

**CNMI Proactive Species Conservation Grant FY08
Final Report**

A. Grant Number: NA08NMF4720496

B. Grant Amount: \$44,502

C. Project Title: CNMI Proactive Species Conservation: Assessment of Status and Habitat Specificity of *Cheilinus undulatus* and *Bolbometopon muricatum* in the Southern Islands of the CNMI

D. Grantee: Commonwealth of the Northern Mariana Islands Coastal Resources Management Office

E. Award Period: 1 October 2008 to 31 March 2010

F. Period Covered by this Report: 1 October 2008 to 31 March 2010

G. Summary of Progress and Expenditures to date:

1. Work Accomplishments

a. Summary of Progress

Objective 1- Quantitative Assessment of SOC Abundance & Distribution

- **Hiring of FTE- Marine Technician 1**

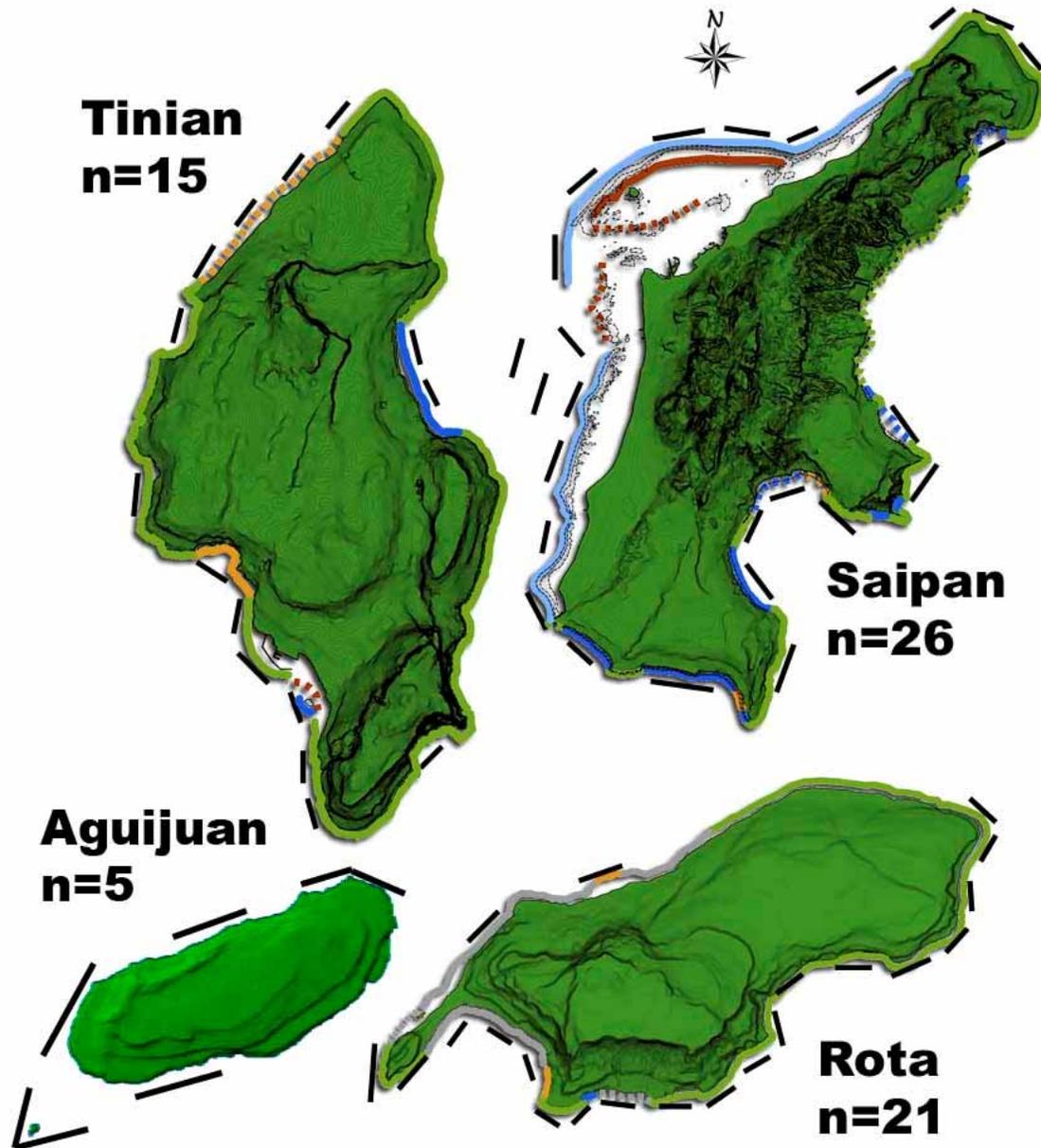
A marine technician was hired, trained and actively participated in surveys.

- **Survey Strategy Developed**

Randomly distributed survey points within strata defined by NOAA NOS's coral reef atlas for the CNMI (fore reef) and CNMI's locally developed habitat maps (Saipan Lagoon only) were developed and utilized to guide surveys. On outer reefs, a total of 62 towed diver surveys were conducted: 26 around Saipan, 21 around Rota, and 15 around Tinian. See figure 1 below.

In Saipan Lagoon, a total of 150 sampling points were proportionally and randomly distributed among habitats within Saipan Lagoon to assess abundance of SOC in lagoon environments. At each point four 50 m x 10 m transects were surveyed for SOC abundance.

Figure 1. Locations of towed diver surveys around Saipan, Tinian, Aguijuan and Rota Islands.



- **Conduct SOC Surveys**

Fish surveys targeting *Bolbometopon muricatum* and *Cheilinus undulatus* on Rota, Tinian and Saipan were conducted as noted above. Initial evaluation of the results supports Saipan Lagoon's importance as a nursery ground for juvenile (<30 cm) *C. undulatus* on Saipan. A total of 27 juvenile *C. undulatus* were recorded from back reef habitats—primarily the Branching (Staghorn) *Acropora* and Back Reef Coral/Rubble habitats. Juveniles were not observed on Rota and Tinian.

No *B. muricatum* were seen during any targeted surveys conducted during this project, though anecdotal reports support their recent presence as sub-adults on Saipan, Rota and possibly Pagan. A juvenile (~35 cm) was photographed among Branching (Staghorn) *Acropora* habitat in Saipan Lagoon.

Numbers of *C. undulatus* are low but widely distributed on fore reefs, with both subadults and adult males and females present around Saipan (8), Tinian(2) and Rota (17). No *C. undulatus* were observed on tows around Aguijuan. These initial are generally supportive of literature reports that points and channels have some importance as areas that may harbor spawning aggregations. Banzai Cliff, Naftan Point, the cut at Wing Beach and Tanapag Harbor's Channel mouth on Saipan and Pona Point and Senhanom Point on Rota are examples where either adult pairs or aggregations have been observed either anecdotally or during surveys.

Although juveniles appear to have a general habitat preference- shallow, back reef habitat with structure- adults appear more catholic in that no clear association could be initially determined. Fish were generally associated with some sort of relief, though this could be a boulder on a pavement-like bottom or could be high relief reef with many hiding places.

While external to this project's surveys, baited video surveys conducted by the University of Guam around Guam and CNMI in 2010 identified deeper reefs (30-90 m) as potentially important habitat for larger adult *C. undulatus*.

Objective 2- Qualitative Assessment of SOC Abundance & Distribution since 1950.

- **Literature and data review**

A review of fisheries literature for SOC in the Marianas is completed and has proved to be of limited value as most publications do not go beyond mention of the presence of SOC in the Marianas. The bibliography is posted on the project website: http://www.cnmicoralreef.net/big_fish.htm

Relevant data sets for the Marianas are limited, but growing. Those of the CNMI's Marine Monitoring Team, University of Guam, NOAA NMFS Coral Reef Ecosystems Division, and a USFWS-led survey of military landing beaches on Tinian currently available for reference. Numbers of SOC from these surveys are low (*C. undulatus*) or next to nonexistent (*B. muricatum*) and do little to inform habitat preferences.

Sightings of *C. undulatus* are primarily sub-adults to adults. Of particular interest is the concurrence of Randall 1987 in identifying shallow backreefs as an important juvenile habitat. Recent survey records of *B. muricatum* consist of a single sighting on Pagan by CRED surveys in 2003 (PIFSC, unpublished data).

- **Interviews with local fishermen**

Interviews with resident fishermen to discuss distribution and abundance of SOC now and in the past continue. A total of fifty (52) interviews were conducted on Saipan and ten (10) on Tinian. Observations support the occurrence of spawning aggregations of *C. undulatus* near the points of peninsula-like coastal formations and possibly near channel mouths. Timing of these aggregations is unclear. Adult *C. undulatus* appear to have home ranges centered on at least on preferred resting place. Divers have reported continued sightings of identifiable individuals at dive sites and fishers have noted that if a *tangison's* home is found that this fish could reliably be found and harvested at a later date. Other fishers noted that even once harvested, certain 'homes' would be replaced by new 'tenants' after a while.

The majority of respondents viewed populations of both SOC to be in decline or, in the case of *B. muricatum*, in decline or had no familiarity with the fish (Table 1). Although mention was made of habitat degradation as a factor for decline of SOC, SCUBA spearfishing and commercial spearfishing were considered the primary cause.

Table 1. Responses by fishermen regarding change in abundance of SOC during their fishing career.

	<i>Bolbometopon muricatum</i> abundance			
	less	same	more	uncertain answer
Saipan (n=52)	18	2	7	25
Tinian (n=10)	4	1	0	5
Total	22	3	7	30

	<i>Cheilinus undulatus</i> abundance			
	less	same	more	uncertain answer
Saipan (n=52)	28	9	4	11
Tinian (n=10)	6	2	0	2
Total	34	11	4	13

During the period of this grant program, a complementary fishing interview project was being conducted by NOAA PIRO on CNMI that targeted 'elder fishermen' over the age of 40. In support of this project, questions on SOC familiarity and abundance were included. A total of 78 fishermen were interviewed with their perspectives on abundance listed below (Table 2).

Table 1. Responses by elder fishermen (>40 years of age) regarding change in abundance of SCO during their fishing career.

	<i>Bolbometopon muricatum</i> abundance			
	less	same	more	uncertain answer
Saipan (n=37)	22	4	5	6
Tinian (n=12)	7	2	0	3
Rota (n=29)	22	4	1	2
Total	51	10	6	11

	<i>Cheilinus undulatus</i> abundance			
	less	same	more	uncertain answer
Saipan (n=37)	26	2	2	7
Tinian (n=12)	7	2	0	3
Rota (n=29)	15	5	1	8
Total	48	9	3	18

Objective 3- Effective Management Strategy

We are continuing dialogue about management issues with fishermen to lay the groundwork for more formal discussions once data collection has been completed.

Habitat Management

As initially proposed, this project sought to identify SOC habitat preferences with the intention of improving populations by improving habitat conditions. Although on the whole, this course of action is not strongly supported by our survey results, juvenile *Cheilinus undulatus* do appear to have an affinity for shallow back-reef coral/rubble and *Acropora* habitats in Saipan Lagoon. At present, the Garapan Watershed adjacent to the Garapan Lagoon section of Saipan Lagoon is the probable next Priority Watershed for CNMI's Coral Reef Initiative. As an area that includes both habitat types utilized by *C. undulatus* juveniles and as the area where a photo record of a juvenile *B. muricatum* was captured, it will serve as an initial test of the benefit of improving water quality to improve habitat quality. However, it is important to note that fishing pressure is likely the key driver in the decline of juvenile and adults of both species, and while habitat improvement is generally desirable, fisheries management is likely to be more rapid and significant in improving SOC populations in CNMI.

Fisheries Actions

Despite being listed as Species of Concern by CNMI's Division of Fish and Wildlife, no regulations are currently implemented to manage either species. A past slot-limit regulation for both taxa is no longer in effect.

The suggestion of minimum size restrictions appears to be non-contentious with a majority of interviewed fishers. A complete ban of fishing for *B. muricatum* would be supported- at least for a limited time period, possibly up to five years. Complete bans on fishing for *C. undulatus* would have low support. This work is being followed up through a funding source additional to this grant program's and a final archipelagic (Guam and CNMI) management plan is anticipated by 2012.

- **GIS Layers for assessing environmental correlates with SOC abundance**

NOAA's Pacific Services Center, South Pacific Geosciences Commission (SOPAC), and the CNMI Coastal Resources Management Office are in the process of geospatially correcting imagery from 1945, 1987, and 1992 to allow assessment of changes in habitat types for Saipan Lagoon. This work is continuing through funding source external to this grant program and is expected to be finalized and freely available through the CRM GIS server by June 2011.

Objective 4- Improve Education and Outreach

We are working with the CNMI's Rare Pride campaign to identify linkages between our effort and the campaign's goal of "Healthy Reefs. Healthy Fish." A poster was developed to illustrate differences between adult and juvenile SOC with a message asking voluntary restraint in capture of sub adult *C. undulatus* and complete cessation of the capture of *B. muricatum*. A similar tool featuring popular food fish- including *C. undulatus*- was developed by NOAA PIRO and is being provided to fishermen on Guam and CNMI.

b. Summary of Work to be Performed

The current grant has provided initial insight into the status and abundance of both Species of Concern in CNMI and the primary grant objectives were met. This project was intended as an initial step in understanding the condition of SOC in CNMI with the eventual goal of rationally deciding on the need for and content of a regional SOC management plan.

Additional funding is being leveraged or has been awarded to specifically grow our understanding of these fishes' ecology in CNMI and Guam. The general consensus among interviewees of SOC decline and current low numbers of both SOC based on surveys supports the need for the development of an archipelagic management plan after the completion of surveys on Guam.

Although *Bolbometopon* is currently being consider for listing under the ESA in the near future, local preference would certainly be to manage this resource

cooperatively within the archipelago at the local level. Indeed our intention in carrying out the current Proactive Species Conservation Grant was to provide the local resource management agencies in Guam and CNMI the necessary information to improve populations of both SOC and avoid the need for listing under the ESA. The ESA has a well documented history of hindering necessary management work through its remarkable layers of associated bureaucracy. A primary consideration in keeping management local- even with federal partnership and support- is that local regulations are likely to prove much more supportive of adaptive management.

2. Applications

a. Publications, presentations, workshops

1) Formal stakeholder meeting was held at the Coastal Resources Management Office on Saipan on the morning of January 15, 2010. A second stakeholder meeting for the evening of the same day had no attendees.

Attendees at the morning meeting included John Starmer- CNMI Coastal Resources Management Office, Michael Trianni- CNMI Division of Fish and Wildlife, Jack Ogomuro- Western Pacific Fisheries Management Council, Richard Seman- Marianas Fishing Magazine, John Gourley, and Benigno Sablan.

The purpose of the project was explained to participants as an effort to survey populations of SOC seek to identify population trends and potential causes for reported declines in CNMI with a focus on habitat/NPS related causes. The use of interviews to understand past condition of SOC was explained along with the intention of providing management recommendations to stakeholders was also stated. It was noted that CRM wished to work with all interested stakeholders to achieve improvement in SOC population status.

Concerns were expressed that any report from the current activities would be used to support a permanently ban fishing for either species at the federal level (e.g. through ESA or other regulations). It was clarified that the intention of the project was to proactively support scientifically supportable local regulation to avoid the need for federal regulation to protect either species.

2) Presentation provided to Western Pacific Fisheries Council Regional Ecosystem Advisory Committee during their March 2010 meeting. A copy of the presentation was made publicly available on the Mariana Islands Proactive Species conservation website at http://www.cnmicoralreef.net/The_Project_files/Starmer_REAC2010_2.pdf

The intentions behind the project were generally well received, with few comments. It was emphasized during the presentation that the intention of the project not to permanently ban fishing for either species, but to generate recommendations that would improve SOC number to enhance access to all stakeholders. It was further noted that CRM intended to provide

recommendations based on appropriate scientific data along with all relevant stakeholder input with the hopes that a community-based management plan would be supported (and driven by) resource users.

3) Minimum size poster- encouraging fishers to voluntarily restrain from taking sub-adult *C. undulatus* and *B. muricatum* and illustrating the changes undergone by the SOC as they grow.

b. Data and information products

PSCG Project Website:

http://www.cnmicoralreef.net/big_fish.htm

Starmer, J.A. 2009. Preliminary review of the marine species of concern in the Commonwealth of the Northern Mariana Islands: *Cheilinus undulatus* and *Bolbometopon muricatum*. (Draft) CNMI Coastal Resources Management Office, Saipan. 19 pp. & appendices

c. Partnerships

CNMI Marine Monitoring Team (CNMI Coastal Resources Management Office and CNMI Division of Environmental Quality)

The MMT provided logistical support and carried out in water surveys.

CNMI RARE PRIDE

The RARE PRIDE coordinator assisted with the development of outreach strategy and an educational poster.

CNMI DLNR Division of Fish and Wildlife

This organization has expressed a strong desire—indeed to be the lead—on any regulatory action regarding SOC in the CNMI. DFW Saipan has conducted fish surveys for a number of years within local marine sanctuaries and further has conducted life history studies on *Cheilinus undulatus*, though the results of this work is yet to be published. This agency will be a key partner in future tasks regarding development of an archipelagic management plan and possible eventual development of regulations to manage both SOC.

Rota DLNR Division of Fish and Wildlife

Rota's DLNR/DFW was a full and supportive partner of this project and provided insight into possible areas of importance for SOC on Rota. Rota DLNR could facilitate the passage of local regulations to improve the condition of SOC on Rota.

NOAA Pacific Services Center

PSC is partnering with CRM to develop historical habitat maps for Saipan Lagoon. These maps are anticipated to be finalized by June 2011.

NOAA NMFS Coral Reef Ecosystem Division

CRED provided towed diver survey and rapid ecological assessment site survey data for Guam and CNMI from past MARAMP cruises.

NOAA NMFS Pacific Islands Regional Office- Saipan

The SOC *C. undulatus* is featured on outreach materials being provided to fishermen, which encourages voluntary adherence to minimum size limits.

NOAA NMFS Pacific Islands Regional Office- Hawaii

An 'Elder Fishermen' oral history project included questions about familiarity with and changes in SOC populations, this partnership is continuing with surveys being conducted on Guam.

University of Guam Marine Laboratory

A student utilizing baited video stations has identified the presence of *C. undulatus* in deeper (20-40 m) waters around Guam and southern islands in CNMI. Though not yet analyzed, data on *C. undulatus* in particular will be made available for inclusion in the continued SOC conservation efforts initiated with this grant program.

3. Expenditure Summary

a. Scheduled:

Personnel	\$25,890
Travel	\$5,430
Contractual	\$3,275
Supplies	\$4,248
Indirect	\$5,659
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	\$44,502

b. Actual:

Personnel	\$22,718
Travel	\$4,899
Contractual	\$3,275
Supplies	\$4,066
Indirect	\$5,581
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	\$40,539