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Community-based Marine Management: A guide for effective tabu areas



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Key contributors:

Johanna Johnson, C₂O Pacific, Cairns, Australia and Vanuatu

David Welch, C₂O Pacific, Cairns, Australia and Vanuatu

Eryn Hooper, OceansWatch New Zealand

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Introduction

Communities in the Pacific Islands have successfully managed and protected their coastal marine areas for many hundreds of years. Governments and NGOs recognise the need to preserve traditional community-based approaches, however, rapidly increasing human populations along with climate change, accelerating coastal development and advances in fishing technology and techniques, means that traditional approaches now need to be complemented with other management approaches. For this to be successful, more than ever communities require guidance on management approaches to secure future coastal ecosystem sustainability.

This Guide was developed in response to requests from communities in North Efate, Vanuatu participating in the RESCCUE project. It provides a set of design principles that can guide community-based management anywhere in the Pacific region and is intended as a simple checklist for setting up and managing local marine areas.

Tabu or marine protected areas are used as community-based management tools in Vanuatu primarily to protect marine resources. When implemented successfully, tabu areas have the potential to ensure activities in coastal marine areas, particularly fishing, are sustainable. However, their effectiveness in many locations is unknown or doubtful due to their design and implementation. This guide summarises the key principles needed to ensure that tabu areas can be effective in helping to provide marine resources for future generations.



Tabu areas in North Efate, Vanuatu

An assessment of tabu areas in north Efate was carried out in 2016 and 2017 for 28 communities (11 in the Nguna-Pele Marine and Land Protected Area Network and 17 in the TasiVanua Network). While 26 communities had some form of tabu area, five currently had their tabu areas open to some type of resource exploitation. Following Tropical Cyclone (TC) Pam in March 2015, closed tabu areas were opened to provide food and in some cases income for communities directly impacted by the cyclone.

A review of five tabu areas in North Efate (Piliura, Laonamoa, Worasiviu, Unakapu and Emua) by Pascal (2011) identified many benefits to communities from protecting marine resources. This included: cash income from tourism, provisions of protein, and ecosystem services such as coastal protection against erosion. The study also found that both subsistence and commercial fisheries benefited from no-fishing tabu areas but no observations demonstrate that they directly improved fishery yields or the maximum carrying capacity for tourism.

Figure 1. Map of North Efate showing tabu areas for 28 villages.
Inset: Location of mapped area on the island of Efate.

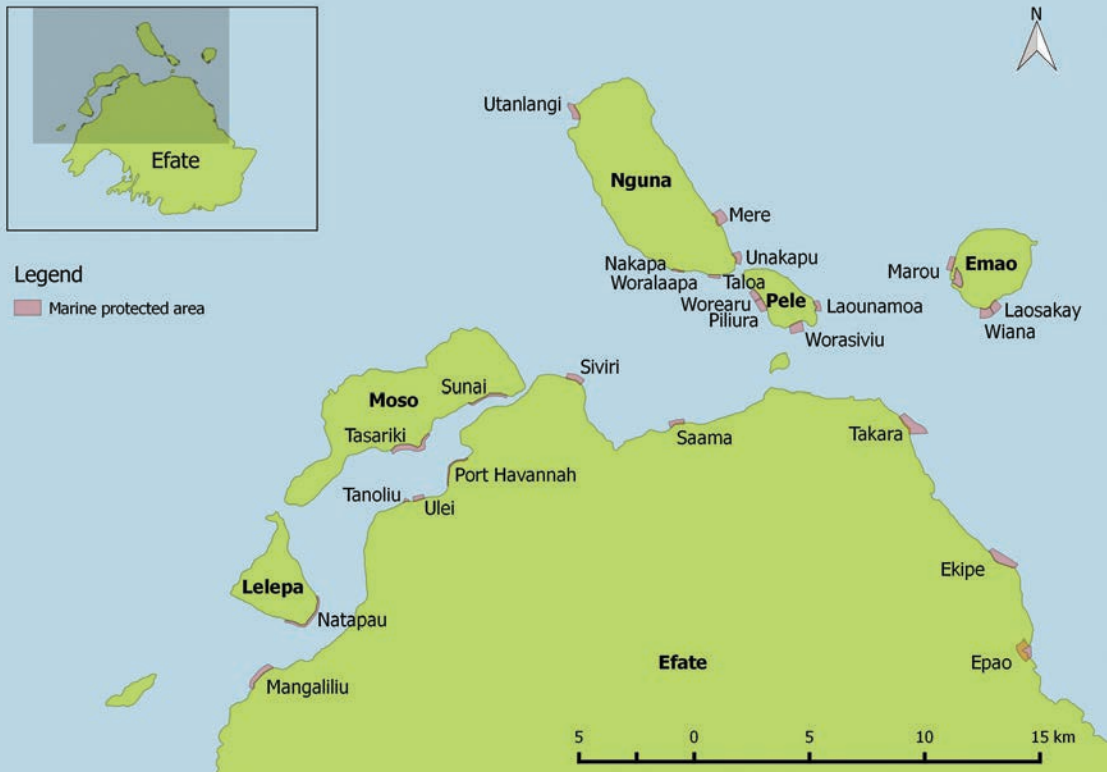




Figure 2. Traditional marking of a Kastom tabu area using leaves (Photo: Eryn Hooper).

National Regulations and Policy. Vanuatu has a number of regulatory options for recognising Protected Areas including:

- Conservation areas under the Forestry Act 2001;
- Marine reserves under the Fisheries Act 2005;
- Protected sites under the Protection of Sites & Artefacts (Amendment) Act 2008;
- Community conservation areas under the Environmental Management & Conservation Act 2002;
- National parks and nature reserves under the National Parks Act 1993; and
- Provincial Councils are also empowered to create environmental protection zones under the Decentralisation and Local Government Regions Act 1994.

In general, current protected areas are not necessarily fully 'protected' but managed by local communities or leaders in such a way as to conserve the present ecosystem.

Tabu areas throughout North Efate vary in size from 180 m of coastline length (Woralaapa) to over 2,300 m (Tasariki) (**Figure 1**). These small protected areas offer variable refuge for locally important, and generally overharvested fish and invertebrates, depending on the distribution and movement of these species (Green et al. 2014). A study in North Efate in 2011-2012 concluded that tabu areas in the region were effective in providing sanctuary for trochus, however were not effective in protecting the more mobile emperor species, *Lethrinus harak* (Dumas et al. 2012). There appears to be no standardised local approach to select the size of tabu areas, although there may be some link between a community's overall marine customary area and the size of their tabu area. The positioning and design of tabu areas is often based on proximity to the village and ease of patrolling the area rather than ecological factors. Boundaries that can be easily recognised are often chosen to allow for easy identification by community members and neighbours of the tabu area.



In some communities, tabu areas are permanently closed, while others are occasionally opened for cultural or socio-economic reasons (e.g. disaster relief post TC Pam, income to pay school fees). There are two common methods widely used by communities in North Efate. The first is the traditionally utilised 'Kastom tabu' area, with a traditional Kastom ceremony and marking the closed area with leaves (**Figure 2**). Kastom tabu areas are often put in place for a defined time ranging from 3 to 5 years but can be longer. Kastom tabu areas are generally fully closed areas that include bans on boat access and swimming but can be opened at the Chief's discretion in order to provide resources for a special event or raising funds for the building of a communal building. The second, more recent approach, is to set up a formal community conservation area (CCA). These areas are intended to be permanently closed but may allow swimming and snorkelling by both villagers and tourists.

Better application of community-managed tabu marine (protected) areas can maximise their contribution to food security and sustainable livelihoods (Green et al. 2013). While many communities in North Efate have established community-managed tabu areas, a number of barriers to sustainable marine management have been identified by communities:

- Difficulty in monitoring traditional tabu areas because of low capacity and large areas.
- Poor community management rules and enforcement.
- Need for awareness raising to improve management of fishing activities.
- Lack of awareness and declining respect of traditional tabu areas.

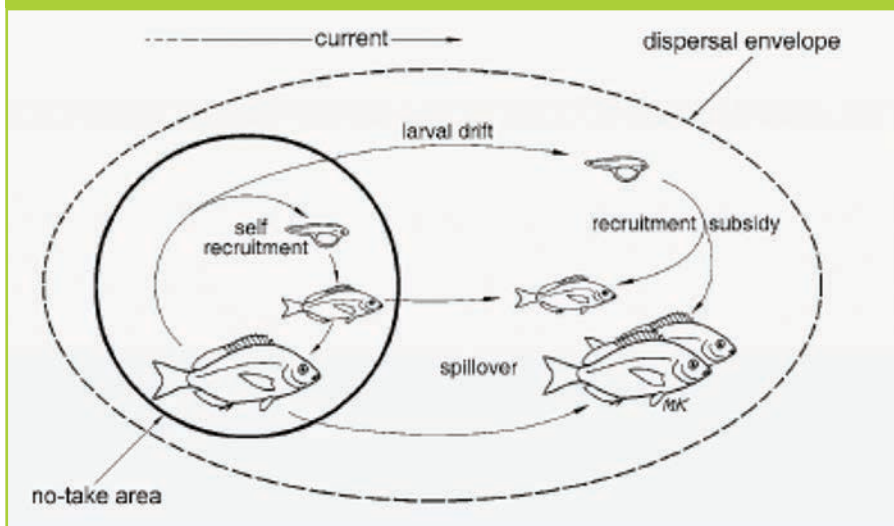
Education and awareness programs are consistently identified as an important support mechanism in strengthening marine protection efforts, with 16 out of the 27 communities interviewed in 2016 (RESCCUE 2016) stating that they would like more support from government and/or other agencies. Public communication through the use of marker buoys and signs (many of which were destroyed or lost in TC Pam) were also highlighted as an important development to support better governance and control of tabu areas. A significant positive is the strong level of commitment to protecting marine resources by North Efate communities.


Marine protected areas and how they benefit communities

Marine protected areas (MPAs) are defined as any “clearly-delineated, marine managed area that contributes to protection of natural resources in some manner” (IUCN-SCPA 2008). They include, but are not limited to, areas with a variety of regulations including marine reserves (areas where extractive and destructive activities are banned) and areas with fisheries restrictions on gear, species, size and access. They also include areas with different governance systems, including government and community managed marine areas.

Throughout the Pacific, tabu (taboo, tambu) areas are a common community-based marine management tool that specify an area of the coastal marine habitat for protection (Bartlett 2009, Govan 2011). However, they are often too small to protect coastal reef fish species with even small home ranges. The key concepts of how tabu areas provide benefit to communities is that, through adequate protection of populations inside the tabu area, their numbers and size will increase. Populations inside tabu areas are then able to provide greater egg production and recruitment of young fish to areas both inside and outside the area through *self recruitment* and *larval drift* (Jones et al. 2009). Also, increased numbers of animals inside the tabu areas result in more individuals moving out to adjacent areas through spillover (Figure 3).

Figure 3. Benefit of tabu (no-take) areas for providing recruits to nearby areas (King 2007).





The establishment of tabu areas (where fishing is not allowed) is increasingly being used as a local management tool in Pacific Island countries. For communities, a key motivation is the belief that these areas will result in improved catches of seafood in nearby fishing areas. However, tabu areas must be carefully designed and managed to achieve this aim. Often, tabu areas are re-opened after only 2–3 years for the short-term gain of increased catches, while foregoing the greater and continued longer-term gain that more permanent closures would bring. Also, tabu areas that are positioned in ‘poorer’ habitats, for example, bare sand or coral rubble, are unlikely to be of much value in terms of either conservation or increased fisheries production. A common issue is that many marine areas owned by villages or clans are too small to set aside a tabu area large enough to be effective in protecting reef fish species, and innovative and less traditional approaches may need to be explored by communities if tabu areas are to be used. Following are the key principles to consider if tabu areas are to be effective.

Key principles for effective tabu areas

1. Governance 2. Design 3. Community Engagement

1. Governance

In the North Efate region of Vanuatu, governance of tabu areas varies considerably, both within and between the TasiVanua and Nguna-Pele environmental networks. Compliance and enforcement is carried out (in some form) in most communities. In general, communities within the Nguna-Pele Network report a higher level of adherence to the rules and regulations than communities within the TasiVanua Network. This may be attributed to a higher level of individual and community awareness within the Nguna-Pele Network due to a combination of long-term funding and support from aid agencies and other NGOs. In addition, TasiVanua communities and network representatives identified the large area represented by the network and lack of funding as significant contributing factors to effective governance. For effective governance of tabu areas there are five key components to consider.

a. Objectives

It is very important for the community to agree on why a tabu area is to be used as a tool for marine protection. Tabu areas may be implemented for many reasons, including to conserve fish, invertebrates and/or habitats, or as a resource for important community events.

- *Have clear objectives for the tabu area*

b. Long-term protection

Some tabu areas are opened from time to time, however, if the objective is to protect marine habitats and animals then permanent closures are needed. This provides the time species need to grow, breed and in some cases, recover to benefit the region. This can take many years for some species. Research shows that the benefits of an area closed for several years can be eroded after only one day of being re-opened to fishing.

- *Effective tabu areas need permanent closure*

c. Enforcement

A system of community-based enforcement with well defined penalties is important to ensure the success of tabu areas. If the community doesn't comply with the tabu rules, the tabu area will be ineffective. The best way to ensure there is respect for tabu area rules, is for rules to be developed in consultation with communities and for there to be ongoing community awareness and education. A successful tabu area engenders a sense of pride in the community.

- *Respect for tabu area rules is best achieved through community involvement and education*



d. Monitoring

Monitoring involves an assessment of tabu areas to determine whether they are effective in achieving their objectives. The RESCCUE Community Marine Monitoring Toolkit provides simple methods for communities to carry out their own monitoring and use results to inform management actions. Demonstrating the success of tabu areas through monitoring is a key way to further strengthen community support.

- *Community monitoring is needed to assess if a tabu area is effective*

e. Coastal Resource Management Plan

Although a tabu area on its own can benefit coastal resources, successful coastal resource management relies on appropriate restrictions on fishing in adjacent marine areas where fishing and other activities take place. That is, a holistic approach is needed for effective coastal resource management. This holistic approach is best achieved with a Coastal Resource Management Plan following the Ecosystem Approach to Fisheries Management (EAFM; SPC 2010) whereby a tabu area is just one of several management actions used and documented. The Coastal Resource Management Plan should consider all activities occurring in the community's marine area and be developed through a consultative process.

In North Efate, there is a large variation between communities in how their tabu areas are managed, with only 9 out of 28 reporting active use of a current management plan. However, 10 communities stated that they would like to develop a management plan, or refine and strengthen an existing management plan. In all cases, these management plans refer only to management of the tabu area and not adjacent marine areas. Any new or revised management plans need to take a holistic management approach that includes management in areas where fishing and other activities are allowed.

- *Developing tabu areas as part of a Coastal Resource Management Plan will help to ensure they are effective*

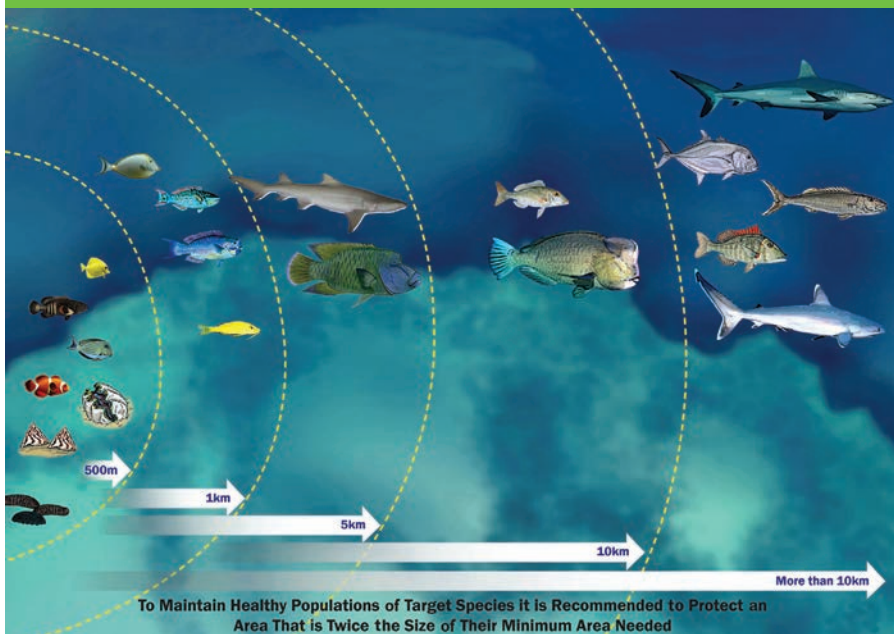
2. Design principles

The design of tabu areas is critical to maximise their benefits for conservation and fisheries (Gaines et al. 2010). Well-designed and effectively managed tabu areas can play an important role in achieving sustainable use of marine resources at local and regional scales. Networks of marine closed areas are recommended for best results (Green et al. 2014), however given the proximity of villages in North Efate this will be achieved if all villages follow these guidelines. For effective design of tabu areas there are three key components to consider.

a. Tabu area size

The size of a tabu area is dependent on the objectives, and is critical to their success. As documented above, almost all tabu areas in North Efate are likely to be ineffective due to their small size and Dumas et al. (2012) demonstrated this for one common coastal fish species. Tabu areas on fringing reefs should protect from the shore across the reef flat and out past the reef crest to ensure all species in the area are afforded protection. For protection of special habitat areas, or damaged habitats needing to recover, the area should cover the entire habitat that is damaged. If marine animals are to be protected, the size of the tabu area will depend on the life cycle and natural range of movement of that animal (Figure 4). For example, invertebrates only require small areas to successfully

Figure 4. Spatial home range of different marine species important for fisheries as an indication of tabu area size needed to effectively protect them (Gombos et al. 2013, Green et al. 2013).



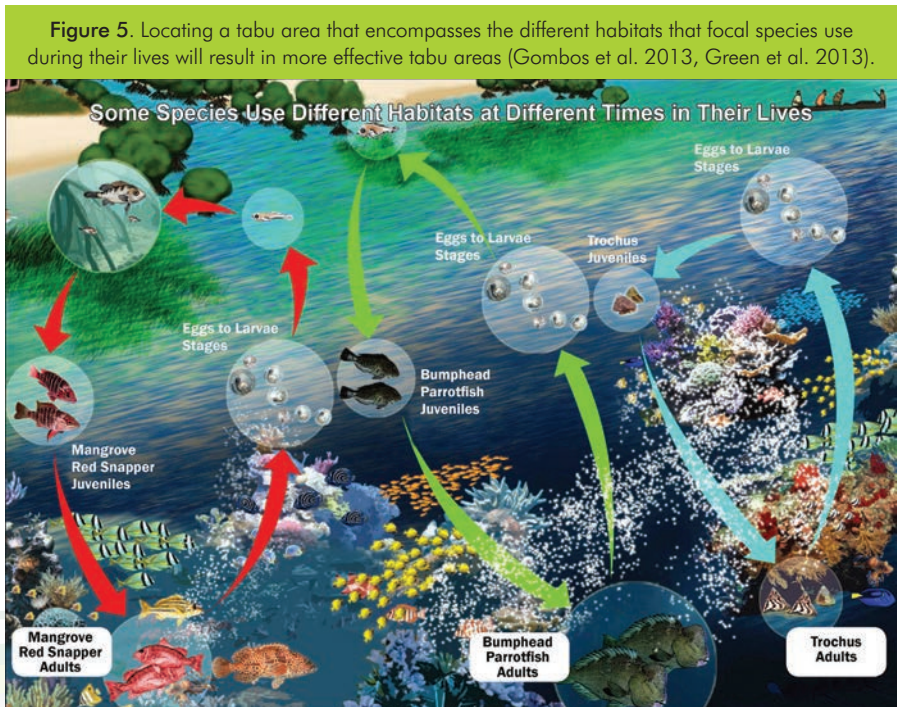
protect them while many fish species need larger areas. Generally, the larger the fish the larger area that is needed for protection. Green et al. (2014) recommend that reserve size should be at least twice the home range size of the species (in all directions) (Figure 4).

- *Tabu areas need to be large enough to protect target species while allowing them to move throughout their natural range*

b. Tabu area location

Coral reefs, seagrass and mangroves provide critical habitat for many marine animals, for spawning (e.g. reef fish), feeding (e.g. dugong and turtles) and as nursery areas (e.g. for reef fish and sharks). Species also use different habitats during the different stages of their lives (Figure 5). In addition, some areas are important because they are in a healthy condition, have survived previous impacts (e.g. cyclones), are where fish spawning aggregations occur or are unique in some way. These factors should be considered when deciding on the boundaries of a tabu area and important sites should be included for protection.

- *Tabu areas should include habitats that support different life cycle stages and important and/or special sites*



c. Tabu area activities

All extractive activities should be disallowed in tabu areas so the area can allow all species to thrive, recover and/or increase in size and number. This will provide the maximum benefit for the community from a tabu area. Tourist activities may be allowed in tabu areas, and a well-managed tabu area can provide important local income to villages through non-extractive activities.

- *All fishing and extractive activities should be prohibited in tabu areas*

3. Community Engagement & Consultation

Critical to the success of a tabu area is the involvement of the whole local community in all stages of the process. If communities are part of the process, they become better educated about why tabu areas are important, feel greater ownership of the tabu area, and are much more likely to respect the tabu area rules. Community involvement and committees significantly helps ensure that tabu areas are effective. Importantly, some adjacent villages may need to come together to be able to create a tabu area large enough to protect local shared species. Although challenging, this will be critical to the success of tabu areas in the future.

- *Community involvement is critical for tabu areas to be effective*

Important Note

Tabu areas should not be viewed as the answer to all coastal resource issues. Tabu areas are an example of one tool, and effectively managing coastal resources also requires the use of tools in areas outside the tabu area, such as fishing restrictions on gears, species, fish size and access.

An example of how to use this guide for setting up a tabu area

1. Community voices concerns that it is harder to catch strong skin and blu fis and their sizes are getting smaller.
2. Hold a community meeting to discuss and agree to create a tabu area:
 - The objective of the tabu area is to protect strong skin and blu fis (see **section 1a**)
 - Decide to protect all fish and invertebrates in the tabu area to benefit all species and make enforcement easier.
3. How large should the tabu area be? Discuss the movement of strong skin and blu fis, refer to this guide (**section 2a**) and ask fisheries officers. Decide the tabu area should extend for 1 km along the coastline.
4. What habitats do these species need to complete their life cycle? Discuss with the community (using **section 2b**) and fisheries officers. Decide the tabu area will extend from the shore to include mangrove/seagrass areas (where babies live), the reef flat (where juveniles live), the reef slope and deeper water beyond (where adult fish live and breed).
5. The community discusses and agrees on activities that are allowed in the tabu area (see **section 2c**). For example: fishing , snorkelling.
6. Discuss with the community that strong skin and blu fis must survive for several years before they can breed and so can take many years to recover from overfishing. Decide to make the tabu area a permanent closure (see **section 1b**).
7. Discuss and write a plan to manage the tabu area (see **section 1e**):
 - Enforcement is needed to help ensure rules are respected (see **section 1c**). Discuss with fisheries officer and identify a local Fisheries Authorised Officer.
 - Monitoring is needed to understand if the tabu area is effective (see **section 1d**). Resource monitors should use the Community Marine Monitoring Toolkit to conduct Fish Catch surveys (**module 1**) for outside the tabu area, Intertidal Invertebrate surveys (**module 2**) and Reef Health surveys (**module 3**).
8. Select a village environmental committee to meet annually to oversee and review the management of the tabu area (see **section 3**):
 - Adopt a broader more holistic management plan that includes, adjacent marine areas and local land areas.
 - Discuss specific management rules in areas where fishing is allowed to prevent overfishing outside the tabu area.
9. To ensure the community is informed and understand the tabu area and any other management rules in place: have regular community meetings, create village signs and place information on village notice boards (see **section 3**).

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