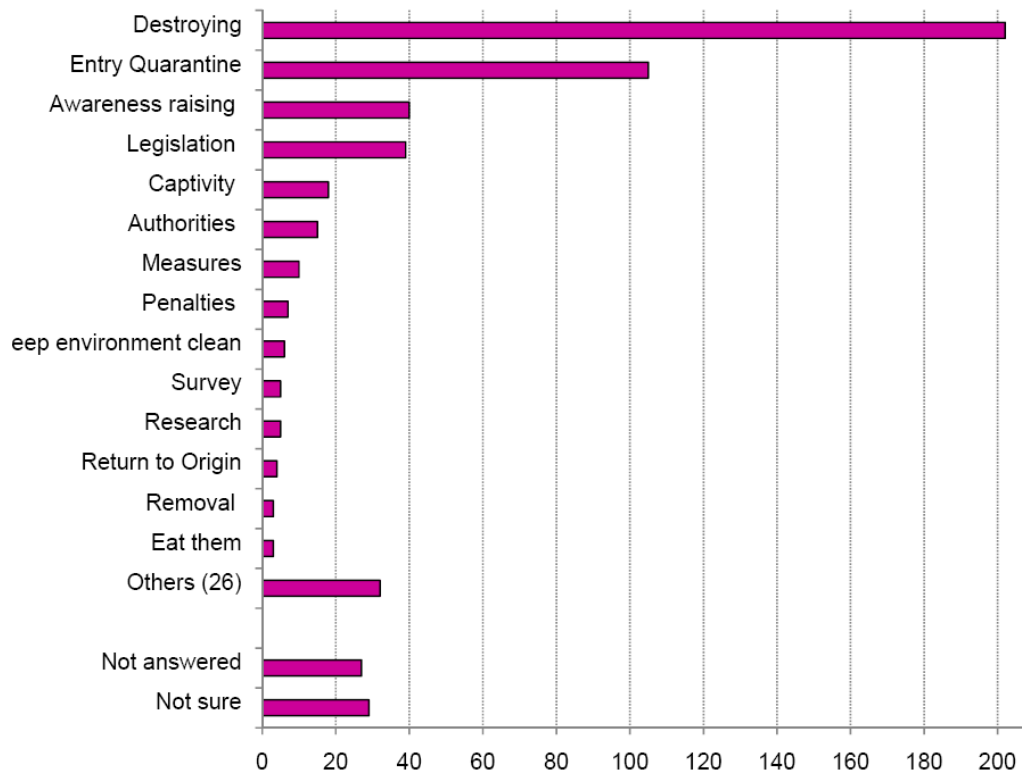


**Figure 6: Recognised Invasive Species in Saint Lucia<sup>40</sup>**

<sup>40</sup> Krauss, Ulrike, 2010 *ibid* at page 23

Cultivated species that have been introduced several generations ago are incorrectly viewed as indigenous to St. Lucia. In particular, few were aware of the Asian origin of mango and banana. More worryingly, the highly invasive water hyacinth ranked second in importance as native aquatic organisms in the public opinion.

When respondents in the aforementioned survey were questioned on management options, the vast majority suggested that the “invasives” should be killed. Many persons interviewed thought that IAS could be put into captivity. The other management options that were mentioned are presented in Figure 7.

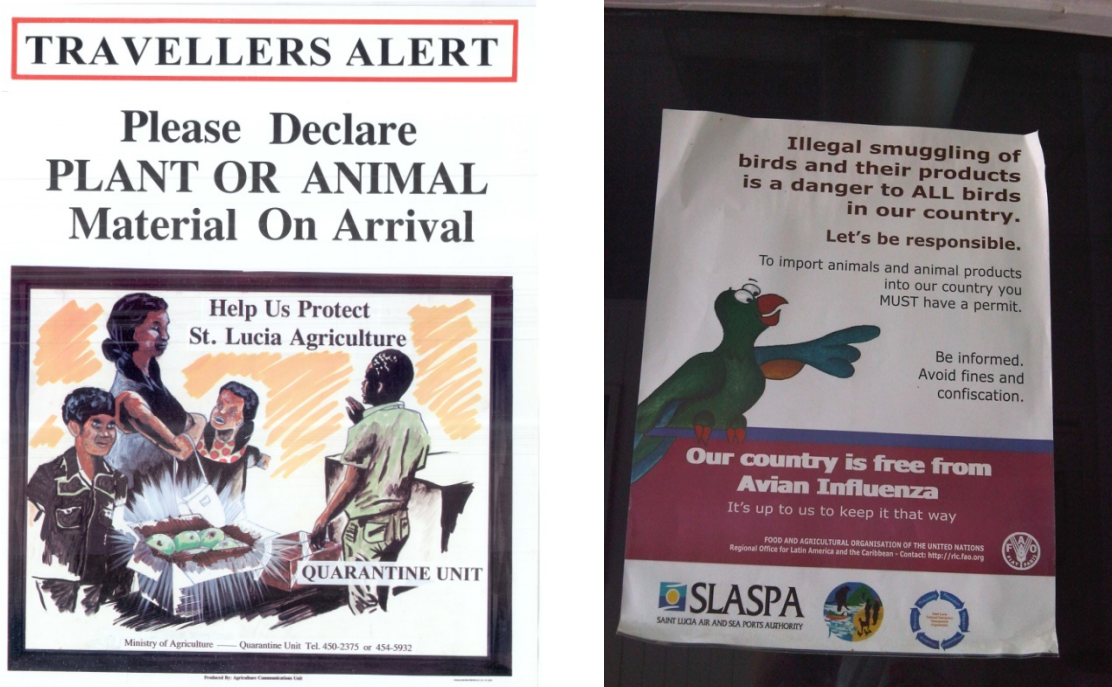


**Figure 7: Management Options for IAS<sup>41</sup>**

Every June, the Crop Protection Unit together with the Livestock Services and Veterinary Unit of the MALFF observes Quarantine Awareness Week. Normally, the activities include an address by the Minister, panel discussions and a film documentary on national television. A quarantine information supplement is also included in a national newspaper with sponsorship by agribusiness companies and non-governmental organizations. Apart from this annual event, plant pest and disease films, produced in English and Kwéyòl with the assistance of MALFF's Communications Unit, are occasionally shown on national television. Posters are placed at official entry points, such as sea- and airports. A sample of these posters is shown as Figure 8.

<sup>41</sup> Krauss, Ulrike, 2010. *ibid* at page 27.

Communicating the relationship between invasive species and quality of life issues is key to the success of a comprehensive strategy to prevent the introduction and control the spread of invasive species. Public education and outreach must be an integral component of a national invasive species management strategy and should include public awareness programs on policies, regulations, risk analysis, and prevention as well as methods to extend research findings to target audiences. Effective long-term strategies will depend on the public's understanding and acceptance of the steps needed to protect natural resources from invasive species.



**Figure 8: Quarantine Awareness Posters produced by MALFF and SLASPA<sup>42</sup>.**

A review of the on-going communications programmes for IAS in Saint Lucia has highlighted a number of gaps and weaknesses<sup>43</sup>:

- Based on the wide variety of institutions mandated to implement environment and biodiversity conservation, there should be some coordination amongst these organizations to institute national and regional communications on IAS and education programmes specific to IAS Management and Control. There is no such coordinating team or committee.

<sup>42</sup> Krauss, Ulrike, *ibid* at page 48

<sup>43</sup> Felix, Marie Louise, 2010(b). Invasive Alien Species Management: Communications, Education, Public Awareness Strategy and Actions. Carried out under the project Mitigating the Threats of Invasive Alien Species in the Insular Caribbean Project No. GFL / 2328 – 2713-4A86, GF-1030-09-03

- Despite the wide and varied opportunities for IAS communications in the country, actual presence of information materials and programmes that enhance public knowledge on IAS and capacities to contribute to national initiatives for biodiversity conservation, are severely lacking.
- There is some information on environmental conservation in circulation. Most of these materials include brochures and posters on fisheries management and legislation, climate change and impacts, forest resource management and coastal zone. Information on past IAS events such as the Pink Mealy Bug and spread of Dengue as a result of the *Aedes aegypti* mosquito exists but are not in active circulation.
- Several international conventions and agreements open doors for communications on IAS but these opportunities are not being exploited. Limited, short-term initiatives have been undertaken in compliance with the terms of conventions such as CBD and CITE, Biosafety, but none of these address IAS specifically.
- Several Government and Non-Government institutions have staff with skills and knowledge on management of biodiversity and associated issues such as IAS, but there is no coordination amongst the agencies to efficiently exploit these human resources.
- Several laws and regulations exist that can help in the control of IAS exist but these are not well publicized. Public compliance with several regulations therefore is therefore not as good as it could be. There is also insufficient explanation of some of the regulations that restrict entry of species into the country. Ignorance of laws and the reasons behind their formulation can often hamper their effectiveness. It is necessary that the public understands the issues surrounding IAS and thus the need to support actions that combat the entry and spread of non-native species. Regulations and laws that conserve biodiversity and or halt decline of habitats and ecosystems must be communicated to the public as a first step to encourage compliance.
- IAS control is not specifically addressed in school curricula although elements of environmental, health and natural sciences are taught.
- Recent surveys show that the public is poorly informed on alien and non alien species. Few persons are aware that some species found in the country are introduced and may, under the right conditions, threaten biodiversity and ecological processes.
- The economic costs of IAS mitigation are not communicated to the public, and so there is insufficient understanding about the linkages between IAS and loss of agricultural (crops, livestock & fisheries) income, increase in health care expenses, and increases in incidents of human and animal illness.
- Health Centres do not communicate adequately the cause of IAS related illnesses in order to increase public efforts to halt entry and spread of IAS.

- There are no special mechanisms defined for communication to the press on IAS. The Media not fully educated on IAS and its impacts.
- No IAS Hazard Management Plan defined and communicated to the public.

Despite the gaps and weaknesses in communication strategies for IAS management in Saint Lucia, there also exist opportunities that support or can be used to support communications, education and public awareness on invasives.

- A number of policy, legislative, regulatory and institutional instruments and frameworks exist that directly support communications, education and public awareness on biodiversity conservation, environmental education, environmental health awareness and national hazard mitigation.
- There are also opportunities under several legal instruments to address information exchanges with the public, pertinent to biodiversity conservation and IAS management, on waste water and solid waste management, import control, and disaster management.
- Under the Biodiversity Convention, there is a clear mandate to inform and educate with the intention to build capacity to conserve natural resources. Access to funding is also possible under this instrument.
- The Ministry of Education through its environmental policy and institutional framework is well positioned to support capacity building at primary, secondary and tertiary levels.
- The Ministry of Agriculture has several Departments under which informational materials may be developed which can directly support public awareness on IAS. The Ministry may also produce documents that inform the public on legislation and regulations that are necessary to ensure management of IAS. Such documents include Acts and Regulations on Fisheries Management, Forest Conservation, Plant Protection, and Import of domesticated animals and wildlife.
- The Ministry of Health is also positioned to inform the public of events that may threaten human health and train staff and the public on means to combat the threat, mitigate impacts and aid in eradication and recovery efforts.
- The National Emergency Management Organization (NEMO) is mandated to undertake actions where necessary to inform the public of pending emergencies and procedures to help mitigate impacts from events that threaten people and places. NEMO thus can play a role in the development of information materials on IAS especially those which have already been identified as having capacities to cause epidemics, loss of capacity for the country to sustain itself.

## 5.0 CONCLUSION

Invasive Alien Species have been pointed out as the second cause of species extinction at the world level (after habitat deterioration or loss), affecting in particular the biological diversity of islands and of evolutionary-isolated ecosystems. The extraordinary rise in the movement of wild species that goes parallel to the globalisation of the economy has produced an acceleration of the rate of introduction of new alien species everywhere, including Saint Lucia, with its deleterious consequences on native biological diversity.

Many international instruments or technical guidelines already deal with IAS issues from various perspectives: plant and animal health, biodiversity conservation, aquatic ecosystems, some sectoral pathways (a summary of key instruments is provided in the Annex to the Strategy). These binding or voluntary instruments provide the baseline from which Saint Lucia has developed and will develop policy, legal and management frameworks to address IAS issues.

New programmes and tools have been developed, notably the Global Invasive Species Programme (GISP) which actively promotes practical regional co-operation. GISP has published a Global Strategy on Invasive Alien Species and a Toolkit of Best Prevention and Management Practices<sup>44</sup>. The Convention on Biological Diversity (CBD) has identified IAS as a major crosscutting theme. In 2002, the CBD Conference of the Parties adopted a specific Decision and Guiding Principles<sup>45</sup> to help Parties implement this requirement. The Decision urges Parties, other governments and relevant organizations to prioritise the development of IAS strategies and action plans at national and regional level and to promote and implement the CBD Guiding Principles.

### 5.1 Challenges and Opportunities for IAS Management in Saint Lucia

The constraints that Saint Lucia presently faces include:

- Low public awareness and sensitisation on issues of IAS;
- shortage and inaccessibility of scientific information (for species identification, risk analysis, detection and mitigation techniques etc.);
- absence of clear and agreed priorities for action;

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<sup>44</sup> McNeely et al (2001) Global Strategy on Invasive Alien Species. IUCN; Wittenberg and Cock (2001) Invasive Alien Species: A Toolkit of Best Prevention and Management Practices. GISP/CAB International.

<sup>45</sup> Decision VI/23 on *Alien Species that threaten ecosystems, habitats and species* (COPVI, The Hague, April 2002) to which are annexed the *Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that threaten Ecosystems, Habitats or Species*.



- ease of introduction and movement (e.g. through various pathways), inadequate inspection and quarantine;
- inadequate monitoring capacity;
- lack of effective emergency response measures;
- outdated or inadequate legislation; and
- poor co-ordination between government agencies, and other stakeholders.

### **5.1.1 IAS Governance**

IAS governance in Saint Lucia needs strengthening. There are four policy options of increasing intensity, ranging from no change to a package involving new legislation:

#### **Option A: Business as usual**

Option A provides a reference point against which other Options can be assessed. But clearly, if no action is taken, new IAS will continue to become established in Saint Lucia with increased associated ecological, economic and social consequences and related costs.

This option involves no new legislative or administrative actions or costs. However, it is not cost-neutral because current impact levels would continue and further increase over time. Production sectors would continue to suffer from reduced productivity and impaired ecosystem services. Distribution of IAS impacts would remain uneven with infrastructure providers, other public authorities, landowners and individuals affected by rising damage and control costs.

#### **Option B: Maximising use of existing approaches and voluntary measures**

The formal legal requirements would remain as they are today but there would be a conscious decision to proactively address IAS problems under existing legislation. This would imply carrying out risk assessments using existing institutions and procedures. Species eradication plans would be developed and supported by national funds. Cross-sectoral stakeholder groups could be set up at appropriate levels to foster exchange of best practice, to develop targeted guidance and to help resolve conflicts of interest. Voluntary codes of conduct could be drawn up to encourage responsible behaviour by retailers, users and consumers.

This option could support discretionary legislative changes. Stakeholders would remain free to import, trade, cultivate, breed and release introduced species (subject to any existing restrictions). Use of existing institutions and procedures for risk assessments would not be broad enough to cover all pathways and vectors. Option B would also not address currently unregulated pathways. Outside existing legislative requirements Option B is non-enforceable.

### **Option B+: Amending existing legislation**

Option B+ is similar to Option B in most respects, but would include amendments to the existing legislation on plant/animal health to cover a broader range of potentially invasive organisms.

In addition to measures under Option B, Option B+ would expand IAS coverage through adjustment of key regulatory instruments. A piecemeal programme of legislative amendments and gap filling could, however, be time-consuming and not beneficial in the end.

### **Option C: Comprehensive, dedicated EU legal instrument**

Option C would involve the setting up of a comprehensive, dedicated legal framework for tackling IAS with independent procedures a dedicated agency for assessment and intervention taking into account existing legislation.

Option C potentially offers the highest level of environmental benefits in terms of its capacity to protect biodiversity, increase ecosystem resilience and support adaptation to climate change. It could provide a legal basis to address all categories of IAS and support an integrated response to IAS threats in all natural systems. Option C has the highest immediate resource implications for Saint Lucia because it involves new legislation, training and capacity-building for relevant personnel and additional investment in border control and risk assessment.

Given Saint Lucia's present situation as a result of the global economic shocks, the most suited option is Option B: there will be a conscious decision to proactively address IAS problems under existing legislation. Species eradication plans would be developed and cross-sectoral stakeholder groups could be set up at appropriate levels to foster exchange of best practice, to develop targeted guidance and to help resolve conflicts of interest; voluntary codes of conduct could be drawn up to encourage responsible behaviour.

In terms of governance, Option B would need to be underpinned by strong cross-sectoral coordination and clearly defined roles and responsibilities. This framework is already available in the Project Steering Committee that is overseeing the preparation of the NISS and the implementation in Saint Lucia of the GEF/CABI/UNEP project.

From a legislative perspective, an Option B instrument could be a framework instrument setting out common key principles and actions on IAS. Option B is fully compatible with voluntary prevention. Voluntary prevention initiatives are relatively low-cost but for maximum effect these need to be supported by investment in professional communication and dissemination. In addition, Saint Lucia can obtain substantial economies of scale (and thus cost savings) by regional sharing of information, alerts, techniques/equipment, expertise and communication materials.

The management and control of IAS present some important challenges for decision-makers in Saint Lucia. Globally, preventing their introduction is seen as the cornerstone of effective measures for dealing with IAS. This approach is believed to be the most cost-effective and environmentally-sound approach as once an invasive species becomes established, eradication may be impossible and ecological damage irreversible<sup>46</sup>. This obligation to control IAS needs to be balanced against international trade obligations as well as social and economic concerns. Developing systems for making sound choices must be a priority for Saint Lucia.

Legal and institutional frameworks will need to be refined to establish complementarity between different sectors. Legislation will need to create effective frameworks that are consistent with international obligations. These could benefit from the use of established legal approaches and principles, such as precaution, cost-recovery measures, rights of public participation, and rights of access to information. Other important management and decision-making tools that could be incorporated in national, sub-regional and regional frameworks include risk analysis and assessment systems, environmental impact assessment and cost-benefit analysis.

Partnerships, with a cross-section of actors at multiple scales, are an important aspect of developing appropriate responses. The inclusion of different stakeholders, from communities, NGOs, research organizations, the private sector and government, is important for developing appropriate policy as well as to be balanced against international trade obligations.

The need for strategic research to support IAS management in Saint Lucia cannot be overemphasized. Research may include compiling a complete inventory of all alien species, including noninvasive ones, determining the impacts to date on ecosystems, and assessing the financial resources needed as against the cost of inaction. This will require new levels of investment in research. Regional Partnerships and collaboration are essential for effective research. Regional cooperation may help lower research costs.

### **5.1.2 Building Awareness and Support**

Both the public and decision-makers in Saint Lucia often have limited understanding of the range of threats posed by IAS. This can make it hard to mobilise relevant agencies and other stakeholders, particularly for introductions that do not affect human health or major economic interests. Raising awareness and commitment is essential to develop shared responsibility and to encourage private efforts and voluntary compliance.

The Communications and Education Strategy provides recommendations for a sustained campaign on IAS. It will therefore suffice to mention here that through the

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<sup>46</sup> Shrine, C., Williams, N., and Gundling, L. 2000. *A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species*. IUCN –the World Conservation Union, Gland.

proposed NISS and the aforementioned Communications Strategy, the following actions will be pursued aggressively:

- Vigorous information and education programmes for different target audiences (general public, schools, local authorities, government agencies etc.) should be established;
- IAS should be incorporated into existing education and public awareness programmes where appropriate, (e.g. on native species and habitat conservation, protected areas, wildlife trade); and
- Key stakeholders will be engaged in the production and dissemination of information and guidance on best practices for those using or affected by IAS.

### 5.1.3 National Invasive Species Strategy

Now that Saint Lucia has assembled its background papers, including a situation analysis of the current situation, it will initiate stakeholder consultations to begin the process of formulating the NISS. The Strategy will *recognise* the following aspects of the problem and outlined measures to address them:

- Shortage and inaccessibility of information on invasive species and best practice management
- Lack of awareness of the impacts of invasive species
- Insufficient networking, coordination and collaboration at the national and regional levels
- Inadequate legislation, regulations, cross-sectoral policies, and enforcement
- Shortage of trained personnel and inadequate facilities
- Insufficient funding

In addition, The NISS will be guided by the following principles:

- Not all introduced species are invasive, and action should be prioritised to deal first with those currently causing, or with potential to cause, the most harm.
- In order to maximise effectiveness and value for money, invasive species risk assessment, prioritisation and management must be based on good science.
- The “precautionary principle” should be applied to the management of introduced species. Where scientific knowledge is insufficient to assess accurately either the risk of a species becoming invasive, or its present or future impact, it should be assumed that impacts will occur and action should be taken to prevent the species spreading or becoming established.
- A hierarchical approach to managing invasives should be adopted, in the following order of priority:
  - ❖ Prevention is more effective and cheaper than management of established invasives, so exclusion of invasives by border control is the first line of defence.
  - ❖ Eradication is more effective and cheaper in the long run than permanent control of a pest population, so eradication should be considered where feasible.
  - ❖ Species that cannot feasibly be eradicated should be considered candidates for biological control.

- ❖ Species that cannot feasibly be eradicated or controlled biologically, especially species whose value to people prevents the use of biocontrol, should be contained within delimited areas where feasible.
- ❖ Permanent control of an established pest population by chemical and/or physical methods should normally be considered the last resort approach, where eradication, biological control and containment are all deemed not feasible with current or achievable resources.

The Thematic areas to be covered in the NISS and the recommendations provided by the Thematic Specialists who are part of the NISS Team will be confirmed after the stakeholder consultations.