

Yap Invasive Species Taskforce Strategic Action Plan 2009-2012

'Aim Humbly, Achieve Greatly'



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Abbreviations

BTS	Brown Tree Snake
COM-FSM	College of Micronesia-FSM
COP	Council of Pilung
COT	Council of Tamol
DAF	Division of Agriculture & Forestry
DHS	Department of Health Services
DPS	Division of Public Safety
DR&D	Department of Resources & Development
EPA	Environmental Protection Agency
FSM	Federated States of Micronesia
GEF	Global Environmental Facility
GGF	Global Greengrants Fund
IS	Invasive Species
IAS	Invasive Alien Species
IPIF	Institute of Pacific Islands Forestry, USFS
ISSG	Invasive Species Specialist Group
IST	Invasive Species Taskforce
MCT	Micronesian Conservation Trust
NBSAP	National Biodiversity Strategic Action Plan
NGO	Non-Governmental Organization
MRMD	Marine Resources Management Division
PILN	Pacific Invasive Learning Network
RISC	Regional Invasive Species Council
SAP	Strategic Action Plan
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SWOT	Strength, Weaknesses, Opportunities and Threats
TA	Technical Assistance
TOR	Terms of Reference
TNC	The Nature Conservancy
USFS	United States Forest Service
USFS S&P	The U.S. Forest Service Region 5 State & Private Grants Program
YapCAP	Yap Community Action Program
YBSAP	Yap Biodiversity Strategic Action Plan
YINS	Yap Institute of Natural Science
YIST	Yap Invasive Species Taskforce

1.0 Executive Summary

The YIST identified four thematic areas of concern for invasive species management in Yap State to be implemented over a four year period (2009 – 2012), which include: capacity building, coordination, public awareness, and funding. This 4-year SAP focuses on eighteen priority invasive species: ten plant species, two reptile species, two rodent species, feral cats and dogs, and two aquatic species. The YIST SAP includes goals, objectives, activities, collaborations, time-frames, funding sources, and estimated costs of activities. A primary objective of the YIST SAP is to eradicate three of the nine invasive plant species by 2011. Another objective is to eradicate rats from at least one outer island and eradicate monitor lizards from Loosiep Island, Ulithi Atoll.

2.0 Introduction to Invasive Species

Invasive alien species have caused major biodiversity losses and ecosystem disturbance on islands worldwide. Islands, such as Yap, are very vulnerable to biological invasions. Invasive species have directly or indirectly caused or contributed to the decline and extinction of many birds, reptiles, mammals and plants. Exotic invasive ants disrupt traditional outdoor lifestyles and cause harm to people and their crops. Invasive weeds compete with other plants for space, nutrients; and some overgrow and kill useful plants. Snakes like the brown tree snake in Guam cause significant economic losses due to power outages and biodiversity losses such as the extinction of several native bird species. In addition, feral pigs cause serious damage to people's gardens resulting in crop loss.

Islands present unique opportunities to manage invasive species. Three main ways to manage invasive species are prevention, eradication, and/or control. Preventing invasions of terrestrial species should be more achievable on islands than at land-locked sites. Eradication should be considered if an invasive species is newly introduced and not widespread.

Many invasive species in neighboring countries are not present in the FSM, and within FSM many are not present in Yap. Therefore a high priority must be given to prevention of the introduction of such invasive species.

3.0 Background

In 2000, when the SPC Plant Protection for Micronesia made plans to print a poster for Yap with the top ten invasive weeds, the first unofficial Invasive Species Taskforce was formed. In 2002, Yap State Legislature appropriated more than \$100,000 to eradicate the cogon grass, locally known as Pan nu Machbab (*Imperata*

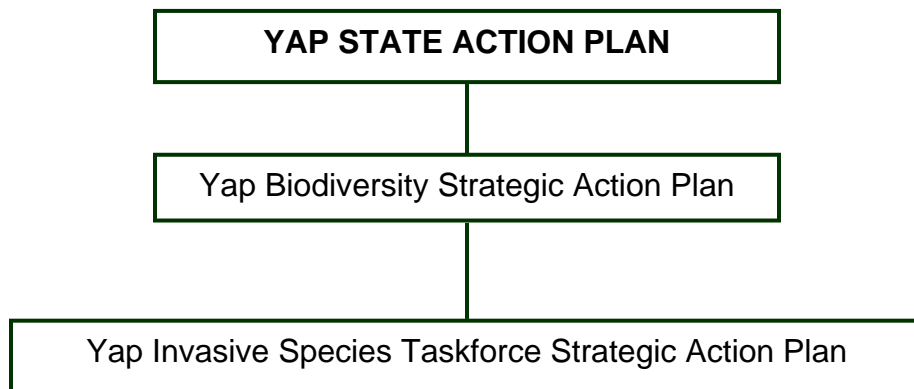
cylindrica). Since 2004, three other species have been added to the priority list for eradication. Currently, eradication efforts for all four species are ongoing and therefore are included in this plan.

The FSM National Biodiversity Strategic Action Plan was endorsed in 2002, and subsequently the Yap Biodiversity Strategic Action Plan (YBSAP) was endorsed in 2004. Invasive species are highlighted in the YBSAP Strategic Direction 4.4, in which bio-security is addressed concerning invasive species issues and other threats to biodiversity. The YBSAP also identifies the need to develop a 5-year invasive species plan. To address YBSAP recommendations, Yap created a position for an Invasive Species Coordinator and a Spray Technician. In 2005, Yap became a founding member of RISC and a member of PILN in 2006.

In February 2008, the YIST was officially organized and the first draft of the SAP was developed. Further, the plan was presented to RISC in August 2008 during the Micronesian Chief Executives Summit in Palau. The present YIST SAP was completed in December 2008, which prioritizes a four year action plan.

3.1 National Planning Framework

The YIST SAP forms a focal plan under the YBSAP, within the State planning framework as indicated below:



The YIST is the coordination mechanism for the State plans with regard to invasive species issues.

3.2 Participants

Representatives from the following agencies assisted with the YIST SAP:

COM-FSM	College of Micronesia-FSM
DAF	Division of Agriculture & Forestry
DHS	Department of Health Services
DR&D	Department of Resources & Development
EPA	Environmental Protection Agency
MRMD	Marine Resources Management Division
PILN	Pacific Invasive Learning Network
SPC	Secretariat of the Pacific Community
TNC	The Nature Conservancy
USFS	United States Forest Service, IPIF
YINS	Yap Institute of Natural Science

4.0 Vision

Yap will have a sustainable strategy to manage aquatic and terrestrial ecosystems, which will ensure the cultural, social, and economic well being of Yap.

5.0 Mission

By 2012, YIST will have developed appropriate institutional arrangements and networks to sustain efforts in protecting crops and natural resources of Yap in order to sustain a serene environment relatively free of invasive species.

6.0 Invasive Species and Issues

YIST identified the following target species in this SAP:

- Rats (*Rattus norvegicus*) – on Yap mainland
- Rats (*Rattus rattus and exulans*) – on uninhabited neighboring islands
- Cats
- Dogs
- Monitor lizard (*Varanus indicus*) – on neighboring islands
- Brown Tree Snake (BTS) (*Boiga irregularis*)
- Tilapia
- Crown of Thorns (COT) (*Acanthaster planci*)
- Fruit flies
- Weeds:
 1. Cogon Grass or Pan nu Machbab (*Imperata cylindrica*)
 2. Chain-of-Love or Sagararaw (*Antigonon leptopus*)
 3. African Tulip (*Spathodea campanulata*)

4. Mile-A-Minute Vine or Makenya (*Mikania micrantha*)
5. "Paper Rose" (*Operculina ventricosa*)
6. Bronze-Leafed Clerodendrum or Februwari (*Clerodendrum quadriloculare*)
7. Pennesetum or "Cat's Tail" Grass (*Pennisetum polystachion*)
8. Merremia or Wachathngal (*Merremia peltata*)
9. Wedelia or Susuwan' (*Wedelia trilobata*)
10. Giant Sensitive Plant or Rachloy' ni Biech (*Mimosa invisa*)

6.1 Other Roles of the YIST

YIST will absorb the roles of the avian flu taskforce and the rat control taskforce, recognizing that these issues are in line with or of equal threat to Yaps' biodiversity as invasive species.

6.2 SWOT Analysis

YIST representatives performed an assessment of the internal and external Strength, Weaknesses, Opportunities and Threats (SWOT) to the implementation of the YIST SAP (Table 1). By prioritizing these challenges into major areas, the group came up with four major thematic headings: capacity building, effective coordination, public awareness, and funding.

Table 1: SWOT Analysis Results

Internal Strengths and Weaknesses	
<i>Strengths</i>	<i>Weaknesses</i>
1. Agency collaboration	1. Lack of funding
2. Smallness of the islands	2. Lack of communication
3. Political support (RISC)	3. Unorganized task force
4. Terrestrial Invasive Coordinator	4. Limited expertise
5. Member of PILN	5. Inadequate number of personnel
6. Locally hired spray technicians	6. Limited Quarantine officers
7. Public Awareness Program	7. Access to supply because of isolation
8. Successfully control three invasive plant species	8. Insufficient laws and enforcement
	9. Reporting of data/findings

External Opportunities and Threats

<i>Opportunities</i>	<i>Threats</i>
1. Technical assistance	1. Lack of effective support
2. Funding sources	2. Not enough staff to absorb technical assistance from outside organizations to carry out work
3. Availability of SWAT teams	3. Need for good case studies information
4. Educational/ Training	4. All talk and no action
5. Networks	5. Upside down pyramid – not enough support for on the ground workers; time, resources and funds are consumed by outside organizations and consultants
6. PILN	6. Well-intentioned introduction of invasive species
7. RISC	7. Military build-up on Guam
8. Public Ed/Awareness	8. Location of Yap between Guam and Palau; vulnerable to invasive species

7.0 Strategic Goals and Objectives

Realistic and achievable goals and objectives for the YIST 4-year SAP are outlined in Table 2 by the YIST working groups based on the four thematic areas.

Table 2: Strategic Goals and Objectives

FUNDING AND RESOURCES							
Goals	Objectives	Project/activities	Output/ Outcomes	Indicators/ Measures	Lead/ Partners	Budget	Timeline
By the end of 2009 preparations have been made to secure funding for invasive species activities	1. By January 2009, YIST SAP endorsed is by Governor and YSL	Finalize the YIST SAP	Finalized and endorsed YIST SAP	YIST SAP endorsement	YIST USFS SPC PILN DAF R&D MRMD	N/A	2009
	2. Submit budget proposals by January 2009 for 2010 budget review	Complete budget proposal write-up and submission and meet with budget review committee	Copy of proposal with budget breakdown	Number of proposals approved		\$200,000	2009
	3. Two project proposal have been completed	Proposal write-up and submission	Proposals approved	Funding available		\$500,000	2010

PUBLIC AWARENESS AND EDUCATION							
Goals	Objectives	Project/activities	Output/ Outcomes	Indicators/ Measures	Lead/ Partners	Budget	Timeline
By the end of 2012, the general population will: Understand the problem of invasive species, Support the work of YIST	1. By the end of 2012, 50% of the population within Yap proper and 25% of the population of the neighboring islands will be aware of the effects and impacts of invasive species	Create and provide public educational/ awareness materials on the context of invasive species (i.e. Publications, Radio, CB Radio, clubs, theme competitions, community and school visits)	Public will be more aware of invasive species problems	Percentage of people and communities targeted	YIST/ SPC PILN (SPREP) USFS YINS YapCAP DOE R&D HPO COM-FSM Public Safety	\$40,000	2012

PUBLIC AWARENESS AND EDUCATION							
Goals	Objectives	Project/activities	Output/ Outcomes	Indicators/ Measures	Lead/ Partners	Budget	Timeline
Undertake activities to address the invasive species problem	2. At least 25% of resource owners will support and collaborate with YIST activities	Advise resource owners of upcoming YIST activities	Resource owners will be aware of and collaborate with YIST	Percentage of areas and resource owners visited	Public Health Yap EPA COT COP Queens University		2012
	3. All (100%) of traditional leaders will be provided with a list of target invasive species to share with their communities	Develop appropriate list and activities for traditional leaders to distribute	At least 10% of households will receive list of target invasive species and implement appropriate control measures	Number of materials distributed to ten municipalities and four neighboring island precincts			2012

CAPACITY BUILDING							
Goals	Objectives	Project/activities	Output/ Outcomes	Indicators/ Measures	Lead/ Partners	Budget	Timeline
By the end of 2012, identify and build capacity for effective prevention, control, and eradication of invasive species	1. Secure/hire needed staff	Secure funding for needed staff	Funding for staff secured	Number of funding sources secured	YIST/ SPC PILN Health Yap EPA COT COP Queens University	\$10,000	2010
		Hire needed staff	Needed staff hired	Number of staff hired		\$10,000	2010
	2. Train and develop capacity of existing and new staff	Develop individual training needs	Matrix of individual training needs completed	Number of matrixes developed for offices		\$4,000	2009

CAPACITY BUILDING							
Goals	Objectives	Project/activities	Output/ Outcomes	Indicators/ Measures	Lead/ Partners	Budget	Timeline
		Develop timetable & activities for training needed	Timetable and training activities developed	List of activities and corresponding timeline		\$4,000	2009
		Conduct identified trainings	Certification of participants in respective trainings	Number of participants certified		\$5,000 to conduct training in Yap	2010 onward

EFFECTIVE COORDINATION							
Goals	Objectives	Project/activities	Output/ Outcomes	Indicators/ Measures	Lead/ Partners	Budget	Timeline
By 2012, there will be increased effective coordination between implementing agencies.	1. All agencies are identified	Call YIST meeting to secure support of implementing agencies and develop MOA 's	List of agencies and MOA	Number of participating agencies and a signed MOA	YIST/ SPC PILN (SPREP) USFS YINS	\$250	December 2008 – June 2009
	2. List important invasive species	On-going data collection on species through surveys	List of top ten invasive species	List available to implementing agencies	YapCAP DOE R&D HPO COM-FSM	\$2,500	December 2008
	3. Identify roles of implementing agencies	Information collected on possible roles of implementing agencies	Information available	Information shared and discussed with implementing agencies	Public Safety Public Health Yap EPA COT COP	\$150	March 2009

Performance-based Invasive Species Work Plan

The following work plans were developed to meet Objective 2 of the “Effective Coordination” YIST SAP Strategic Goals and Objectives. The ten work plans, detailed in Table 3, are based on selected invasive species for control and/or eradication activities. The work plans are summarized as follows:

- 1) Terrestrial Invasive Species Eradication Program: Cogon Grass or Pan nu Machbab (*Imperata cylindrica*); Chain-of-Love or Sagararaw (*Antigonon leptopus*); African Tulip (*Spathodea campanulata*) - \$60,000
- 2) Terrestrial Invasive Species Eradication Program: Mile-A-Minute Vine or Makenya (*Mikania micrantha*) - \$40,000
- 3) Terrestrial Invasive Species Eradication Program: “Paper Rose” (*Operculina ventricosa*); Bronze-Leafed Clerodendrum or Februwari (*Clerodendrum quadriloculare*); “Cat’s Tail” Grass (*Pennisetum polystachion*); Merremia or Wachathngal (*Merremia peltata*); Wedelia or Susuwan’ (*Wedelia trilobata*); Giant Sensitive Plant or Rachloy’ ni Biech (*Mimosa invisa*) - \$15,000
- 4) Terrestrial Invasive Species Eradication Program: Monitor lizard (*Varanus indicus*) - \$135,000
- 5) Terrestrial Invasive Species Eradication Program: Rat (*Rattus spp.*) - \$250,000
- 6) Terrestrial Invasive Species Eradication Program: Rat (*Rattus norvegicus*) - \$200,000
- 7) Terrestrial Invasive Species Control Program: Brown Tree Snake (BTS) (*Boiga irregularis*) - \$25,000
- 8) Terrestrial Invasive Species Control Program: Feral Cats & Dogs – \$10,000
- 9) Aquatic Invasive Species Control Program: Tilapia - \$50,000
- 10) Aquatic Invasive Species Control Program: Crown of Thorns COTs (*Acanthaster planci*) - \$20,000

The funding required to implement these work plans is estimated to be **\$805,000**.

Table 3: Performance-based Invasive Species Work Plan

1. Terrestrial Invasive Species Eradication Program - ¹ Cogon Grass or Pan nu Machbab (*Imperata cylindrica*); ² Chain-of-Love or Sagaraw (*Antigonon leptopus*); ³ African Tulip (*Spathodea campanulata*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity	All three species are declared to be eradicated	1. Surveillance	1. Areas in Yap are surveyed and treated	1. Numbers of areas treated	DAF YIST RISC SPC USFS Public	By 2011	\$60,000
		2. One day/wk MOP-UP operation is conducted	2. Elimination of three species	2. Species eradicated			
		3. Public awareness	3. Public informed and better cooperation	3. Declaration of success story			

2. Terrestrial Invasive Species Eradication Program – ⁴ Mile-A-Minute Vine or Makenya (*Mikania micrantha*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity	75% of Mikania is controlled	1. Surveillance	1. Mapping of infested areas	1. Number of areas mapped	DAF YIST RISC SPC USFS Public	By 2012	\$40,000
		2. Treatment one day/wk is conducted	2. 75% controlled	2. Percentage of <i>Mikania</i> controlled			
		3. Public awareness	3. Public informed and better cooperation	3. Number of communities informed			

3. Terrestrial Invasive Species Eradication Program – ⁵ "Paper Rose" (*Operculina ventricosa*); ⁶ Bronze-Leafed Clerodendrum or Februwari (*Clerodendrum quadriloculare*); ⁷ "Cat's Tail" Grass (*Pennisetum polystachion*); ⁸ Merremia or Wachathngal (*Merremia peltata*); ⁹ Wedelia or Susuwan' (*Wedelia trilobata*); ¹⁰ Giant Sensitive Plant or Rachloy' ni Biech (*Mimosa invisa*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity	Minimize incidence	1. Conduct research on control methods	1 Efficient control method in place	1. Decrease in percentage	DAF YIST RISC SPC USFS Public	By 2012	\$15,000
	Notify and educate public	2. Public awareness and community involvement	2. Public supports and actively cooperates with control effort	2. Number of communities involved			

4. Terrestrial Invasive Species Eradication Program - Monitor lizard (*Varanus indicus*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve terrestrial and marine biodiversity	Eradicate monitor lizards from Loosiep Island, Ulithi Atoll	1. Determine best control methods	1 Choose and apply best methods	1. Evidence of absence of monitor lizards by 2012	DAF YIST RISC SPC USFS MRMD YINS Public	By 2012	\$135,000
	Survey and prioritize other islands for possible monitor eradication projects	2. Implement control methods and surveys	2. Reports on pre and post biodiversity surveys and population monitoring	2. Number of data and reports			
		3. Conduct pre and post bio surveys					
Notify and educate public	4. Monitor population	3. Community participation	3. Number of communities involved				

5. Terrestrial Invasive Species Eradication Program – Rat (*Rattus norvegicus*)

Goals	Objectives	Activities	Outputs/outcomes	Indicators/Measures	Lead/Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity, human health and welfare, and food security	Eradicate rats from at least one outer island	1. Determine best control methods	1 Choose and apply best methods	1. Evidence of absence of rats by 2012	DAF YIST RISC SPC USFS YINS Public	By 2012	\$250,000
	Survey and prioritize other islands for possible rat eradication projects	2. Implement control methods and surveys 3. Conduct pre and post bio surveys 4. Monitor population	2. Reports on pre and post bio surveys and population monitoring	2. Number of data and reports			
	Notify and educate public	5. Conduct public awareness	3. Community participation	3. Number of communities involved			

6. Terrestrial Invasive Species Eradication Program – Rat (*Rattus spp.*)

Goals	Objectives	Activities	Outputs/outcomes	Indicators/Measures	Lead/Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity, human health and welfare, and food security	By 2009 control program in place in Yap Proper	1. Determine best control system	1 Choose and apply best methods	1. Less incidence of rats in households	DAF YIST RISC SPC USFS YINS Public DHS Yap EPA	By 2012	\$200,000
	Reduce population of rats on Yap	2. Collect information on results	2. Information reported on rat species	2. Number and species of rats recorded in surveys			

6. Terrestrial Invasive Species Eradication Program – Rat (*Rattus spp.*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
	Notify and educate public	3. Inform public of best methods to use and engage their involvement	3. Community participation	3. Number of communities involved			

7. Terrestrial Invasive Species Control Program - Brown Tree Snake (BTS) (*Boiga irregularis*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity and the human environment	Form a brown tree snake (BTS) rapid response team to assist with the USGS BTS Project, Rapid Response Team in Guam	1. Create a Yap-based response team to assist BTS – Guam	1 Organized snake response group created	1. Number of agencies involved	DAF YIST RISC SPC USFS YINS Public DHS Yap EPA	By 2010	\$25,000
		2. Attend training in Guam	2. Trained on-island snake response team	2. Number of people trained			
		3. Assist in the field with BTS rapid response team	3. On-island assistance available	3. Number of times searches conducted			
		4. Increase public awareness	4. Public aware of how and where to report snake sightings	4. Number communities informed			

8. Terrestrial Invasive Species Control Program - Feral Cats and Dogs

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve terrestrial biodiversity, human health and welfare, and food security	A public education/awareness program in place to decrease number of feral cats and dogs	1. Support yearly one-week animal clinics and submit proposals for a permanent state veterinary clinic	1. Healthier animals, increased public health and decreased number of feral cats and dogs	1. Fewer feral cats and dogs	DAF YIST RISC SPC USFS YINS Public COM DHS DPS Yap EPA	By 2012	\$10,000
		2. Develop awareness materials and conduct community meetings	2. Decreased number of feral cats and dogs through improved awareness	2. Number of awareness programs			
		3. Conduct public awareness	3. Community participation	3. Number of communities involved			

9. Aquatic Invasive Species Control Program – Tilapia

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve marine biodiversity by controlling and managing tilapia	Assess distribution and population	1. Conduct surveys	1 Better knowledge of distribution & population of tilapia	1. Number of surveys conducted	DAF YIST RISC SPC USFS	By 2012	\$50,000

9. Aquatic Invasive Species Control Program – Tilapia

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
	Develop appropriate control mechanisms	2. Find and test different control methods	2. Control methods developed	2. Effectiveness of control methods developed	MRMD Public DHS Yap EPA		
	Public awareness program in place	3. Develop awareness materials and conduct community meetings	3. Decreased number of tilapia through improved awareness	3. Number of communities involved			

10. Aquatic Invasive Species Control Program - Crown of Thorns COTs (*Acanthaster planci*)

Goals	Objectives	Activities	Outputs/ outcomes	Indicators/ Measures	Lead/ Partners	Timeline	Resources: Funding
To protect and preserve marine biodiversity	Assess status of COTs	1. Conduct surveys	1 Better knowledge of distribution & population of COTs	1. Number of surveys conducted	DAF YIST RISC SPC USFS MRMD Public DHS Yap EPA	By 2012	\$20,000
	Develop appropriate control mechanisms	2. Find and test different control methods	2. Control methods developed	2. Effectiveness of control methods developed			
	Public awareness program in place	3. Develop awareness materials and conduct community meetings	3. Decreased number of tilapia through improved awareness	3. Number of communities involved			

9.0 Conclusion

The YIST SAP is an essential step towards addressing key threats to Yap's terrestrial and marine habitats, human safety and welfare, and food security. It is the vision of YIST that "By 2012, YIST will have developed appropriate institutional arrangements and networks to sustain efforts in protecting crops and natural resources of Yap in order to sustain a serene environment relatively free of invasive species." This plan directly acknowledges that invasive species are a critical issue to the future of our islands and people. Through collaboration between Yap state government, communities, local organizations, and partners, YIST aims to accomplish the goals and objectives outlined in this plan.

The YIST SAP is only as effective as the will to implement it and the funding to support it. It is anticipated that the Yap State leadership and communities will support this endeavor for the well-being of the people of Yap.

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