

YAP

**Weed Management Project Design and
Implementation**

**For: *Spathodea campanulata* (“African Tulip”)
REPORT**



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**Weed management project planning, implementation
and monitoring/evaluation
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INTRODUCTION

This report aims to assess the invasive plant African Tulip on Yap. It looks at the planning, implementation, monitoring and evaluation of the programmes success. Past inconsistencies, or a short history of control, in the collection and implementation of control of this species has meant that in some sections other invasive plants have been used to provide an example of what should be done to implement, plan, record, and evaluate the eradication of African Tulip.

Large knowledge gaps were evident in many of the sections within this report. The workshop in which this report was written has gone some way to address these knowledge gaps. There is now a framework to which the programme may be attached. Further training is essential to follow up on these improvements and ensure further skill sharing and updating.

1) PLANNING

OBJECTIVE

To eradicate African Tulip (*Spathodea campanulata*) in the State of Yap because it affects the livelihood of the local communities including cultural, economical, and environmental effects. This project is a species-led objective.

PLANT CHARACTERISTICS

African tulip is dispersed by wind, gravity, water and humans (it is a desirable ornamental plant). Dispersing range depends on the down stream, wind velocity and direction, human intentional introductions. Very little is known on when they mature, and it has no natural inhibitors to growth known. It is propagate vegetatively and via seed. The viability of seeds is unknown but it can possibly be controlled effectively with ringed-chopping stem and treat with 100% *garlon-4*, Table 1. This is feasible because there are only five infested sites in Yap.

Table 1. The African Tulip biology and characteristics.

Project Type	Species – Led (African Tulip)
Dispersal vectors	1) Wind 2) Water 3) Gravity 4) Human
Dispersal distance	Depend on human intentionally introduce
Maturity Rate	Unknown
Natural inhibitor to growth	Unknown
Seed viability	Unknown
Control method	Ringed stem and treated with Garlon-4
Can you control it faster than it spread	Yes
Time when dormant or faster/slower	Unknown
What time of year is maturity	Unknown

RECOMENDATIONS

- Trying to reduce the amount of Garlon-4 used

PROJECT SITE CHARACTERISTICS

All sites are easily assessable. However, all the sites are privately owned and landowners must be consulted and get their permission to control the plant on their land. The front of the invasion is limited to five sites and they are less than five acres. The stratified zones of invasion are within 20-30 feet from the centre of the infested sites. The long distance spread does not occur often and the distance is limited to intentional human introductions. The area within the project site is not favourable for the species to spread. Therefore, implementation of the project will be easier. Two infested sites are accessible by car.

TIMING

The species is spreading slowly and it has no dormant period. The duration from seeds to maturity is estimated to be about 2-3 years. When it matures is unknown and when it flowers is also unknown.

RECOMMENDATIONS

- To complete control before the plants flower.

2) IMPLEMENTATION

Implementation of the project starts with public awareness and contacting the landowner. Treatment starts with ringing the stem and sprayed (with garlon-4); cut branch or stump must be hanged up to prevent regrown vegetatively. Garlon-4 is the least toxic chemical available. The work will be implemented by Francis Liyeg and the invasive technicians. Since seed viability is unknown, the work will be done every month and 30 hours per month will be dedicate to eradication of this species. The tools and materials required are backpack sprayer, handheld sprayer, shovel, knife, herbicides, vehicle, safety items, flagging tape-“Danger”, measuring cup, POL, GPS/GIS, computer, and office supply.

RECOMENDATIONS

- Encourage utilising the lowest toxicity method and lowest dose.

MAPPING

In the past, the extent of the infestations was visualised using local marking and unique landscape features. Thirty feet is always added to the edge of an infestation to extend the perimeter out and the 30 feet added serve as a buffer zone and these define an infested site, Figure 1. Since 2001, Queens University has been coming to Yap and measuring the extent of the imperata sites using GPS/GIS. In the past database is only updated once a year when the Queens University visits in June. This has limited management capability as any new site discovered after June will not be entered in the database until June next year. This has changed when David donated a Garmin GPS to the Yap team.

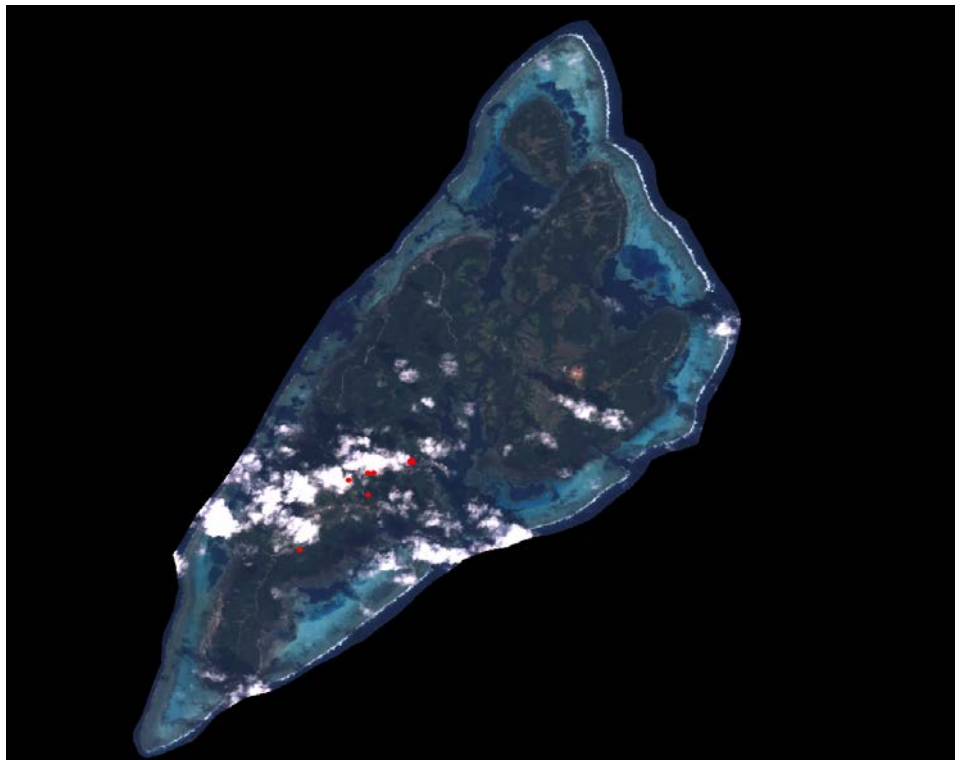


Figure 1. The location of infested sites in yap.

RECOMMENDATIONS

- All infested sites should be GPS and entered into a GIS database as soon as possible.
- Should continue to work with Queens University while they are capable of continuing on with their current programme.
- Acquire outside help to assist the invasive task force to become independent in recording locations with GPS and storing this information within a GIS.
- To acquire a good handheld GPS unit and adequate GIS software together with training in how to make these technologies work best for our team.

HUMAN RESOURCES

In Table 2 is the control implementation schedule identifies when and where human resources are required during the year. The schedule indicates that human resources are stretched at some times during the year. This will be important if further sites are added to the program. The time estimates can be reviewed and updated as data records of time required per site is gained. Three personnel (one supervisor and two technicians) are currently available with 3,800 annual hours available to eradicate all invasive plants. On average 38 hours each month should be dedicated to African Tulip and average 633 total hours per site per year. Skills needed for each personnel are identified in Table 3; however, a common skill that it is needed is the GPS/GIS and how to use it to manage a program/project.

Table 2. Yap Invasive task force work schedule

SEASON FINANCIAL YEAR CALENDAR YEAR SITE	TYPHOON 1ST OCT	TYPHOON NOV	WET DEC	WET JAN	WET FEB	WET MARCH	APR	DRY MAY	DRY JUNE	DRY JULY	DRY AUG	TYPHOON 30-Sep SEPT
AFT01	2	2	2	2	2	2	2	2	2	2	2	2
AFT02	8	8	8	8	8	8	8	8	8	8	8	8
AFT03	12	12	12	12	12	12	12	12	12	12	12	12
AFT04	12	12	12	12	12	12	12	12	12	12	12	12
AFT05	1	1	1	1	1	1	1	1	1	1	1	1
COL01	24	24	24	24	24	24	24	24	24	24	24	24
COL02	8	8	8	8	8	8	8	8	8	8	8	8
COL03	8	8	8	8	8	8	8	8	8	8	8	8
COL04	8	8	8	8	8	8	8	8	8	8	8	8
IMP01	84	84	84	84	84	84	84	84	84	84	84	84
IMP02	10	10	10	5	5	5	5	10	10	10	10	10
IMP03	10	10	10	5	5	5	5	10	10	10	10	10
IMP04	10	10	10	5	5	5	5	10	10	10	10	10
IMP05	10	10	10	5	5	5	5	10	10	10	10	10
IMP06	10	10	10	5	5	5	5	10	10	10	10	10
HOURS PER MONTH	217	217	217	192	192	192	217	217	217	217	217	217
AVAILABLE HOURS	320	320	320	320	320	320	320	320	320	320	320	320
RESIDUAL HOURS+FL	103	103	103	128	128	128	103	103	103	103	103	103

Table 3. DAF Invasive Skills Register

Organisation Work Skills Register					
Staff		Francis L.	Henry L.	John P.	Francis R.
Experience (Years)		4	6	1	8
Highest Education		AS degree	HS	2 yrs. (MOC)	AS degree
STAFF POSITIONS	SKILLS				
Project Manager	Planning				
	Managing Resources				
	Managing Finance				
	Report				
	Analyse				
	GIS				
Leader	People management				
	Office Skill				
	Advance Skills				
Team Support	Navigation Skills				
	GPS skill				
	Site Records				
	Daily records				
Field Technician	Planting methods				
	4-wheel driving				
	Herb. Certification				
	Drivers license				
	First Aid Certification				
	Chainsaw safety & Maintenance				
	Foliar spray appl.				
	Cut stump appl.				
	Ring chopping & treatment				
	Herbicides Pro.				
	Site survey and searching				
	Weed ID				
	Hand tool skills				
	Health & safety				
	Employee induction				

RECORDING

The data will be entered by Francis Liyeg and stored in our site record database and used to measure progress. It will be backed up on an external hard drive daily. Francis Ruegorong will do the analysis. We will use paper, pen, computer, GPS/GIS to record the following, Table 4.

Table 4. The Yap Database headings.

Date	SITE ID	Search Radius (ft)	Area Treated (ft².)	Treated Plants				New Site (NS) or Followed Up (FU)	Chemical Used	Chemical Mix Ratio: (400 ml Hand bottle Spray)	Water (L/ hand bottle sprayer)	Chemical used (ml)	Lift over of chemical used (mL.)	Total man hours spent at each site	# of People went out	# of People sprayed	NOTES / COMMENTS
				Age Class (# of mature)	Age Class (# of juvenile)	Age Class (# of seedling)	Total # of Treated plant										

3) MONITORING AND EVALUATION

We are going to monitor:

- Monitoring progress via acres treated
- Spray volume per site shows reduction in infested areas
- Number of a particular site visit and person hour shows change in stages (initial control foliar, propagules bank {seeds, rhizomes}, restoration)

We will evaluate:

- Evaluating effectiveness
- Treatment methods
- Chemical concentration (% of herbicides)
- Site visit (how frequent and how long)

SUCCESS MEASURES- Key Performance Indicators (KPI'S)

The measures will be represented in graphs from data exported from the database and manipulated in Microsoft Excel. The measures we are going to use to measure our successes are:

- Total spray volume over time per site (or group of sites)
- Total hours over time per site (or group of sites)
- Age class over time per site (or group of sites)
- The success measures age classes on Site AFT02b.

In Figure 2 showed that in 2007 the Yap Invasive Taskforce was successful in eradicating the mature plant and by 2009 there was only 2 seedlings reported on the site showed that the Taskforce is successful in reducing the seedbank. The other KPI indicator measures age classes, Figure 3 revealed that the total man hours and amount of chemical used dropped as the age class in the site was reduced to only seedlings. In conclusion the resources allocated to this site are sufficient to eradicate African Tulip in Site AFT02b.

RECOMENDATIONS

- That the suggested measures are used.

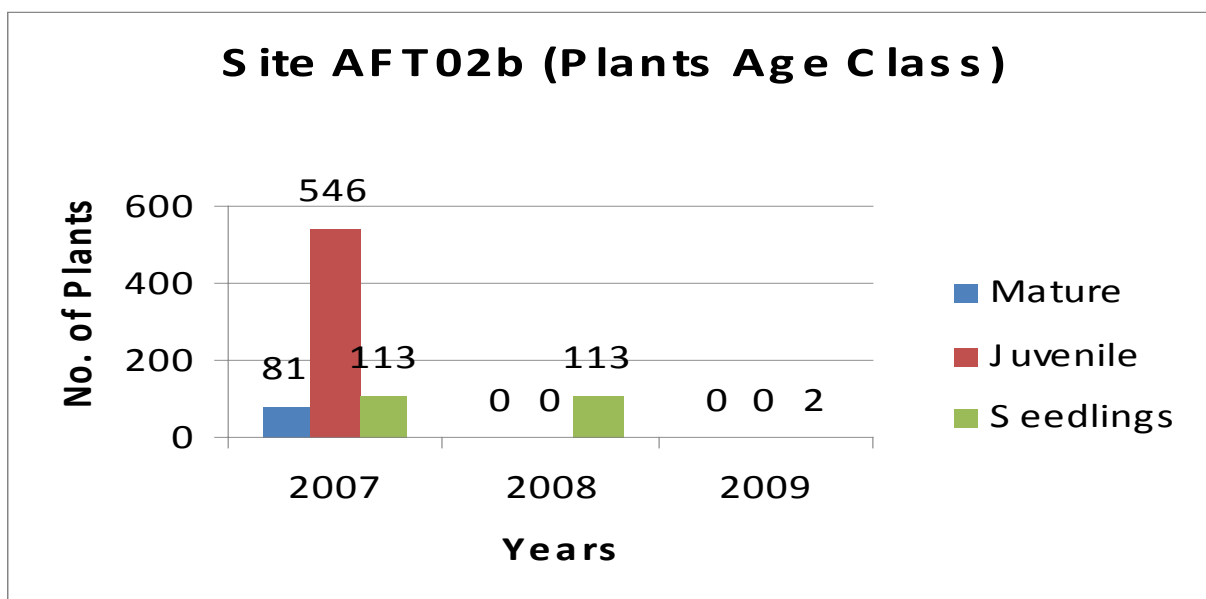


Figure 2. The African Tulip age classes

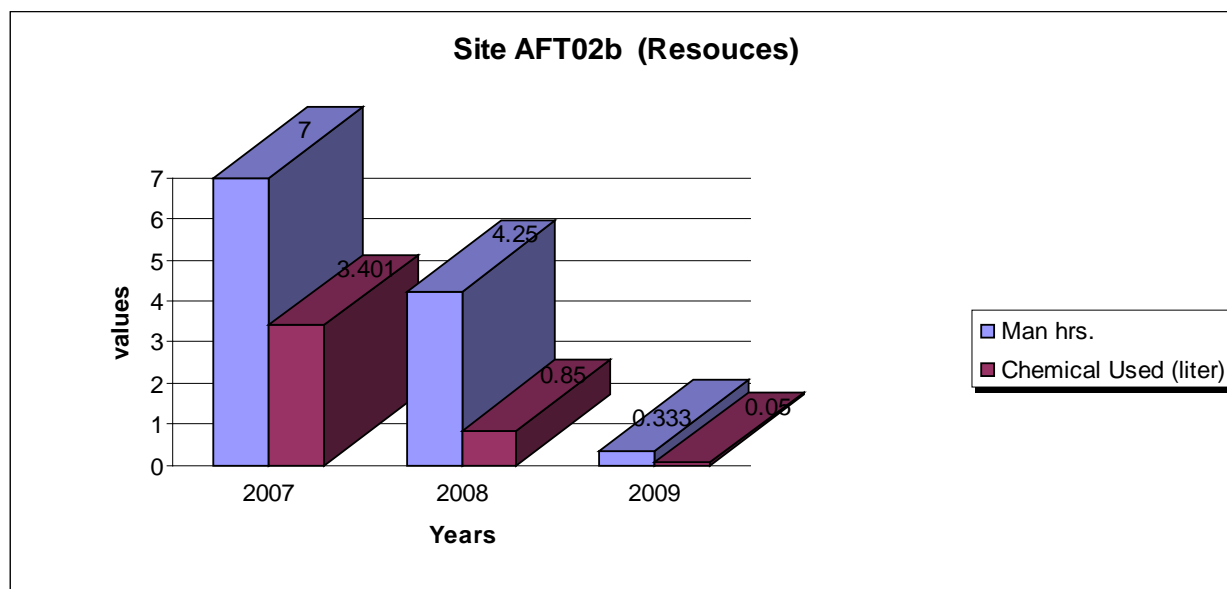


Figure 3.. The amount of chemical and total man hours used over time.

EVALUATION

Yes we were successful at lowering the coverage of African Tulip. A regular fixed schedule and better data recording should provide more consistent success measures in the future