



Strategy and Action Plan

**For Invasive Alien Species
in the Caribbean Region
2011-2016.**

29th July 2011

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An output of the Project: Mitigating the Threats of Invasive Alien Species in the Insular Caribbean (MTIASIC) and collaborating countries, institutions, not for profit organisation and citizens of the wider Caribbean

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List of Acronyms

CABI CLA	CAB International Caribbean and Latin America
CAPE	Caribbean Advance proficiency Exam
CaRAPN	Caribbean Agricultural Policy Network
CARIVET	Caribbean Animal Health Network
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CEHI	Caribbean Environmental Health Institute
CEPA	Communication Education and Public Awareness
CFRAM	Caribbean Regional Fisheries Mechanism
CIAS	Caribbean Invasive Alien Species
CIASNET	Caribbean Invasive Alien Species Network
CISWG	Caribbean invasive Species Working Group
COTED	Council for Trade and Economic Development
CSEC	Caribbean Secondary Education Certificate
CTLS	Caribbean Tourism Learning System
CTO	Caribbean Tourism Organisation
CXC	Caribbean Examinations Council
DMR	Department of Marine Resources
EDRR	Early Detection and Rapid Response
FAO	Food and Agriculture Organisation of the United Nations
FWI	Freshwater Invasive Species
GEF	Global Environment Facility
GISP	Global Invasive Species Programme
IABIN	Inter-American Biodiversity Information Network
IAS	Invasive Alien Species
IASWG	Invasive Alien Species Working Group
IICA	Inter-American Institute for Cooperation on Agriculture
MALFF	Ministry of Agriculture, Lands, Forestry and Fishery (St Lucia)
MFPLMA	Ministry of Food Production, Lands and Marine Affairs (Trinidad & Tobago)
MTIASIC	Mitigating the Threats of Invasive Alien Species in the Insular Caribbean
NEPA	National Environment and Planning Agency
NGO	Non-governmental Organisation
OECS	Organisation of Eastern Caribbean States
RAC/REMPEITC	Regional Marine Pollution Emergency, Information and Training Center Wider Caribbean
TNC	The Nature Conservancy
UN	United Nations
UNEP	United Nations Environment Programme
WTO	World Trade Organisation

Preface

The project: “Mitigating the Threats of Invasive Alien Species in the Insular Caribbean” (MTIASIC) is funded by the Global Environment Facility (GEF). There are five participating countries: The Bahamas, Dominican Republic, Jamaica, Saint Lucia and Trinidad and Tobago. These countries and many international, regional and national organisations have provided both cash and in kind co-financing to facilitate the success of the project.

The United Nations Environment Programme (UNEP) is the lead implementing agency. CAB International Caribbean and Latin America (CABI CLA) is the Lead Executing Agency. There are five national executing agencies: Department of Marine Resources, Bahamas (DMR); the Ministry of the Environment and Natural Resources, Dominican Republic; National Environment and Planning Agency, Jamaica (NEPA); Ministry of Agriculture, Lands Forestry and Fisheries, Saint Lucia (MALFF); and Ministry of Food Production, Lands and Marine Affairs, Trinidad and Tobago (MFPLMA).

Under Component One, the project will develop national IAS strategies for the above mentioned participating countries. However, The Bahamas had in place a national IAS strategy and bio-security plan, prior to the start of the project in 2009 so its revision will be accommodated. Component Two will develop regional IAS strategies for three ecosystems: fresh water, terrestrial, and marine. It is expected that both national and regional strategies would be developed synergistically. In addition to developing strategies, the project envisaged the strengthening of existing mechanisms or the development of new mechanisms for regional cooperation on IAS issues.

At the inception meeting in October 2009 in Jamaica, the decision was taken to employ working groups or task teams in the development of both the national and regional strategies. To this end national working teams were formed as sub groups attached to the National Steering Committees or consultants were hired where appropriate. The National Steering Committee has oversight for project implementation at the national level. The chair persons of the respective national

fresh water; terrestrial and marine working groups make up the regional working group. However, in the case of St Lucia, there was a single aquatics group which included marine expertise.

In June 2010 the first regional consultation was held in Port-of-Spain, Trinidad and Tobago. The members of the three regional working groups were present with the exception of the Dominican Republic. This first consultation followed the Caribbean Plant Health Directors Forum and reviewed the first draft Caribbean IAS Strategy that was compiled by Mr. Farad Hosein, Consultant with the Caribbean Agricultural Policy Network (CaRAPN) in association with the MTIASIC project. Members of the various working groups were also trained in assessing the impact of IAS in the Caribbean. However, following the request for a facilitator by the national steering committee in Trinidad, Dr. Bibi Shanaz Ali was hired to assist the working groups in following up on their tasks.

A second draft was prepared by Dr. Ali that incorporated all the comments made at the first consultation. The second draft was reviewed by the three regional working groups at the second regional consultation which was held in Saint Lucia on 11-12th October 2010. A third draft was prepared incorporating all of the comments made at that meeting.

The fourth draft by Dr Floyd Homer reorganized and edited the previous version, and was sent to project participants for review and comment. The fourth draft was also presented for discussion at the 3rd Regional Consultation and IAS Legal Workshop held in Nassau, The Bahamas during 21-23rd March, 2011. A fifth draft was circulated in May 2011 for additional review and comments from a wider audience. The current final draft integrated the latest comments of the project participants and other stakeholders.

It is anticipated that this strategy and action plan would be utilized by the key stakeholders across the wider Caribbean region to inform local decision making.

Introduction

In this document, the definition of Invasive Alien Species will be that adopted by the Convention on Biological Diversity in its Decision VI/23, that is:

"invasive alien species" refers to a species, subspecies or lower taxon, introduced outside its natural past or present distribution; including any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce; whose introduction and/or spread threatens ecosystems, habitats or species.

The strategy and action plan recognizes that not all alien species are invasive and **does not** take into consideration indigenous invasive species.

Biodiversity of the Caribbean Islands are particularly vulnerable to the threats posed by invasive alien species (IAS). The spread of IAS can eventually result in losses of economically important species and endemism, as well as threats to the survival of local biodiversity. These threats to biodiversity also affect the ecosystem functions and the cultural and economic uses made of biodiversity by local communities. Caribbean institutions have renewed their efforts in preventing entry of new IAS and in the eradication or control of established IAS on their countries.

This CIAS-Strategy therefore seeks to establish a framework for Invasive Alien Species management in the Caribbean Region by addressing the following two main challenges:

1. The need to strengthen existing national and regional programmes that protect the natural resources which are under pressure from the entry and establishment of Invasive Alien Species through increased global trade and travel; and

2. The need to develop new or enhance current national and regional coordination and cooperation mechanisms that will allow a more rapid and efficient response to new and existing alien species invasions.

Challenges in Invasive Alien Species Management in the Caribbean

Given the emerging importance of IAS on trade and biodiversity maintenance and the mandatory nature of international instruments, there is recognition that generally, the Caribbean agencies has been challenged by the following issues (not necessarily in order of priority):

- Shortage or inaccessibility of scientific information (for species identification, risk analysis, detection and mitigation techniques etc.);
- Limited public awareness of the impacts of invasive species;
- Insufficient networking, coordination and collaboration, including the absence of clear and agreed priorities for action
- Ease of introduction and movement of alien species;
- Limited effective emergency response measures;
- Inadequate and/or outdated legislation, regulations, cross-sectoral policies, and enforcement;
- Shortage of appropriately trained personnel for inspection, quarantine, monitoring, etc;
- Inadequate quarantine and research facilities;
- Insufficient, unavailable, unsustainable or untimely funding.

Any strategy and action plan for the successful management of Invasive Alien Species must address these challenges in a manner that acknowledges the socio-economic and political realities under which government agencies operate in the Caribbean. It must also seek to maximise the participation of NGOs, other civil society organisations, and private individuals in the management of IAS in our region.

International Framework for Action

The Convention on Biological Diversity (CBD) Article 8 (h) prescribes that all parties to the Convention: “*Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species*”. At the Sixth Meeting of the parties to the CBD held in the Netherlands in 2002, a report was presented on the status, impacts and trends of alien species that threaten ecosystems, habitats and species. In follow-up, the Conference of Parties adopted Decision VI/23 which encouraged governments to take a range of identified actions and to be guided by a set of principles in the implementation of Article 8 (h).

GUIDING PRINCIPLES FOR THE PREVENTION, INTRODUCTION AND MITIGATION OF IMPACTS OF ALIEN SPECIES THAT THREATEN ECOSYSTEMS, HABITATS OR SPECIES (adapted from COP 6 Decision VI/23. <http://www.cbd.int/decision/cop/?id=7197>)

Introduction

While each country faces unique challenges and will need to develop context-specific solutions, the Guiding Principles give governments clear direction and a set of goals to aim toward. The extent to which these Guiding Principles can be implemented ultimately depends on available resources. Their purpose is to assist governments to combat invasive alien species as an integral component of conservation and economic development. Because these 15 principles are non-binding, they can be more readily amended and expanded through the Convention on Biological Diversity's processes as we learn more about this problem and its effective solutions.

According to Article 3 of the Convention on Biological Diversity, States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

It should be noted that in the Guiding Principles below, the definition of key terms are listed at the end of these principles.

Also, while applying these Guiding Principles, due consideration must be given to the fact that ecosystems are dynamic over time and so the natural distribution of species might vary without involvement of a human agent.

A. General

Guiding principle 1: Precautionary approach

Given the unpredictability of the pathways and impacts on biological diversity of invasive alien species, efforts to identify and prevent unintentional introductions as well as decisions concerning intentional introductions should be based on the precautionary approach, in particular with reference to risk analysis, in accordance with the guiding principles below. The precautionary approach is that set forth in principle 15 of the 1992 Rio Declaration on Environment and Development and in the preamble of the Convention on Biological Diversity.

The precautionary approach should also be applied when considering eradication, containment and control measures in relation to alien species that have become established. Lack of scientific certainty about the various implications of an invasion should not be used as a reason for postponing or failing to take appropriate eradication, containment and control measures.

Guiding principle 2: Three-stage hierarchical approach

1. Prevention is generally far more cost-effective and environmentally desirable than measures taken following introduction and establishment of an invasive alien species.
2. Priority should be given to preventing the introduction of invasive alien species, between and within States. If an invasive alien species has been introduced, early detection and rapid action are crucial to prevent its establishment. The preferred response is often to eradicate the organisms as soon as possible (principle 13). In the event that eradication is not feasible or resources are not available for its eradication, containment (principle 14) and long-term control measures (principle 15) should be implemented. Any examination of benefits and costs (environmental, economic and social) should be done on a long-term basis.

Guiding principle 3: Ecosystem approach

Measures to deal with invasive alien species should, as appropriate, be based on the ecosystem approach, as described in decision V/6 of the Conference of the Parties. This regional strategy seeks to specifically address Fresh Water; Marine and Terrestrial Ecosystems in the Caribbean.

Guiding principle 4: The role of States

1. In the context of invasive alien species, States should recognize the risk that activities within their jurisdiction or control may pose to other States as a potential source of invasive alien species, and should take appropriate individual and cooperative actions to minimize that risk, including the provision of any available information on invasive behaviour or invasive potential of a species.
2. Examples of such activities include:
 - a. The intentional transfer of an invasive alien species to another State (even if it is harmless in the State of origin); and

- b. The intentional introduction of an alien species into their own State if there is a risk of that species subsequently spreading (with or without a human vector) into another State and becoming invasive;
 - c. Activities that may lead to unintentional introductions, even where the introduced species is harmless in the state of origin.
3. To help States minimize the spread and impact of invasive alien species, States should identify, as far as possible, species that could become invasive and make such information available to other States.

Guiding principle 5: Research and monitoring

In order to develop an adequate knowledge base to address the problem, it is important that Caribbean States undertake research on and monitoring of invasive alien species, as appropriate. These efforts should attempt to include a baseline taxonomic study of biodiversity. In addition to these data, monitoring is the key to early detection of new invasive alien species. Monitoring should include both targeted and general surveys, and benefit from the involvement of other sectors, including local communities. Research on an invasive alien species should include a thorough identification of the invasive species and should document: (a) the history and ecology of invasion (origin, pathways and time-period); (b) the biological characteristics of the invasive alien species; and (c) the associated impacts at the ecosystem, species and genetic level and also social and economic impacts, and how they change over time.

Guiding principle 6: Education and public awareness

Raising the public's awareness of the invasive alien species is crucial to the successful management of invasive alien species. Therefore, it is important that States should promote education and public awareness of the causes of invasion and the risks associated with the introduction of alien species. When mitigation measures are required, education and public-awareness-oriented programmes should be set in motion so as to engage local communities and appropriate sector groups in support of such measures.

B. Prevention

Guiding principle 7: Border control and quarantine measures

1. States should implement border controls and quarantine measures for alien species that are or could become invasive to ensure that:
 - Intentional introductions of alien species are subject to appropriate authorization (principle 10);
 - Unintentional or unauthorized introductions of alien species are minimized.
2. States should consider putting in place appropriate measures to control introductions of invasive alien species within the State according to national legislation and policies where they exist.
3. These measures should be based on a risk analysis of the threats posed by alien species and their potential pathways of entry. Existing appropriate governmental agencies or authorities should be strengthened and broadened as necessary, and staff should be properly trained to implement these measures. Early

detection systems and regional and international coordination are essential to prevention.

Guiding principle 8: Exchange of information

1. States should assist in the development of an inventory and synthesis of relevant databases, including taxonomic and specimen databases, and the development of information systems and an interoperable distributed network of databases for compilation and dissemination of information on alien species for use in the context of any prevention, introduction, monitoring and mitigation activities. This information should include incident lists, potential threats to neighbouring countries, information on taxonomy, ecology and genetics of invasive alien species and on control methods, whenever available. The wide dissemination of this information, as well as national, regional and international guidelines, procedures and recommendations such as those being compiled by the Global Invasive Species Programme should also be facilitated through, *inter alia*, the clearing-house mechanism of the Convention on Biological Diversity.
2. The States should provide all relevant information on their specific import requirements for alien species, in particular those that have already been identified as invasive, and make this information available to other States.

Guiding principle 9: Cooperation, including capacity-building

Depending on the situation, a State's response might be purely internal (within the country), or may require a cooperative effort between two or more countries. Such efforts may include:

- a. Programmes developed to share information on invasive alien species, their potential uneasiness and invasion pathways, with a particular emphasis on cooperation among neighbouring countries, between trading partners, and among countries with similar ecosystems and histories of invasion. Particular attention should be paid where trading partners have similar environments;
- b. Agreements between countries, on a bilateral or multilateral basis, should be developed and used to regulate trade in certain alien species, with a focus on particularly damaging invasive species;
- c. Support for capacity-building programmes for States that lack the expertise and resources, including financial, to assess and reduce the risks and to mitigate the effects when alien species are introduced and become establishment. Such capacity-building may involve technology transfer and the development of training programmes;
- d. Cooperative research efforts and funding efforts toward the identification, prevention, early detection, monitoring and control of invasive alien species.

C. Introduction of species

Guiding principle 10: Intentional introduction

1. No first-time intentional introduction or subsequent introductions of an alien species already invasive or potentially invasive within a country should take place without prior authorization from a competent authority of the recipient State(s). An

appropriate risk analysis, which may include an environmental impact assessment, should be carried out as part of the evaluation process before coming to a decision on whether or not to authorize a proposed introduction to the country or to new ecological regions within a country. States should make all efforts to permit only those species that are unlikely to threaten biological diversity. The burden of proof that a proposed introduction is unlikely to threaten biological diversity should be with the proposer of the introduction or be assigned as appropriate by the recipient State. Authorization of an introduction may, where appropriate, be accompanied by conditions (e.g., preparation of a mitigation plan, monitoring procedures, payment for assessment and management, or containment requirements).

2. Decisions concerning intentional introductions should be based on the precautionary approach, including within a risk analysis framework, set forth in principle 15 of the 1992 Rio Declaration on Environment and Development, and the preamble of the Convention on Biological Diversity. Where there is a threat of reduction or loss of biological diversity, lack of sufficient scientific certainty and knowledge regarding an alien species should not prevent a competent authority from taking a decision with regard to the intentional introduction of such alien species to prevent the spread and adverse impact of invasive alien species.

Guiding principle 11: Unintentional introductions

1. All States should have in place provisions to address unintentional introductions (or intentional introductions that have become established and invasive). These could include statutory and regulatory measures and establishment or strengthening of institutions and agencies with appropriate responsibilities. Operational resources should be sufficient to allow for rapid and effective action.
2. Common pathways leading to unintentional introductions need to be identified and appropriate provisions to minimize such introductions should be in place. Sectoral activities, such as fisheries, agriculture, forestry, horticulture, shipping (including the discharge of ballast waters), ground and air transportation, construction projects, landscaping, aquaculture including ornamental aquaculture, tourism, the pet industry and game-farming, are often pathways for unintentional introductions. Environmental impact assessment of such activities should address the risk of unintentional introduction of invasive alien species. Wherever appropriate, a risk analysis of the unintentional introduction of invasive alien species should be conducted for these pathways.

D. Mitigation of impacts

Guiding principle 12: Mitigation of impacts

Once the establishment of an invasive alien species has been detected, States, individually and cooperatively, should take appropriate steps such as eradication, containment and control, to mitigate adverse effects. Techniques used for eradication, containment or control should be safe to humans, the environment and agriculture as well as ethically acceptable to stakeholders in the areas affected by the invasive alien species. Mitigation measures should take place in the earliest possible stage of invasion, on the basis of the precautionary approach. Consistent with national policy or legislation, an individual or entity

responsible for the introduction of invasive alien species should bear the costs of control measures and biological diversity restoration where it is established that they failed to comply with the national laws and regulations. Hence, early detection of new introductions of potentially or known invasive alien species is important, and needs to be combined with the capacity to take rapid follow-up action.

Guiding principle 13: Eradication

Where it is feasible, eradication is often the best course of action to deal with the introduction and establishment of invasive alien species. The best opportunity for eradicating invasive alien species is in the early stages of invasion, when populations are small and localized; hence, early detection systems focused on high-risk entry points can be critically useful while post-eradication monitoring may be necessary. Community support is often essential to achieve success in eradication work, and is particularly effective when developed through consultation. Consideration should also be given to secondary effects on biological diversity.

Guiding principle 14: Containment

When eradication is not appropriate, limiting the spread (containment) of invasive alien species is often an appropriate strategy in cases where the range of the organisms or of a population is small enough to make such efforts feasible. Regular monitoring is essential and needs to be linked with quick action to eradicate any new outbreaks.

Guiding principle 15: Control

Control measures should focus on reducing the damage caused as well as reducing the number of the invasive alien species. Effective control will often rely on a range of integrated management techniques, including mechanical control, chemical control, biological control and habitat management, implemented according to existing national regulations and international codes.

Definition of key terms

- i. "alien species" refers to a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce;
- ii. "invasive alien species" means an alien species whose introduction and/or spread threatens biological diversity (For the purposes of the present guiding principles, the term "invasive alien species" shall be deemed the same as "alien invasive species" in decision V/8 of the Conference of the Parties to the Convention on Biological Diversity.);
- iii. "introduction" refers to the movement by human agency, indirect or direct, of an alien species outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction;
- iv. "intentional introduction" refers to the deliberate movement and/or release by humans of an alien species outside its natural range ;
- v. "unintentional introduction" refers to all other introductions which are not intentional;
- vi. "establishment" refers to the process of an alien species in a new habitat successfully producing viable offspring with the likelihood of continued survival;
- vii. "risk analysis" refers to: (1) the assessment of the consequences of the introduction and of the likelihood of establishment of an alien species using science-based information (i.e., risk assessment), and (2) to the identification of measures that can be implemented to reduce or manage these risks (i.e., risk management), taking into account socio-economic and cultural considerations.

Policy Statement

The development of a CIAS-Strategy should be informed by a regional policy on Invasive Alien Species. However, no such policy exists for the Caribbean, but a policy statement can be constructed from existing commitments and international agreements adopted by Governments in the region. Consistent with the obligations under the Convention on Biological Diversity, the Cartagena Protocol on BioSafety, and the Protocol concerning Specially Protected Areas and Wildlife (SPAW Protocol), the following IAS policy statement is proposed:

Invasive alien species represent one of the primary threats to biodiversity, human health and all economic sectors, especially in small island developing States. Increased global trade, transport, tourism and climate change, are likely to further increase the risks posed by invasive alien species. The Governments of the Caribbean are committed to preventing the introduction, control or eradication of those alien species including living modified organisms, which threaten ecosystems, habitats or species. The Governments and relevant agencies shall take the necessary measures to protect, preserve and manage in a sustainable manner, threatened ecosystems, habitats, and species.

This policy will be implemented through the CIAS-Strategy and Action Plan, addressing key challenges by:

- Enhancing collaboration on IAS issues at the regional level;
- Using science and the precautionary principle as the basis for decision-making;
- Communicating IAS issues to the public;
- Educating nationally and regionally to change behaviours to reduce the impacts of IAS;
- Improving human resource and other capacities;
- Streamlining of regulations and laws governing trade; human movement to minimize the risk of moving IAS into and within the region;
- Instituting cost recovery mechanisms to ensure sustainability of national actions and regional collaboration on IAS issues; and

- Advocating for increased political commitment and support at national, regional and international levels.

CIAS STRATEGY

Scope

The CIAS-Strategy will focus on the prevention and management of:

- Intentional introduction of species for use in biological production systems including agriculture, forestry, fisheries, landscaping, recreational, ornamental purposes and for biological control of pests;
- Intentional introduction of species as a commodity for uses where there is a known risk of escape or release to the wild, i.e. zoos, aquaculture, aquariums, horticulture, pet trade, etc.;
- Unintentional introduction of invasive species through pathways involving transport, trade, travel or tourism as well as natural pathways such as: climatic events (hurricanes), migratory birds, vegetation, debris, dust clouds etc.

As well as the:

- Rehabilitation and restoration of species, habitats or ecosystems; and
- Management of data, information and knowledge generated or acquired to assist in the management of IAS.

CIAS-Strategic Goal

The CIAS-Strategic Goal is to create an enabling environment for the effective management of invasive alien species within the Caribbean. The goal will have been realised when the systemic, institutional, and individual capacities are sufficiently built or developed for effective IAS management.

The CIAS Strategy and Action Plan will not be implemented by any single regional organisation but it is expected to guide the development and implementation of national IAS strategy and action plans, led by the respective national IAS working groups.

OBJECTIVES AND ACTION PLAN

In order for the CIAS-Strategy to fulfil the mandate of effective prevention, early detection, rapid response and effective management of regional IAS threats, key objectives must be achieved in a timely manner. The framework below outlines the activities and tasks that need to be taken by regional stakeholders to achieve these objectives.

OBJECTIVE # 1: Establish a Regional Coordinating Mechanism by utilising existing mechanisms where appropriate, with the attendant political support at both the national and regional levels.

Such a mechanism will identify the needs and provide the necessary support to ensure effective coordination and implementation of the CIAS-Strategy along with monitoring and evaluation of national IAS strategies and any emerging developments pertaining to IAS.

Activity	Tasks	Responsibility
1. Convene an Interim Regional Steering Committee/ Secretariat by August 2011 to guide the establishment of the Regional Coordinating Mechanism	i. Identify all the critical agencies that are or will be involved in national IAS management, by participating countries and select a maximum of 3 members representing Fresh Water, Terrestrial and Marine ecosystems from identified national agencies to be country representatives in the interim regional steering committee. ii. Establish an interim regional steering committee to develop ToRs and to guide the establishment of the Regional Body. ii. Establish a regional body with competent national representation to provide adequate coordination and	National – IAS Working Groups Country Project Directors

	<p>collaboration between key national and international agencies.</p> <p>iv. Establish regional ecosystem technical working groups.</p>	
2. Develop a shortlist of potential regional coordinating mechanisms by August 2011	<p>i. Identify existing regional institutions/ instruments that have the potential to fulfill the CIAS strategy.</p> <p>ii. Conduct a SWOT analysis on above identified institutions/instruments.</p> <p>ii. Generate a shortlist of recommended regional institutions/ instruments.</p>	<p>National – IAS Working Groups</p> <p>Country Project Directors</p>
3. Identify country champions to promote the issue among policy makers by August 2011	<p>i. Select appropriate policy maker by participating country.</p> <p>ii. Ensure political support by mainstreaming IAS issues with national and regional decision makers.</p>	Country Project Directors

OBJECTIVE # 2: Establish mechanisms to reduce the spread of IAS within the region through trade and other identified pathways.

Activity	Tasks	Responsibility
1. Design the protocol that will facilitate a common, regional approach to decision-making with respect to the effects of IAS on trade by December 2013.	<p>i. Review general trade inspection procedures.</p> <p>ii. Identify procedures aimed at current specific priority invasive species.</p> <p>iii. Identify priority species and pathways for immediate monitoring, containment and control.</p> <p>iv. Make detailed recommendations</p>	<p>National – IAS Working Groups</p> <p>Country Project Directors</p>

	<p>for improvements with an aim to filling the gaps to allow effective implementation of the national IAS strategy and the CIAS-Strategy.</p> <p>v. Develop trade controls directed at preventing the export or import of specific priority invasive species.</p> <p>vi. Develop the protocol to strengthen and expand existing national and internal (inter-island) risk and impact assessment for proposed deliberate movements of species and for the movement of goods that may accidentally carry invasive species.</p> <p>vii. Design the systems to strengthen and promote implementation of international standards governing control of potentially invasive species via trade.</p>	
2. Identify vectors and pathways for entry and spread of IAS that threaten the region.	<p>i. Conduct the necessary critical analysis on pathways for invasion.</p> <p>ii. Identify procedures aimed at current specific priority high risk pathways.</p> <p>iii. Make detailed recommendations for improvements with an aim to filling the gaps to allow effective implementation of the national IAS strategy and the CIAS-Strategy.</p>	<p>National – IAS Working Groups</p> <p>Country Project Directors</p>
3. Conduct pathway risk analysis by December 2012	<p>i. Identify priority IAS threats to the region for immediate monitoring and containment to prevent entry and spread into the region.</p> <p>ii. Develop and test pathway risk assessment protocol.</p> <p>iii. Adopt pathway risk assessment protocol for IAS that threaten the region and test.</p> <p>iv. Design training programme for all</p>	<p>CABI</p> <p>UWI</p> <p>CIAS-Technical Working Groups</p> <p>National – IAS Working Groups</p>

	<p>relevant line personnel.</p> <p>v. Design programme to ensure training of taxonomists within the member countries and to facilitate sharing of these human resources within the region.</p>	
<p>4. Design the protocols that facilitate a regional approach to decision-making by December 2012.</p>	<p>i. Conduct the necessary critical analysis on pathways for invasion.</p> <p>ii. Identify procedures aimed at current specific priority invasive species.</p> <p>iii. Make detailed recommendations for improvements with an aim to filling the gaps to allow effective implementation of the national IAS strategy and the CIAS-Strategy</p>	<p>National – IAS Working Groups</p> <p>Country project Directors</p>

OBJECTIVE # 3: Strengthen national and regional institutional frameworks to allow effective national and regional management of IAS.

Activity	Tasks	Responsibility
<p>1. Compile all relevant institutional details of the proposed regional framework and the supporting national frameworks by country by December 2011</p>	<p>i. Identify key national and regional agencies involved in the IAS management.</p> <p>ii. Conduct a SWOT analysis on above agencies as it relates to their specific function within the national strategy and the CIAS Strategy.</p> <p>iii. Identify critical control points for prevention and early detection.</p> <p>iv. Make detailed recommendations for resource improvements with an aim to filling the gaps to allow effective implementation of the national IAS strategy and the CIAS Strategy.</p>	<p>National – IAS Working Groups</p> <p>Country Project Directors</p> <p>Ecosystem Working Groups</p>
<p>2. Identify the</p>	<p>i. Identify and catalogue the present</p>	<p>CABI</p>

<p>cooperative efforts needed intra and extra-regionally to effectively manage IAS in the region by December 2011</p>	<p>cooperative efforts, bilateral and/or multilateral approaches with other countries intra and extra- regionally, as it relates to IAS management.</p> <ul style="list-style-type: none"> ii. Evaluate these efforts to determine adequacy and areas for improvement. iii. Recommend additional efforts needed and the potential collaborating institutions. 	
<p>3. Implement programmes to build national and regional capacity by January 2012</p>	<ul style="list-style-type: none"> i. Based on SWOT analysis above, identify the capacity building needs. ii. Obtain national and regional consensus with respect to the distribution of experts and databases. iii. Organize training programmes for selected persons. iv. Develop programmes and materials to increase awareness for key regional, national, sectoral and community target groups, including curriculum development for formal education. v. Ensure international collaboration and linkages in selected areas. vi. Design and implement a regional invasive species training plan to build capacity at the regional and national levels. vii. Establish and maintain a system of technical advice and support based on a register of relevant regional and international experts. 	<p>National – IAS Working Groups</p>

OBJECTIVE # 4: Strengthen mechanisms to enable the exchange of information between national, regional and international stakeholders.

Activity	Tasks	Responsibility
<p>1. Design the system that will enable the establishment and maintenance of regional resource centres by December 2013</p>	<ul style="list-style-type: none"> i. Design the system to establish and maintain regional resource centres for specific invasive species services (e.g. bio-control, risk analysis, information management). ii. Provide data and obtain accessibility to global information resources such as: the Global Invasive Species Database (GISD), Global Register of Invasive Species and Global Biodiversity Information Forum, as key repositories of global invasive species information useful for the Caribbean. iii. Promote membership of and contributions to international conventions, committees and working groups by Caribbean groups. iv. Promote use of the CIAS website for information exchange 	<p>National – IAS Working Groups</p>
<p>2. Facilitate improved access to all relevant information sources by December 2013</p>	<ul style="list-style-type: none"> i. Develop an interactive web-based regional species reference collection, in collaboration with other institutions in the wider Caribbean. ii. Develop protocols and provide assistance for the development of National species reference collections. iii. Promote pilot project and information generated from pilot to other territories. iv. Pilot project should promote issues at higher level of governance both nationally and regionally. 	<p>CABI National – IAS Working Groups</p>

OBJECTIVE # 5: Facilitate an evidence based approach to the management of IAS through the conduct of research and monitoring.

Activity	Tasks	Responsibility
<p>1. Adapt protocols to establish long-term mechanisms for the conduct of research in key IAS management areas by December 2013</p>	<ul style="list-style-type: none"> i. Develop or review and adapt protocols and provide assistance for the development of National species reference collections. ii. Develop and strengthen linkages with taxonomic institutions and experts within and outside the Region such as BioNet and CariNet. iii. Develop and implement a regional research plan on IAS and provide support for implementation of national research plans. iv. Investigate the environmental economic and other impacts of IAS whose impacts are unconfirmed but suspected to be serious. v. Investigate the risk associated with biological control agents and programmes. vi. Develop or review and adapt protocols and guidelines to assist national agencies in implementing biological control programmes. vii. Promote and provide assistance to the development and implementation of National monitoring plans for IAS. viii. Design programme to ensure training of taxonomists within participating countries and to facilitate sharing of these human resources within the region. 	<p>CABI</p> <p>National – IAS Working Groups</p> <p>Country Project Directors</p>

<p>2. Utilise rehabilitation or restoration techniques in the management of IAS degraded habitats by 2013.</p>	<p>i. Identify priority habitats or ecosystems severely impacted by IAS for rehabilitation or restoration.</p> <p>ii. Adopt or develop protocols for rehabilitation or restoration of IAS impacted sites.</p>	<p>Country Project Directors</p> <p>National – IAS Working Groups</p>
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OBJECTIVE # 6: Design and utilise methodologies to prevent or control harmful national intentional and unintentional introductions and mitigate the regional spread of IAS.

Activity	Tasks	Responsibility
<p>1. Identify or develop guidelines for invasive species management agencies in the Caribbean by December 2012</p>	<p>i. Maintain the regional relationships under the auspice of the Region Coordinating Mechanism to monitor and evaluate the implementation of these Guidelines and accompanying action plans.</p> <p>ii. Develop and disseminate legislative guidelines for pathways management and control mechanisms using best practices.</p> <p>iii. Develop capacity for compliance and enforcement of IAS legislation at the National level.</p> <p>iv. Periodically review and make recommendations to amend existing regional and national policies and procedures for managing trade, movement, holdings, releases into the environment, establishment and management of invasive species.</p> <p>v. Identify or develop model technical protocol and procedures for the Caribbean, enabling countries to use best practices in developing</p>	<p>CABI</p> <p>UWI</p> <p>GISP</p> <p>RAC-REMPEITC</p> <p>CIAS-Technical Working Groups</p> <p>National – IAS Working Groups</p>

	<p>or modifying their internal procedures.</p> <p>vi. Adopt/develop best practice procedures for prevention, eradication, control and restoration projects.</p> <p>vii. Develop guidelines and protocols for contingency plans for managing different kinds of newly arrived invasive species and carry out field trials.</p>	
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OBJECTIVE # 7: Develop a fund raising strategy that will secure adequate financing for implementation of activities under the CIAS Strategy and action Plan and National IAS programmes.

Activity	Tasks	Responsibility
1. Design and utilise fund raising strategy.	<p>i. Identify sources of funding for components of the CIAS Strategy/Action Plan and National IAS programmes.</p> <p>ii. Recruit consultant to prepare the fund raising strategy.</p> <p>iii. Prepare and submit proposals for funding to targeted sources.</p>	National – IAS Working Groups

It should be noted that the CIAS Strategy and Action Plan does not deal with all issues related to IAS, but only those identified as priority by project participants. Any new or emerging priority issues can be incorporated into subsequent revisions of this strategy and action plan.

At the end of the 5-year period of this plan, a review of its implementation should be undertaken and facilitated by the project participants and other key stakeholders. Following the review and recommendations, a new 5-year strategy and action should be prepared.

The Ecosystem Approach

The CBD COP5 Decision V/6 recommended the use of an ecosystem approach in the management of biological diversity and by extension, invasive alien species. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning (<http://www.cbd.int/decision/cop/?id=7148>). Decision V/6 further recommended the following five points as operational guidance in application of the ecosystem approach:

1. Focus on the functional relationships and processes within ecosystems;
2. Enhance benefit-sharing;
3. Use adaptive management practices;
4. Carry out management actions at the scale appropriate for the issue being addressed, with decentralization to lowest level, as appropriate;
5. Ensure inter-sectoral cooperation.

The CIAS-Strategy adopts the GISP model and recognizes the value in managing IAS using a terrestrial, freshwater and marine ecosystem approach. The four essential elements that will comprise the management of IAS at the ecosystem level are:

1. Prevention of harmful intentional and unintentional introductions;
2. Detection and identification of new invaders upon entry and respond rapidly to new invaders upon detection by containment;
3. Management of established and spreading invaders through eradication, containment and control; and
4. Rehabilitation and restoration of degraded sites or native species population.

The key considerations in the development of each specific Strategy were identified in earlier planning sessions as:

- The species that were most likely to invade and establish in the region
- The potential impacts of these species in the region
- Prevention of invasions
- Detection and identification of new invaders upon entry and rapid response to new invaders upon detection by containment
- Procedures and coordinating mechanisms for management of IAS
- Information, including risk assessments dissemination throughout the region
- Capacity-building within the region to manage IAS
- Sustainable funding of the strategy to manage IAS

With regards to a regional marine IAS strategy, the following issues were noted:

- Transfer of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water and Sediments in the Wider Caribbean Region
- Managing the Invasive Indo-Pacific Green Mussel, *Perna viridis* for example in Jamaica
- Developing and implementing a National Lionfish Response Plan for example in The Bahamas, St. Maarten, US Virgin Islands
- Managing marine biofouling and IAS
- Managing IAS in aquaculture
- Appropriate Risk Assessments and Pathway Analyses
- Strengthening pre-border protection and border inspection
- Implementing effective public awareness and education campaigns
- Facilitating a change in trade and commercial practices (e.g. banning high risk MIAS from the aquarium trade)
- Providing necessary legislative support

Details of each regional ecosystem (terrestrial, marine and freshwater) strategy and action plan were developed by the respective Task Force and finalised by participants at the Bahamas workshop in March 2011. These ecosystem plans are presented in Appendix 1.

CIAS - KEY OUTCOMES

Successful implementation of the CIAS Action Plan will lead to the following key outcomes:

1. Systemic, institutional and individual capacities within and among Caribbean countries developed for effective management of IAS.
2. Prevention of harmful intentional and unintentional introductions of invasive alien species into Caribbean countries.
3. Detection and identification of new invaders upon entry and rapid response to new invaders upon detection by containment or eradication.
4. Implementation of management plans targeted to specific, established IAS.
5. Restoration or rehabilitation of degraded areas after the eradication of IAS wherever appropriate.

Conclusion

The CIAS-Strategy is intended to generate an effective, integrated, comprehensive, and science-based approach for addressing the IAS problem in the Caribbean Region, now and in the future. It is anticipated that its implementation will lead to reduced environmental degradation, decrease in losses of native species and improved socio-economic opportunities for Caribbean communities.

Resources

National Strategy and Implementation Plan for Invasive Species Management, USDA Forest Service. October 2004.

http://www.fs.fed.us/foresthealth/publications/Final_National_Strategy_100804.pdf

Cooperative Initiative on Invasive Alien Species (IAS) on Islands

<http://www.issg.org>

Global Strategy on Invasive Alien Species

www.gisp.org/publications/brochures/globalstrategy.pdf

Guidelines for Invasive Species Management in the Pacific

www.sprep.org/att/publication/000699_RISSFinalLR.pdf

European Strategy on Invasive Alien Species

www.nobanis.org/files/eu_strategy_inva.pdf

An Invasive Alien Species Strategy for Canada

http://www.ec.gc.ca/eee-ias/98DB3ACF-94FE-4573-AE0F-95133A03C5E9/Final_IAS_Strategic_Plan_smaller_e.pdf

A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species www.gisp.org/publications/toolkit/legalframeworks.pdf

Invasive alien species in Africa: Developing effective responses

[http://www.eoearth.org/article/Invasive alien species in Africa: Developing effective responses](http://www.eoearth.org/article/Invasive_alien_species_in_Africa:_Developing_effective_responses)

Overview of the management of invasive alien species from the environmental perspective

<http://www.fao.org/docrep/008/y5968e/y5968e07.htm>

Framework for a Strategy and Action Plan for the Management of Invasive Alien Species in the City of Cape Town

www.capetown.gov.za/en/EnvironmentalResourceManagement/.

Piero Genovesi (2001) Guidelines for Eradication of Terrestrial Vertebrates: a European Contribution to the Invasive Alien Species Issue

<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1023&context=icwdmoter>

Invasive Alien Species: A Toolkit of Best Prevention and Management Practices (2001). Eds, R. Wittenberg and M.J.W. Cock. CAB International, W

Appendix 1

Regional Freshwater Invasive Alien Species Strategy

(Finalised by participants at the 3rd Regional Consultation and IAS Legal Workshop held in Nassau, The Bahamas during 21-23rd March, 2011)

Objective	Action	Agencies	Timeframe
Establish and maintain competent regional support and coordination for freshwater invasive species management in the Caribbean Region	Identify national and regional agencies and areas of competence and resources important for FWI spp. management <ul style="list-style-type: none"> • Tertiary and research institutions • Agencies responsible for trade in ornamental aquatic spp., fisheries enhancement and aquaculture, ports of entry, watershed restoration and forestry, water resources management • NGOs, initiatives and programmes • Existing networks and communication channels 	Universities, Clearing House Mechanisms, CABI, TNC, CISWIG/CARICOM, IASWGs in each country, Regional IABIN body, Ciasnet.org	Within Y2 of the completion of the strategy
	Establish and maintain an adequate coordination and collaboration mechanism (network) between key regional agencies	CABI, CISWIG, CFRAM, COTED (Environment), White Water to Blue Water	By end of Y3
	Ensure country support by HIGHLIGHTING AND mainstreaming invasive species issues with national and regional decision-makers	FAO, CABI, CISWIG Caribvet.	By end of Y3
	HIGHLIGHTING AND mainstreaming invasive species issues in National BioDiversity Strategies in honour of each country's obligations under the 1992 Convention on Biological Diversity.	CISWIG, CFRAM, National Focal Points	Y2

Objective	Action	Agencies	Timeframe
	Identify technical gaps (species ID, awareness, legislation and enforcement) and opportunities for technical cooperation between entities	Universities, Clearing House Mechanisms, CABI, TNC, CISWIG, IASWGs, Regional IABIN, CIASNET, CFRAM, FAO	Y1
	Develop formal cooperation agreements (e.g. MOU) between regional and national entities to promote information sharing, project development & collaboration, joint fund-raising to ensure sustainable management of FWI species	Clearing House Mechanisms, CABI, TNC, COTED (Environment), WTO, FAO, Caribvet	Y4
	Make policy recommendations for improving the regional/national capacity for management of FWI species in the aquatic ornamental trade, fisheries enhancement and aquaculture, watershed restoration and forestry.	COTED (Environment) Ministries with responsibility for Trade, Agriculture, Customs, Plant quarantine, Veterinary Services,	Y4
	Build support among key decision-makers for addressing the FWI problem using cost benefit analyses and other effective and relevant tools. This would also inform the public education strategy at various levels.	COTED (Environment), CABI, CISWIG, IICA, Caribbean Conservation Network (www.caribbeanhub.net); IPSC	Y3
Facilitate and streamline Public Education & Awareness Raising	Regional Harmonisation of curriculum with reference to freshwater invasives (FWI). <ul style="list-style-type: none"> Develop a proposal for the scope of knowledge for schools from primary to 	Ministry with responsibility for Education, CXC (CSEC and CAPE) Tertiary Institutions (universities,	By end of Y4 curriculum developed and forwarded to Ministries By end of Y2

Objective	Action	Agencies	Timeframe
	<p>secondary institutions.</p> <ul style="list-style-type: none"> ○ Curriculum should focus on the uniqueness that governs the invasion of priority freshwater invasive species. • Develop a proposal for freshwater invasive species curriculum to be incorporated at the primary, secondary and tertiary level • Send proposal to education policy makers to be tabled for discussion by Educators. Develop proposal in consultation with stakeholders (Ministry with responsibility for Education, Educators and Researchers) • Develop curriculum for Brownies, Girl Guides, Scouts and other voluntary youth organizations 	<p>community colleges and institutes), CARICOM (COTED), OECS, Caribbean Tourism Learning System (CTLS) through the Caribbean Tourism Organization (CTO), Environmental Education NGOs CEHI, Institute of Marine Affairs</p> <p>Regional Coordinating Bodies</p>	<p>By end of Y2 curriculum development and forwarded to Ministries</p> <p>By end of Y3</p> <p>By end of Y3</p>
	<p>Design and implement a FWI training plan to build capacity of ports and regulatory agencies at the regional and national levels</p> <ul style="list-style-type: none"> • Develop a training plan for knowledge generation on freshwater invasive species amongst the major stakeholders (Customs officers, Plant quarantine officers, Veterinary Officers, National Museums, Ornamental Traders, Fisheries Officers and Pet Traders). Training should sensitise participants to: 	<p>CABI, CISWIG, Researchers, (Universities, TNC), Environmental/Agricultural/Land/Fisheries Regulatory bodies e.g. NEPA in Jamaica, Custom officers, Plant quarantine officers, Veterinary Officers, National Museums, Ornamental Traders, Fisheries</p>	<p>Y3</p>

Objective	Action	Agencies	Timeframe
	<ul style="list-style-type: none"> • Basic freshwater species taxonomy • Access to and use of identification keys/field guides for ease of identification upon encounter of unusual species. • Agencies to be notified when new species are encountered • Determine Target for Training Plan. • Formulate Training Plan and mobilise resources (training materials, resource persons and funding) for implementation 	<p>Officers and Pet Traders) CEHI</p>	<p>By end Y1</p> <p>By end Y2.5</p> <p>By end of Y3</p>
<p>Strengthen national and regional frameworks (eg. Legislative etc.) to allow for effective management of FWI</p>	<p>Develop voluntary codes of conduct for different target stakeholders</p> <ul style="list-style-type: none"> • Clearly define the roles of each regulatory body in the interception of new freshwater species at the border. • Develop and implement containment and control programme • Encourage compliance of laws, regulations and guidelines 	<p>CARICOM Member States, COTED (Environment), CABI, Researchers, Environmental/Agricultural/Land/Fisheries Regulatory bodies e.g. NEPA in Jamaica, Ministry with responsibility for Environment, Agriculture, Custom, Plant Quarantine, Veterinary Services, Ornamental Traders, Fisheries Officers and Pet Traders, Private Sector,</p>	<p>Y4</p>

Objective	Action	Agencies	Timeframe
	<p>Identify priority species and pathways for immediate monitoring containment and control to be disbursed to major stakeholders (Ports, Crop Protection, Quarantine, Veterinary Services, Customs, Pet Shops, Horticulturalist, Aquaculture Traders etc.)</p> <ul style="list-style-type: none"> • Refer to existing data, historical records and institutional knowledge to create baseline status of species. • Develop Reference List of species. • Identify priority invasive species using risk assessment, pathway analysis and niche modelling while incorporating the use of established database (eg. IABIN and Caribbean Hub) in these processes that will enable the ranking of species from high to low risk, invasive or potentially invasive and the development of a ‘Red List of IAS’. • Identify priority species based on invasives established in countries with similar habitats. • Establish FWI regional register of experts and their expertise. • Assemble and disseminate register • Develop survey instrument and post on CIASNET.org • Ensure that IAS are not introduced or reared in programmes and initiatives. • International standards for the export of Freshwater 	<p>CABI, Researchers, Ministry with responsibility for Environmental, Agriculture, Customs, Plant Quarantine, Veterinary Services and control of invasive species</p>	<p>Y2</p> <p>Y3</p> <p>Y3</p> <p>Y3</p> <p>Y1.5</p>

Objective	Action	Agencies	Timeframe
	Invasive Species		By end of Y1
	<p>Develop National and Regional CEPA's plans for implementation during the life of strategy. Identify the target audience and develop appropriate messages which can be duplicated throughout the region through media houses and institutions to raise awareness about the impact of FWI</p> <ul style="list-style-type: none"> ○ Develop and conduct sensitisation and awareness programmes for key regional, national, sectoral and community and target groups through: <ul style="list-style-type: none"> ● Seminars ● Workshops ● Brochures ● Posters ● Videos (segments on NEWS) ○ Posters created should provide information on unwanted species, penalties for having these species in your possession, information on health and biological concerns, and persons to contact regarding FWI. Posters to placed in areas such as: <ul style="list-style-type: none"> ● Airport Terminals ● Wharves ● Pet stores and Flower shops 	<p>CABI, Researchers, Environmental/Agricultural/Land/Fisheries Regulatory bodies, Agricultural and Environmental Ministries, Caribbean Conservation Network, IASWGs CEHI</p>	<p>Y2</p> <p>Y2.5</p>

Objective	Action	Agencies	Timeframe
	<p>Improve institutional arrangements to prevent the introduction and management the spread of FWI</p> <ul style="list-style-type: none"> ○ Identify the areas where management capacity for freshwater invasive species and training need to be improved and to build capacity accordingly ○ Establish an electronic regional clearing house with national nodes ○ Creating a database of invasives to be housed at Universities or National Museums or a virtual herbarium ○ Locate a FWI Focal Point in appropriate national agency ○ Establish national databases of animals and plants located at pet shops and plant stores. Inventory submitted yearly to regulatory agencies and monitored according to reports submitted. 	<p>CARICOM [COTED], OECS, CABI, Researchers, Environmental/Agricultural/Land/Fisheries Regulatory bodies, Ministries responsible, Agricultural , Trade, Environment, Custom, Plant quarantine, Veterinary services, Fisheries</p>	<p>Y3</p>
	<p>Establish protocols for IAS prevention through early detection and rapid response</p> <ul style="list-style-type: none"> • Enhance the ability of the region to more rapidly and accurately identify new introduced freshwater species which has the potential to be invasive • Develop best practices guidelines for early detection and rapid response to IAS that will include responding to introductions at ports of entry <p>Develop guidelines and responsibilities to respond to</p>	<p>CABI, Researchers, Environmental/Agricultural/Land/Fisheries Regulatory bodies, Ministries with responsibility for Agriculture, Trade, Environment, Customs, Plant quarantine, Veterinary service, Fisheries, National IASWGs</p>	<p>Y3</p>

Objective	Action	Agencies	Timeframe
	intentional and unintentional introductions		
	<p>Apply effective species and pathway risk assessment</p> <ul style="list-style-type: none"> • Develop guidelines to gather information about new species • Develop protocol for collection of voucher specimen • Use of tools such as IABIN and software for niche modelling technology to conduct impact assessments and cost benefit analysis • Conduct risk analysis of species identified as priority species which provide empirical justification for the need of FWI management and control introduction. However species on ‘BANNED’ list would not require the use of such tools. <p>Develop plan, identify funds, and mobilise resources</p>	<p>CABI, Researchers, Environmental/Agricultural/Land/Fisheries Regulatory bodies eg. NEPA in Jamaica, Ministry with responsibility for Agriculture, Customs officers, Plant quarantine officers, Veterinary Officers, National Museums, Ornamental Traders, Fisheries Officers and Pet Traders) National IASWGs, Caribbean Conservation Network, Island Conservation, IICA</p>	<p>Y3</p> <p>Y4</p>
Facilitate the use of bilateral and multilateral efforts to share information, develop programmes, to facilitate cooperation in research and capacity building	Strengthen the implementation of international standards) governing control of potentially invasive species at export with particular attention to the main trading partners of Caribbean countries	CABI, COTED, Ministries with responsibility for, trade, environment and agriculture, land, fisheries, Caribbean Fisheries and Management Resource (Belize),	By Y5

Objective	Action	Agencies	Timeframe
	<p>Strengthen collaboration between regional institutions and governments on IAS research issues</p> <ul style="list-style-type: none"> ○ Identify projects addressing the issue of freshwater invasive alien species to prevent an overlap and a duplication of efforts. ○ Establish and maintain regional centres of excellence for FWI 	<p>Planning institutes, Universities</p> <p>Research Institutions, National Museums, etc.</p>	<p>Y1.5</p> <p>Y5</p>
	<p>Develop and implement adequate export (include import) controls directed at preventing the export of specific priority invasive species.</p> <ul style="list-style-type: none"> ○ Review export (include import) inspection procedures directed at specific priority invasive species and identify gaps. ○ Strengthen and expand existing national and internal (inter-island) risk and impact assessment for proposed deliberate movements of species and for the movement of goods that may accidentally carry invasive species. ○ Facilitate a common, regional approach to decision-making on proposed introductions, including on the categorization of species as: <ol style="list-style-type: none"> (1) Low risk, (2) Minimally restricted ‘permitted’ species (3) Moderate-risk ‘restricted’ species and (4) High-risk ‘prohibited’ species and the automatic prohibition of 	<p>COTED, CABI, Researchers, Ministries dealing with Trade, Land , Agriculture, Custom, Plant quarantine officers, Veterinary services, Fisheries, Ornamental Traders, and Pet Traders</p>	<p>Y3</p>

Objective	Action	Agencies	Timeframe
	any organism or good not included on the permitted or restricted lists.		
	Identify and develop long-term regional funding for FWI management in the Caribbean		Y4
	Table the concerns on IAS at Regional meetings through Ministers. <ul style="list-style-type: none"> ▪ Equate IAS with issues of international concern such as Climate Change and obligations under CBD. 	Subcommittees of CARICOM such as COTED (Council for Trade and Economic Development), OECS	Y2

Regional Marine Invasive Alien Species Strategy

(Finalised by participants at the 3rd Regional Consultation and IAS Legal Workshop held in Nassau, The Bahamas during 21-23rd March, 2011)

Approach	Activity	Tasks	Lead Agencies	Time to Complete
Prevention	Identify all pathways and vectors for entry and spread of IAS that threaten the region and design protocols that facilitates a regional approach to decision-making	<ul style="list-style-type: none"> i. Conduct the necessary critical analyses on pathways and vectors for invasion, such as PBBS/marine taxonomic assessment ii. Identify procedures aimed at current specific priority invasive pathways and vectors iii. Make detailed recommendations for improvements with an aim to filling the gaps to allow effective implementation of the national IAS strategy and the CIAS-Strategy. iv. Formation of a Pathway analysis Regional Working Group 	Agencies responsible for Marine Research, Port State Control, Marine Resource Management, Environment	2012 – ongoing
	Implement Programmes to build national and regional capacity	<ul style="list-style-type: none"> i. Based on SWOT analysis, identify the capacity building needs. ii. Obtain national and regional consensus with respect to the distribution of experts and databases. iii. Organize training programmes for selected persons. 	Agencies responsible for Marine Research, Port State Control, Marine Resource Management, Education, Environment	2015-2020

Approach	Activity	Tasks	Lead Agencies	Time to Complete
		<ul style="list-style-type: none"> <li data-bbox="660 271 1019 633">iv. Develop programmes and materials to increase awareness for key regional, national, sectoral and community target groups, including curriculum development for formal education. <li data-bbox="660 674 1019 813">v. Ensure international collaboration and linkages in selected areas. <li data-bbox="660 875 1019 1055">vi. Adopt or develop protocols for rehabilitation or restoration of IAS impacted sites. <li data-bbox="660 1095 1019 1346">vii. Design and implement a regional invasive species training plan to build capacity at the regional and national levels. <li data-bbox="660 1386 1019 1637">viii. Establish and maintain a system of technical advice and support based on a register of relevant regional and international experts. 		
	Develop the protocol to establish long-term mechanisms for the conduct of research in key IAS management areas	<ul style="list-style-type: none"> <li data-bbox="660 1682 1019 1895">i. Develop protocols and provide assistance for the development of National species reference collections. <li data-bbox="660 1935 1019 2040">ii. Develop and strengthen linkages with taxonomic 	Agencies responsible for Marine Research, Port State Control, Marine Resource Management, Environment	2015

Approach	Activity	Tasks	Lead Agencies	Time to Complete
		<p>institutions and experts within and outside the Region such as BioNet and CariNet.</p> <p>iii. Capacity building of taxonomic expertise to generate baseline data, identification of new species arrivals (detections) screening of species (detection) importations (Inspections)</p> <p>iv. Develop and implement a regional research plan on IAS and provide support for implementation of national research plans.</p> <p>v. Investigate the environmental economic and other impacts of IAS whose impacts are unconfirmed but suspected to be serious.</p> <p>vi. Investigate the risk associated with biological control agents and programmes.</p>		
	Develop and Implement a regional public education and outreach programme	<p>i. Develop and strengthen regional databases</p> <p>ii. Develop DVDs and other public education materials for regional impact</p> <p>iii. Social Networks</p> <p>iv. Courses in schools and</p>	Academic Institutions and Agencies for Education	2015

Approach	Activity	Tasks	Lead Agencies	Time to Complete
		universities v. Exchange Programmes		
	Establish a Regional Task Force for Marine IAS	Coordinate and Monitor marine IAS activities throughout the region	Agencies responsible for Marine Research, Port State Control, Marine Resource Management, Environment	2013
	Design and Implement the protocol that will facilitate a common regional approach to decision-making with respect to the effects of trade on the introduction of IAS	<ul style="list-style-type: none"> i. Review general trade inspection procedures. ii. Identify procedures aimed at current specific priority invasive species. iii. Identify priority species for immediate monitoring, containment and control. iv. Make detailed recommendations for improvements with an aim to filling the gaps to allow effective implementation of the national IAS strategy and the CIAS-Strategy. v. Develop trade controls directed at preventing the export or import of specific priority invasive species. vi. Develop the protocol to strengthen and expand existing national and internal (inter-island) risk and impact assessment for 	Agencies responsible for Marine Research, Port State Control, Marine Resource Management, Trade, Environment	2015

Approach	Activity	Tasks	Lead Agencies	Time to Complete
		<p>proposed deliberate movements of species and for the movement of goods that may accidentally carry invasive species.</p> <p>vii. Design the systems to strengthen and promote implementation of international standards governing control of potentially invasive species via trade with particular attention to the main trading partners of Caribbean countries and the categorization of species as: (a) low-risk (b) moderate risk and (c) high-risk “prohibited” species; and the automatic prohibition of any organism or good not included on the permitted or restricted lists.</p>		
Legislation		<p>i. Develop and fortify lists of IAS (on schedules), periodic review.</p> <p>ii. Mandated by law that risk assessment has to be conducted by approved entity at the expense of the importer.</p> <p>iii. The establishment of a National Invasive Species Council. This Council will operate within the limitations of the Regional IAS Schedules; i.e. if an</p>		

Approach	Activity	Tasks	Lead Agencies	Time to Complete
		<p>application comes in for any importation of a species on this list, the IAS Council has the legal responsibility and authority to decide on that application. Coordination can be done through a Regional Cooperation Agreement and facilitates Regional Forums and Meetings of the respective IAS Councils.</p>		

Regional Terrestrial Invasive Alien Species Strategy

(Finalised by participants at the 3rd Regional Consultation and IAS Legal Workshop held in Nassau, The Bahamas during 21-23rd March, 2011)

Approach	Activity	Task	Lead Agencies	Timeline
Prevention	Development a priority list of terrestrial IAS and quantify its invasive potential (Risk Assessment)	<ul style="list-style-type: none"> • Identification of terrestrial IAS in the region • Review and select appropriate risk assessment tool • Conduct risk assessment • Preparation of priority list 	Environmental, Agricultural, Health and Border control agencies	Y1
				Y1
				Y2
				Y2
	Identification of all pathways / means of spread of terrestrial IAS	<ul style="list-style-type: none"> • Conduct critical pathway analysis of entry, internal migration and exit pathways for alien and native invasive species 	Environmental, Agricultural, Health and Border control agencies	Y2
				Y4
	Establishment of regulation to enforce prevention of the introduction of IAS through the pet and horticultural trade	<ul style="list-style-type: none"> • Conduct stakeholder consultation • Develop draft legislation • parliamentary review 	Legal Affairs, Environmental & Agricultural agencies, NGOs	Y2
		<ul style="list-style-type: none"> • Establish and implement media / information programmes 		Y2
	Development of an education / public awareness campaign	<ul style="list-style-type: none"> • Identification of gaps in ability of responsible agencies to regulate the prevention of the entry of IAS 		Y3
				Y3

	Building capacity of regulatory agency to assist in the prevention of entry of IAS	<ul style="list-style-type: none"> • Development of training and retraining programmes of border control personnel 		
Detection, Identification & Response	<p>Build capacity of border control personnel</p> <p>Development of new and revised and strengthen existing monitoring and surveillance protocols</p> <p>Improvement of communication between countries of the Region.</p>	<ul style="list-style-type: none"> • Continuous training of staff • Production of guidelines and handbooks • Training of trainers • Review of protocols and develop specific ones on monitoring and surveillance • Test the collection of information and data analysis • Train personnel on implementation • Train personnel on the use of CIASNET.org 	Environmental, Agricultural, Health and Border control agencies	<p>Y4</p> <p>Y2</p> <p>T3</p>
Management & Control	Establish an assessment protocol to determine status of invasion	<ul style="list-style-type: none"> • Determine pop size, distribution, factors contributing to invasion and impact of invasion. • Review existing protocols for assessment of invasiveness and risk • Select and modify if necessary a model for implementation • Test 	<p>Environmental, Agricultural, Health and Border control agencies</p> <p>Environmental, Agricultural, Health and Border control</p>	<p>Y2/3</p> <p>Y3/4</p>

		<p>appropriateness and modify model</p> <ul style="list-style-type: none"> • Train personnel in data collection, input and analysis • Generate report for management use <p>Determination of the best management method/practice for dealing with IAS</p> <ul style="list-style-type: none"> • Evaluation of existing practices • Evaluation of new IPM approaches • Conduct field trials and desk top exercises • Data collection, analysis and reporting • Implement 'new' practices 	agencies	
Rehabilitation and Restoration	Development of a protocol to ensure restoration and rehabilitation of degraded sites and native species protocol	<p>Development of baseline information of habitat and species:</p> <ol style="list-style-type: none"> Data collection and review Analysis of data Develop report <p>Determine impact of species / ecosystems selected for rehabilitation / restoration:</p> <ol style="list-style-type: none"> Analysis of information that will direct the rehabilitation/ restoration Develop model for rehabilitation/ restoration. <p>Develop protocols to prevent</p>	Environmental, Agricultural, Health and Border control agencies	<p>Y4</p> <p>Y2</p> <p>Y3</p>

	<p>Establishment of a breed and release program</p>	<p>reintroduction of IAS that caused degradation</p> <ol style="list-style-type: none"> a. Prepare list of steps o prevent re-introduction b. Validate the model with stakeholders c. Generate report outlining full guidelines <p>Develop program for breeding and releasing native spp affected by IAS.</p> <ol style="list-style-type: none"> a. Acquire healthy spp b. Rear / cultivate spp under normal conditions c. Release and monitor selected spp. d. Monitor population until it develops to desired threshold e. Continue observing for re-introduction of IAS 		<p>Y3/4</p>
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