PILOT TRAINING WORKSHOP: WEED MANAGEMENT PROJECT DESIGN AND IMPLEMENTATION

REPUBLIC OF PALAU
22 – 30 APRIL, 2008

TECHNICAL REPORT

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1.0 INTRODUCTION

The Pacific Invasives Initiative (PII) recognised the need for effective data management as part of successful project management and initiated planning for such a workshop in 2006. Demand for training in data management was identified during a skill-sharing survey undertaken by PII later in 2006. Subsequent discussions with David Moverley (Technical Officer and Contract Manager for Te Ngahere, a New Zealand ecological restoration company), Joel Miles (Palau OERC) and Sean Austin (TNC Micronesia) led to the recognition that a more comprehensive weed management project design and implementation workshop was needed. A pilot workshop was facilitated and evaluated by Bill Nagle (PII) and technical content was designed and delivered by David Moverley.

This report discusses the aims, methods, outcomes and recommendations of the pilot training workshop on weed management project design and implementation held in the Republic of Palau from the 22nd to the 30th of April 2008.

2.0 OVERVIEW

The pilot workshop was organised to provide:

1) Weed control personnel with the confidence and skills for effective data collection and management for project planning, implementing, monitoring, evaluating and accountability purposes.

2) An efficient and effective data collection and management system that is easy to use and maintain and is adaptable to similar projects across the Pacific.

Participant evaluation of the workshop suggested that both outcomes had been met (see PII evaluation for details www.issg/org/cii/PII). This report provides an analysis of each component of the workshop and recommendations for proposed actions to reinforce the training provided.

Weed management project design and implementation is a complex intricately layered process. This workshop condensed twenty years of weed management experience into seven days of intense activity for the participants. Many components of a comprehensive successful project design and implementation programme were covered. This basic structure was well received by the participants and should lead to more effective and efficient weed management programmes. Another benefit of this workshop was the recognition that further gains can be made by building on this basic structure with customised training specific to the needs identified within each organisation. These are detailed within the recommendations and proposed actions section.

The workshop takes the participants sequentially through the principle components of planning, implementation, and monitoring and evaluation, focusing on one selected plant pest (Appendix one). Each section builds on the previous section and utilises of the results of that section to progress. In this way implementation is a result of planning, and monitoring and evaluation is a result of implementation. All these sections are intimately linked to provide a well designed project built on good decision making and resulting in measurable results.

3.0 ACKNOWLEDGMENTS

Thanks to the locals who made us extremely welcome and looked after us during our stay and to the following organisations who contributed to the success of the workshop.

Bureau of Agriculture, Republic of Palau (BoA)

Division of Agriculture and Forestry, Yap, Federated States of Micronesia (YapDAF)

Office of Environmental Response and Coordination, Republic of Palau (OERC)

Pacific Invasives Initiative (PII)

Pacific Invasives Learning Network (PILN)

Palau Automated Land and Resource Information System (PALARIS)

The Nature Conservancy (TNC)

4.0 PARTICIPANT PROJECTS

4.1 Aim

For all attendess to acknowledge and understand participants projects as they currently stand. To broaden participants' experience and knowledge of project weed management.

4.2 Method

Participants presented a powerpoint presentation of their projects. David Moverley presented examples of weed control projects from New Zealand to demonstrate the different approaches that can be used, how and why their used, how they are recorded and how success is measured. These examples provide an overview of the workshop.

4.3 Outcome

Attendees are aware of each others' projects and have a broader knowledge base of weed management. Attendees have been introduced to the workshop content and concepts.

4.4 Recommendation

This is a valuable, important and enlightning session. It should remain as the first session to further workshops.

Participants at the workshop:

Bill Nagle (Facilitator), David Moverley (Instructor), Francis Liyeg, Francis Ruegorong (YapDAF) Rosemary Kiep (DEH), Dino Mesubed (BoA), Oshiro Lorin (DEH), Pua Michaels (BoA)

5.0 PLANNING

"the art of projecting and directing the larger military movements and operations of a campaign"

This section of the workshop looks at the factors that have a major impact on planning a successful weed control programme, from determining objectives, plant characteristics, project site characteristics, and significant time events. These negative or positive factors will influence the programme from start to finish.

One species was selected by each organisation to complete this section of the training. It is important to determine how each module may influence other pest plants that are determined to be priorities for each organisation.

5.1 PROJECT OBJECTIVES

5.1.1 Aim

For the participants to determine what their objective was and for what reasons achieving their objective was important for their country or state. For the participants to determine whether the programme to achieve the objective was site-led or weed-led.

5.1.2 Method

Instructor-led powerpoint presentation providing New Zealand examples of different projects with different objectives ranging from eradication of single pest species (weed-led) projects to the ecological restoration of sites with many pest species (site-led). The objectives and their reasoning were emphasised. Workbooks were completed by each agency for this section and discussed amongst workshop participants.

5.1.3 Outcome

Participants determined and justified their objective to themselves and others, and whether it was suited to either a site-led or weed-led programme. A record of this was captured within their workbook. All participants evaluated their objective as eradication through a weed-led programme, and was necessary due to neagative environmental, economical and cultural effects.

5.1.4 Recommendation

That participants continue to determine their objectives and the type of programme required for each of their pest species or identified sites, and their justification of why the objective is important for their country or state.

5.2 PLANT CHARACTERISTICS

5.2.1 Aim

For the participants to determine what the characteristics of the plant were that are important for the species spread and control. These included the dispersal vectors, dispersal distance, maturity rate, natural inhibitors to growth, maturity and spread, seed viability and whether the plant can be effectively controlled.

5.2.2 Method

Instructor-led powerpoint presentation providing examples of different species, their lifestyle, disresal vectors, characteristics of spread, seed viability and different control methodologies. Workbooks were completed by each agency for this section and discussed amongst workshop participants.

5.2.3 Outcome

Participants identified the important lifestyle events and those that were unknown, their dispersal vectors, characteristics of their spread and a control method for their species.

appeared to show no sign of wind dispersal at the airport site during a site visit. Being an exposed elevated site suggests that the seed at this site is not reaching maturity. The existence of this plant for twenty years at this site with no infestation in the surrounding area suggests that dispersal is primarily vegetative, this is evidenced by its historical short dispersal distance and downhill spread. Long distance human dispersal through dirty machinery relocation is probably the greatest opportunity this plant has to greatley increase its coverage along roadsides and throughout the country. The imperata is currently being treated with a glyphosate mix at a rate of 18.75 percent with a drizzle nozzle every month. This is an excessively high rate of glyphosate to be using. In Yap they are using a much lower rate of herbicide to treat with a standard fan nozzle following flattening the plant with machinery.

The Yap participants identified a dormant growth period of two months for chain-of-love, and identified streams, birds and humans as dispersal vectors. The two sites are currently controlled by cutting the stems and digging up the tubers.

5.2.4 Recommendation

That participants continue to determine what the characteristics are of other pest plants in their country that are important for each species spread and control. Including the dispersal vectors, dispersal distance, maturity rate, natural inhibitors to growth, maturity and spread, seed viability and whether each plant can be effectively controlled.

5.3 PROJECT SITE CHARACTERISTICS

5.3.1 Aim

For the participants to determine what the characteristics of the project site were and how the site influenced implementation of control, where the “front”, “stratified” and “long distance” dispersal zones were and which areas within the site were more favourable to plant spread.

5.3.2 Method

Instructor-led powerpoint presentation providing examples of how the project site characteristics influence how a project should be implemented to utilise the positive and negative influences the project site has on the dispersal and control of the pest species, how to distinguish between the different zones within an infestation and what areas of the project site are categorised as which zones.
Workbooks were completed by each agency for this section and discussed amongst workshop participants.

5.3.3 Outcome

The relatively flat site, FAA regulations (e.g. No planting of tall trees for weed supression) and flight scheduling were identified as the predominent project site characteristics that influenced control implementation of in Palau. Invasion zones were identified as “front” (end of runway), “stratified” (adjacent farmland) and “long distance” (where ever the mowing machinery was taken to).

The Yap participants identified chain-of love's preference for alkaline soils, the current sites acidic soils, and suggested a link as to why ths plant was not producing seed. The site is easy to access by road. The identified invasion zones were “front” (two sites less than an acre), “stratified” (twenty to thirty feet from the infestation). They did not identify any “long-distance “ dispersal but did recognise that humans could spread the plant around as an ornamental garden plant.

5.3.4 Recommendation

That participants continue to determine what the characteristics of the project site are for other pest plants, how they influence implementation of control, where the “front”, “stratified” and “long distance” dispersal zones are and which areas within the sites were more favourable to plant spread.

5.4 TIMING

5.4.1 Aim

For the participants to determine what significant time variables were important within the life cycle of the plant while implementing the control stategy and whether control can be implemented faster than the plant can spread.

5.4.2 Method

Instructor-led powerpoint presentation providing examples of significant time variables that were important within the life cycle of plants that influenced its spread and examples of how these life style characeristics can be used within a weed management project to improve the success of the project.
Workbooks were completed by each agency for this section and discussed amongst workshop participants.

5.4.3 Outcome

The Palauans identified that appeared to flower 3-4 months after being sprayed, it grows year round and can spread vegetatively at any time.
The Yapees' identified a dormant period in the chain-of-love lifestyle, a flowering period of March to May and estimated an age to maturity of two months.

5.4.4 Recommendation

That participants continue to determine what significant time variables are important within the life cycle of other pest plants while implementing their control stategy and whether control can be implemented faster than the plant can spread.

6.0 IMPLEMENTATION

"the art of handling forces in battle or in the immediate presence of the enemy"

This section of the workhop accomodates the findings of the planning section while determining how, when and who will implement the programme, and how it will be mapped and recorded. One species was selected by each organisation to complete this section of the training. It is important to determine how each module may influence other pest plants that are determined to be priorities for each organisation.

6.1 METHODS AND MEANS

6.1.1 Aim

For the participants to determine what methods of control they would use on the pest plant to be most effective and efficient, while utilising a lowest toxicity policy. For participants to determine who would implement the control operations, at what interval and time of year, and what tools and materials would be required.

6.1.2 Method

Instructor-led powerpoint presentation providing examples different plants and situations when cut stump and foliar applications were best suited or a combination of both. A simple chart to determine who was available to do the implementation was introduced as was a programme schedule to determine what parts of the calendar year were most suited to control. A primary framework for pest plant control was introduced.
All participants inspected the Palau teams equipment and discussed the advantages and disadvantages of the tools that they currently use.
Workbooks were completed by each agency for this section and discussed amongst workshop participants.

6.1.3 Outcome

Both countries identified what method of control they used, who would do the work, and what time of the year it would be done.
On inspection of the Palauans equipment, general consenses suggetsted that the "Mark It Red" marker dye be replaced with a water based blue dye (much lower toxicity, easier to clean off equipment), a suitable surfactant be used (none currently used), hand sprayers be used for cut stumping (more accurate, more efficient use of resources (herbicide)) and further health and safety equipment was required such as hand soap and chainsaw safety equipment.

6.1.4 Recommendation

That time be spent with both organisations in "their field" introducing new herbicides and improving their decision making towards what methods and herbicides to use in different situations and for different types of plants. Palau's larger landmass, issues and scope of priority plants suggests they would benefit to a greater degree than Yap.

6.2 MAPPING

6.2.1 Aim

For the participants to determine what defines a “site” or how they visualise a “site”, how it is best represented spatially as a polygon or a point, how they will reference or fix the site spatially both on the ground and on a map and how they will measure its size.

6.2.2 Method

Instructor-led powerpoint presentation introducing the concept of “spatial data” and providing examples of how pest plants should be mapped by using either polygons or points and given a unique identification. Examples of how this information can be used advantageously were provided including the use of GIS and GPS tracklogs, and the use of historical information. A short excersise on determining the size of an infestation was completed to ensure the difference of square metres/feet and meters/feet squared was understood.
Workbooks were completed by each agency for this section and discussed amongst workshop participants.

6.2.3 Outcome

Although participants showed an understanding of the principles, both organisations were at a very basic level of accomplishment at the beginning of this module. The instructor spent time individually with each organisation progressing their development.

The Palauans had two GIS layers of sites which had been surveyed by PALARIS and themselves. The layers consisted of unidentified point locations in one layer and point determined perimeters of polygons in the other layer. From this the instructor assembled one layer eliminating points within or on the boundary of the polgons and then adding the polygons to the point layer to provide one comprehensive site layer. Each site was then given a unique identification attribute so each site was unique and could be linked to the site record, site information and species information. This was aided by Phoebe from PALARIS who also helped Pua from the PBoA organise the database. The layer table was exported to Microsoft Excel for importation into Microsoft Access as the unique site idenification “key” attribute.
After completing this excersise it was known that there are 198 known sites. Of these sites some can probably be eliminated or added to larger sites as the field staff implement their control and determine whether a separate site is actually required.

The Yapese had quite a different scenario. They have historically used local landmarks as site locations, except for their infestation which have had their perimeters measured by Queens University annually since 2000 in June. They noted that a disadvantage of this is that new sites and progress on this site is only updated annually.

None of the participants were soley accomplished in the use of GPS or GIS. The PBoA had the added benefit of PALARIS who will need to understand the unique GIS techniques that weed management requires. The YapDoAF have the added benefit of Queens University, but again the specific GIS skills for weed management are not used.

Figure 1: Part of the Palau Mikania map showing site locations and unique identification.

6.2.4 Recommendation

Both organisations should map all sites for priority weeds and give each one a unique identification in the form of "MIK001" To do this they should be enabled daily with GPS to record locations of new sites and map GPS to locate all sites. The process between PALARIS and the PBoA needs to be identified properly and confirmed to work adequately to provide a seemless flow. The Yap DoAF should be enabled with GIS capability at a local level and trained in its use specifically for weed management.

6.3 HUMAN RESOURCES

6.3.1 Aim

For the participants to determine what human resources thay have for use on an annual basis, how much was required to implement the required control at each site or groups of sites, and what the key skills each employee required to complete their tasks effectively and safely from basic control operations through to managing the project.

6.3.2 Method

Instructor-led powerpoint presentation providing examples of how to complete a simple spreadsheet to analyse the amount of human resource they had available to them and what they required to complete their planned works, how to analyse the results to determine a surplus of resources, or whether they needed to build capacity. Another spreadsheet was introduced to analyse the different skills that personnel needed to complete the project, how well their organisation was equiped with the required skills, or wether they needed to build further capacity. Workbooks were completed by each agency and spreadsheets completed on the computers. The results were discussed amongst workshop participants.

6.3.3 Outcome

The participants created spreadsheets for scheduling current operations and the skills required. The financial year and seasons were defined and time resource estimates were entered for each site or group of sites. The time resource estimates were compared to actual resources available. Both organisations appeared to have enough resource to implement the control of the sites that are in the current programme but capacity would need to be built if further plant pest species were added, or efficiencies in the current programme would need to be increased. It is also noted that these resources have been estimated and that they should be updated as true quantities are recorded upon implementation.
The skills required for the project were similar in both organisations spreadsheets. Notably the GIS and GPS skills were not evident amongst the staff of both organisations. Also of note was the absence of First Aid amongst the Palauans. Both organisations appeared to have enough skills and depth to build capacity, and indeed the Yapese have a new employee who has started recently.

CONTROL OPERATION SCHEDULE													
	UNSETTLED			DRY SEASON				WET SEASON				UNSETTLED	
FINANCIAL YEAR	1st Oct											30-Sep	
CALENDAR YEAR	October	November	December	January	February	March	April	May	June	July	August	September	**Total Hours/ area**
Airport (IMP)	10	10	10	10	10	10	10	10	10	10	10	10	**120**
Ngerkebesang (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Echang (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Meyuns (MIK)	4	4	4	4	4	4	4	4	4	4	4	4	**48**
Malakal (MIK)	2	2	2	2	2	2	2	2	2	2	2	2	**24**
Long Island (MIK)	2	2	2	2	2	2	2	2	2	2	2	2	**24**
Medalaii (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Ngerbeched (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Itechetii (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Ngerchemai (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Ngerbechedesau (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Airai (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Ngatpang (MIK)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Ngkeklau (MIK)	4	4	4	4	4	4	4	4	4	4	4	4	**48**
Peleliu (MIK)	16	0	16	0	16	0	16	0	16	0	16	0	**96**
Topside (AFT)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Airai (AFT)	4	4	4	4	4	4	4	4	4	4	4	4	**48**
Ngerderar (AFT)	8	8	8	8	8	8	8	8	8	8	8	8	**96**
Hours/Month	**130**	**114**	**130**	**114**	**130**	**114**	**130**	**114**	**130**	**114**	**130**	**114**	**1464**
AVAILABLE HOURS	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**1920**

Figure 2: Palau Control Operation schedule

Site	TYPHOON		WET SEASON					DRY SEASON				TYPHOON	Hrs./Site
FINANCIAL YEAR	1st Oct											30-Sep	
CALENDAR YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr	May	Jun	Jul	Aug	Sept	
weloy keng (COL001)	0	0	0	0	0	10	10	10	10	10	10	10	70
gagil gapchar (COL002)	0	0	0	0	0	10	10	10	10	10	10	10	70
P/park Gifiy (IMP)	30	30	30	30	30	30	30	30	30	30	30	30	360
Across N/weather (IMP)	30	30	30	30	30	30	30	30	30	30	30	30	360
Balaqar (IMP)	30	30	30	30	30	30	30	30	30	30	30	30	360
Comsat (IMP)	20	20	20	20	20	20	20	20	20	20	20	20	240
Across old weather station (IMP)	20	20	20	20	20	20	20	20	20	20	20	20	240
Dachngar (AFT001)	40	0	40	0	40	0	40	0	40	0	40	0	240
Nimar (AFT002)	40	0	40	0	40	0	40	0	40	0	40	0	240
HOURS PER MONTH	210	130	210	130	210	150	230	150	230	150	230	150	**2180**
AVAILABLE HOURS	200	200	200	200	200	200	200	200	200	200	200	200	**2400**

Figure 3: Yap Control Operation Schedule

STAFF SKILLS				
	SKILL			
PROJECT MANAGER	Planning			
	Managing Resources			
	Managing Finances			
	Report			
	Analyse			
	GIS			
LEADER	People Management Skills			
	Office Skills			
	Advanced Plant ID			
TEAM SUPPORT	Navigation Skills			
	GPS Skills			
	Site Records			
	Daily Records			
FIELD TECHNICIANS	Planting Methods and Techniques			
	4 Wheel driving			
	Drivers Licence			
	First Aid Certification			
	Chainsaw operation			
	Chainsaw safety & maintenance			
	Foliar Spray Application			
	Cut Stump Application			
	Pesticide Application			
	Herbicide Properties			
	Site survey/searching			
	Weed ID			
	Handtool safety			
	Health and Safety			
	Employee Induction			
STAFF		Joe Tiobech	Dino Mesubed	Pua Michael

Figure 4: Palau Skill Identification Register

Staff Positions	Skills			
	Planning			
	Managing Resources			
	Managing Finances			
	Report			
	Analyze			
	GIS			
	People Management Skills			
	Office Skills			
	Advanced Plant ID			
	Navigation Skills			
	GPS Skills			
	Site Records			
	Daily Records			
	Planting Methods & Techniques			
	4 Wheel Driving			
	Drivers Licence			
	First Aid Certification			
	Chainsaw Operation			
	Chainsaw safety & maintenance			
	Foliar Spray Application			
	Cut Stump Application			
	Pesticide Application			
	Herbicide Properties			
	Site survey/ searching			
	Weed ID			
	Hand tool Skills			
	Health and Safety			
	Employee Induction			
		Francis Liyeg	Francis Ruegorong	Henry L.	John P.
		3	5	5	2 wks.
		AS Degree	AS Degree	High School	2 yrs. Certificate

Table two: This human resource skill chart identifies the skills that are required to implement the control programme and where these skills are missing.

Figure 5: Yap Skill Identification Register

6.3.4 Recommendation

The operational schedules should be updated by the participants following implementation to ensure the estimates are a true measure of time required for each site or group of sites.
Improvement in control methods could reduce the regularity that many of these sites need to be visited, allowing further resources to be used on new species.
Skills identified as being required but not met should be addressed.

6.4 RECORDING

6.4.1 Aim

For the participants to determine what measurable site-records during each control operation they would collect, how they would collect the data, what would happen to the data and where it would be stored and backed up.

6.4.2 Method

Instructor-led powerpoint presentation providing examples of expensive monitoring techniques conducted separate to control operations and efficient monitoring techniques focussed on measuring success while control is being implemented. Keeping it simple was reinforced and the essential records required to measure success were discussed, along with how they should be recorded on either a flat or relational database. Who would enter the data and where it would be stored was also determined.
Workbooks were completed by each agency for this section and historical data was entered and formatted on Microsoft Excel. The results were discussed amongst workshop participants.

6.4.3 Outcome

The participants identified key data needed to measure success and used their own historical data to complete a record sheet for one site in Micosoft Excel. The Palauans had a tough job of locating and entering their data from paper record sheets, which was a valuable lesson in collecting data consistantly and storing records in an electronic format. The Yapese had electronic data stored in a fairly usable condition, it did however need summarising to make it usable for measuring succes. The instructor, Phoebe and Pua managed to get the draft database operational for the sites which had been given unique identification during mapping. This database is now suited to collecting performance measures. Other data can be added in with new columns and the site information and species information tables can all be linked together through the “key” attribute of “Site ID”. The Yapese were also given a copy of this so they can utilise the power of a relational database.

6.4.4 Recommendation

That the database is used daily to record site visits, further required attributes are added to the site records table as required, and queried reports are designed to produce the required information for reporting. Each new site should be added to the database with a unique identification.

7.0 MONITORING AND EVALUATION

This section of the workshop aims to use the results of the previous section and determine measures of success, evaluate if the programme is being successful, and reporting these results to stakeholders.
One species was selected by each organisation to complete this section of the training. It is important to determine how each module may influence other pest plants that are determined to be priorities for each organisation.

7.1 MEASURING SUCCESS

7.1.1 Aim

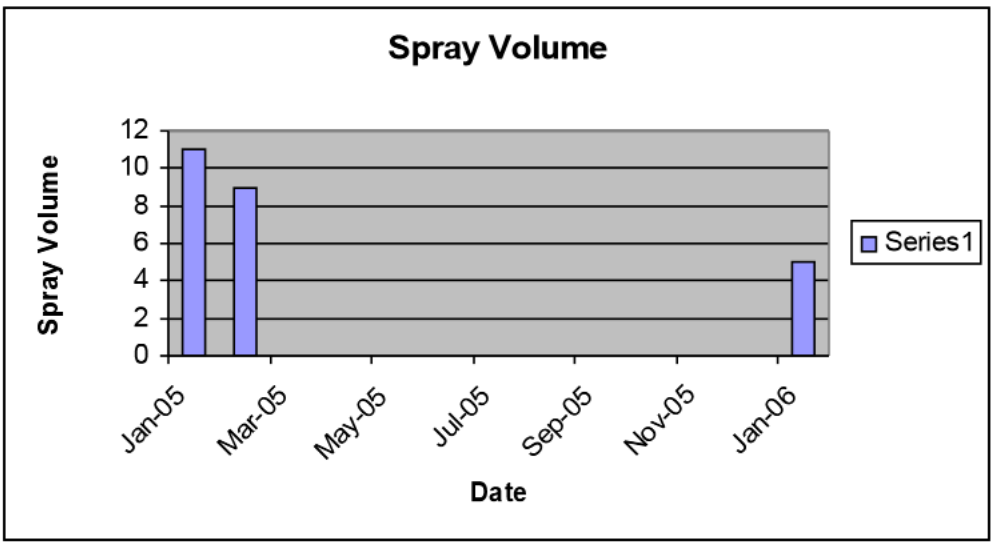
For the participants to determine which "key performance indicators" or "measures of success" they would use, how they would achieve these measures and who would be responsible for ensuring they were completed.

7.1.2 Method

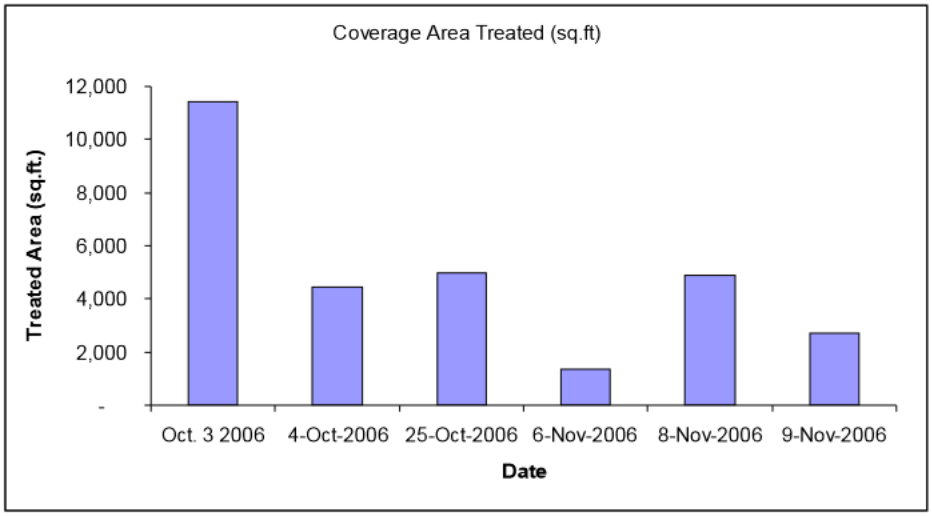
Instructor-led powerpoint presentation providing examples of monitoring, from qualitative photo-points to quantitative key performance indicators.
Workbooks were completed by each agency outlining which success measures they would use. Graphs were constructed to measure success of their projects to-date from historical records. The results were discussed amongst workshop participants.

7.1.3 Outcome

The Palauans constructed their graphs successfully which showed a reduction in plant biomass at the airport site, however missing data or missed implementation events reduce the effectiveness of the measure.



The Yapese constructed their graphs successfully to show a reduction in coverage area at their airport site. Apparently a typhoon hit the area leaving the team without the equipment they needed as shown by the spike in November 2006.



7.1.4 Recommendation

That the participants use these success measures and the others provided in the workshop to justify success and identify problems.

7.2 EVALUATION

7.2.1 Aim

For the participants to determine if they were having success towards achieving their objective using their success measures, and if they were not why not? If they were not succesful participants are to determine ways of improving their success.

7.2.2 Method

Instructor/ agency interaction discussing whether their project had been successful from studying their graphs. Participants were encouraged to provide reasons why they had been successful/ unsuccesful, and how they could make changes or improvements to their project to make them more successful.
Workbooks were completed by each agency for this section and discussed amongst workshop participants.

7.2.3 Outcome

The participants successfully identified whether they had been successful or not and identified improvements they could make. These improvements largely involved consistency in time between operations and keeping good records.

7.2.4 Recommendation

That participants regularly identify whether or not they have been successful and constantly look for improvement.

7.3 REPORTING

7.3.1 Aim

For the participants to compile a report that was clear, concise, accurate, objective, measurable, accountable and contained reccomendations towards required changes or further actions to allow the project to be more successful.

7.3.2 Method

Instructor-led powerpoint presentation providing examples of reports containing the essential elements of a successful and meaningful report. Ecouragement that they had completed or discussed all of these elements within the workshop, and by compiling their workbooks into a single document they would have a full report.

7.3.3 Outcome

Participants constructed their reports with the help of the instructor using all the information, spreadsheets, maps, success measures and evaluation they had completed over the duration of the workshop. Unfortunately this was a fairly rushed excersise, however the system that was used to complete the workshop meant that the majority of constructing the report was formatting. By compiling the report the amount of issues we had got through during the workshop was emphasised and proved to the participants that they had worked through their project plan in a systematic and thorough manner.

7.3.4 Recommendation

That participants complete their reports in the manner suggested and they email their reports to David Moverley to look over. More time on this section would be beneficial and the use of computers from the start of the workshop would enable participants to enter the information as we progressed.

8.0 RECOMMENDATIONS AND PROPOSED ACTIONS

8.1 THE WORKSHOP

The workshop as it was implemented was generally well received. The scope was fairly thorough and the system used followed a logical progression. The focus on project management as opposed to just data management (as was initially suggested) was, in hindsight, essential and benefited the participants in a far greater way than a focus on data management ever could have. It is vital that a project is managed properly at all levels if data is to be of any use at all, and the opportunity to improve and update skills in all areas of project management and implementation is difficult to access, procure and maintain. Considering the timeframe and the amount of information to consider, process and understand, and the participants of whom were from different organisations with different skill levels and issues, it was always going to be an extremely challenging and intensive workshop. The result of this is that for some of the participants the modules were not in enough depth, particularly when organisations needed a lot of customised or one-on-one help.

Probably the best ways to address this are:

The pre-workshop questionaire should include more questions relating to the modules of the workshop.
Participants should return pre-workshop questionaires at least two weeks before the workshop.
Participants are fully prepared with historical data, current maps etc.
To schedule training to individual organisations customised to each organisations further needs.

Most of these recommendations just involve further organisation before the workshop, which on this occaison was hampered by key people unfortunately not being available due to illness and other circumstances. The exception to this is the recommendation for further customised training.

8.2 CUSTOMISED TRAINING

During the workshop it became apparent that each organisation required further customised training. This is because each organisation has different levels of technical support, skill, education and technology. The resulting differences in project management experience mean that successful weed management may be difficult or impossible to measure without further training. All needs for these agencies could not be met in the basic workshop and if organisations are to be self-sufficient, further customised training to address those differences is required.

The best way to overcome this situation is to spend time with individual organisations after they have completed a basic workshop, that need to fill in the gaps and iron out any problems where they have arisen. The optimum time to do this is as soon as possible after the workshop so the entire process can be set up and implemented correctly. There is nothing more frustrating for field staff and management than collecting data that is not based on consistent implementation rendering results difficult to interpret.

8.2.1 Palau Bureau of Agriculture (Forestry Division)

Customised training for this organisation to be self-sufficient should address the folowing issues:

Ensure workshop recommendations are applied on a daily basis.

Ensuring a consistent method of control is used for each weed species.

Introduction of alternative herbicides and their use.

Ensuring field staff are capable of using GPS correctly for use in weed projects.

Ensuring field staff were competent in rationalising weed sites.

Aiding the staff in prioritisation of weeds and sites.

Working with PALARIS to ensure GIS activities are consistent with weed management.

Ensuring the work schedule is updated following ground operations.

Most of these issues can be addressed by spending time with the field staff in the field, supplying the proper GPS unit with weed sites mapped on it, acquiring some alternative materials, helping the staff to record and enter data and ironing out the mapping process with Phoebe from PALARIS. Spending time with Joe Tiobech and Joel Miles is essential as they are key people and were not able to be at the workshop.

8.2.2 Yap Department of Agriculture and Forestry

Customised training for this organisation to be self-sufficient should address the folowing issues:

Ensure workshop recommendations are applied on a daily basis.

Self-sufficient GIS and GPS capability.

Introduction of alternative herbicides and their use.

The Yap Department of Agriculture and Forestry are well equiped to benefit from spatial technology but resources are lacking. Introduction of some alternative herbicides and spending time in the field with field staff would be of great benefit. The most positive step would be the introduction of self-sufficient spatial technology to their operations. Some would have you believe that this technology is expensive but this is not the case. To purchase the the correct GPS unit and GIS software would be approxiamately $(US)1,000 and Francis Ruegorong's computer skills are adequate to easily train him directly in their use. There is a big difference between having GPS and GIS skills and using them effectively and specifically to weed management. This would benefit their programme, increase the regional skill base, and allow the Yap team to develop. Francis also requested some further help with applying for grants.

9.0 APPENDIX ONE: TRAINING SCHEDULE

10.0 APPENDIX TWO: WORKSHOP OUTLINE