

A Practical Solution to Lionfish Management: CORE Foundation's Caribbean Lionfish Response Program

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ABSTRACT

In less than a decade, the Indo-Pacific lionfish has rapidly spread throughout the Atlantic and Caribbean regions. Marine ecosystems, as well as the fisheries-based economies of smaller Caribbean countries, will be adversely affected by the invasion of lionfish if not properly managed in a timely manner. The Caribbean Oceanic Restoration Education (CORE) Foundation has successfully developed and implemented an efficient, yet simple, lionfish management program using a bilateral marine management strategy, the Caribbean Lionfish Response Program. This two-pronged programmatic approach includes placing divers in the water to locate and remove the non-native Indo-Pacific lionfish species, while simultaneously educating local and visiting user groups, youth, and the general public on the threat that lionfish pose to Caribbean environs, fisheries, and tourism. Working together with local agencies, environmental organizations, dive shops, divers, local fishermen and tourists allows CORE to utilize all resources as one. CORE has also established the Caribbean Alliance, a collaborative partnership between other territories and countries throughout the Caribbean. As a result, all parties involved are moving forward together with the common goal of maintaining the critical environmental balance of the Caribbean's beautiful underwater world. This paper will provide unique insights into how CORE has built and maintained a practical/field-tested marine invasive species eradication/public awareness program. CORE is sincerely committed to not only working with their existing partners, but also hopes that their successes and failures can be shared with other agencies and organizations, thus providing a tested model for areas facing similar catastrophic oceanic management challenges.

KEY WORDS: Lionfish, eradication, management

Una Solucion Practica Para Controlar La Poblacion Del Pez Leon: Programa De Repuesta De La Fundacion CORE Para Peces Leon en el Caribe

En menos de una década, el pez León Indo-Pacífico se ha propagado rápidamente a través del mar Caribe y el Atlántico. El ecosistema marítimo al igual que la industria pesquera en las islas caribeñas más pequeñas, se verán afectadas negativamente por la invasión del pez León si no se controla apropiadamente y rápidamente esta invasión. La Fundación C.O.R.E por sus siglas en inglés, es una fundación que ha desarrollado exitosamente e implementado eficientemente un programa de control del pez León usando estrategias bilaterales de control al medio marítimo. Estos dos programas incluyen colocar buzos en las aguas para localizar y remover el pez león el cual no pertenece a estas aguas, simultáneamente educando a grupos jóvenes y al público en general acerca de la amenaza que el pez león representa para el Caribe y sus alrededores, pescadores y turismo. Trabajando junto con agencias locales, organizaciones ambientales, tienda de buceo, buzos, pescadores y turistas permite a la Fundación C.O.R.E utilizar todos los recursos como uno solo. La Fundación C.O.R.E también ha establecido una alianza para el Caribe, una sociedad de colaboración entre otros territorio y países en todo el Caribe. Como resultado todos los entes involucrados están avanzando con el objetivo común de mantener el equilibrio ambiental del maravilloso mundo submarino de las aguas del Caribe. Este documento le proporcionará una visión única de cómo la Fundación C.O.R.E a construido y mantenido pruebas y practica de campo marino de las especies invasoras y un programa de erradicación y prevención. La Fundación C.O.R.E esta sinceramente comprometida no solo a colaborar y a trabajar con sus alianzas existente pero también espera que sus éxitos y fracasos puedan ser compartidos con otras agencias y organizaciones, esto proveerá un modulo de pruebas para áreas que enfrenten similares desafíos de magnitud catastrófica como esta.

PALABRAS CLAVE: Pez Leon, erradicacion, administracion

Une Solution Pratique pour la Gestion du Poisson-Papillon: Programme d'Intervention de la Fondation Core Auprès du Posson-Papillon des Caraïbes

En moins d'une décennie, la rascasse volante Indo-Pacifique s'est rapidement propagée dans toutes les régions de l'Atlantique et des Caraïbes. Les écosystèmes marins, ainsi que les économies de la pêche fondée sur des plus petits pays des Caraïbes, seront affectées par l'invasion de la rascasse volante si elle n'est pas correctement gérée en temps opportun. La fondation CORE (Caribbean Oceanic Restoration Education), située sur les Iles Vierges États-Uniens, a développé avec succès et a mis en œuvre un programme de gestion de la rascasse volante efficace mais simple, utilisant une stratégie de gestion bilatérale: La Programme Caraïbes d'Intervention à la Rascasse Volante. Cette approche programmatique à deux volets consiste à placer des plongeurs dans l'eau afin de localiser et supprimer l'espèce non-autochtone de rascasse volante Indo-Pacifique, tandis que, simultanément, d'éduquer des groupes d'utilisateurs locaux et visiteurs, les personnes jeunes et le grand public sur la menace que font peser la rascasse volante sur les environs Caraïbes, la pêche et le tourisme. En collaboration avec les agences locales, les organisations environnementales, des boutiques de plongée et les plongeurs, ainsi que les pêcheurs locaux et touristique, permet CORE d'utiliser toutes les ressources lui disponibles à la fois. La fondation CORE a également créé l'Alliance Caraïbes (Caribbean Alliance), un partenariat de collaboration entre les territoires et les pays des Caraïbes. Actuellement, toutes les parties concernées s'avancent avec l'objectif

commun de maintenir l'équilibre essentiel du magnifique environnement sous-marin des Caraïbes. Cet article servira un point de vue unique sur la façon dont CORE a construit et a maintenu un programme d'éradication des espèces envahissantes marines et de sensibilisation publique pratique et testé sur terrain. La fondation CORE s'engage sincèrement non seulement à travailler avec leurs partenaires actuels, mais espère aussi que leurs succès et leurs échecs peuvent offrir aux autres organisations un modèle bien éprouvé pour les régions confrontées aux mêmes défis de la gestion catastrophique océaniques.

MOTS CLÉS: Poisson-papillon, éradication, programme d'intervention

INFORMATION

The information provided in this paper is a direct result of successful "field-tested" lionfish management strategies and methodologies initiated and implemented by the author, who is the Founder and CEO of The CORE Foundation. According to a support letter received by CORE, from one of our primary partners the National Park Service (NPS), CORE is presently the only comprehensive organization in the Caribbean whose primary goal is to implement an International multi-agency lionfish reduction/education initiative:

Since CORE's inception a little less than one year ago - the NPS also states that the following tasks have already been carried out and achieved:

- i) The CORE Foundation has demonstrated remarkable leadership, partnership development and organizational skills by developing and instigating the first successful and comprehensive lionfish Research and Eradication protocol and program in the Caribbean,
- ii) CORE has built a substantial volunteer partnership with recreational dive shops and divers, US Virgin Islands (USVIs) federal and territorial governments and numerous non-governmental organizations, and has already expanded this effort to the British Virgin Islands (BVI), Puerto Rico, and the greater Caribbean,
- iii) CORE recently founded and manages the Caribbean Alliance, an organization that unifies Territories and Countries within the Caribbean Basin to work towards the common goal of locating and removing lionfish from the sea.

Although CORE is a relatively new program, the numbers show (refer to Summary for CORE work totals) that this cutting-edge effort has achieved a great deal in a very short period of time. However, do not be fooled into thinking that CORE in any way believes they have already found all of the answers in regards to eradicating this aggressive invasive. On the contrary, CORE will continue to rely on their own field-based experience, as well as the most current information available from tenured ecologists and researchers, marine biologists and agency managers, to create the most proficient program possible by utilizing the most current information to improve and grow as an organization.

Outlined below is a practical ground-proven program framework that could be used as a model for developing and conducting other lionfish management programs, as

well as information pertaining to the planning and realization of quality marine-oriented outreach environmental education/public awareness program. This simple multi-tiered organizational makeup allows CORE to focus on locating and removing lionfish from the sea, while simultaneously educating local users, tourists, and the general public on the lionfish issue with the ultimate goal of controlling the Caribbean lionfish invasion "as much as possible" over the long-term.

THE LIONFISH INVASION

According to Dr. Mark Hixon and his team from Oregon State University, with support from NOAA's Undersea Research Program (NURP), the Indo-Pacific lionfish are rapidly invading the waters of the Caribbean and tropical Atlantic. Due to their population explosion and aggressive behavior, lionfish have the potential to become the most disastrous marine invasion in history by drastically reducing the abundance of coral reef fish and leaving behind a devastated ecosystem.

PhD student Mark Albins, of Dr. Hixon's team, devised a controlled experiment testing the effects of lionfish on native fish communities by documenting the recruitment of newly settled reef fish on 20 patch reefs near Lee Stocking Island: ten reefs with a lionfish and ten reefs without. Fish censuses were conducted at one week intervals for a total of five weeks. Test results showed that recruitment was significantly lower on lionfish reefs than on control reefs. Dr. Hixon then summarizes - while complete eradication does not seem realistic, affected areas are encouraged to initiate targeted lionfish control efforts as soon as possible. Efforts to reduce densities of lionfish at key locations may help to lessen their ecological impacts.

The Caribbean hosts a much smaller and more fragile marine environment than exists within locations such as the Bahamas, so the Caribbean is not only facing catastrophic ecological degradation, but could easily be looking at losses in the hundreds of millions of dollars over the next few years in fishing and tourist incomes. The USVI Department of Tourism reports that a 25% loss in revenues from the water sport industry would be devastating, affecting not only water sports, but also heavily impacting the hotel and restaurant industries and overall economy of the US Virgin Islands.

Using this engaging data as well as other research completed on the potential of lionfish to completely degrade marine environments, CORE has built and put into action a program that presently is helping to control the

incursion of lionfish to Caribbean waterways: the Caribbean lionfish Response Program! But before we delve into an overview of that and other CORE programs...let's take a quick look at who CORE is...and how this organization is truly making a difference in Caribbean fisheries management.

THE CORE FOUNDATION

In September of 2009, the author attended a local presentation on the lionfish problem where he resides on St. Croix Island. After researching the issue further, it was clear that no proactive lionfish management strategy existed, and no real field work had been done, to manage this invasive species since it was introduced into the Atlantic in 1992. Add to this dilemma underfunded resource management agencies, a declining economy, and no grant funding available for lionfish management, and the author decided to start a nonprofit group that would "directly deal" with the important Caribbean lionfish issue. This then set the framework for establishing CORE, and in March of 2010, The CORE Foundation received its nonprofit status in the USVI and a true marine management success story was in the making.

The primary goals of The CORE Foundation are:

- i) To place trained divers in the waters across the USVI territory to safely and efficiently search for and remove lionfish, and, to accomplish other oceanic restoration work,
- ii) To educate local divers, fisherman, local school children, visiting tourists and the general-public on the urgent lionfish crisis and how each of these education audiences can contribute to help resolve this rapidly growing invasive species issue.

The "Mission" of The CORE Foundation is to advance the profession of marine stewardship to ensure the longevity, preservation and benefits of the Caribbean Sea for local user groups and for tourist visitors, through a consistent collaborative management effort between non-governmental marine user groups and organizations, agency managers and the scientific community.

The "Vision" of CORE is that the values and benefits of Caribbean marine systems are understood, treasured, and preserved by all people and that The CORE Foundation has the necessary resources to ensure the continuation of such benefits for future generations.

Read on to find out more about how the CORE program is structured and how this successful non-profit organization is getting important ocean-based work done with no cost to the people of the Caribbean basin, or, to the various understaffed/under-budgeted natural resource managing agencies.

Caribbean lionfish Response Program

The Caribbean lionfish Response Program (CLRP) is the umbrella program for The CORE Foundation. All CORE lionfish programming and related activities fall under the all-encompassing CLRP. Originally, the CLRP was developed by CORE to serve the USVI's lionfish Management Committee, in which CORE, is still an active and productive participant.

This committee represents the key marine management agencies and organization within the US Virgin Islands and is made up of the USVI's Department of Planning and Natural Resources, The Nature Conservancy, National Park Service, the University of the Virgin Islands St. Croix Environmental Association, CORE, and many others. Due to the time-sensitive nature of the imperative lionfish issue, CORE drew upon the framework that was created in the initial CLRP, and independently moved forward to establish the current "field-based" Caribbean lionfish Response Program that is active throughout all of the US Virgin Islands.

The first of two primary objectives for the current CLRP is scheduling and conducting systematic lionfish search dives across the Territory. These dives are bilateral: first focusing on areas that are not frequented by local water based user groups such as moored dive sites or areas that are inaccessible from the shore and second: areas that have been reported to host high lionfish activity. By diving these non-moored sites and less frequented areas, CORE can gain a much better understanding of the overall degree of the invasion. If heavily populated areas are indeed found, the location is of course further researched and carefully monitored, and CORE then simply dispatches search/response boats to those specific locales to remove fish.

The second foremost objective of our CLRP is responding to and conducting in-water response dives, where trained CORE divers respond to reported lionfish sightings. The very backbone of the CLRP is our talented and dedicated cadre of Response Divers that CORE has dispersed throughout the USVI's. This competent group of divers is specifically trained in the "SAFE" practice of locating and removing lionfish from the sea, and all carry the necessary skills, knowledge and tenacity to do this work on a consistently recurrent basis. Sighting calls can be received seven days a week/24 hours a day. In most cases CORE's response time is less than 24 hours, and in many instances, it's much quicker than that! CORE has also built an extensive network with local dive operators who share information on sightings and assist in the removal of lionfish.

Although locating and removing lionfish from the water via the CLRP is CORE's current priority, The Foundation also oversees a myriad of other "sub-programs" that are managed under the Caribbean lionfish Response Program umbrella:

- i) CORE Diver Training Courses: Level 1 and 2

- ii) CORE Public Information and Education Program
- iii) CORE Visitor lionfish Identification Program
- iv) CORE's Charter Boat lionfish Partnership Program
- v) Caribbean Alliance

Diver Training Courses

To properly prepare divers to accomplish "quality" lionfish-related work, CORE coordinates and conducts two Diver Training Courses that instruct divers on how to correctly participate in organized lionfish management dives:

(Level - 1) Teaches divers how to participate in group led systematic lionfish search dives,

(Level - 2) Teaches advanced response divers the different methodologies and techniques that CORE has developed, and uses, to safely remove both juvenile, as well as adult lionfish from our waters.

CORE has also developed, and been approved by PADI, to offer a new fully-accredited lionfish Systematic Search Specialty Training Course. This innovative session will be taught by CORE instructors and will serve as the baseline for CORE's Level-1 Diver Training Course.

Public Information and Education Program

It is by no means an accident that "education" is included in CORE's name, as public awareness and understanding of the pressing issues facing our Caribbean waterways is indeed one of the Foundation's top priorities. For this reason, CORE has launched an organized, aggressive and consistent information and education (I&E) campaign that utilizes both direct and in-direct outreach educational methodologies and programming to engage and educate local oceanic user groups, local students, and tourist visitors.

Local User Group Education

Educating local USVI and Caribbean users on the lionfish issue is the first step in improving how locals use and behave in the water, and CORE is presently accomplishing this using a myriad of educational methodologies. The majority of local user group education is and will continue to be carried out by key CORE staff, such as the Dive Coordinators and lionfish Response Divers. These dedicated workers shoulder the dual in-field duties of educating locals and locating/removing lionfish. CORE has also designed specific I&E programs just for visitors who frequent the USVI, and who are avid users of our beautiful aquatic world.

The "lionfish Sighting/Warning Card" is yet another example of the types of quality educational materials CORE has already developed, implemented, and dispersed to better inform and educate local users and visitors on the lionfish intrusion. This informative educational piece is a

"4 x 6" full color postcard that has three very distinct messages. The front of the card hosts lionfish sighting information that includes an area-specific telephone number to call when lionfish are sighted. The card also carries a very clear warning message that lets people know that lionfish are dangerous and have venomous spines.

Finally, the back of the Sighting Card shows lionfish "quick facts" that explain why the fish is such an ecological threat and how it quickly can destroy our important aquatic systems and commercial and private fisheries - if not kept in check! These cards have proven to be very effective in regards to raising public awareness with our local commercial fishermen.

Keeping in step with CORE's commitment to utilize the - multiple-purpose strategy - wherever and whenever possible, the sighting/warning cards will not only be used to educate local users, but will also be made available to the general public "For Free" through a variety of retail outlets, dives shops, snorkel tour outfitters and resorts. Because the cards will be used to educate such a diversified local and general public audience, they have been specifically developed so that all viewers can clearly understand and retain the educational messaging they provide.

Since CORE began working with the local public, one of the greatest obstacles to overcome was the people's confusion between native and non-native fish species. For decades, local fishermen throughout the Caribbean had been mistaking the native Scorpion Fish for the menacing invasive lionfish. Though both species are from the *Scorpaenidae* family, they look completely different, and only the lionfish poses a threat to Caribbean marine environments.

To overcome this obstacle, CORE designed the "lionfish Education Poster" which is placed in strategic locations such as popular fishing spots, swimming beaches, and at partnering dive shops and snorkel company offices across the Territory. The top of the poster shows four different pictures of lionfish in different habitats so the viewer can get a good understanding of how the lionfish appears in different situations.

The middle of the poster has two large pictures of our local Scorpion Fish, with a boldly-stated section that explains the difference between the two species, emphasizing, that the Scorpion Fish is "not" the problem species. Each poster provides the area-specific phone number for its location so users can call in a sighting, or, with information that they actually caught a lionfish. This functional educational aid has significantly helped to rectify the mistaken identity issue with our local people and will also be used, on a smaller scale, to educate our non-local general public.

The "Caribbean lionfish Marker" is an incredibly simple but effective field-management tool made of a 3/4 inch steal washer, colored survey tape and a wine cork. For the last nine months these markers have proven to be

invaluable in locating lionfish, as they can be seen in the water by our response divers from over 100 feet away, making it very easy for the diver to locate previously sighted fish that people have called in for removal. CORE field workers strongly encourage all local and visitor water based user groups to take a CORE lionfish marker with them, to make more, and to show others how to properly construct and use them.

Local user group outreach education programs are yet another means that CORE uses to educate local user groups and organizations such as dive clubs and local fishermen associations. These formal style presentations are a positive means of sharing the lionfish management message with local organizations, and can also serve to help build and/or improve relations with these important local users. Programs can range from a short 15 minute talk, to a formal one hour Power Point presentation, but each and every one of these presentations is seen and managed as a prime window of opportunity to get to know our local groups and organizations.

Media-Based Education

Working with local, regional, and International media is a fundamental element of CORE's Information and Education Action Plan. Television, radio, as well as written media will all be utilized to pass the critical message of the lionfish incursion onto the public. Newspaper and magazine articles, Internet blogs and Facebook/Twitter-style postings and articles have already been written and will continually be published using these media venues. CORE has plans to dramatically increase their labors in the media-related education arena through the development and use of new I & E materials, such as a new lionfish/Reef Awareness Video, which is currently in the process of being written and financed.

General Public Education

Although CORE educators clearly understand that generalized "shotgun" educational programming realistically only produces in-direct results, it is our feeling that it is still useful to incorporate a few general public educational techniques into CORE's overall education agenda. For example, displaying the "Lionfish Education Poster" described above at visitor centers, prominent tourist attractions, resource management agencies and environmental organization meeting places will certainly help to convey to the general public the basic lionfish issue and the currently accepted user practices.

General public users are also currently becoming more aware of the lionfish, and other Caribbean marine issues, through direct and in-direct educational outreach work by CORE educators at beaches, boat docks, dive shops, resorts and other prominent water-associated gathering destinations. This is being accomplished by CORE field educators going out and speaking with local and visiting ocean user's, and drawing upon educational materials such

as the lionfish Sighting/Warning Cards and lionfish Education Posters to help in this outreach. Once again, although in-direct general public education is not the most efficient mode of implementing education, there are some advantages to using this large-scale delivery method. Hence, CORE plans to incorporate some generalized educational programming, as described above, in an effort to reach out to the larger general public audience on the lionfish issue.

Local Classroom Education

It is obvious that our youth eventually become the recreation and commercial outdoor users of tomorrow. Therefore, CORE feels it is integral to the future of our Caribbean marine systems to reach out to our young ones by visiting local schools and providing students with "quality" educational programming. Currently, CORE is partnering with the Beacon Schools to develop and offer a marine-oriented/lionfish curriculum that would be made available to schools across all three of the U.S. Virgin Islands. The curriculum is being designed to teach sound marine stewardship, and of course, will cover the important problem and connected solutions pertaining to the Indo-Pacific lionfish.

Needless to say, it is not realistic to think that every student can be contacted and educated every year, and that if not carefully planned, a great deal of program overlap could tend to minimize the overall proficiency of CORE's classroom activities. But by incorporating a progressive educational approach that includes two distinct in-classroom presentations, one at the primary grade level and another at the secondary grade level, the best chance for efficiently educating local youth thus exists. Both programs are being carefully developed to directly reach each targeted age group at their particular learning-level, and each will utilize an audience-participatory teaching style, as it is a well known by good educators that people learn by doing!

Education Program Evaluation

Any successful education program carries a carefully designed evaluation component. While the overall success of indirect educational methodologies like posters and brochures cannot easily be assessed, the effectiveness of activities such as school presentations and diver training sessions can indeed be measured. Whenever possible, formal CORE outreach education activities will be tracked, documented and carefully monitored in an effort to evaluate how well these programs are accepted, as well as, how well audiences retain the essential information that was communicated.

Education Program Summary

The Indo-Pacific lionfish has been in the Atlantic Ocean for 18 years, and The CORE Foundation believes it is more than time to bring people together across the

Caribbean to build and maintain a consistent, efficient, and manageable lionfish information and education program. After vesting over 8,000 man hours into lionfish management, CORE has learned one thing for certain, if we do nothing, the lionfish will destroy everything in its path. CORE sincerely believes that through a combination of consistent/aggressive educational programming and persistent field eradication activities – this non-native intruder can be managed indefinitely.

Visitor lionfish Identification Program

Tourism is obviously a huge part of the USVI's financial stability. At present, CORE is only able to use mostly local people to help identify and remove lionfish. People come from all over the World to enjoy our beaches, waters, and local cultures and CORE is insistent in finding ways to incorporate these visiting users into our lionfish eradication effort. The "Visitor Lionfish Identification Program" is an important new CORE strategy that is currently being test-piloted. The program enlists visiting water users into our existing effort to fight the lionfish, and by adding these visiting divers/snorkelers into CORE's current efforts, CORE would increase their presence in the water enormously.

The primary tool used in the Visitor LID Program is the "Visitors ionfish Identification Card." The card would allow tourist divers and snorkelers to quickly determine whether the fish they see is indeed a lionfish, or simply one of our local reef fish. The program has the potential to save our response divers countless hours by minimizing false sightings and would most likely reduce the number of useless deaths of our local fish substantially.

The Visitors ID Card only takes a few moments for local dive shops and snorkel tour personnel to explain to non-local users, and is a great ice breaker for our outfitters to get to know their new customers. These cards immensely increase our eyes/efforts in the water by utilizing nearly every diver and snorkeler who visits the USVIs, or, the Caribbean! The card is reusable, durable and easy to use, and is produced at no cost to our local dive and snorkel shops, and, is totally free to the public. The ID cards will also be made available to local users, making them a multi-purpose cost-effective educational tool.

Charter Boat Lionfish Partnership Program

CORE is partnering with dozens of Charter Boat Companies, who rent 100s of vessels throughout the USVI and BVIs. CORE will be by placing top-dollar, professionally designed and constructed, lionfish information placards in prominent locations upon each ship where they can be viewed by all guests who charter water craft. The placards have the same valuable information as our sighting cards and have all the direct numbers to call for sightings from St. Thomas to the BVIs. This program is directed at all who frequent the USVIs or BVIs to charter vessels to sail or motor about our beautiful waters.

THE CARIBBEAN ALLIANCE

In March of 2010, CORE founded and currently manages, the Caribbean Alliance, an organization that unifies Territories and Countries within the Caribbean Basin to work towards the common goals of:

- i) Maintaining natural and healthy marine systems for the long-term, and
- ii) Conducting invasive species research, control, and eradication work,
- iii) Accomplishing comprehensive issue-driven marine habitat improvement projects.

The Caribbean Alliance is based on the idea – one cannot successfully remove lionfish from around one's island if the neighboring islands do not follow suit. When CORE began their Caribbean Lionfish Response Program in 2009, there was no proactive lionfish program being run anywhere in the Caribbean. Since there was no template for other countries and territories to build upon, the Caribbean Alliance was formed. This then provided the perfect means for CORE to share their "practical" programmatic successes, and letdowns, with other areas.

Now, if another territory wants to begin their own program, CORE's tested techniques and methods can serve as the base for helping to establish this new lionfish undertaking. On and above CORE sharing their field-tested processes - all Alliance groups are encouraged to share their lionfish management outcomes as well - so everyone involved greatly benefits from this International partnership.

One example of a successful International lionfish management exchange is the solid working relationship between the BVIs and Core. Under the Caribbean Alliance, CORE has partnered closely with the BVIs to help them build their own Lionfish Response Program. The first step in accomplishing this was developing search grids across their many islands and formulating sectors for systematic searches. This gave the BVIs a starting point in which to utilize their diver operators in managing their waters, thus helping the BVIs build and maintain their own lionfish Response Program. Another important component of the BVI International partnership that must be noted is CORE's positive relationship with the BVIs Conservation and Fisheries Department.

The BVI lionfish consultation was completed by merely adapting the CORE Lionfish Response Program framework to the BVIs respective fishing regulations, terrain and specific biological needs. This helped to empower the BVIs program to mature, and now they can contribute to the long-range goals of the greater Caribbean Alliance.

Puerto Rico is yet another positive example of CORE's abilities to reach out and successfully work with other areas. CORE currently manages an on-going transfer of ideas and techniques with Puerto Rican lionfish specialists and agency managers, and has been invited to bring more of the lionfish eradication oriented program-

ming to this country in the very near future. One of CORE's first completed projects with Puerto Rico was to translate their lionfish education posters and sighting cards into Spanish.

SUMMARY

In summary, the CORE Foundation is a new organization that has a great deal to learn and a great deal yet to achieve. But we are determined to continue forward in partnership with the USVIs, the BVIs, and with the greater Caribbean Region, to combat the lionfish threat!

Respectfully, in less than one year, CORE has accrued the following work totals:

- i) Systematically searched for lionfish in more than 1,300,000 square meters of oceanic shelf around St. Croix, St. Thomas and St. John Islands,
- ii) Removed over 200 lionfish from "all areas" around St. Croix, St. Thomas, and St. John Islands,
- iii) Accomplished over 8,000 hours of lionfish eradication and visitor contact public information and education work, and have done, so in a "safe and professional manner,"
- iv) Have 15 Dive shops and Snorkel companies already in partnership with CORE,
- v) In partnership with the Beacon Schools to co-develop and implement a "hands-on" Marine/lionfish classroom curricula and associated practical activities,
- vi) Distributed more than 25,000 education-based materials in the USVI, 10,000 in the BVIs, and 10,000 in Puerto Rico.

Our program is only one example of what can be done if people come together to accomplish properly planned and carried out in-field lionfish management activities. Let's all continue to try and work together to build "more" positive lionfish management examples!

The author would like to share his appreciation to the GCFI Conference Committee for lending him the opportunity to present at this prestigious conference. And, it is his sincere hope that this paper will in some-way help other areas in their fight against lionfish. Please feel free to contact the author via e-mail at nolionfish@yahoo.com - or - write CORE at info@nolionfish.com for more information on getting involved with The Foundation, or to schedule a lionfish consultation meeting for your respective area. Our doors are "always open" to anyone interested in helping to protect and preserve the natural integrity and value of our crucial Caribbean marine treasures...for future generations.

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