Member's Report ICRI GM 29 – Central Caribbean Marine Institute

INTERNATIONAL CORAL REEF INITIATIVE (ICRI)
29th General Meeting
20-23 October 2014 – Okinawa, Japan

Member's report on activities related to ICRI

Reporting period October 2013 – September 2014

1. **Updates on your activities.**

Project 1

Cornerstone(s) implemented through the project	Check all that apply: ☒ Integrated Management ☒ Capacity Building ☒ Science & Monitoring ☐ Periodic Assessment (Review)
Project Title	Restoring the Critically Endangered Staghorn Coral (*Acropora cervicornis*) in the Cayman Islands
Location	Cayman Islands
Dates	September 2012 – present (ongoing)
Main Organizer(s)	Central Caribbean Marine Institute, Cayman Islands Government Department of Environment
Main Stakeholder(s)	Cayman Islands Government (Department of Environment), Cayman Islands dive and tour operators, wider scientific community, wider Caribbean coral reef managers
Description of Project (Please elaborate on how the project implements the FFA cornerstones)	CCMI has collaborated with the Cayman Islands Government Department of Environment (CIDOE) to create the first coral nursery (focused on staghorn coral *Acropora cervicornis*) in the Cayman Islands. The goal of the project is to develop a set of science-based best practices for coral restoration in the Cayman Islands in order to enable the implementation of new policies to encourage the creation of similar projects across the country with appropriate scientific and governmental oversight. The coral nursery has also served as a platform for building capacity for restoration work among CIDOE, local scientists, and local volunteers through two training workshops hosted by CCMI.
Outcome (Expected outcome)	The results from the coral nursery pilot project will serve as an example for the creation of policies to govern future coral propagation work in the Cayman Islands. This will promote the recovery of the endangered staghorn coral as well as conservation management, education and outreach, and citizen science through the involvement of the local community in future coral restoration projects.
Lessons learned	Best-practice methodologies specific to the Cayman Islands have been and continue to be developed. A nationwide survey of extant wild staghorn coral populations has been conducted, indicating that sufficient wild populations exist for future restoration work.
Related websites (English preferred)	http://reefresearch.org/research/

Project 2

Cornerstone(s) implemented through the project	Check all that apply: ☒ Integrated Management ☒ Capacity Building ☒ Science & Monitoring ☐ Periodic Assessment (Review)
Project Title	Long-Term Assessment and Monitoring Programme (LAMP)
Location	Cayman Islands
Dates	1999 – present (ongoing)
Main Organizer(s)	Central Caribbean Marine Institute
Main Stakeholder(s)	Cayman Islands Government (Department of Environment), wider scientific community
Description of Project (Please elaborate on how the project implements the FFA cornerstones)	CCMI has conducted long-term monitoring on Little Cayman reefs since 1999, and has ensured comparability of data to other locations by using the widely-accepted Atlantic and Gulf Rapid Reef Assessment (AGRRA) methodology. This data has been made accessible through publications (Jackson et al., eds. 2014, Manfrino et al. 2013, van Hooidonk et al. 2012, etc.). CCMI participated in the Wider Caribbean working group meeting of the GRCMN in Curacao to help establish a regional science & monitoring plan related to the health of coral reefs.
Outcome (including expected outcome)	By conducting long-term monitoring, researchers at CCMI are able to understand how the reef environment changes over time and in response to stressors such as elevated temperatures or hurricanes. Thus far, CCMI has documented high levels of recovery after stressors such as bleaching events compared to other Caribbean locations (Manfrino et al. 2013). This has largely been attributed to its geographic remoteness, low anthropogenic stresses (population <200), and minimal runoff (no rivers or streams).
Lessons learned	Long-term monitoring is highly valuable and yields important results which can inform management decisions. However, consistency in data collection is difficult to maintain over long periods of time. To ensure accuracy and consistency over time, CCMI is in the process of developing a training and methodology handbook, in accordance with the GCRMN upcoming protocols, to appropriately guide all future data collectors. CCMI will work closely with the CIDOE and other UKOTs agencies to share best practices and tools related to LAMP.
Related websites (English preferred)	http://reefresearch.org/research

Project 3

Cornerstone(s) implemented through the project	Check all that apply: ☒ Integrated Management ☐ Capacity Building ☒ Science & Monitoring ☐ Periodic Assessment (Review)
Project Title	Coral Reef Early Warning System (CREWS)
Location	Cayman Islands
Dates	2009 – present (ongoing)
Main Organizer(s)	Central Caribbean Marine Institute, National Oceanic and Atmospheric Administration (NOAA)
Main Stakeholder(s)	Cayman Islands Government (Department of Environment), United States Government (NOAA), CCMI, wider scientific community

Description of Project (Please elaborate on how the project implements the FFA cornerstones)	The Coral Reef Early Warning System (CREWS) is a buoy which collects and processes local oceanographic and atmospheric data and uses models to warn of potential climate-related events, such as mass coral bleaching. CCMI's CREWS is part of a network of monitoring stations and buoys located across the Caribbean and worldwide. This data is made available in real time to researchers, coral reef mangers, and the public. NOAA uses this data in conjunction with satellite and radar data to analyse and forecast regional trends.
Outcome (Expected outcome)	CCMI intends to continue collecting and transmitting oceanographic and atmospheric data using the CREWS on a long-term basis. It is NOAA's intent to expand this monitoring network by installing more stations globally and to refine the system's capability to better predict the impact of climate patterns on coral reefs. The long-term goal of the program is to provide information regarding the impact of climate change on the coral reefs which will ideally lead to improved ecosystem-based management.
Lessons learned	After foul weather caused by Hurricane Sandy irreparably damaged the CREWS pylon in 2012, it was replaced with the existing buoy, which is better able to resist inclement weather conditions. In addition, CCMI has integrated its Long-Term Assessment and Monitoring Programme to better respond to bleaching alerts from the CREWS by identifying and reporting on vulnerable species and locations via our website.
Related websites (English preferred)	http://reefresearch.org/research. NOAA is beta-testing a CHAMP portal which will have live data feeds from the CREWS buoys. CCMI will link to this website when it is ready for use by the general public.

Project 4

Cornerstone(s) implemented through the project	Check all that apply: ☒ Integrated Management ☐ Capacity Building ☒ Science & Monitoring ☐ Periodic Assessment (Review)
Project Title	Managing the Impacts of the Invasive Lionfish (*Pterois volitans/miles* complex)
Location	Cayman Islands
Dates	2012 – present
Main Organizer(s)	Central Caribbean Marine Institute, University of Florida
Main Stakeholder(s)	Cayman Islands Government (Department of Environment), Wider Caribbean coral reef managers, Wider Caribbean dive and tour operators; local community
Description of Project (Please elaborate on how the project implements the FFA cornerstones)	This project aims to determine the effectiveness of targeted culls as a technique to manage populations of the invasive lionfish and mitigate their impact on native species. The results of this long-term scientific collaboration will allow CCMI to make recommendations to include culling in integrated management within the Cayman Islands and across the wider Caribbean. The effectiveness of culling is highly dependent on the involvement of local volunteers to aid in removal efforts, and volunteers are strongly encouraged to collaborate on this project through coordinated community culls.
Outcome (Expected outcome)	The effectiveness of culling lionfish as a management tool will be determined, and recommendations will be made to the Cayman Islands

	government, the scientific community, and the greater public through reports and publications.
Lessons learned	To date, it has been determined that the average size of lionfish and the average density of lionfish on reefs are reduced by targeted culling (Frazer et al. 2012). Investigations into the impact of culling on the native fish community are ongoing.
Related websites (English preferred)	http://reefresearch.org/research

2. Contribution to the ICRI Plan of Action and GM.

a. Engaging other sectors

CCMI's Lionfish project best exemplifies a case of several sectors collaborating for a positive environmental outcome. In this example, the Cayman Islands Government, CCMI scientists, and the local community work together to manage the impacts of the invasive lionfish in Cayman. Upon recognizing the threat of the lionfish to Cayman's coral reefs, the government instituted a culling program, legalizing the mostly-banned capture method of spearfishing in order to enable local divers to obtain a license and spearfish for lionfish only. Thanks to this government culling program, locals in Little Cayman are able to cull lionfish and do so regularly, in a self-organized weekly community cull. Scientists from CCMI are then able to monitor culled reef sites to determine the effectiveness of culling as a management strategy and weigh, measure, and dissect collected lionfish. The lionfish meat is then returned to local fishers for consumption or sale in the local market. The local community, albeit small, is fully engaged in the culling efforts and have a high degree of awareness regarding the need for lionfish culling.

Ultimately, CCMI scientists will be able to make recommendations back to the Cayman Islands Government regarding the effectiveness of lionfish culling in the Cayman Islands and how best to expand, adjust, or refocus the culling program in order to maximize its positive impact on local reefs. In the future, once the appropriate policies are designed and put in place, we hope that CCMI's Coral Restoration project will involve similar cooperation between the government, CCMI scientists, and the local community.

b. Reef zoning for multiple use

Location where a zoning plan has been implemented	Grand Cayman, Little Cayman, Cayman Brac
Year when the zoning plan was implemented	1986
Is the zoning plan accepted by the local community?	☒ Yes ☐ No
Did the zoning plan cause conflicts among stakeholders? Not known	☐ Yes ☐ No
Did the zoning plan resolve conflicts among stakeholders? Not known	☐ Yes ☐ No
Has there been effective enforcement for stakeholders to follow the zoning plan?	☒ Yes ☐ No
Overall, how would you rate the success of the zoning plan?	☒ Very successful ☐ Somewhat successful ☐ Not so successful ☐ Unsuccessful

CCMI does not directly designate or enforce marine reserve zoning. Marine reserve zoning is managed by the Cayman Islands Government Department of Environment, although CCMI supports reef zoning by providing scientific information on zoning effectiveness. Thus, CCMI can only provide a third-party perspective on marine reserve zoning in the Cayman Islands. Reef zones in the Cayman Islands include:

- Marine Park Zones (no taking of marine life alive or dead, with certain limited exceptions
- Designated Grouper Spawning Areas (no fishing for Nassau groupers 1 Nov through 31 March)
- No Diving Zones (No SCUBA diving)
- Environmental Zones (no taking of marine life alive or dead with no exceptions, no in-water activities or anchoring, boats must maintain speeds of 5 mph or less)
- Replenishment Zones (no taking of conch or lobster by any means)
- Wildlife Interaction Zones (no taking of marine life, no feeding of any marine life unless approved by Marine Conservation Board)
- Animal Sanctuaries/Ramsar Sites (no hunting, littering, or collecting of any species)
- Prohibited Diving Zones (No SCUBA diving unless licensed to do so by the Marine Conservation Board)

Additional information on Cayman Islands marine reserve zoning is available at http://www.doe.ky/laws/marine-parks-brochure/.

The Cayman Islands Department of Environment employs enforcement officers to patrol Little Cayman's zoned areas which protect~50% of the island's coastline to effectively enforce marine reserve zoning laws.

3. **Publications.**

Title (incl. author and date)	**Website URL if available**	**Type of publication** (Paper, report, etc.)
Austin T, Bush P, Fenner D, Manfrino C, McCoy C, Miller J, Nagelkerken I, Polunin N, Wil E, Williams I, AGRRA, CARICOMP, Reef Check (2014) Cayman Islands In Jackson JBC, Donovan MK, Cramer KL, Lam VV (Eds.), *Status and Trends of Caribbean Coral Reefs: 1970-2012*	http://www.icriforum.org/sites/default/files/Caribbean%20Coral%20Reefs%20-%20Status%20Report%201970-2012.pdf	Report
Zhu X, Minnett PJ, Berkelmans R, Hendee J, Manfrino C (2014) Diurnal warming in shallow coastal seas: Observations from the Great Barrier Reef regions	http://www.sciencedirect.com/science/article/pii/S0278434314000879	Paper (Continental Shelf Research)
Diller JL, Frazer TK, Jacoby CA (2014) Coping with the lionfish invasion: Evidence that naïve, native predators can learn to help	http://www.sciencedirect.com/science/article/pii/S0022098114000513	Paper (JEMBE)
Pellow K, ed. (2014) CCMI 2013 Annual Report	http://reefresearch.org/files/uploads/AR2013E.pdf	Report
Lohr KE, Camp EF, Manfrino C (2013) First record of the basslet *Gramma dejongi* outside of Cuba	http://link.springer.com/article/10.1007%2Fs00338-013-1089-y	Paper (Coral Reefs)

4. **General Information.**

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