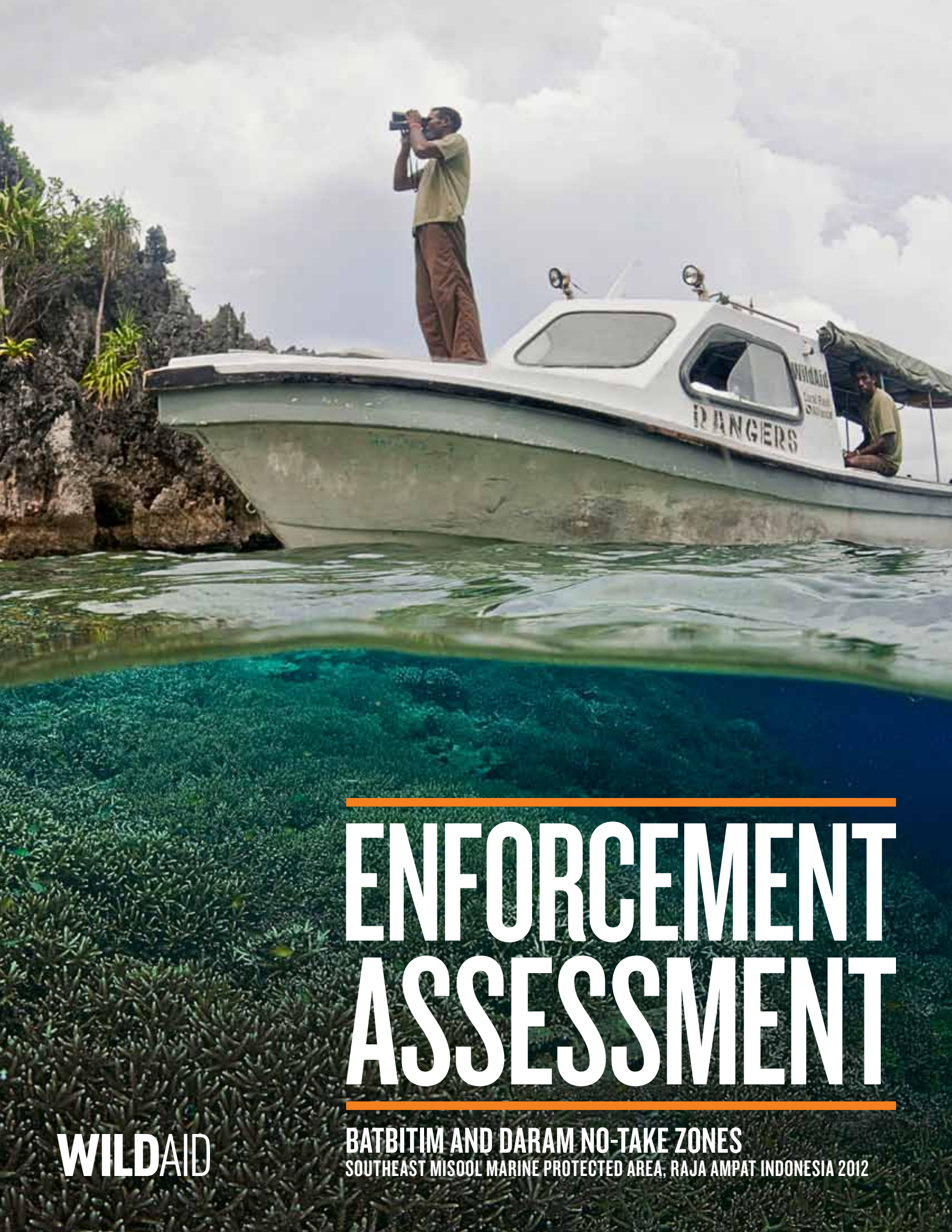


# ENFORCEMENT ASSESSMENT

## BATBITIM AND DARAM NO-TAKE ZONES

SOUTHEAST MISOOL MARINE PROTECTED AREA, RAJA AMPAT INDONESIA 2012

WILDAID

## ASSESSMENT METHODOLOGY

This assessment represents the work of a multi-national team and was carried out in Raja Ampat over a 2-week period in April 2012. Research methods were developed and applied by WildAid in cooperation with Baseftin staff and local investigator Naneng Setiasih. Given both resource and time constraints, we were unable to carry out key interviews with police, Fisheries, Forestry and Judicial officials. However, we are confident that sufficient information was collected to create a reasonably accurate snapshot of the local operating environment.

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## ACRONYMS

| | |
|---|---|
| AIS | Automatic Identification System |
| CI | Conservation International |
| CORAL | Coral Reef Alliance |
| IDR | Indonesian Rupiah |
| IMO | International Maritime Organization |
| MCA | Marine Conservation Agreement |
| MER | Misool Eco Resort |
| MDGS | Millennium Development Goals |
| MPA | Marine Protected Area |
| NGO | Non Governmental Organization |
| NTZ | No-take Zone |
| TNC | The Nature Conservancy |
| SOP | Standard Operating Protocols |
| VHF | Very High Frequency |
| WFF | Walton Family Foundation |

# ABOUT WILDAID

WildAid's mission is to end the illegal wildlife trade in our lifetimes by reducing demand through public awareness campaigns and providing comprehensive marine protection. We have successfully developed a model that strengthens the key elements of the law enforcement chain: surveillance, interdiction, prosecution, and sanction in several MPAs throughout the developing world. We work with governments in the design of strategic control and vigilance strategies that use the power of technology to increase efficacy while lowering patrolling costs. Given weak judicial systems, we also work with partners to develop innovative fining mechanisms that ensure compliance.

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# CONTENTS

<< LEFT: *Misool Eco Resort*

# PROJECT BACKGROUND

***2005 - 2011***

In November 2005, the Misool Eco Resort (MER) established a Marine Conservation Agreement (MCA) with the local community of Yillu in exchange for the right to establish a tourism resort on Batbitim Island and to protect 126 SNM as a No-Take Zone (NTZ) within the SE Misool Marine Protected Area (MPA). The agreement prohibited fishing within the NTZ yet respected traditional "sasi" zones allowing the targeting of Trochus niloticus and Turbo marmoratus for two weeks every two years. Resort construction began in June 2006 and the MER officially opened its doors to the public in October 2008.

From 2007 to 2010, the enforcement of the Batbitim NTZ was primarily funded by MER with limited external support from CORAL and WildAid. The patrol team was comprised of three staff and a 7-meter patrol boat with two 40hp outboard motors. While initial patrols were not very structured, they were effective in establishing a presence and integral in creating awareness among local community fishers. In March 2010, substantial external funding via the WFF, The Nature Conservancy and WildAid was invested to bolster enforcement capacity and ensure community benefits in exchange for the conservation of two NTZs. The Walton investment included a lease payment for the creation of the Daram NTZ, acquisition of a 9 meter aluminum patrol boat with two 85hp outboard motors, construction of three base camps, two community projects and critical operating funds to underwrite six staff and the patrolling operations for both NTZs. In October 2010, MER negotiated the 98 SNM NTZ around Daram island with the local community of Fafanlap and Usaha Jaya.

In an effort to separate conservation activities from the business/shareholders and ensure local ownership of marine resources, the MER established a local NGO called Misool Baseftin Foundation, meaning "Misool: We Own It Together" in January 2011. The Board is comprised of five Indonesian members and the organization possesses its own bank account and is a registered Indonesian charity. While still highly dependent on MER for the subsidizing of operations, Misool Baseftin is in its early stage and holds promise for success. Underpinning all tourism and enforcement is MER's commitment to community outreach and ensuring local benefits via employment at the resort, hiring of local patrol rangers, monthly community outreach activities, the construction of a kindergarten in Fafanlap and a community trade center at Usaha Jaya, among other initiatives.

## ASSESSMENT OBJECTIVES:

The main objective of this assessment is to evaluate Misool Baseftin enforcement activities in order to strengthen strategic operations, lower recurring operational costs and increase compliance. The specific objectives are:

1. Determine the main strengths and weaknesses of the current enforcement strategy by evaluating operations planning, intelligence analysis, standard operating protocols, number of patrols and patrol routes, and applied technology, among other factors.

   *(Key Assumption: Better enforcement does not necessarily equal more patrols)*

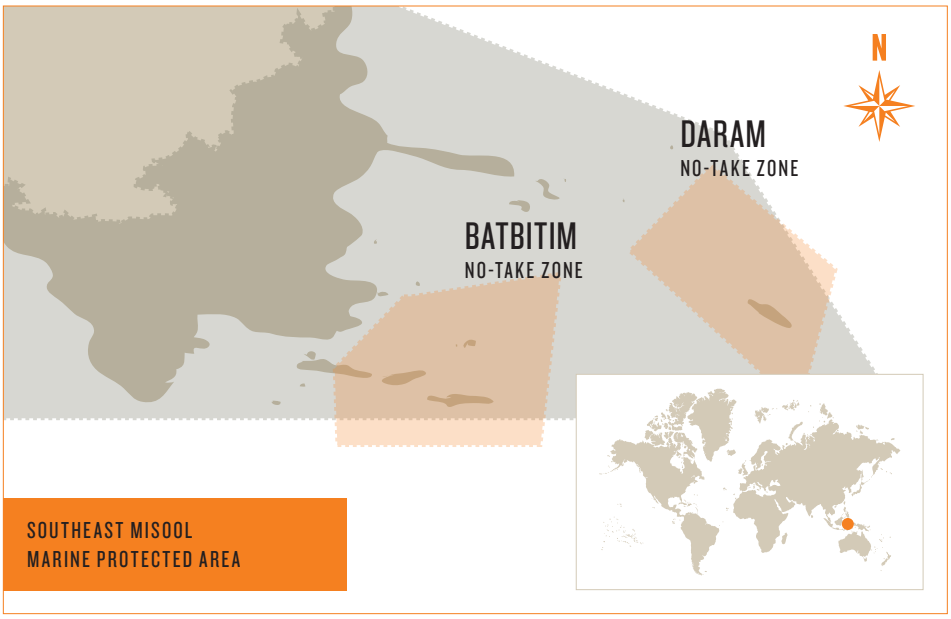
2. Prioritize a series of recommendations to lower patrol costs as well as increase detection efficacy. The final recommendations will be structured into three phases and will include system design including energy requirements and overall cost estimate (CAPEX/ 5 year maintenance plan, personnel and training requirements).

WildAid focuses on the law enforcement chain that encompasses the activities of detection, interdiction, prosecution and the fining of lawbreakers. An effective law enforcement system should dissuade potential lawbreakers from committing illegal activities as the consequences/ risks associated with apprehension outweigh economic gain. The law enforcement chain requires that each link function in an effective manner and no one link is more important than another. Also critical, yet not part of the enforcement chain, is the vital role that outreach and the education of stakeholders plays in MPA acceptance and compliance.

# GENERAL MPA CHARACTERISTICS:

Raja Ampat is located in the center of the Coral Triangle and is home to the highest concentration of fish and coral biodiversity found anywhere in the world today. The area is geographically isolated and surrounded by open seas, creating an oasis for pelagic fish. Under the sea surface, an extensive network of pinnacles, ridges and plateaus exists. In some locations, a relatively shallow sea floor is networked with deeper reefs. The reefs and pristine pinnacles are exceptionally healthy with abundant and diverse fish life.

The Batbitim (126 SNM ) and Daram (98SNM ) NTZs are located within the Southeast Misool MPA and are separated by 24.6 nautical miles. The areas are characterized by their abundance (100+) of small islands, islets and rocks and an extremely irregular coastline with numerous coves and 100-150m+ peaks. The geographical and topographical complexities pose difficulties for the use of radar and radio communication due to the numerous shadows that are created for microwave and VHF waves, respectively. Both NTZs are not close to maritime traffic routes.




## PERMITTED ACTIVITIES WITHIN NTZS:

Tourism, Diving, Snorkeling, kayaking, coconut harvesting (traditional owners) and "sasi" fishing every two years for Batbitim and every five years for Daram.

## COASTAL DEVELOPMENT AND POLLUTION:

There are no coastal developments other than 3 ranger stations and MER within the NTZs. Within the Southeast Misool MPA, coastal development is limited to the pearl farm and 11 small villages. The villagers typically construct small houses set on 2-meter high wooden platforms, possess no grey or black water treatment systems and tend to dispose of trash (paper and plastics) directly into surrounding waters. While the volume of paper and plastic consumption is small, the lack of proper disposal (as well as trash from elsewhere brought in on currents) results in litter scattered throughout the communities.

<< LEFT: *Southeast Misool artisinal fishing vessels*
<< ABOVE: *Typical coastal development at the village of Yillu*

## LOCAL COMMUNITY AND FISHING SECTOR CHARACTERISTICS:

### LOCAL POPULATION:

The province of Papua is the easternmost province of the republic of Indonesia. The indigenous population of Papua consists of 300 ethnic groups that are becoming outnumbered by migrants from other islands in Indonesia. The province has the lowest human development index of the country. Literacy rate is 75 %, with only 6.2 mean years of schooling per capita (BPS statistics 2006). For many non-economic indicators of poverty, including those measured by the Millennium Development Goals (MDGs), Papua lags behind most other provinces. There are 11 communities living within the Southeast Misool MPA with a total population of 4,460+ inhabitants. There are an estimated 1,200 villagers from Yillu, Fafanlap and Usaha Jaya (the concession area villages). The closest village, DaBatan, is located 12NM from the Batbitim NTZ.

### SOCIO-ECONOMIC DATA:

Official statistics were difficult to obtain yet most employed individuals reported an average of 50,000 IDR daily ($^{US}$5.55): the current minimum wage for Raja Ampat. The largest source of formal employment in Southeast Misool is the Pearl Farm followed by tourism, then NGOs. Fishing and the cultivation of eggplant, water spinach, chili, coconut, mango, durian, and guava are the sources for subsistence.

### FISHER CHARACTERISTICS:

There are an estimated 200+ fishers inside the Southeast Misool MPA who typically use small 3-5 meter vessels with 5-10hp outboard motors or no engine at all. Fishermen are not organized into cooperatives nor are they required to register vessels with any management authorities. Fuel is subsidized at 8,000 IDR for artisanal fishers and is sold only at Harapan Jaya while commercial rates are 12,500 IDR. While the majority of fishers used hand lines for subsistence means, there are two Yillu businessmen who each own 4-5 fishing vessels and employ local fishers to harvest resources. Fishers from other Papua provinces enter the MPA regularly and tend to use larger vessels with more crew. Large Javanese vessels also enter Southeast Misool and usually hire the local police or Navy for escort. Given the size of the latter vessels, Baseftin should not interdict and would require coordination with TNC and authorities.

**THREATS TO DARAM AND BATBITIM**

| TYPE | FISHING GEAR | NUMBER OF VESSELS | VESSEL SIZE | EQUIPMENT | FISHING YEAR ROUND |
|---|---|---|---|---|---|
| LOCAL SOUTH-EAST MISOOL FISHERS | Hand Lines | 200+ | 3 - 5 meters with 5 - 10 Hp motor | Cell phones/ SMS | No |
| EXTERNAL ARTISANAL FISHERS *(Sorong, Halmehara)* | Dynamite, Cyanide (Rare), Gill Net, Longline, Drag Line | N/A | 5 - 6 meters with internal engines and outboards | VHF Radios/ SMS/ GPS | No |
| INDUSTRIAL FISHERS *(Java)* | Longlines | N/A | 7 - 30 Gross Tons | AIS?/VHF Radios/ SMS | Yes |

*Source: local community and ranger interviews*

The monsoon season spanning June to September can produce 30-knot winds and 3+ meter waves, which makes oceanic travel nearly impossible for most fishers possessing small vessels. Industrial fishers from Java tend to encroach upon the area, especially Daram, during this season as their vessels can withstand the harsh oceanic conditions. Target Fisheries in the area include: Sharks, live reef fish (groupers and Napoleon Wrasse), snappers, tuna, jacks, lobster, bivalve, sea cucumber, shellfish, and squid.

# ANALYSIS OF CONTEXT/ LEGAL FRAMEWORK

Realizing the complexity of Indonesian laws and the numerous variations that exist among provinces, we have briefly examined the contextual framework of the West Papua Province. The hierarchy of Indonesian government consists of the following five levels:

| INDONESIAN POLITICAL ORGANIZATION | BATBITIM AND DARAM MCAS |
|---|---|
| National | Indonesia |
| Province | West Papua |
| Regency | Raja Ampat *(Bupati)* |
| District | Southeast Misool |
| Villages | Yellu, Fafanlap and Usaha Jaya *(Adat and official government leader ((elected every 5 years.))* |

While the new national fishery laws 31/2004 and 45/2009 and spatial law 27/2007 provide the framework for establishing and administering MPAs and NTZs (that are administered under the Department of Fisheries at District levels), the bulk of regulations and decrees guiding marine conservation and zonation activities are promulgated at the Regency and local "Adat" level. Unique to only West Papua, the Adat, the traditional local community council, has traditionally recognized authority to govern its ancestral lands and presents a very unique advantage for the local administration of protected areas and the rule of law. The decentralization law 22/1999 recognizes Adat tenure rights nationally. The law specifically:

- Devolves nearshore management of marine and costal resources to provincial and district governments.
- Sets district boundaries at 4 NM from the coast and provincial boundaries from 4 NM to 12 NM.
- Allows the adoption and integration of the customary laws and local territorial rights into local government policy (Siry 2011).

*"The unwritten 'adat' law in Indonesia gives local communities traditional rights for exploration, management, exploitation, and conservation. In addition to the Indonesian Constitution of 1945, the Adat Law is recognized by Act No. 5, 1960, the Agrarian Act, which states that 'the applicable law for land, water and air space is under Adat Law, providing that it does not conflict with national interests or disrupt the unity of the nation. These community rights therefore should be consistent with national interests and in accordance with written laws and regulations' (Marine Aquarium Council 2006). The traditional adat law is recognized in the far eastern and western parts of the country". (TNC)*

In Raja Ampat, many of the general MPA development guidelines including fishing and gear prohibitions have been established at the Regency level. These include the prohibition of fishing in the NTZs; the prohibition of harvesting of mantas, dugong, sharks, aquarium fish, and turtles; the prohibition of cyanide and bomb fishing; the restriction of fishing gear (trawling, compressor fishing); the establishment of joint patrols, among others. However, fines for illegal fishing and the establishment of NTZs have all been promulgated at the Adat level. Given limited government resources and institutional presence in Southeast Misool, governance falls primarily on the local communities and specifically the village leaders.

<< TOP LEFT/MIDDLE: *Children of Yillu*
<< BOTTOM LEFT: *Artisinal fishing vessel.*

## DISSEMINATION OF REGULATIONS

TNC, MER, Baseftin, CORAL, among others, have been instrumental in lobbying for and disseminating many of the environmental regulations in the Southeast Misool MPA. MER and Baseftin have carried out community socialization activities since the signing of the first lease agreement in 2005. The activities have included the use of movies, posters, fact sheets and most importantly weekly meetings between village leaders and rangers. Key to NTZ acceptance has been the constant socialization of regulations to villagers and even when apprehended in fraganti, first time and repeat offenders often received warnings, not fines, in order to avoid community backlash. Most recently, Baseftin has begun to incorporate local villagers into patrols in order to ensure community buy-in and further strengthen compliance. Starting in 2012, Rare Conservation will also be supporting the implementation of a Pride Campaign (through TNC and in collaboration with MER) with particular focus on behavior change in local communities to achieve compliance with NTZ regulations throughout the Southeast Misool MPA (including the leased zone areas under MER management, and the more recently designated NTZs in the wider MPA).

The Raja Ampat Regency has also facilitated public events through expositions, festivals, among other mediums as one of the mechanisms to socialize government programs including conservation and tourism initiatives. While this has indirectly helped to disseminate regulations, targeted socialization programs for each of the regulations has not taken place.

## STAKEHOLDERS

PUBLIC SECTOR

| INSTITUTION NAME | PHYSICAL PRESENCE IN THE MPA: MEANS, INFRASTRUCTURE, PERSONNEL | ROLE IN THE MPA | TYPE OF ATTITUDE TOWARDS THE MPA & ACTIVITY |
|---|---|---|---|
| Army | Army based at Pearl Farm and 6-perimeter posts (30 officers) plus 1 officer located in each village. (Total 41) | Security of the Southeast Misool District with clear focus on Pearl Farm. Open to collaboration with MPA patrols, yet require financial support. | Support. Limited budget, dependent upon Pearl Farm. |
| Police | Dormitory and station at Fafanlap, though only 1 stationed in Fafanlap. 18 officers at Pearl Farm. | Focus on rule of law. Currently 2 officers working with TNC on patrols, yet require financial assistance. | Support. Limited budget, dependent upon Pearl Farm. |
| Environment | Office at Waisai. | Carry out EIAs in Raja Ampat. No presence in Southeast Misool. | Support |
| Tourism | Office at Waisai. | Collects Raja Ampat entrance fee (500,000 IDR for Foreigners & 250,000 IDR for locals). Annual entrance fee revenue: US$222,000 (2010) with positive trend. Issues hotel, live-aboard, and other tourism related permits as well as industry standards. | Support. Planning, Tax Collecting, Monitoring, and Permits. |
| Fishing/Aquaculture | Office at Waisai. | Permits for fishing (vessels greater than 10 GT.) Artisanal fishers are not registered with official government agency. | Support. Planning, Investigation, Permits, Dissemination, Control and Vigilance. |
| Local Government Representatives | There is a government representative in every village in Southeast Misool: 11 villages. No villages are located in the concession areas yet pertain to Yillu, Falfanlap, Usaha Jaya | Officers are elected every 5 years and responsible for government duties. Note: Local community leaders more powerful than elected community leader and often they are one in the same. | Support. Planning, Permits, Dissemination, Control and Vigilance. |

## STAKEHOLDERS

PRIVATE SECTOR

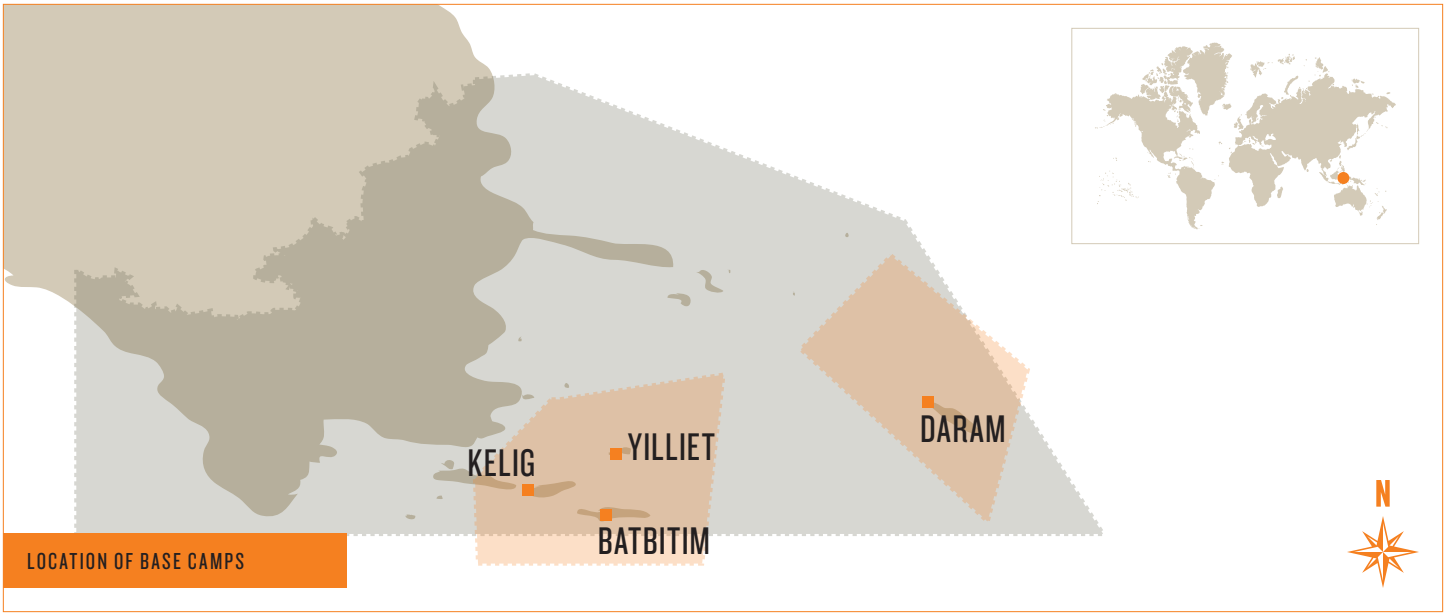
| ACTOR | PHYSICAL PRESENCE IN THE MPA: MEANS, INFRASTRUCTURE, PERSONNEL | TYPE OF STAKEHOLDER | TYPE OF ATTITUDE TOWARDS THE MPA & ACTIVITY |
|---|---|---|---|
| MER | 16 room eco resort with 110 employees (75% local hires) | Private Business | Support. Tourism, Investigation, Monitoring, Education, and Dissemination. |
| Pearl Farm | 2,000 employees (75% local hires) | | Support. Cultivation of pearls. |
| Anchovy fisherman | Estimated 30 fishers | Local Fishers | Indifferent. Extractive. Note most operating without permits/ regulations needed. |
| Liveaboard operators | 25 vessels/14 passengers per vessel. 375 employees though 99% non-local hires | Private business (many Bali-based) | Support or indifferent (depends on the operator). Tourism. |
| TNC | Office in Harapan Jaya, Misool. 20+ local employees. | NGO | Support. Control and Vigilance, Investigation, Monitoring, Education and Dissemination |
| Baseftin | Office in Batbitim. 7 local hires. | NGO | Support. Control and Vigilance, education and Dissemination. |
| Ferry Operator | Sorong Based. 12-16 crew from Sorong. | Private Business | Indifferent. Transportation. on Type of attitude Should be placed across from Ferry Operator not Baseftin. |

# SURVEILLANCE AND DETECTION

Baseftin employs a private-community enforcement model for both Batbitim and Daram NTZs. There are a total of 6 Baseftin rangers, 6 paid Community rangers and 1 security officer who comprise the enforcement team. Community rangers are rotating positions to increase the amount of community engagement and buyoff on the NTZs. Baseftin coordinates 10 patrols per month with the aluminum patrol vessel and has constructed three base camps with respective small boat with 10hp engine to ensure continuous presence and to lower fuel costs required for constant patrolling. There is currently no institutional presence (Police, Army, Fisheries) for patrols though a police official may be incorporated into the Daram patrol. Daram is permanently staffed with 3 rangers and is the primary target for bomb fishers, among others, given its remoteness and relatively short existence as a NTZ (less than one year old). The other two base camps will be staffed with two or three officers (Baseftin rangers or Community rangers) on a weekly basis. The current placement of base camps is strategic to ensure constant presence in the NTZs though the Yillet post could be eliminated in the future if Baseftin were to share the TNC base camp of Yam.

## FACTOR ANALYSIS

| OBSERVED FACTOR | CRITERIA |
|---|---|
| Personnel | 4 rangers, 1 Patrol Manager & 1 Baseftin Manager. MER currently underwrites a mechanic and 1 security officer for patrols. In addition, there are 6 community patrol members who participate in patrols: 2 at Daram, 1 at Kalig, 1 at Yillet and 2 at Batbitim. |
| Training | Rangers have received basic courses in patrolling and operations and CORAL has provided training in administration and is assisting in the drafting of SOPs. WildAid recommends the following basic IMO courses for ALL crew: 1) Survival at sea; 2) Firefighting; and, 3) First Aid. In addition, a search and rescue course is recommended for boat captains. WildAid will perform a review of the SOPs once a final draft version is completed. |
| Standard Operating Protocols | The current Baseftin SOPs are still limited and observations of the rangers revealed they understand and practice what they have learned, but key procedures have not been considered yet or "put into practice". Improvement areas identified include: Need of log books on-board boats, at base camps and main base; Regular communication protocols; Basic rules for operating a VHF network; Establishment of performance indicators; lookouts and duty sections assignment, boarding procedures, Patrol boat custody and the use of "Ready for Sea" reports. |
| Patrol Team Professionalization | We recommend further professionalization of the Baseftin patrol crew by establishing uniform standards and establishing a general code of conduct. Currently, the MER and Baseftin uniforms are almost identical and Baseftin may consider a uniform change in order to separate the image of the organization before the eyes of the community. |
| Size and Complexity of Marine Area | Batbitim: 126 SNM NTZ / Daram: 98 SNM NTZ. 100+ islands, islets and rocks within NTZs. Daram base camp requires weekly replenishment of fuel and food. |
| Vigilance Means | One 9 meter aluminum vessel with two 85hp engines/ One 7-meter fiberglass with two 40hp engines and Three 3-meter wood patrol vessels with 2 10hp engines for each base camp. An additional 9-meter fiberglass patrol vessel with 2 85hp engines is expected for July 2012 in order to replace the original 7-meter patrol vessel. Maximum patrol speeds range from 6 knots for small vessels to 30 knots for aluminum patrol boat. There are three base camps: Kalig, Yillet and Daram. Given the high fuel consumption of 85hp engines, we would recommend that Baseftin purchase two 40hp outboards for the new patrol vessel. The 85hp engines should be used for Daram and the 40hp for Batbitim. |

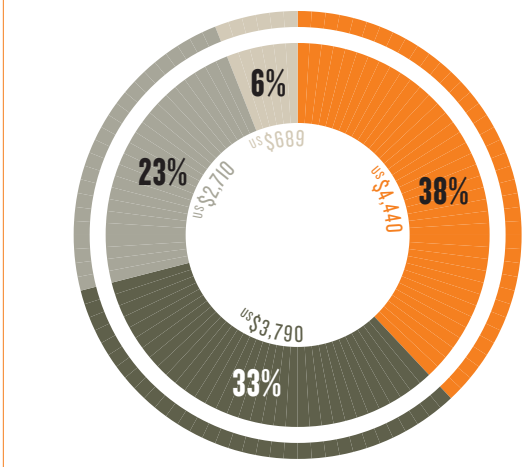



## ANALYSIS

| OBSERVED FACTOR | CRITERIA |
|---|---|
| Technology used in Vigilance | Radar is not appropriate for areas under surveillance. Radio communication is limited: two handheld 1-Watt radios (not marine radios) and one base radio on Baseftin boat. Currently no clear radio communication links exist between base camps and Baseftin. While rangers reported using the following equipment, there were no binoculars, GPS, night vision binoculars, digital cameras nor video cameras at the time of our visit. WildAid donated a GPS, binoculars and video camera upon our departure. We recommend the establishment of a marine VHF network as a short-term priority and will provide system specifications. We also recommend the use of GPS and Google maps to track both patrol patterns and in order to monitor fuel use. Integration with TNC/Conservation International's VHF network is also recommended for coordination purposes. Over the long term, we are recommending the use of AIS to monitor large vessels especially for the monsoon season and for tracking Baseftin patrol vessels. |
| Distance of Popopultation and Multiple Uses within the MPA | Closest local population from Batbitim 12NM, 35NM from Daram. |
| MPA close to maritime traffic routes | There are no traffic lanes through the NTZs. Maritime traffic is immediately south in the Ceram Sea. |
| Availability of means | Patrol vessels have 75%+ availability. Baseftin employs 2-stroke motors given ease of maintenance with local mechanic and local familiarity with equipment. While 4-stroke outboards are more efficient, their adoption would pose problems for maintenance due to their high tech sophistication level. |
| Systematization and Planning of Vigilance | The patrols are not random, but planned on a weekly basis. There are monthly meetings with rangers to discuss strategy and to make adjustments to patrol plans. There is one reporting form that is comprehensive and has been improved upon over the past 5 years. |
| Availability of Intelligence Information | Rangers receive information from Yillu and Fafanlap villagers on illegal fishing operations. Liveaboards also provide occasional tips. |
| Days Operating Per Month/Year | The large Baseftin patrol boat carries out 10 patrols per month and its availability exceeds 75% (optimum). The Daram outpost is manned with three crew who possess a 3-meter patrol vessel. Both Kalig and Yillet base camps were still under construction as of April 2012. |

## REOCCURRING OPERATING EXPENSES

Upon analysis of current monthly patrol expenses (US$11,628), Fuel and Maintenance represent the largest expense followed by personnel. Baseftin has already taken cost-cutting measures by acquiring three 3-meter patrol vessels with 10 HP engines and by constructing three base camps. Considerations have also been made to reduce the number of patrols and extend the trips of rangers on Daram from 5 to 10 days as one round trip to Daram costs US$350 in fuel alone. These all appear to be practical measures that could easily reduce costs by US$1,000+ a month. We understand that initially more patrols may be needed for Daram, but hopefully there will be a reduction over time.




MONTHLY
OPERATING COST BREAKDOWN

- FUEL & MAINTENANCE
- PERSONNEL
- BASE CAMP
- COMMUNITY OUTREACH

# INTERDICTION

| OBSERVED FACTORS | CRITERIA |
|---|---|
| Speed and Autonomy of Vessels | The 9-meter patrol vessel has a maximum speed of 30 knots while the 3-meter vessels reach 10 knots. Average cruising velocity for patrols is 12 knots and autonomy of 9-meter vessel is 8 hours and 6 hours for 3-meter vessels. |
| Inter-Institutional Cooperation | Currently Baseftin does not coordinate patrols with other institutions, however, initial discussions have been initiated with TNC, the police and the Pearl Farm. Given the encroachment of bomb fishers at Daram, Baseftin is investigating the possibility of stationing a police officer at the base camp. TNC currently pays 4,500,000 IDR a month for a local police officer so Baseftin may have to do the same. Discussions are underway to 'borrow' TNC's policeman to support Daram activities. Once the VHF radio network is operative, collaboration should become easier. |
| Boarding Procedures and Crime Scene Investigations | Baseftin is still reviewing a final version of its boarding procedures as part of their SOPs. They do not carry out crime scene investigation yet may consider if cases will ever be sent through the judicial system. For the near future, basic measures have been proposed by WildAid such as registering the GPS position of the incident, situation reporting to the Main Base (via radio), filming the boarding as well as taking as many pictures as possible. A debriefing session with the Baseftin patrol manager will be part of any boarding situation. |
| Evidence Collection and Management | As illegal fishing cases never go beyond traditional trials, Baseftin rangers typically just confiscate fishing gear and catch, then tow the illegal fisher to the village for the trial. We recommend that minimum guidelines be incorporated into SOPs for the collection and management of evidence. |
| Detailed Investigation at the Scene of a Crime | Currently not part of SOPs. |
| Appropriate and Adequate Reporting | Current onboard reporting format covers all relevant factors. We recommend complementing the report with portable GPS automatic route recording. |
| Correct Presentation of Documentation for Administrative or Judicial Sanctions. | No cases have gone beyond the community trial level. |
| Relationship Between Detected and Intercepted Infractions. | Rangers receive information from Yillu and Fafanlap villagers on illegal fishing operations. Liveaboards also provide occasional tips. |

<< LEFT: *Captain of the Baseftin patrol vessel on patrol*

# PROSECUTION AND SANCTION

| OBSERVED FACTORS | CRITERIA |
|---|---|
| Background | Over the course of two years, MER has worked with the community leaders of Yillu to develop a local fining mechanism that is truly unique and effective for NTZ enforcement. In summary, the mechanism permits the Adat council to levy fines against anyone fishing in the Batbitim NTZ. The ruling, which is signed by all the Adat leaders and the village head, imposes fines of between 5,000,000 and 10,000,000 IDR (approximately US$500-US$1,000) per boat that is caught fishing inside the NTZ. The ruling has been in effect since May 2011. There are three key advantages to this mechanism:<br>1. The Adat ruling and sanctions can be completed within one or two days as opposed to a court case which may take many months to complete.<br>2. The Adat ruling presents zero costs whereas cases processed via the judicial system can be costly and require third-party funding.<br>3. The Adat fine goes straight into the local community fund and hence provides incentive to catch and prosecute infringing fishermen.<br>Baseftin is working with Fafanlap community leaders to develop a similar Adat ruling for Daram, however, based on their experience with the Yillu community, this process may take the next couple of years. The main reason for this is that there is a general reluctance to immediately impose fines, particularly on local community members. Instead, the community allows a period of socializing the concept and gives warning letters to infringing fishermen. This has worked to reduce the vast majority of offenders, who, after receiving warnings from the Adat leaders, stop fishing in the NTZ. The fines are then imposed for the final few fishermen who do not heed the warnings. This means that by the time fines are imposed the majority of the local community already accepts the NTZ concept and there is no backlash or loss of community support. Baseftin will however work to have a fine imposed for fishermen from outside the local community in place sooner as there is not the risk of losing community support when fining them. |
| Speed and Effectiveness of Administrative Processes | Two Illegal fishing cases in Batbitim were resolved by the Adat **in only one day**. No cases have been processed for the Daram NTZ. |

>> TOP RIGHT: *External fishing vessel*
>> BOTTOM RIGHT: *Mantas of Raja Ampat*
>> BOTTOM LEFT: *Coral*

| OBSERVED FACTORS | CRITERIA |
|---|---|
| Speed and Effectiveness of Judicial Processes | As of April 2012, no illegal fishing cases from Batbitim nor Daram had been processed via the judicial system. Environmental crimes tend to be a low priority for local officials and often costly as organizations must underwrite expenses of the Fisheries offices, Judges and/or prosecutors. We learned of two illegal fishing cases processed in Raja Ampat with the support of CI and TNC.<br><br>CASE 1: Fishers were caught finning sharks and bombing reefs in Wayag in 2010. The four fishers were found guilty after a 3-month court case and one appealed through the higher court supported the lower court's verdict after an additional 3-months. Fine: 8 months prison and 1 mil IDR. CI invested US$4,500 for the case.<br><br>CASE 2: Fishers bombing in Kofiau in 2012. The fishers were found guilty after a 2-month process. Fine: 1 year 3 months and 200M IDR fine. TNC invested US$2,700. These cases are critical in setting precedent that environmental laws will be enforced by formal government authorities and help in ensuring compliance with environmental laws. |
| Relation of cases not resolved | Two illegal fishing infractions have resulted in fines. |
| Follow-up of cases | The Ranger, Adat Council and violators all participate in the administrative process. A third-party appeal mechanism does not exist. |
| Relationship between initiated and sentenced processes | No cases have been processed via the judicial system. |
| Time of process | The two cases processed via the "Adat council" were resolved in one day. The two cases processed via the judicial system required two to three months. |
| Executed sanctions | In May 2011 the Adat ruling was enacted for the first time and two shark fishing boats that were apprehended just after they had laid their nets within the MCA. These boats were brought to the village, had their catch confiscated and were immediately fined 5,000,000 IDR. The second sanction involved the fining of a local fishing "Boss" 25,000,000 IDR who had instructed five of his boats to use longlines within the Batbitim NTZ. The local village leader had warned him repeatedly yet he continued to disrespect the local law. |

<< TOP LEFT: *Base camp patrol vessel with 10HP outboard at Daram*
<< MIDDLE LEFT: *Baseftin rangers at Daram*
<< BOTTOM LEFT: *Base camp under construction at Kelig*
<< CENTER SPREAD: *Island of Raja Ampat*

<< LEFT: *Misool Eco Resort staff*

# SUMMARY OF FINDINGS

Overall, Baseftin possesses excellent detection capacity to cover both NTZs given the current amount of personnel, patrol vessels and base camps. The strategic placement of base camps lowers patrolling costs and guarantees a continuous presence, which serves as an important deterrent. The rangers are utilizing a patrol-reporting format and have an adaptive planning mechanism in place. Recommendations for improvement are important and various formats were prepared and delivered for implementation (Base camp Log Book, Boat Log Book, Ready for Sea report, Spare parts inventory, and fixed assets inventory). The greatest weakness observed is the lack of an operational VHF radio network and the lack of basic surveillance equipment such as GPS and binoculars. Once operational, the VHF network will allow for improved coordination and should enable Baseftin to further lower fuel and maintenance costs. Over the medium to long term, we believe the community can be further incorporated into the enforcement system through the provision of marine radios, the painting of fishing vessels and the creation of a fisher registry (additional details provided on page 25). Finally, the addition of an AIS Receiver at Batbitim would increase detection capacity of commercial fishing vessels entering the Southeast Misool MPA and could be shared with partners.

>> RIGHT: *Misool Baseftin patrol vessel near Kelig*

With respect to interdiction, Baseftin possesses adequate vessels for interdicting local and foreign fishers from Sorong. Under fair weather conditions, the system works well. However, the monsoon season poses a problem, as even the 9-meter patrol vessel is not recommended for use in 2+ meter waves and stormy conditions. Locals report Javanese longliners enter the area during the monsoon months and Baseftin should develop a strategy with the police, Navy and TNC to counteract these larger vessels.

With respect to prosecution and sanction, the local Adat fining mechanism is excellent. Baseftin is optimistic that a similar mechanism can be established for Daram. In the future, we would only recommend that Baseftin consider working with TNC to process a symbolic illegal fishing case via the judicial system. This could serve as strong additional deterrent to foreign illegal fishing vessels. The CI and TNC cases are important for creating precedent and additional cases will only further consolidate advances and build awareness among all resource users and authorities that environmental crimes will not be tolerated under Indonesian law.

For the sake of brevity, we have listed a series of recommendations for the improvement of each component of the law enforcement chain. We recommend the implementation of activities over three phases in order to ensure feasibility, as some are simply more important than others.

*>> Please refer to the list on the right*

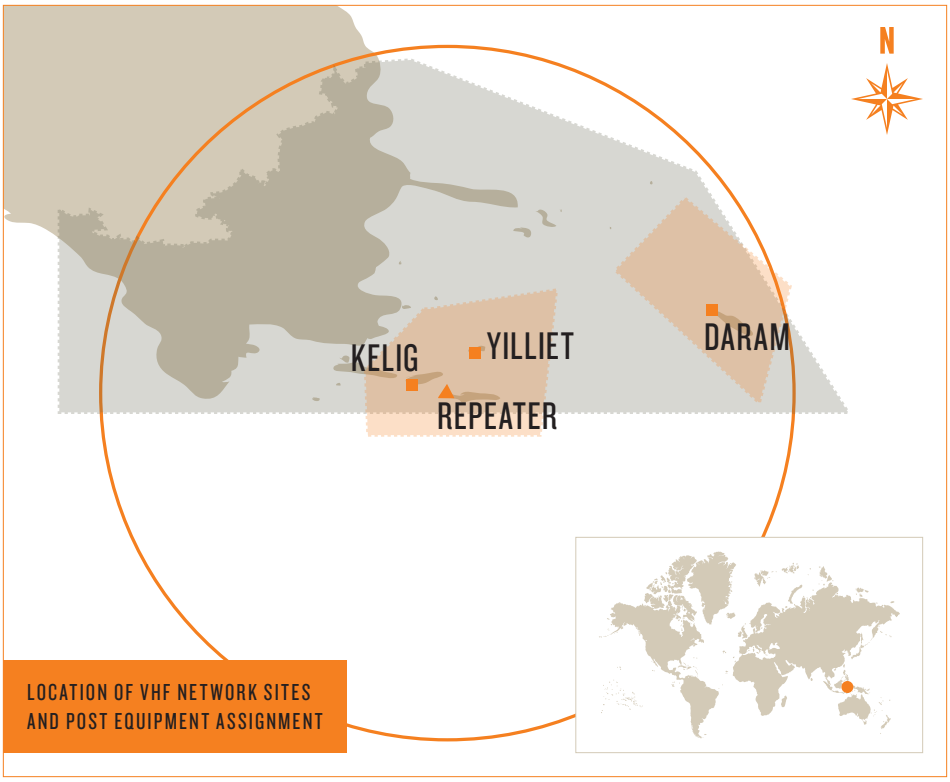
| COMPONENT | RECOMMENDATION | | |
|---|---|---|---|
| | IMMEDIATE - PHASE I | MEDIUM TERM - PHASE II | LONG TERM - PHASE III |
| DETECTION: | 1. Installation of Marine VHF Radio Network on Batbitim, boats and remote posts.<br>2. Installation of a private VHF base radio at Batbitim for coordination purposes with CI & TNC.<br>3. Improve local rangers training: Basic IMO Courses and Boat Captain's Course. | 1. Incorporation of local fishers into system as first alert aids.<br>2. Carry-out fisher registry in Yillu Village.<br>3. Paint fishing vessels one color with unique markings per village and establish framework for local fishery management authority.<br>4. Continuously monitor fuel once all networks are established to identify costs savings. | 1. Installation of an AIS to monitor large commercial vessels and improve tracking of Baseftin patrol vessels in real time.<br>2. Implement Class B AIS transceivers on board of larger Baseftin vessels. |
| INTERDICTION: | 1. Coordinate with local police and TNC to intercept foreign vessels encroaching upon the NTZ.<br>2. Establishment of a critical spare parts inventory. *Please refer to page 30 for details* | 1. Improve Crime Scene Investigation and report writing in the event a case is submitted via the judicial system. | 1. Employ AIS to coordinate interdictions with authorities who possess larger patrol vessels. In addition, numerous smaller vessels could be deployed to assist Baseftin rangers. |
| PROSECUTION/SANCTION | 1. No recommendations as Adat ruling is highly effective and efficient. | 1. Highlight a symbolic illegal fishing case and process via the judicial system. | No Recommendations |

# TECHNICAL SPECIFICATIONS

## DETECTION PHASE I:

### I. INSTALLATION OF VHF RADIO NETWORK

The greatest area for improvement in the Baseftin surveillance system is the need for a radio communication system. The core of enforcement operations is the VHF radio network. The network will not only link the base camps managed by Baseftin, but also those manned by allied NGOs and the neighboring villages. At the Main Base, a Repeater Station is needed in order to extend the communications range of all the stations on shore and at sea. High-powered VHF Base Stations are needed at the Main and remote bases as well as on board the two bigger patrol boats. Smaller boats and individual rangers should be equipped with handheld marine radios operating with improved capabilities such as higher power and high performance antennas.




LOCATION OF VHF NETWORK SITES AND POST EQUIPMENT ASSIGNMENT

| POST | AIS SHORE STATION | MARINE VHF REPEATER | MARINE VHF BASE STATION | MARINE VHF HANDHELD RADIO | PRIVATE VHF RADIO |
|---|---|---|---|---|---|
| Batbitim | 1 | 1 | 1 | 2 | 1 |
| Patrol Boat BASEFTIN 1 | - | - | 1 | 1 | - |
| Patrol Boat BASEFTIN 2 | - | - | 1 | 1 | - |
| Kalig | - | - | 1 | 1 | - |
| Yillet | - | - | 1 | 1 | - |
| Daram | - | - | 1 | 1 | - |

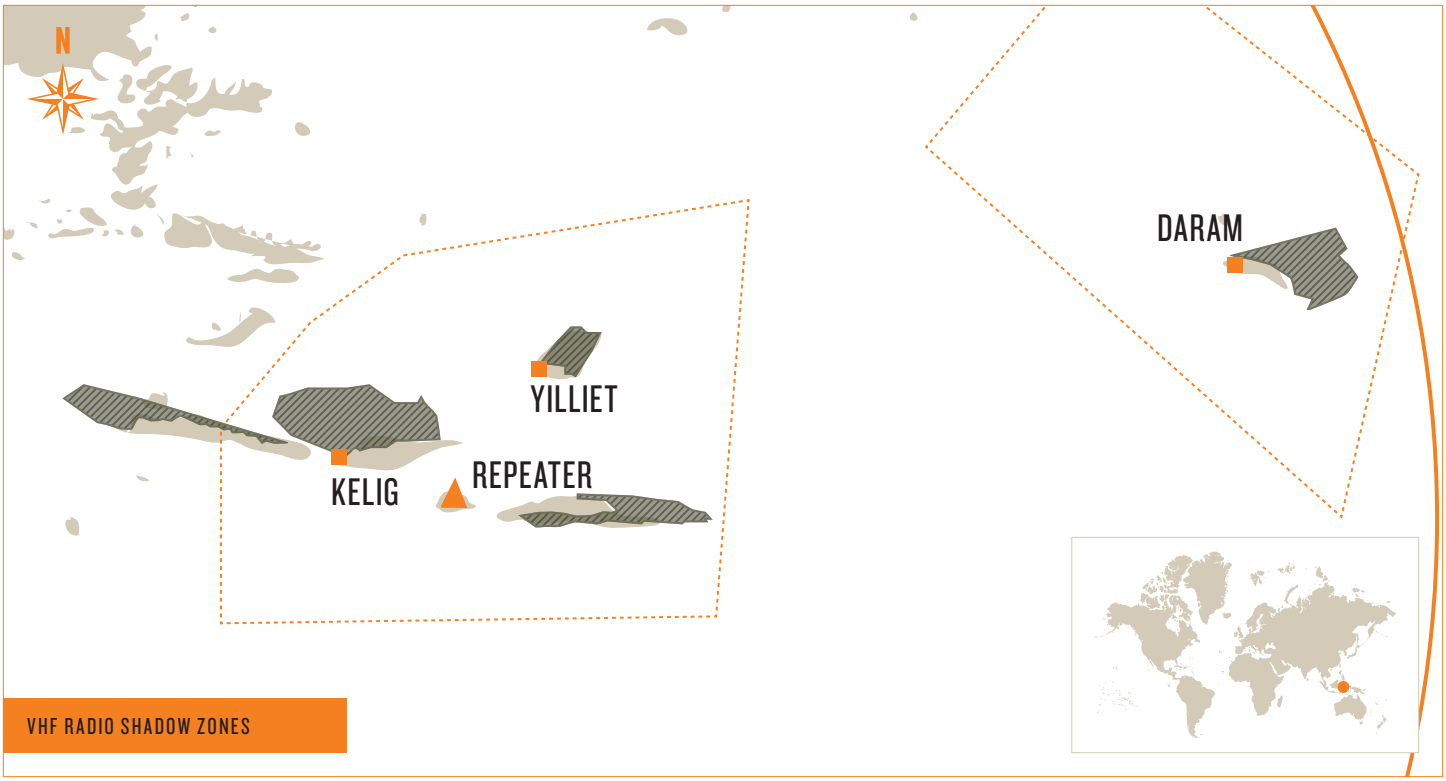
Batbitim has been selected as the marine VHF Repeater site and as the AIS Shore Station because of its location in the center of the region and its logistic capability and available energy sources to sustain the operation of the site. Both the VHF Repeater as well as the AIS station must have high gain antennas (>6dB) for improving maximum range performance. The following maximum ranges are expected:

- AIS: 45-50 NM for detecting AIS Class A transceivers (big ships) and 25-30 NM for Class B vessels
- Marine VHF Repeater: 30 nautical miles for connecting with other VHF Base Stations
- Private VHF base station: 30 nautical miles for connecting to TNC's and CI's stations. 25W with 6db whip antenna.

Marine VHF 25W base station should be installed on the remote bases. Due to the remoteness of the region, high gain antennas are recommended (6 dB whip antennas).

Handheld Marine VHF radios must have 4W to 6W transmission power and an additional high gain antenna is highly recommended for improving radio performance at long distances. It is expected that with these options, the maximum distance for handheld to Base station could be around 10 NM.

Due to the fact that there are many high elevation islands in the sector, the performance of the VHF radio network has coverage limitations even with the repeater station at Batbitim. The gray shaded zones in the radio coverage graph below illustrates where communication is limited. In addition we have listed communication difficulties by site and provided recommendations.




| SITE | PROBLEMS OBSERVED | RECOMMENDED ACTIONS |
|---|---|---|
| Kalig | Has no line of sight to the proposed Marine VHF Repeater site at Batbitim | • Locate the antenna by the beach at the south part of the base (+/- 30 m.).<br>• Use a 30m-50m cable to connect the antenna to the Base Radio at the Post<br>• High gain antenna (≥6dB) highly recommended |
| Yillet | Has no feasible line of sight with the VHF Repeater site at Batbitim. | • It has communications with the Daram Post and Yam Post (TNC). These stations could relay the calls when trying to contact Batbitim.<br>• A medium term alternative could be to locate a 2nd VHF Repeater site at Gelu. This could be done as a joint project with TNC if an agreement is reached.<br>• High gain antenna (≥6dB) highly recommended |
| Daram | Has no clear line of sight with the VHF Repeater site at Batbitim | • Antenna must be placed at the left side of the post. If possible, place it at the small hill located at the left side of the Post.<br>• Distance from the antenna to the Base Radio is a major issue. Do not exceed 50m.<br>• Distance shall be kept as short as possible.<br>• High gain antenna (≥6dB) highly recommended |

## 2. INSTALLATION OF PRIVATE VHF BASE RADIO AT BATBITIM

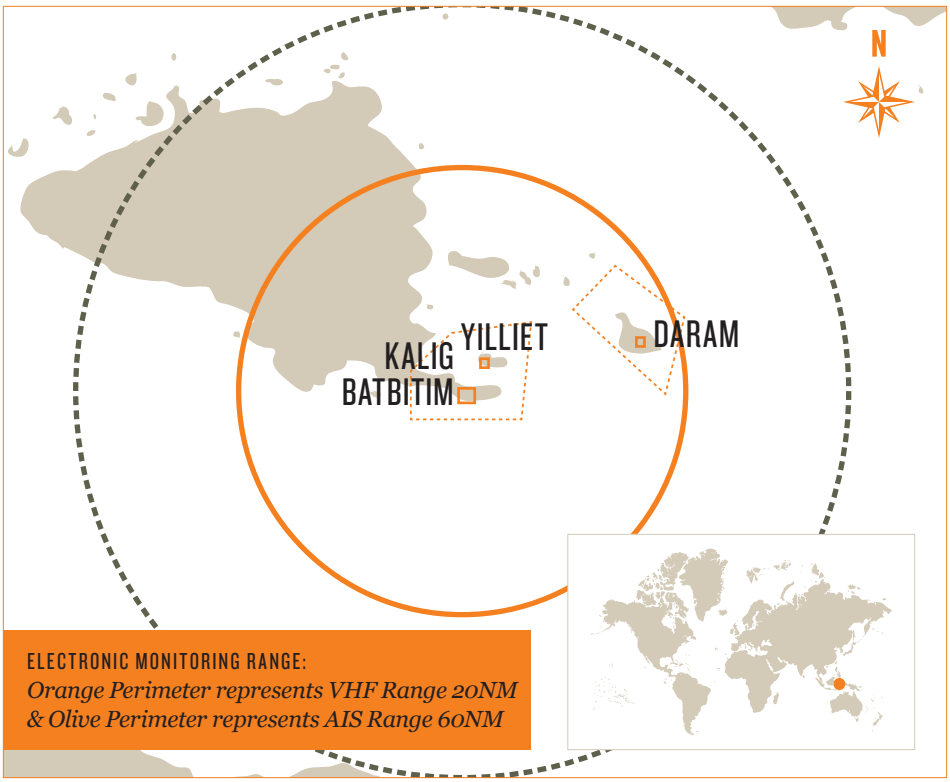
Upon completion of the local marine VHF network in Southeast Misool, Baseftin should also consider the installation of a private VHF base radio at Batbitim for coordination purposes with CI & TNC. This would allow for improved coordination with allied NGOs and Authorities and the development of a complete VHF network for the Raja Ampat Walton Initiative.

<< LEFT: *WildAid Oswaldo Rosero trains Baseftin Manager Hery Yusamandra on the use of a new GPS device.*

# DETECTION PHASE II:

## 3. COMMUNITY BASED PATROL RANGERS

1. Negotiate the **painting of all fishing boats with a single color per community**, as well as the installation of a pole and community flag on every boat. From an enforcement perspective, this will help in easily differentiating between local and foreign fishers. Baseftin could simultaneously discuss the possibility of creating a **Fisher and Fishing Boats register** as currently there are no limits to either one. While maybe not an issue for now, it could become a problem given migration and rebounding fishing stocks. Fishers would need to pay a symbolic fee for a local Adat fishing license, the painting of vessels and simply for "ownership of the TURF". The register would need to be updated annually in order to include new members/vessels as well as for the retirement of fishers/vessels. A fisher registry could further solidify the relationship between Baseftin and the community as well as involve the fishers in fishery monitoring and vigilance activities.
2. Once the VHF radio network is operational, Local Community Enforcement Agents (fishers) would receive a marine VHF handheld radio and could warn Baseftin rangers about any unusual activity or unidentified boats entering the MPA. Local community enforcement agents would require minimum training and equipment at first yet their inclusion may be cheaper than hiring "official" rangers over the long term. Radio property and responsibilities for their use must be clearly stated and resolved in advance. The VHF radio network will also allow better coordination between local communities and Baseftin in the event of a contingency (lost fishermen, wreckage, oil spill, etc.).
3. In cooperation with communities, begin discussions to establish limits for the number of fishermen and fishing boats. We recommend establishing a fishery capture registration program for a rapid estimation of captures per unit of effort and the state of the stocks.
4. While the aforementioned activities are dependent upon community consultation, we believe that this could serve as a framework for replication throughout the Southeast Misool MPA, Raja Ampat Regency and beyond. We also strongly suggest that the initiative be carried out on a pilot basis with one community to determine feasibility.




# DETECTION PHASE III:

## 4. INSTALLATION OF AIS STATION IN BATBITIM

Given the incursion of commercial fishing vessels in the MPA and poor navigation with patrol vessels during monsoon months, Baseftin should consider the installation of an AIS repeater. As most commercial and passenger vessels are mandated to use AIS, Baseftin would be able to see who is entering the Southeast Misool MPA within a 60 nautical mile perimeter. The information could be relayed to patrol partners, authorities and the local community. AIS transceivers could also be placed on each patrol vessel so the Baseftin patrol manager could locate the exact location of patrol vessels in real-time. This is convenient for management purposes and for coordinating interdictions.

## BUDGET SUMMARY

*(Refer to Annex I for Budget Detail)*

| A. COMMUNICATONS, SURVEILLANCE AND SAFETY EQUIPMENT NEEDS | | | | | |
|---|---|---|---|---|---|
| ITEM | EQUIPMENT | YEAR I | YEAR I | YEAR 3 | TOTAL |
| 1. | Safety of Life as sea equipment: Lifejackets, flares, searchlights, flashlights, etc. | US$ 3,075 | US$ 1,808 | US$ 6,075 | *US$ 10,958* |
| 2. | VHF Radio Communications: Base stations, handhelds, high gain antennas | US$ 9,065 | - | - | *US$ 9,065* |
| 3. | Surveillance equipment: Binoculars, night vision devices, GPS | US$ 911 | US$ 2,990 | - | *US$ 3,901* |
| 4. | AIS Station and control center | US$ 29,392 | - | US$ 35,640 | *US$ 65,032* |
| 5. | Main Base Control post office | US$ 6,000 | - | - | *US$ 6,000* |
| | | *US$ 48,444* | *US$ 4,798* | *US$ 41,715* | |
| **B. CRITICAL SPARE PARTS LIST** | | | | | |
| ITEM | EQUIPMENT | YEAR I | YEAR 2 | YEAR 3 | TOTAL |
| 1. | Critical Spare parts lot | US$ 7,638 | - | - | *US$ 7,638* |
| 2. | Spare outboard motor 85HP | - | US$ 10,500 | - | *US$ 10,500* |
| | | *US$ 7,638* | *US$ 10,500* | - | |
| **C. TOTAL INVESTMENT FLOW** | | | | | |
| ITEM | EQUIPMENT | YEAR I | YEAR 2 | YEAR 3 | TOTAL |
| 1. | Patrol and Surveillance Equipment Requirements | ***US$ 56,083*** | ***US$ 15,298*** | ***US$ 41,715*** | ***US$ 113,096*** |

# OTHER RECOMMENDATIONS

## 1. PRINT MPAS & MCAS ON NAUTICAL CHARTS

Baseftin should coordinate with other NGOs and the appropriate entity responsible for the printing of Indonesian Nautical Charts for the inclusion of MPA and MCA boundaries on nautical charts. This will be a concrete way to disseminate local information to the greater Indonesian fisher community.

## 2. RECOMMENDED PERFORMANCE INDICATORS

| INDICATOR | DESCRIPTION | ASSUMPTION |
|---|---|---|
| BOAT AVAILABILITY | Number of days each patrol vessel is available per month. | On an annual basis, a vessel should be in operating condition at least 75% of the time. |
| SEIZURES | Monthly report of boats captured classified by the type of infraction, fishing gear, origin of fishers & resulting sanction. | Seizures should decrease over time as local and foreign fishers become aware of constant enforcement presence. |
| SIGHTINGS | Monthly report of boats detected yet not interdicted. | Base camps and small patrol vessels serve as a deterrent. |
| TOTAL OPERATIONAL COSTS | Total monthly expenses on fuel and maintenance. | Fuel and maintenance costs should decrease as radio communication network and base camps come on line. Monthly expenses will then stabilize at a lower recurring level. |
| MILES PATROLLED PER MONTH | Total sum of miles patrolled on a monthly basis per the patrol boat GPS and the log book. | Average of 84 nautical miles per week. |

## 3. GPS AS A MANAGEMENT TOOL

We recommend the use of portable GPS devices on every patrol as the Baseftin Manager can later download the patrol course to Google Earth and Maps. The Google platform allows the Manager to view the patrol track, determine overall distance traveled and can help in identifying irregularities, as distance covered should correlate with amount of fuel used. Often times fuel can be sold at sea.

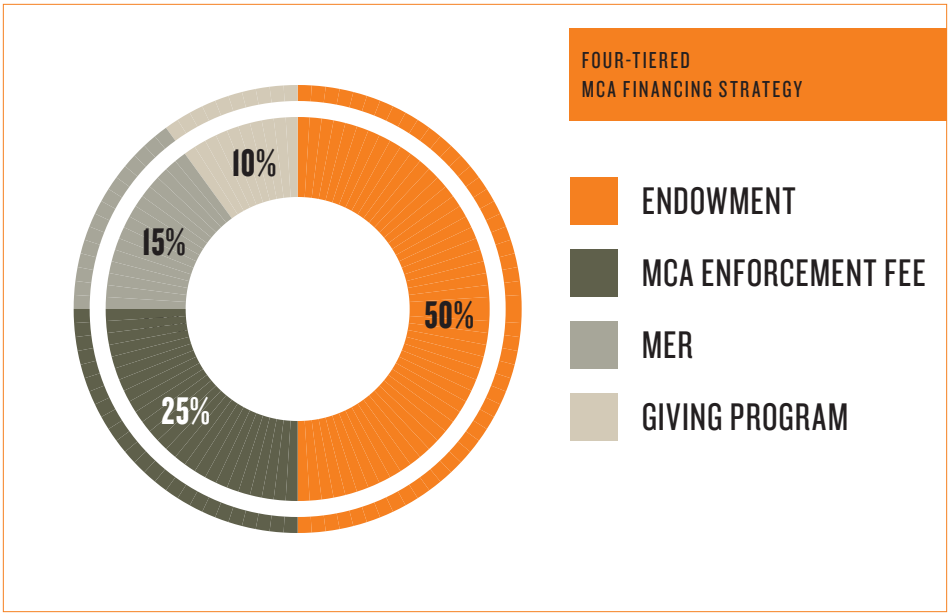
## 4. FINANCIAL SUSTAINABILITY

Currently patrol operations are sustained primarily by external foundation funding and a transition plan needs to be defined over the medium to long term. Annual Baseftin patrolling operations cost US$140,000. This figure does not take into consideration the following: the replacement of outboard motors every 5 years @$10K per motor, annual US$5K radio/equipment network maintenance, further lease payments nor any community social projects among other miscellaneous expenses. While we have recommended several cost-cutting measures in the assessment, overall we still estimate a minimum annual price tag of US$200,000 to sustain operations. With the exit of foundation funding, who among the stakeholders can sustain Baseftin operations and infrastructure needs? We briefly explored the following possible funding sources: Government, Foundation created endowment, MCA specific entry fee for tourism operators, the Misool Eco Resort and finally a guest donor program.

A quick investigation into the government option revealed little realistic hope. Currently, all tourists entering Raja Ampat must pay a small entry fee, which is collected at the Regency level. In 2010, a total of US$222,000 was collected for distribution throughout the entire Regency. The fund is currently divided in the following manner: 40% for conservation, 40% for community investment, and 20% for administration.

Fund administration is politically motivated and the overall amount is not a material source given the scope of conservation and social needs of the entire Regency. Even police and Navy collaboration is often underwritten by the large NGOs. In short, reliance on the government to fully fund operations would be overly optimistic and even co-management of an enforcement fund is risky given recent events at Komodo National Park. Government cooperation is vital yet fund management and operations administration does not necessarily have to be placed under their complete control.

WildAid recommends considering a four-tiered MCA financing strategy to sustain Baseftin operations.




ENDOWMENT:

An endowment would represent the core of the funding portfolio and would ensure uninterrupted patrolling of the MCAs and sustain minimum Baseftin operation costs while other revenue streams were developed. Using a very conservative spending rate formula, we estimate the need for US$3 million @ 3.5% to yield US$105,000 annually. This represents roughly 50% of the total estimated operational budget. Maintaining a diversified portfolio, which includes stocks, bonds, real estate, venture capital and other investments, would minimize volatility.

MCA ENFORCEMENT FEE:

Currently there are over 25 liveaboards who operate in Raja Ampat, yet very few contribute to conservation activities beyond paying the local tourism license and entry fees. They clearly benefit from enforcement activities; however, they do not pay for the service and truly represent an untapped opportunity. MER is currently developing a fundraising strategy for live-boards that could conceivably cover more than 30% of Baseftin operating expenses in the long term. Again, using a conservative formula, we estimate 25 live-aboards with average of 100 tourists per year @ US$20/passenger yields US$50,000 annually. This represents roughly 25% of the total estimated operational budget. There are two potential problems with the development of this alternative:

1. There are rumors of a tax to be levied on Raja Ampat tourism operators, which could prove disastrous for the industry as well as crush best attempts to help fund conservation initiatives.
2. MER/Baseftin must exercise caution in attempting to levy user fees for their NTZs as this may be legally complicated. The generation of local streams of revenue could also complicate the relationships with local communities as they may view the income as theirs and not understand that there is a time limit to current income sources. This is important as current illegal fishing fines levied by community elders goes to the community and does not support Baseftin operations.

MISOOL ECO RESORT:

It is important to note that the MER currently underwrites several expenses that include: mechanics, security officials, accountant, food logistics, utilities, and office space among others. This represents roughly 10% of the total operational budget. While just completing its third year of operations, MER has yet to turn a profit, but could still perhaps contribute a set percentage of profits to Baseftin operations beyond what is currently allocated. In short, MER could conceivably underwrite 15% of total operations over the long term.

GIVING PROGRAM:

A 'Friends of Misool' giving program could be established whereby guests of MER and liveaboards could join an ongoing donation program administered by Baseftin. These members would receive newsletters and be asked to contribute via annual fund drives. Specific high-net-worth individuals could be targeted for more substantial donations. Over time, the community of donors could grow into an important source of funds representing roughly 10% or more of the total estimated operational budget.

BOTTOM: *Crab*

# DETAILED BUDGET

## BASEFTIN PATROL & SURVEILLANCE EQUIPMENT REQUIREMENTS

### A. COMMUNICATONS, SURVEILLANCE AND SAFETY EQUIPMENT NEEDS

| ITEM | QTY. | UNITS | EQUIPMENT | US$ REFERENTIAL UNITARY PRICE | US$ LOCAL PRICE INDONESIA | TOTAL | REMARKS |
|---|---|---|---|---|---|---|---|
| *1.* | 3 | U. | Megaphone 25W with rechargeable batteries | US$45 | US$60.35 | US$181.04 | 1 for each remote base boat. 1 for the main base boat |
| *2.* | 5 | U. | First Aid Kit | US$17 | US$193.61 | US$968.06 | 1 for each remote base. 2 for main base |
| *3.* | 15 | U. | PFD, Life saving Jacket (floatation) Yellow or Orange | US$85 | US$114.75 | US$1,721.25 | To complete the current stock of life jackets |
| *4.* | 2 | U. | LED Search Lights. w/Rechargeable batteries | US$129 | US$174.70 | US$349.41 | - |
| *5.* | 4 | U. | Leatherman Multi Tool | US$70 | US$94.50 | US$378.00 | 1 for each remote base. 1 for main base |
| *6.* | 4 | U. | Solar powered flashlights with battery backup | US$40 | US$54.00 | US$216.00 | 1 for each remote base. 1 for main base |
| *7.* | 6 | U. | Inflatable Vinyl Boat Fender (10.5" x 30", White) | US$70 | US$94.96 | US$569.75 | For the new boat |
| *8.* | 5 | U. | Coastal Locator Flares Kit | US$60 | US$81.00 | US$405.00 | 1 for each remote base. 1 for main base |
| *9.* | 2 | U. | Portable waterproof GPS | US$350 | US$472.50 | US$945.00 | - |
| *10.* | 5 | U. | Class B AIS transceiver. Waterproof, floatable and with long duty cycle rechargeable batteries | US$900 | US$1,215.00 | US$6,075.00 | 1 for each remote base boat. 1 for the main base boat |
| *11.* | 6 | U. | Water proof & floatable Handheld Marine VHF Radio 4W or 6W (ICOM) with built in GPS-DSC capability | US$245 | US$330.75 | US$1,984.50 | To be used by crew of the remote stations boats |
| *12.* | 6 | U. | Spare batteries for handheld marine VHF ICOM radios | US$45 | US$60.10 | US$360.61 | - |
| *13.* | 6 | U. | ICOM high performance Antennas for Handheld Marine VHF radios | US$38 | US$51.30 | US$307.80 | Needed for increasing comms range |
| *14.* | 5 | U. | ICOM Marine VHF 25W Base Station with Power supply unit | US$500 | US$675.00 | US$3,375.50 | Each to be installed at remote bases and main base |
| *15.* | 5 | U. | ICOM marine VHF Base Station 6 dB Antenna with cable and ancillary parts | US$450 | US$607.50 | US$3,037.50 | Each to be installed at remote bases and main base |
| *16.* | 3 | U. | Marine waterproof Binoculars 7X50 or up to 12X50 | US$125 | US$168.75 | US$506.25 | 1 for each remote base. 2 for main base |
| *17.* | 2 | U. | Night Vision Devices with 5X Zoom | US$800 | US$1,080.00 | US$2,160.00 | 2 for remote bases. 1 for main base |
| *18.* | 3 | U. | 14.1 MPixel Digital Camera with Optical16x Zoom and built in GPS | US$270 | US$364.50 | US$1,093.50 | For the patrolling boat on duty |
| *19.* | 0 | U. | Portable Water proof HD video camera | US$280 | US$378.00 | - | For the patrolling boat on duty |
| *20.* | 3 | U. | 8 GB SDHC Flash Memory Cards for cameras | US$15 | US$20.25 | US$60.75 | For the patrolling boat on duty |
| *21.* | 3 | U. | Digital Camera storage bag | US$20 | US$27.00 | US$81.00 | - |
| *22.* | 1 | U. | IS Base Station Antenna 6 dB. Fiber Glass | US$800 | US$1,080.00 | US$1,080.00 | To be installed at MER |
| *23.* | 1 | U. | AIS Base Station Receiver ITU M.1371-1, 12V | US$4,500 | US$6,075.00 | US$6,075.00 | To be installed at MER |
| *24.* | 3 | U. | Solar panels 250 W, 30 VDC máx., 3.5 Amp min. | US$650 | US$877.50 | US$2,632.50 | To be installed at MER |
| *25.* | 3 | U. | Solar panels 135 W, 30 VDC máx., 3.5 Amp min. | US$450 | US$607.50 | US$1,822.50 | 1 per Remote Base Stations w/2 batteries |

# BASEFTIN PATROL & SURVEILLANCE EQUIPMENT REQUIREMENTS

## A. COMMUNICATONS, SURVEILLANCE AND SAFETY EQUIPMENT NEEDS (CONTINUED)

| ITEM | QTY. | UNITS | EQUIPMENT | US$ REFERENTIAL UNITARY PRICE | US$ LOCAL PRICE INDONESIA | TOTAL | REMARKS |
|---|---|---|---|---|---|---|---|
| *26.* | 1 | U. | Charge Controller 20-30A, 12/24 VDC | US$325 | US$438.75 | US$438.75 | 1 at Main base |
| *27.* | 3 | U. | Charge Controller 20-30A, 12/24 VDC | US$325 | US$438.75 | US$1,316.25 | 1 for each remote station |
| *28.* | 2 | U. | Electrolyte Gel Batteries 12V, 115 Ah | US$450 | US$607.50 | US$1,215.00 | At AIS station for powering Receiver |
| *29.* | 8 | U. | Electrolyte Gel Batteries 12V, 115 Ah | US$450 | US$607.50 | US$4,860.00 | 2 at each Remote Base. 2 for Main Base |
| *30.* | 1 | U. | Wooden Base for the Solar Panels | US$200 | US$270.00 | US$270.00 | - |
| *31.* | 3 | U. | Inverters (for remote bases) 220V 50Hz 3Amp | US$300 | US$405.00 | US$1,215.00 | - |
| *32.* | 1 | U. | Wood or Fiber Glass shelter for Batteries, charge controller, AIS eqiupment. 1.5m x 1.5m x 2m | - | US$3,000 | US$3,000 | To protect and store batteries and electronic equipment at main base solar generation station |
| *33.* | 1 | U. | PC Workstation | US$1,600 | US$2,160.00 | US$2,160.00 | Xeon Quad Core W3520, 4GB RAM, 2.66MHz, HDD 2x300 GB, 7.2k SATA RAID. NVIDIA Quadro 290 w/246MB graphics card |
| *34.* | 1 | U. | AIS data viewer software | US$5,000 | US$6,750.00 | US$6,750.00 | Provided by MaxSea - FURUNO |
| *35.* | 1 | U. | LED 21 inch monitor | US$250 | US$337.50 | US$337.50 | - |
| *36.* | 1 | U. | 4 port 10/100 BaseT Switch. Include 100 m. UPT cat 5e cable and connectors | US$1,000 | US$1,350.00 | US$1,350.00 | - |
| *37.* | 2 | U. | 4 port 10/100 BaseT router/switch. Includes 100 m cat 5e cabling and connectors | US$500 | US$675.00 | US$ $675.00 | - |
| *38.* | 3 | U. | Microwave 5.8GHz radios w/Reflector antennas | US$1,700 | US$2,295.00 | US$6,885.00 | - |
| *39.* | 1 | U. | 1.5m, 3inch diameter Poles for AIS Antenna ans Microwave radio antennas | US$600 | US$810.00 | US$ $810.00 | - |
| *40.* | 1 | U. | Lightning Rod. Franklin type | US$1,500 | US$2,025.00 | US$2,025.00 | - |
| *41.* | 1 | U. | Grounding Cooper Rod and grounding mesh | US$1,900 | US$2,565.00 | US$2,565.00 | - |
| *42.* | 1 | U. | Civil works for Antennas, Grounding, solar panels installation | US$2,500 | US$3,375.00 | US$3,375.00 | - |
| *43.* | 1 | U. | Engineering and integration. Surveillance System | US$5,000 | US$6,750.00 | US$6,750.00 | AIS base station and microwave links |
| *44.* | 1 | U. | Engineering and integration. Electrical System | US$5,000 | US$6,750.00 | US$6,750.00 | Includes solar generation, lightning protection and grounding installation |
| *45.* | 1 | U. | Main Base Office with 3 Bunk dormitory. | - | US$ 6,000.00 | US$ 6,000.00 | 3mx3mx2.5m wood infrastructure, 2 desks |
| | | | | | | | |
| | | | SUB - TOTAL | | | US$95,807.90 | |

# CRITICAL SPARE PARTS LIST

| ITEM | QTY. | UNITS | EQUIPMENT | US$ REFERENTIAL UNITARY PRICE | US$ LOCAL PRICE INDONESIA | TOTAL | REMARKS / YAMAHA PART NUMBER |
|---|---|---|---|---|---|---|---|
| *1.* | 2 | Set | Powerheat gasket kit | - | US$ 52.88 | US$ 105.76 | 688-W0001-02 |
| *2.* | 3 | Set | Carburetor repair kit | - | US$ 2.23 | US$ 6.68 | 688-14483-A0 |
| *3.* | 1 | U. | starting motor assy | - | US$ 500.95 | US$ 500.95 | 688-81800-12 |
| *4.* | 1 | U. | CDI unit assy | - | US$ 356.23 | US$ 356.23 | 688-85540-00 |
| *5.* | 3 | U. | Ignition coil assy | - | US$ 47.31 | US$ 141.93 | 697-85570-00 |
| *6.* | 1 | U. | Stator assy | - | US$ 389.62 | US$ 389.62 | 688-85510-01 |
| *7.* | 4 | U. | Fuel pump assy | - | US$ 36.18 | US$ 144.72 | 692-24410-00 |
| *8.* | 4 | U. | Filter assy | - | US$ 30.61 | US$ 122.45 | 61N-24560-00 |
| *9.* | 2 | U. | Housing, oil seal (crankshaft) | - | US$ 30.62 | US$ 61.23 | 6H1-15359-01-94 |
| *10.* | 2 | U. | Bearing, lower (crankshaft) | - | US$ 44.53 | US$ 89.06 | 93306-206u5 |
| *11.* | 2 | U. | Bearing, main journal | - | US$ 55.66 | US$ 111.32 | 93310-835u8 |
| *12.* | 4 | U. | connecting rod assy | - | US$ 139.15 | US$ 556.61 | 688-11650-03 |
| *13.* | 4 | U. | Pin, dowel | - | US$ 0.45 | US$ 1.78 | 93603-21111 |
| *14.* | 4 | U. | Pin, piston | - | US$ 11.13 | US$ 44.53 | 663-11633-00 |
| *15.* | 4 | U. | Piston (std) | - | US$ 44.53 | US$ 178.11 | 688-11631-03-94 |
| *16.* | 4 | U. | Piston, ring set (standard) | - | US$ 16.70 | US$ 66.79 | 688-11603-A0 |
| *17.* | 2 | U. | Bearing, crankshaft upper | - | US$ 50.10 | US$ 100.19 | 93310-636 u4 |
| *18.* | 6 | Set | Bearing, con rod | - | US$ 50.10 | US$ 300.57 | 93310-730 V8 |
| *19.* | 2 | - | pnion assy, starter | - | US$ 144.72 | US$ 289.44 | 633-81832-11 |
| *20.* | 1 | Set | relay assy, trim | - | US$ 189.25 | US$ 189.25 | 61A-81950-00 |
| *21.* | 1 | - | starter relay assy | - | US$ 55.66 | US$ 55.66 | 661-81941-10 |
| *22.* | 2 | Unit | Gasket, upper casing | - | US$ 5.57 | US$ 11.13 | 688-45113-A0 |
| *23.* | 1 | - | Main switch assy | - | US$ 94.62 | US$ 94.62 | 703-82510-43 |
| *24.* | 4 | - | Impeller | - | US$ 18.93 | US$ 75.70 | 688-44352-03 |
| *25.* | 2 | - | Gear, reverse | - | US$ 96.85 | US$ 193.70 | 688-45571-01 |
| *26.* | 2 | - | Gear, fwd | - | US$ 100.19 | US$ 200.38 | 688-45560-00 |
| *27.* | 2 | - | Pinion, gear | - | US$ 64.01 | US$ 128.02 | 688-45551-01 |
| *28.* | 2 | - | Bearing, rev.gear | - | US$ 16.70 | US$ 33.40 | 93306-207u0 |
| *29.* | 2 | - | Bearing, fwd gear | - | US$ 50.10 | US$ 100.19 | 93332-000w7 |
| *30.* | 2 | - | Nut (prophehaft housing) | - | US$ 16.70 | US$ 33.40 | 688-45384-00 |
| *31.* | 30 | L | Gear oil (SAE 90) | - | US$ 3.34 | US$ 100.19 | |

# CRITICAL SPARE PARTS LIST (CONTINUED)

| ITEM | QTY. | UNITS | EQUIPMENT | US$ REFERENTIAL UNITARY PRICE | US$ LOCAL PRICE INDONESIA | TOTAL | REMARKS / YAMAHA PART NUMBER |
|---|---|---|---|---|---|---|---|
| *32.* | 2 | - | Propeller | - | US$ 220.00 | US$ 440.00 | GE5-45949-00EL |
| *33.* | 4 | - | Tab, trim | - | US$ 16.70 | US$ 66.79 | GE5-45371-10 |
| *34.* | 4 | - | Fuel pipe comp | - | US$ 55.66 | US$ 222.64 | 6Y2-24306-53 |
| *35.* | 32 | ltr | Engine Oil (meditran S40/SAE 40) | - | US$ 2.78 | US$ 89.06 | - |
| *36.* | 10 | U. | Spark plug | - | US$ 1.67 | US$ 16.70 | - |
| *37.* | 4 | U. | Batteries 12V 105Ah for YAMAHA 85HP o/b motor | - | US$ 225.00 | US$ 900.00 | - |
| *38.* | 4 | U. | Command Cables (Moorse) | - | US$ 65.00 | US$ 260.00 | - |
| *39.* | 6 | U. | Fuel rubber pumps w/hose | - | US$ 15.00 | US$ 90.00 | - |
| *40.* | 2 | U. | Anchors | - | US$ 13.00 | US$ 26.00 | - |
| *41.* | 10 | Tubes | Grease | - | US$ 15.00 | US$ 150.00 | - |
| *42.* | 2 | U. | Tool Set | - | US$ 140.00 | US$ 280.00 | - |
| *43.* | 10 | Unit | propeller | - | US$ 1.67 | US$ 16.70 | - |
| *44.* | 2 | Unit | Shaft (propeller shaft) | - | US$ 33.40 | US$ 66.79 | - |
| *45.* | 2 | Unit | Ignition coil assy | - | US$ 16.70 | US$ 33.40 | - |
| *46.* | 2 | Unit | pulser coil | - | - | - | - |
| *47.* | 2 | Unit | carburetor set | - | US$ 16.70 | US$ 33.40 | - |
| *48.* | 2 | Unit | Piston | - | US$ 11.13 | US$ 22.26 | - |
| *49.* | 2 | Unit | Ring piston | - | US$ 11.13 | US$ 22.26 | - |
| *50.* | 2 | Unit | Bearing (crankshaft) | - | US$ 5.57 | US$ 11.13 | - |
| *51.* | 15 | mtr | starting rope | - | US$ 1.11 | US$ 16.70 | - |
| *52.* | 2 | Unit | oil seal (crankshaft) | - | US$ 1.12 | US$ 2.23 | - |
| *53.* | 2 | Unit | valve | - | US$ 5.57 | US$ 11.13 | - |
| *54.* | 2 | Unit | Pash rod | - | US$ 2.79 | US$ 5.57 | - |
| *55.* | 2 | Unit | Throttle lever compartment | - | US$ 8.35 | US$ 16.70 | - |
| *56.* | 2 | Unit | Gasket kit | - | US$ 5.57 | US$ 11.13 | - |
| *57.* | 2 | Unit | Cross Joint | - | US$ 22.27 | US$ 44.53 | - |
| *58.* | 1 | U. | 85 HP outboard motor | - | US$ 10,500.00 | US$ 10,500.00 | - |
| | | | | | | | |
| | | | SUB - TOTAL | | | US$18,138.73 | |

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