



**Regional Lionfish Strategy Workshop  
Cancun, Mexico  
August 27<sup>th</sup> – 28<sup>th</sup> 2010**

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**WORKSHOP SUMMARY**

**INTRODUCTION**

This document summarizes dialogue, activities and outputs of the first *Regional Lionfish Strategy Workshop* conducted in Cancun, Mexico on August 27<sup>th</sup> – 28<sup>th</sup>, 2010. The summary does not serve as an analysis of workshop results and identified next steps. Rather, the included outputs inform future development of a ‘best practices’ manual and serve as the foundation of a regional strategic framework for lionfish control in the wider Caribbean.

The workshop engaged a diverse set of marine resource professionals, with attendees hailing from 20 different Caribbean countries and territories. Participants included marine protected area (MPA) managers, fisheries officers and resource management authorities, scientists, non-governmental organizations (NGOs), academics, and regional project managers.

The director and staff of the Cozumel Reefs National Marine Park, serving as workshop host, provided extensive planning, preparation and logistical support. The overall planning team consisted of the US National Oceanic and Atmospheric Administration (NOAA), Comision Nacional de Áreas Protegidas Naturales or Mexican National Commission for Protected Areas (CONANP), Reef Environmental Education Foundation (REEF), the Regional Activity Center for the Protocol on Specially Protected Areas and Wildlife (SPAW-RAC) and the International Coral Reef Initiative (ICRI).<sup>1</sup>




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<sup>1</sup> See Appendix 1 for a list of participants, planning team members, facilitator and local support staff.



## DAY 1

Thursday, August 27<sup>th</sup> 2010

8:30 a.m. – 6:00 p.m.

### 1. *Welcome introductions, workshop objectives and ground rules*

Ricardo Gomez Lozano, director of the Cozumel Reefs National Marine Park, opened the workshop and welcomed all participants. Mr. Gomez stressed the scale and severity of the lionfish invasion across the wider Caribbean, and highlighted the unity of concern that brought all participants together. He explained that forging new collaboration among participating countries and a wide array of stakeholder groups across the region represented a central goal of the workshop.

Mr. Gomez subsequently introduced Alfredo Arellano Guillermo, CONANP director for the Mexican state of Quintana Roo. Mr. Arellano welcomed participants on behalf of Mexico as the host country. He emphasized the unique biodiversity and significant economic value provided by Caribbean coastal environments, and highlighted the growing threat of the lionfish invasion. He encouraged participants to capitalize on each country's individual experience and initiate mutual development of a regional strategy to address the problem.

Mr. Gomez concluded the introduction by thanking key supporters, including the French government in its role as the ICRI Co-Secretariat, the SPAW-RAC, REEF and NOAA as supporters of a wider Caribbean lionfish initiative, and the government of Mexico for hosting the workshop.

Mr. Gomez next introduced Rich Wilson of Seatone Consultants, the facilitator for the workshop. Mr. Wilson explained that in his capacity as facilitator he provides a *process* and *structure* to the workshop that allows participants to focus on *content*, in this case the lionfish invasion in Caribbean waters and how to address the challenge it represents. In addition, Mr. Wilson stressed how the workshop afforded participants an opportunity to seek consensus viewpoints on the strategic direction of lionfish control efforts across the region. Mr. Wilson then offered all participants a moment to introduce themselves to the entire group, highlight their country of origin, and describe their professional background.

Mr. Wilson provided an overview of how the planning team—NOAA, CONANP, REEF, SPAW-RAC and ICRI—collaborated extensively to define objectives for the workshop. He described objectives as targets that give participants direction and cultivate shared responsibility over the course of a two-day workshop. He subsequently reviewed and gained consensus from the group on the following objectives:

- Identify and refine 'best practices' for control of the invasive red lionfish (*Pterois volitans*) in the wider Caribbean
- Create the foundation for a regional body to work collaboratively on lionfish issues in the wider Caribbean



- Increase regional awareness, communication, collaboration, and capacity to assess ecological impacts and control lionfish in the wider Caribbean
- Achieve consensus among workshop participants on effective lionfish control strategies, action items, and future initiatives while simultaneously recognizing the unique challenges faced by each Caribbean country represented at the workshop

Following open discussion and agreement on objectives, Mr. Wilson proposed workshop ground rules for enhancing group effectiveness. He explained that early agreement and adoption of ground rules establishes a 'code of conduct' that guides participant interaction and fosters an environment of openness, mutual learning and respect. While some proposed ground rules were merely procedural (e.g. turn cell phones off, avoid side bar discussions), others focused on participant behavior and group interaction. Following review and open discussion, the group approved by consensus the following additional ground rules:

- Be clear, concise and on-point with comments, and explain your rationale
- Combine advocacy and inquiry
- Test assumptions and conclusions
- Jointly design next steps and how to move forward
- Maintain tolerance of others (added by the group)

## 2. *Overview of the lionfish invasion, biology/ecology, impacts*

Mr. Wilson next introduced NOAA scientist James Morris to provide background information on the lionfish, and ensure accurate understanding of the invasion in Caribbean waters. Mr. Morris presented an overview of current scientific knowledge on the biology and ecology of the lionfish. He focused on the status of the invasion, reproduction, predator/prey relationships, diet, and potential future impacts for the Caribbean region.

Mr. Morris then introduced Stephanie Green, a doctoral candidate and researcher from Simon Fraser University in Vancouver, Columbia. Ms. Green discussed the results of recent data collection and analysis from the Bahamas. She highlighted lionfish impacts and associated reduction of native species. She further described lionfish reduction targets needed to mitigate impacts on native fish populations. Ms. Green culminated her presentation by showing a graphic that illustrated the spread of lionfish from a small number of locations in Florida and the Bahamas to nearly all Caribbean countries and territories by 2010.

## 3. *Presentation of country control strategies and management plans highlighting key elements, successes and challenges*

Following scientific presentations on lionfish, Mr. Wilson introduced Mr. Lad Akins, Director of Operations for REEF, who provided opening remarks for the country and territory presentations. Mr. Akins briefly described REEF's previous work on invasive species issues in the region. He highlighted REEF's past efforts to survey key lionfish issues and collaborate with several countries to conduct trainings as well as develop protocols, strategies and management plans for



lionfish control. He stressed, however, that much has changed since REEF’s initial work on the lionfish issue, particularly given the rapid pace of the invasion. Furthermore, he pointed out that many countries have not yet had an opportunity to share their early experiences with control and management.

Mr. Akins then spoke to the purpose and rationale for the upcoming presentations. He emphasized the benefits of a regional gathering, particularly the opportunity it afforded stakeholders to share and discuss critical issues in a group environment and thus learn from the experiences of others. As such, the chosen presentation format (see below) created a forum where participants could assess which control strategies and best practices are working across the region, which are not, and what challenges the group will face in striving to meet both short and long-term success in controlling the invasion. Finally, he emphasized how the substance of the presentations would inform later discussions on strategic approaches and next steps following the workshop.

Mr. Wilson reminded participants of the presentation template sent out by the planning team prior to the workshop. He requested that presenters stay within the ten-minute timeframe provided for each presentation. He subsequently reviewed the main components of the template, which provided instructions for country-specific power point presentations on the following key topics:

- Status of the invasion (i.e. date of first fish sighting; how many now; how many per site and/or habitat type; notable sightings, etc.)
- Control strategies (i.e. existence of a formal plan or not; key elements of control strategy such as removal methods; monitoring; outreach and education; partnerships)
- Success to date (i.e. what has worked, why and lessons learned)
- Challenges (i.e. what limits or prevents success and why)
- Resources (i.e. available funding, human resources, field resources, etc. for control strategies; expected future resource needs)
- Needs (e.g. human, financial, technical)
- Concluding statement (i.e. hopes, concerns, expected benefits from the workshop)

The following countries, territories and organizations presented at the workshop:<sup>2</sup>

Bahamas	Belize	Bermuda	Bonaire	Cayman Islands
Colombia	Cuba	Dominican Republic	USA	Jamaica
French Antilles	Mexico	Puerto Rico	St. Maarten	Turks and Caicos
US Virgin Islands	Venezuela	Centre for Agricultural Bioscience International		

<sup>2</sup> All workshop presentations have been posted on the ICRI website (<http://icriforum.org/key-topics/alien-invasive-species>).





#### 4. *Discussion of key strategy topics*

Following completion of all presentations, Mr. Wilson opened the afternoon session by highlighting how participants would engage in open discussion, back-and-forth dialogue and brainstorming exercises throughout the remainder of the workshop. Specifically, key topics associated with lionfish control—as identified in the presentations—would be reviewed and participants would begin documenting, and in some cases refining, effective strategies linked to each topic or sub-topic.

Mr. Wilson described how discussion of specific strategies across a broad spectrum of topics lays the foundation for an overarching regional strategic framework for lionfish control in the wider Caribbean. In addition, outputs from the discussion inform content of a ‘best practices’ manual for the region. Such a manual may be regionally focused yet adoptable or adaptable at a local level regardless of what stage of the invasion a country or territory was experiencing.

The presentation template ensured similar structure and content from all presenters. This enabled the planning team to conduct a rapid analysis of information following completion of the presentations. The analysis produced a draft list of key topics for opening discussion during the afternoon session. Mr. Wilson introduced and reviewed it with participants to determine the level of accuracy and completeness.

The group briefly discussed whether or not to add ‘capacity building’ or ‘development of national response plans’ as key topics. Mr. Wilson described how the planning team asked similar questions during its analysis and determined that most topics could be included under these two broad headings, but more specific topics were favored to such general terms. Finally, he asked participants if they agreed or disagreed with such rationale, during which time it was agreed not to use such broad terms.

The group subsequently identified ‘resource needs’ as a key topic missing from the draft list. Several participants commented on how identification and acquisition of resources consistently represents one of their biggest challenges. Other participants attempted to evaluate whether or not resource needs could be incorporated into other topics. Finally, the group as a whole agreed and recommended addition of resource needs as a primary topic requiring further discussion and exploration.

Mr. Wilson reminded participants that the initial topics list was in no way permanent, and could be adjusted by the group in the future as needed or appropriate. Following open discussion and review, participants agreed to the following key topics and sub-topics as representative of the current strategic approach to lionfish control in the region:

1. Education and outreach
  - a. Private sector
  - b. Government
  - c. Public



- d. Communication plan
2. Control
    - a. Collection and handling
    - b. Training
    - c. Reporting and documentation
    - d. Incentives
    - e. Marketing for food consumption
  3. Policies and regulations
    - a. Enabling
    - b. Limiting
    - c. Regional<sup>3</sup>
  4. Partnerships
    - a. Volunteer recruitment
    - b. Cross-sector
  5. Resource needs
    - a. Human
    - b. Financial
    - c. Technical
  6. Research
    - a. Priorities
    - b. Needs
    - c. Coordination

The bulleted lists below reflect the outputs of the group discussions. Each identifies and links strategies to one or more of the aforementioned key topics or sub-topics. In addition, at this stage of the workshop Mr. Wilson began using a volunteer participant to translate the discussion from English to Spanish. This followed a recommendation by several participants that such translation would ensure greater understanding and participation from Spanish speakers with limited English skills.

## EDUCATION AND OUTREACH

### ***Private sector***

- Conduct workshops and trainings (dive industry, fishermen, tourism associations)
- Design and disseminate posters, stickers and printed materials (all sectors)
- Target and publish in select industry publications
- Request funding from private companies and educate in the process

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<sup>3</sup> This segment of the discussion was delayed until the next steps exercise at the end of day 2.



- Give presentations at trade association gatherings
- Maintain reporting 'hotlines' and email (all sectors)
- Stress financial benefits of control
- Target private sector at a regional scale
- Target airports and seaports
- Promote recognition of partners (all sectors)
- Target the food and hospitality sector
- Establish a regional 'Day of the Lionfish'

### **Government**

- Disseminate results of research
- Use research data and analysis results to motivate government action
- Prepare response plan prior to invasion
- Use response plan to motivate government action
- Train and mobilize first responders (see also control/training below)
- Create network of regional bodies and governments
- Target and be persistent with political powers
- Target key government meetings and promote inter-governmental coordination
- Conduct face to face meetings with government officials
- Utilize other stakeholder groups to engage government officials (e.g. conservation NGOs)
- Create policy briefs
- Invite officials to events and to see lionfish in the water
- Communicate an ecological and economic message to influence government officials
- Aim high and be ambitious

### **Public**

- Engage the media with press releases and public service announcements
- Host workshops and lectures for the public
- Recruit a high level or famous individual as a spokesperson
- Build broad stakeholder involvement
- Create and host tournaments and fishing derbies
- Engage schools and universities
- Standardize informational materials for all sectors
- Use the internet and other available technology (e.g. social networking sites)
- Host 'Lionfish Tasting' events
- Host information fairs
- Create displays for aquariums and museums
- Target public health issues and hospitals

### **Communication plan**

- Consider existing models and plans when developing education/outreach materials
- Utilize and communicate standardized information for reporting (e.g. data sheets)
- Pace the message to meet response plan goals and objectives



- Ensure quality control of communication and messaging
- Use peer review protocols for communication
- Maintain a central source for information with multiple formats/tools/languages
- Maintain awareness of different language requirements

Upon completing the discussion on education and outreach, Mr. Wilson adjourned day 1 of the workshop at 6 p.m.

## **Friday, August 28<sup>th</sup> 2010**

**9:00 a.m. – 5:30 p.m.**

Mr. Wilson opened the workshop by providing a re-cap of day 1 and reviewing the agenda for day 2. He noted slight modification of the agenda in order to provide participants additional time to identify and refine various control strategies. In response, he informed participants of limited time available to formally construct a regional strategic framework document. He reminded participants how outputs from the strategy exercises would inform next steps and activities following the workshop. Moreover, he again stressed that the cumulative outputs of the workshop provide the foundation of a regional strategic framework for lionfish control in the wider Caribbean that may be further developed in the future. And finally, he reminded participants how their combined experiences inform development of a ‘best practices’ manual based on regional level knowledge yet adoptable or adaptable to meet local circumstances, needs and challenges.

### *1. Discussion of key strategy topics continued*

#### CONTROL

##### ***Collection and handling***

- Provide education and training on safe handling and environmentally sensitive techniques (see also in training below)
- Prioritize control (e.g. establish rationale, type, location and frequency of control)
- Conduct passive marking prior to capture
- Conduct targeted searches

##### ***Training***

- Conduct in-water training to motivate volunteers and enhance effective control
- Facilitate ‘Train the Trainers’ programs
- Provide training on how to construct removal gear
- Provide training on first aid and medical response (see also education and outreach/government above)
- Provide cooking classes and training on food consumption
- Collaborate with the dive industry and fishermen (see also education and outreach/private sector above)
- Establish protocols for proper use of specimens following collection





- Use available online technology

### ***Reporting and documentation***

- Standardize approaches (e.g. format, criteria, frequency, etc.) for reporting (see also [research priorities/coordination](#) below)
- Maintain regional and national nodes for reporting: centralized database and source for information (see also [education and outreach/communication plan](#) above)
- Develop a comparative matrix for different ways to report and maintain data
- Simplify the reporting approach/method for volunteers and others
- Link collection to reporting
- Establish a mechanism to measure food consumption rates
- Link reporting to education (locally, nationally and regionally)

### ***Incentives***

- Establish tournaments and derbies
- Create 'adopt-a-reef' programs
- Recognize efforts of volunteers and partners
- Provide discounts for purchase of scuba equipment
- Purchase, in whole or in part, removal gear for volunteers (e.g. fishermen)
- Promote individual food consumption (i.e. 'catch your own dinner')
- Create tax incentives or other government incentives (e.g. dive operator participation, fishermen licensing, etc.)
- Include control strategies in management plans, business plans, and reports for groups seeking funding
- Use bounties if/when appropriate
- Provide direct government payments if/when appropriate
- Generate prizes and rewards for removal
- Establish and maintain national records (e.g. biggest fish/most fish captured)
- Award academic credits to university students for community service
- Promote lionfish control as a 'Green Initiative'

### ***Marketing for food consumption***

- Educate the public about lionfish as a food resource
- Clarify negative perceptions about the dangers of lionfish
- Develop links between supply and demand for lionfish
- Find alternative products (e.g. pet food, fertilizer, pharmaceuticals, etc.)
- Highlight the risks of creating a market for lionfish (i.e. fishermen interest to 'grow and maintain' lionfish on the reef)
- Highlight lionfish consumption as a 'green alternative' to other fish species
- Ensure quality control of product (e.g. quality of meat or presence of toxins)
- Recruit marketing experts
- Be open to creative marketing, yet bring a balanced perspective to limit economic and cultural 'acceptance' of an invasive species



- Consider government subsidies (e.g. like agriculture, farm, export, etc.)
- Establish a campaign in partnership with the aquarium industry
- Consider marketing strategies for all sizes of fish
- Ensure that the invasive (negative) nature of lionfish in the Caribbean is highlighted in all marketing materials
- Link decline in lionfish to restoration of native fish populations

## POLICIES AND REGULATIONS

### ***Enabling***

- Establish free use of legal fishing gear (e.g. no licensing fees)
- Permit special gear types
- Prohibit import of lionfish and other potentially damaging invasive species
- Connect penalties to prohibitions
- Streamline regulations
- Permit removal within MPAs
- Apply protected area and fishery management plans to enhance protection of indigenous and endangered species
- Identify gaps in existing policies and regulations in order to promote economic use of lionfish
- Review sustainable fishery regulations relative to invasive species
- Establish lionfish as a unique fishery
- Consider regulations for disposal of captured specimens
- Establish an inter-disciplinary technical advisory committee
- Develop and formalize national response plans consistent with different stages of the invasion
- Adopt or adapt compatible policies and regulations from other countries
- Ensure consistency between national regulations and international treaties and agreements

### ***Limiting***

- Change and/or adapt regulations to permit restricted gear where appropriate or needed
- Evaluate and streamline regulations regarding commercial sale of lionfish
- Compile a list of limiting regulations and authorities (national and regional as appropriate)
- Streamline the regulatory process by issuing special exemptions or rules instead of changing regulations
- Consult and coordinate with appropriate experts and authorities to effectively interpret the law
- Involve enforcement officials and prosecutors where appropriate or needed
- Involve diverse stakeholders to achieve goals



## PARTNERSHIPS

### ***Volunteer recruitment***

- Utilize the media to target key stakeholder groups
- Maintain a call in 'hotline' and email listserv (see also education and outreach/private sector above)
- Build networks of volunteers
- Develop formal volunteer programs and partner with others as appropriate
- Target schools, dive shops, universities, fishermen associations, and community groups
- Use lionfish events as a recruitment tool (e.g. workshops, tournaments, community meetings)
- Access skilled people through established programs (e.g. research programs)
- Address liability issues when developing a volunteer program
- Create non-cash incentives for volunteers
- Consider non-traditional uses of volunteers
- Identify desired incentives (i.e. what would motivate volunteers)
- Document in-kind contributions

### ***Cross-sector***

- Involve all sectors in development of national lionfish response plans (public, private, civil society)
- Maintain diverse membership on lionfish committees and working groups
- Conduct outreach to sectors other than one's own
- Identify decision makers in target partner organizations
- Identify partner benefits and needs
- Use online tools to link sectors
- Explore unconventional partnerships

## RESOURCE NEEDS<sup>4</sup>

### ***Human*** (*significant overlap with education and outreach/volunteer recruitment section*)

- Dedicate government staffing and resources
- Engage and change behavior of poachers in favor of lionfish capture

### ***Financial***

- Target available government funds
- Target funds from the tourism sector
- Target external funders (e.g. private foundations, bi-lateral and multi-lateral agencies)
- Target national conservation funds
- Create a trust fund

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<sup>4</sup> The facilitator noted that the workshop did not afford sufficient time to address this topic in detail. He acknowledged its importance and the need for it to be addressed in greater detail in the future.



- Acquire sponsorships
- Seek voluntary money contributions
- Promote exchange/trade/barter programs
- Conduct 'willingness to pay surveys' with visiting tourists
- Appeal to civic responsibility
- Generate revenue through sale of promotional materials
- Host public and private fundraising events
- Establish fees based on natural resource penalties
- Be creative with existing funds

***Technical*** (significant overlap with financial above)

- Promote information sharing between local groups and between countries
- Approach external funders
- Partner with others to access expertise and additional material resources (government agencies, NGOs, community groups)
- Create peer and information exchange programs
- 'Piggyback' on other research

**LIONFISH RESEARCH**

Following extensive brainstorming and discussion on the strategies linked to each key topic—1) education and outreach, 2) control, 3) policies and regulations, 4) partnerships, and 5) resource needs—Mr. Wilson opened a discussion on research. He began by recognizing the complex nature of the subject. He then described the purpose of the discussion as seeking to generate ideas and identify priorities, rather than articulating strategies or striving to achieve consensus on the overall future direction of scientific research (see bullets below).

NOAA lionfish researcher James Morris provided additional commentary to frame the context of the discussion. He highlighted the connection between the identification of research needs; acquisition of funding; process of conducting scientific research; and generation of results that inform effective management. He emphasized how initial identification of priorities by this group may catalyze research in the near term, and potentially help create new funding opportunities for researchers that in turn could support managers and others in their efforts to control lionfish.

Mr. Wilson subsequently described how analysis of the country and territory presentations generated a detailed list of identified research needs. Prior to showing the list to the group, he facilitated a brief discussion to determine if participants held similar viewpoints regarding research priorities. Mr. Wilson asked participants to identify their most pressing needs by considering the most important questions they need answered. He reminded the group that this was a simple brainstorming exercise. As such, consensus was not a goal nor would participants, due to time constraints, discuss or debate the merits of any identified research need.

Finally, Mr. Wilson acknowledged that some presentations demonstrated control strategies informed by research, whereas others noted how lack of coordination on research inhibits





control efforts. To conclude the discussion, participants were asked to consider ways that coordination could improve across the region.

## PRIORITIES

- Assign socioeconomic value to lionfish impacts
- Model projected expansion of the invasion, including larval dispersal
- Conduct and widely disseminate applied research on how to maximize catch and minimize by-catch
- Conduct and widely disseminate applied research on how to effectively target lionfish in deep water
- Standardize research methods as needed or appropriate
- Determine effectiveness of removals
- Highlight the risk or lack thereof regarding Ciguatera associated with lionfish
- Explore connectivity issues
- Conduct spatial monitoring of lionfish
- Investigate sterilization as a potential control method
- Investigate invasive/native species interaction

## NEEDS

### ***Control and management***

- Improve understanding of best management practices and the most effective removal techniques
- Assess densities and population statistics (see also monitoring and assessment below)
- Improve understanding of how to create market demand for consumption

### ***Monitoring and assessment***

- Conduct ongoing surveys of reefs and other coastal ecosystems (e.g. mangroves, sea grass beds, artificial reefs)
- Acquire lionfish data from dive operators and fishermen
- Access data from tournament catches
- Access relevant data from other projects
- Access data based on 'hotline' reports

### ***Economic impacts***

- Assess impacts on the tourism industry
- Assess impacts on commercial and artisanal fishing
- Assess impacts on livelihoods
- Assess impacts on human health

### ***Ecological impacts***

- Conduct comprehensive assessment and evaluation of ecological impacts (biodiversity)



- Assess and evaluate impacts to MPAs
- Assess and evaluate effects on coral reef recruitment
- Improve understanding of native species displacement

### ***Biology and Ecology***

- Identify 'hotspot' locations (invasion zones)
- Improve understanding of larval distribution patterns
- Improve understanding of reproduction
- Improve understanding of native species predator/prey relationships

### **COORDINATION**

- Standardize and streamline methods as needed or appropriate (see also [research priorities](#) above)
- Identify and coordinate to minimize overlaps between lionfish research and data collection associated with other investigations
- Share and discuss research results at international conferences: Specially Protected Areas and Wildlife (SPAW), International Coral Reef Initiative (ICRI), Gulf and Caribbean Fisheries Institute (GCFI), International Tropical Marine Ecosystem Management Symposium (ITMEMS)
- Use list servers to widely disseminate information: Coral-List, CaMPAM, GCFI
- Engage in direct cross sector communication between researchers, resource managers and other relevant agencies, NGOs and civil society groups
- Identify a technical focal point for information sharing (see also [education and outreach/communication plan](#) above)
- Promote information exchanges between MPAs and other relevant agencies, NGOs and civil society groups
- Integrate a lionfish component into other ongoing research and data collection
- Improve coordination between funders of research

### ***2. Identification of next steps***

Mr. Wilson described the final discussion of the workshop as a brainstorm focused on next steps. He reminded the group how over the course of two days they had built the foundation of a regional strategic framework aimed at controlling lionfish in Caribbean waters. He then introduced two key questions to initiate discussion of follow up actions that enable the group to continue the process—in other words, activities that need to happen in the weeks and months following the first-of-its-kind *Regional Lionfish Strategy Workshop*, and ways that workshop participants and others across the region can improve communication and collaboration on the issue. He pointed out how the discussion would attempt to answer the following questions:

1. How does this group envision itself collaborating in the near and long term future?
2. What regional mechanisms and institutions may strengthen this group's efforts?



Mr. Wilson utilized the first question to initiate a discussion of next steps that increase and sustain collaboration amongst this group and with others in the region. In response, participants considered formation of a regional-level ‘working group’ or ‘task force’ to address the lionfish issue. Participants contributed ideas to how such a working group may be structured, who would be involved, and what would be needed to sustain such a body. In addition, the group discussed the most important and effective means to disseminate the results of the workshop, and both recruit and assist countries, territories and stakeholder groups not present.

To begin addressing the second question above, Mr. Wilson made reference to an earlier presentation provided by Franck Gourdin, regional coordinator for the Specially Protected Areas and Wildlife (SPAW) protocol. Mr. Gourdin spoke briefly about how SPAW—managed by the United Nations Environment Program – Caribbean Environment Program—may strengthen development and implementation of a regional strategic framework for control of the lionfish in the wider Caribbean.

Specifically, Mr. Gourdin emphasized how SPAW could strengthen regional coordination, regulation, and common policing related to research, trade, education and program development on lionfish issues. He also stressed how SPAW could serve as a link between lionfish experts and decision makers. Finally, he highlighted the importance of presenting the results of the workshop at the upcoming SPAW conference in Montego Bay, Jamaica in October 2010.

Mr. Wilson then tasked the group identify additional regional or sub-regional mechanisms and institutions that may strengthen both development and implementation of a regional strategic framework. Results of both discussions are included in the bullet list below.

## NEXT STEPS

### ***Develop a regional lionfish ‘working group’ for the wider Caribbean***

Facilitate collaboration through development of a regional ‘working group’ or ‘task force’:

- Ensure composition reflects diverse membership of professionals and countries
- Define vision, mission and guiding principles
- Determine how the working group will be led
- Identify needs to ensure durability of the working group
- Create an organogram to build working group structure
- Identify and apply lessons learned from similar initiatives

Define a clear message with supporting data about:

- The current status of the lionfish invasion and ongoing control efforts
- Newly established regional collaboration among countries and stakeholder groups
- Needs and help required to resolve current and expected future challenges



Share lessons learned:

- Reconvene the group to share success stories and address ongoing challenges
- Create a central source for information, and workshop participants and others begin using and contributing to this source

### ***Disseminate workshop summary/outputs***

- Share workshop summary/outputs at upcoming regional meetings and conferences (e.g. SPAW, GCFI, ICRI, ITMEMS)
- Determine the most effective way to make collaboration and the lionfish message go 'viral' across the wider Caribbean
- Utilize workshop outputs to garner support from high level government officials back home (participants)
- Incorporate workshop outputs into a regional marine invasive species strategy
- Assist countries not present at the workshop in preparing for the lionfish invasion
- Communicate workshop outputs to regional Caribbean fisheries mechanisms
- Use workshop outputs to develop and disseminate a 'best practices' manual
- Conduct outreach to non-Caribbean countries

### ***Acquire additional support***

Funding and recruitment:

- Identify additional potential funding sources
- Recruit participation and collaboration from countries not present at the workshop

Identify regional mechanisms to support implementation of a regional lionfish strategy:

- United Nations Environment Program - Caribbean Environment Program (UNEP-CEP) under the Specially Protected Areas and Wildlife Protocol (SPAW)
- Caribbean Fisheries Management Council (CFMC)
- Western Central Atlantic Fishery Commission (WECAFC)
- NOAA International Coral Reef Conservation Program (NOAA CRCP)

Identify sub-regional bodies to support implementation of a regional lionfish strategy:

- Organization of Eastern Caribbean States (OECS)
- Organización del Sector Pesquero y Acuícola de Centroamerica (OSPESCA)
- Caribbean Regional Fisheries Mechanism (CRFM)
- Development Consultants Network (DCN)
- Netherlands Antilles Coral Reef Initiative (NACRI)

### ***Control and research***

- Identify priority control areas and establish short and long range strategic goals
- Initiate regional coordination of research





### 3. Workshop conclusion

Mr. Wilson began closing remarks by reminding participants that the first ever *Regional Lionfish Strategy Workshop* represented the beginning of dialogue and collaboration, and recognized that everyone had a great deal of work ahead of them in addressing the lionfish invasion. He acknowledged that several issues had been placed in the ‘parking lot’ during the course of the workshop and thus required further discussion by the group.<sup>5</sup> These issues included the following:

- Identify and coordinate the most effective methods to share research and influence decision makers
- Create a matrix that highlights the pros/cons/costs and other criteria for various gear types used to control lionfish in the wider Caribbean;
- Explore how to use international agreements in support of regional control of lionfish in the wider Caribbean
- Consider export channels for lionfish (both fishery and aquarium trade) from the wider Caribbean (strong disagreement on this issue amongst the group)
- Consider secondary impacts of the lionfish invasion in the wider Caribbean

Mr. Wilson thanked Ms. Estrella Malca, NOAA research associate, for her assistance with translation during the course of the strategy brainstorm exercises. He informed all participants that a workshop summary would be disseminated by September 2010.

Finally, Mr. Wilson provided planning team members an opportunity to make closing remarks. Both individually and collectively—Lad Akins (REEF), James Morris and Scot Frew (NOAA), and Ricardo Gomez Lozano and Alfredo Arellano Guillermo (CONANP)—thanked participants for their attendance and hard work during the course of the two-day workshop. Each expressed enthusiasm for and stressed the importance of enhanced collaboration and coordination on lionfish issues across the wider Caribbean. Finally, the planning team thanked supporters of the workshop, including the French government, NOAA, the SPAW-RAC, ICRI and all the individuals who made the event possible.

At 5:30 p.m. Mr. Wilson adjourned the workshop.

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<sup>5</sup> The parking lot is a technique that allows a facilitator to maintain focus of a group conversation by temporarily putting aside or ‘parking’ an issue while still validating its importance and acknowledging the need to re-visit the issue at a later time.



## Appendix 1. Workshop Attendees

### Country and Territory Representatives

Alfredo Arellano  
*Regional Director of CONANP*  
*Quintana Roo, Mexico*

Anabel Leyva Rojo  
*CONAPESCA, Mexico*

Camilo Trench  
*Discovery Bay Marine Laboratory*  
*Jamaica*

Craig Lillyestrom  
*Director, Marine Resources Division, Department of*  
*Natural and Environmental Resources*  
*Puerto Rico*

Estrella Malca  
*Protected Resources and Biodiversity Division,*  
*National Marine Fisheries Service, NOAA*  
*USA*

Francisco Eduardo Ursúa Guerrero  
*CONANP*  
*Mexico*

Gamble, Lloyd R.  
*Foreign Affairs Officer, Invasive Species*  
*US State Department*  
*USA*

Isaias Majil  
*Marine Protected Areas Coordinator*  
*Belize*

Kelvin Serrano  
*Marine Resources Division*  
*Puerto Rico*

Margarita García Martínez  
*CONANP*  
*Mexico*

Marisol Torres Aguilar  
*CONANP*  
*Mexico*

Ana Isabel González Martínez  
*CONANBIO*  
*Mexico*

Bradley Johnson  
*Research Officer*  
*Department of Environment, Cayman Islands*

Chris Flook  
*Coordinator of Lionfish Research, Bermuda Aquarium*  
*Museum and Zoo*  
*Bermuda*

Dave Gulko  
*CSI ICRI, Committee on Coral Reef Enforcement and*  
*Investigation*  
*USA*

Fabien Védie  
*Environment State Service*  
*Isla Martinique, French West Indies*

Franck Gourdin  
*Project Coordinator at the SPAW-RAC*  
*Guadeloupe, French West Indies*

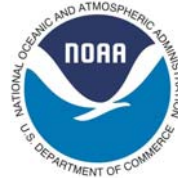
Georgia Born Schmidt  
*CONABIO*  
*Mexico*

Jaime Manuel González Cano  
*CONANP MPA Director - Cancun*  
*Mexico*

Kemit-Amon Lewis  
*Coral Conservation Manager, the Nature Conservancy*  
*USVI*

María del Carmen García Rivas  
*CONANP MPA Director – Banco Chinchorro*  
*Mexico*

Marlon Hibbert  
*Fisheries Officer*  
*Department of Environment and Coastal Resources*  
*(DECR), National Environment Centre*  
*Turks and Caicos*



Michael Braynen  
*Director, Department of Marine Resources  
Bahamas*

Nacor Bolaños  
*Biólogo con énfasis en Biología Marina Subdirección de  
Gestión Ambiental CORALINA  
Columbia*

Naitram (Bob) Ramnanan  
*Project Manager, Caribbean and Latin America, CABI  
Trinidad and Tobago*

Nancy Daves  
*Capacity Building Coordinator, Office of International  
Affairs, National Marine Fisheries Service, NOAA  
USA*

Noemi Peña  
*Departamento de Recursos Naturales y Ambientales  
Biologo III, Laboratorio de Investigaciones Pesqueras,  
DRNA  
Puerto Rico*

Oscar Lasso  
*Investigador y curador sección de ictiología Museo de  
historia natural La Salle Venezuela  
Venezuela*

Pedro Chevalier Monteagudo  
*J.Dpto.Acuariología  
Acuario Nacional de Cuba  
Cuba*

Ramón de Leon  
*Manager - Bonaire National Marine Park  
Bonaire*

Raul Villaseñor  
*CONAPESCA  
Mexico*

Ricardo Gómez  
*CONANP MPA Director – Cozumel  
Mexico*

Roberto Mendoza  
*Profesor Investigador  
Departamento de Fisiología y Ecología de Organismos  
Acuáticos, Universidad Autónoma de Nuevo León  
Mexico*

Ruben Torres  
*Director, Reef Check Foundation  
Dominican Republic*

Tadzio Verboets  
*Manager, Nature Foundation St. Maarten  
Netherlands Antilles*

## Planning Team

Laddie Akins  
*Director of Operations  
Reef Environmental Education Foundation  
USA*

Scot Frew  
*International Program Office, National Ocean Service,  
NOAA  
USA*

Ricardo Gomez Lozano  
*CONANP MPA Director – Cozumel  
Mexico*

Stephanie Green  
*Ph.D. candidate  
Simon Fraser University  
Canada*

James Morris  
*National Centers for Coastal Ocean Science, National  
Ocean Service, NOAA  
USA*

Francis Staub  
*International Coral Reef Initiative (ICRI)  
France*

Hélène Souan  
*SPAW Regional Activity Center  
Guadeloupe*



## Facilitator

Rich Wilson  
*Principal, Seatone Consultants*  
USA

## Support Staff

Marisol Torres Aguilar  
*CONANP*  
Mexico

Helen Annette Ken Sanchez  
*CONANP*  
Mexico

Abelardo Brito Bermúdez  
*CONANP*  
Mexico

Roberto Luque Andrade  
*CONANP*  
Mexico