

Rapid Ecological Assessment of Chuuk Lagoon, the Hall Islands (Pafeng) and the Mortlock Islands (Lukeisen)

The greatest, local **threat** to Chuuk's coral reefs is **dynamite fishing**.



On the atolls there was a notable **absence of sea cucumbers**, a key link in coral reef food webs that reduce, repackage, and recycle nutrients.



A total of 564 species of fish in 217 genera and 63 families were recorded during the present survey, including **306 new range records** for Chuuk State. The **total known fish fauna** of the Chuuk region now stands at **615 species**.



Survey Team

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Throughout Micronesia, marine ecosystems are under increasing pressure from large-scale and localized threats such as climate change, overharvesting of resources, and land-based sources of pollution. Recognizing the great dependence upon the natural resources of their islands, the leaders of Micronesia are committed to assisting communities in managing these resources for their continued use. One Micronesia-wide movement for addressing these critical threats is the establishment of protected areas networks. Well-managed protected areas create healthy reproductive populations of coral reef assemblages, more resilient to threats such as climate change, serving to replenish fish and corals at local and regional scales. In the past 3 years, the Conservation Society of Pohnpei, the Kosrae Conservation and Safety Organization, the Yap Community Action Program, the Chuuk Conservation Society (CCS), the Micronesia Conservation Trust, and the Nature Conservancy have partnered with the communities, State and National governments of the Federated States of Micronesia (FSM) to understand the current distribution, abundances, and status of marine ecosystems by conducting rapid ecological assessments (REAs) in the states of Pohnpei (2005), Kosrae (2006), Yap (2007) and Chuuk (2008). Chuuk State contains one of the largest lagoons in Micronesia, and 3 outer island groups comprised of 11 atolls and 3 single islands. A team of local resource managers and regional scientists conducted the Chuuk REA from 28 July to 21 August, 2008, encompassing a total of 69

sites in 21 days (Figures 1-4). A summary of the survey follows, while the complete report is available from CCS.

Goals of the Chuuk REA:

- Assess biodiversity / status of marine resources in coral reef habitat
- Identify and prioritize threats to marine resources
- Use survey results to provide advice on developing an MPA network and other management needs

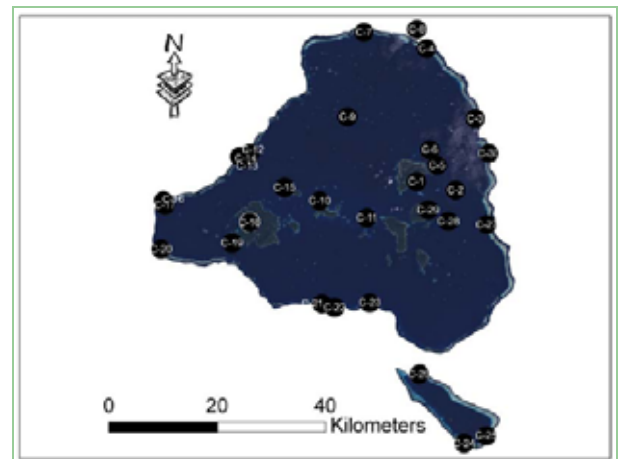


Figure 1. A map showing the sites surveyed in Chuuk Lagoon.

CCS, the Chuuk Division of Marine Resources, and the FSM Protected Areas Network Coordinator hosted a kick-off meeting in Weno prior to the survey to introduce the survey team, methods, and proposed sites to key stakeholders. Participants assisted the team by identifying additional sites where surveys should be conducted. Ultimately, surveys were conducted within as many ecological habitats as possible, focusing upon high diversity and resources-rich localities. During each survey, diversity, distributions, and abundances of corals, fish, algae, and macroinvertebrates were documented by the team using standard, easily replicable scientific protocols. From these surveys, the current status of the marine communities, and any recent impacts and future threats to these areas, were identified.

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Results

- A total of 564 species of reef fish were recorded during the survey, including 306 species that were never before documented in Chuuk State. The current total known fish fauna for the Chuuk region stands at 615 species.
- A formula for predicting the total number of reef fish species indicates that at least 860 species can be expected to occur in Chuuk State, compared with 928 in Yap, 664 in Pohnpei, and 518 in Kosrae.
- A total of 330 species of corals were identified, with diversity being highest in Chuuk Lagoon due to the presence of unique ecological habitats not found on the atolls
- Coral abundance was extremely high on many outer atoll reefs, suggesting a lack of recent natural disturbances.
- A total of 1,066 samples of seaweed were preliminarily identified and dried. More than 80 new species were recorded during the survey, for a preliminary total of 243 species of seaweed now recorded for Chuuk.
- Overfishing and destructive methods, such as dynamite fishing, are considered to be the greatest concern for Chuuk's coral reef ecosystem, however, localized pollution also contributed to declines in coral reef health.

Most reefs were considered to be under their natural state (~70 %), however reefs adjacent to large populations and land-based pollution sources had less coral and more algae. On Chuuk, the inner barrier reefs (i.e., back-reef margins) had the greatest coral species richness; but these same reefs seem to be under the greatest destructive pressure from dynamite fishing and deserve much greater management consideration from local governments and communities. Although consistently low in coral abundance and diversity, several atoll lagoons contained numerous, site-specific resources of special concern, and are recommended for enhanced management consideration. The extremely low populations of most sea cucumbers observed during the REA, which have not recovered since widespread harvest by a Korean company several years back, is also of great concern, primarily because of the cascading impacts on ecosystem function.

Passages connecting outer reef and lagoon habitats contained the highest fish diversity. The highly threatened Napoleon Wrasse (*Maam*) was relatively scarce, being observed at only 31% of the survey sites. However, the species was exceptionally abundant at East Fayu Island. Additionally, the mangrove bay at Tol Island in Chuuk Lagoon appears to be an important nursery ground for this species. East Fayu Island in the Hall Group was one

of the most outstanding sites for fishes, including small reef species and larger fishes species such as sharks, jacks, tunas, and Napoleon wrasse.

During the survey, the team met with 6 communities in the Hall Islands and Mortlock Islands as well, to secure permission to conduct surveys, and seek insights from the communities on potential threats affecting their resources and additional sites to be surveyed. Finally, a post survey meeting with key stakeholders was held in Weno, to provide preliminary results and next steps.

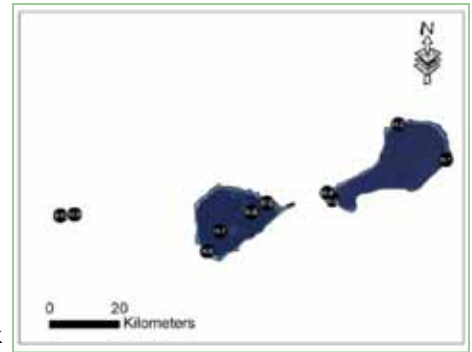


Figure 2. A map showing the sites surveyed in the Hall Islands.

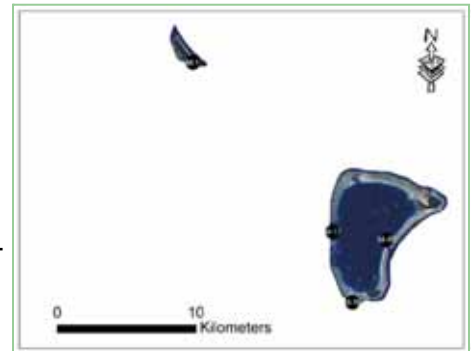


Figure 3. A map showing the sites surveyed in Upper Mortlock Islands.

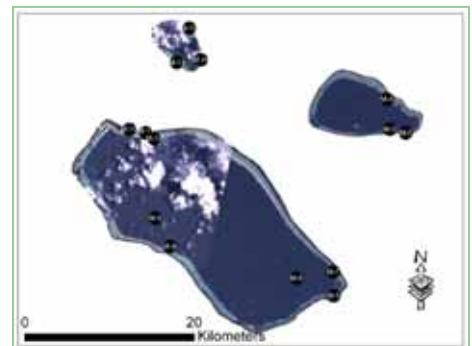


Figure 4. A map showing the sites surveyed in the Lower Mortlock Islands.

