Samoa – Invasives Prioritization and Management Planning Workshop

Matautu-tai, 9 - 10 August 2007

Meeting Report

Acknowledgement:

This workshop has been made possible thanks to funding by Conservation International Pacific Islands Program and the great amount of support received from: James Atherton Conservation Outcomes Manager, Conservation International Pacific Islands Program; Dr Jill Keys Coordinator, Pacific Invasive Learning Network; Dr. Alan Tye, Invasive Species Officer, Secretariat Pacific Regional Environment Programme and staff members from the Ministry of Natural Resources and Environment: Faumuina Pati Liu, Afele Faiilagi and Natasha Doherty.

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1. Background

The Samoan archipelago is part of the Polynesian-Micronesian Biodiversity Hotspot because of its unique geological formation and relative isolation from any other continental plate or large landmass. This has resulted in a relatively high rate of endemism for both plants and animals. Despite this, however, there is a prevailing belief amongst the scientific community that much of Samoa's biodiversity has yet to be properly assessed, inventoried, categorized and catalogued for our future generations to come. Initial investigations indicate that at present Samoa's biodiversity has a significant number of threatened plants (136 species) and animal species for both marine (18 species) and terrestrial (31 species) ecosystems.

Over the last several decades in particular, an alarming number of invasive species have arrived and established in Samoa either as intentional or unintentional introductions. The vast majority of these are related to human activities or human interactions with very few arriving through natural means. A number of these invasive species now have already become or now must be considered serious threats to the country's biodiversity, food security, sustainable development, and human livelihoods.

In general terms, Samoa has done well concerning environmental and biodiversity conservation issues having ratified 25 out of the 28 Multi-lateral Environmental Agreements (MEA's) and having accomplished or put into progress many of the convention obligations and associated reports and activities.

Samoa recognized the threat certain invasive species pose for the country and in 2003 established a National Invasive Alien Species (NIAS) Steering Committee comprising a stakeholder group of governmental Ministries and agencies, regional organizations, community groups, donor agencies and private sector individuals concerned with the prevention and reduction of the impacts of invasive species. For the last several years, this committee has been working on and setting the framework for the National Invasive Alien Species Implementation Action Plan (NIASIAP). This plan identifies the key actions needed to effectively assess and manage the threat and impacts of existing and potential invasive species.

NIASIAP is to be completed by end of 2007 and submitted for Government approval. Some of the proposed actions in NIASIAP have already been implemented with the financial and technical assistance of international donors and environmental NGO's.

Samoa's National Invasive Task Team (SNITT) comprised of various Government Ministries, Regional Organisations, International/Regional and National NGO's, and private sector will actively participate in the further development and revision of NIASIAP accordingly and implement and oversee actions required to reduce the impacts of invasive species by developing programs targeting invasives in their order of priority, feasibility and potential impacts on national economy, environment and human livelihoods.

A two day workshop was held from 9 to 10 August 2007, hosted by the Ministry of Natural Resources and Environment in partnership with Samoa's National Invasive Task Team and Conservation International. The general program was as follows:

- General introduction to invasive species and methodology behind preparation of invasive species spreadsheet and prioritization process.
- Explanation of Galapagos model and categorization scheme and the management feasibility model.
- Completing spreadsheet (Filling in the gaps)
- Invasive Species Management Planning Process and Examples
- Management plans – drafts

2. Purpose

To determine the top 20 manageable invasive plants in Samoa and to then prioritises the work that needs to be done to manage them effectively. The workshop will aim:

- Complete and cross check the invasive species prioritization spreadsheet for invasive plants in Samoa.
- Conduct prioritization to identify the top 20 priority invasive plants for active management in Samoa.
- Prepare an outline plan of necessary actions to manage the priority invasive species in Samoa.

3. Results

A total of 18 participants from various Government Ministries, International/Regional Organizations and National NGO's; see Annex 1 for participants list. The full meeting agenda is shown in Annex 2.

3.1 Workshop Proceedings

3.1.1 Day 1: Thursday 9 August

On day one, the workshop was formally opened by Faumuina Pati Liu (Assistant Chief Executive Officer, Division of Environment & Conservation, MNRE). A brief overview was given by the ACEO on the background and the objectives of the workshop. He also acknowledged the importance of the collaboration and partnership of the Government of Samoa through MNRE with Conservation International (CI) and SPREP to ensure the issue of invasive species is being dealt with serious attempt as part of our collaborative efforts towards safeguarding our native biodiversity and sustainable management of our biological resources. In his opening remarks he had announced and officially welcomed Dr. Alan Tye, Invasive Species Officer, SPREP as part of the invasive species national team.

The opening was then followed by a presentation by Natasha Doherty (Terrestrial Conservation Officer, DEC, MNRE) an introduction to invasive species in general and their impacts and also the methodology behind the development of the ranking method in Samoa. All presentation can be found in Annex 3.

The second presentation was given by Dr. Alan Tye (Invasive Species Officer, SPREP) who demonstrated the Galapagos Weed Risk Assessment (WRA) model, the management feasibility model and how these could be applied to the Samoa ranking model.

The remainder of the day was then handed over to James Atherton (Conservation Outcomes Manager, Conservation International Pacific Islands Program) who facilitated the group discussion and the completion of the invasive plants spreadsheet. Given the expertise and the general knowledge of various representatives from different Ministries and NGO's who participated through group discussions we were able to concluded with a preliminary prioritization of the top 20 priority invasive plants for management in Samoa. This prioritization of the said preliminary priority invasives was based on the simple data base system for scoring and prioritizing invasive species which SNITT has been developing over the last 18 months.

Open discussion/Issues Noted:

- "Endemic congenic species present in Samoa" this criteria in the ranking system has be sent to Dr. Art Whistle to be filled in due to a lack of knowledge here in Samoa.
- *Impomoea aquatica, Mimosa diplotricha* and *Passiflora foetida* had the wrong flower photographs, need to change the photographs.
- *Leucaena leucocephala*, *Lantana camara* and *Mimosa diplotricha* have biological controls in Samoa.
- Need to add in species from Agriculture's list of invasive plants.
- Proposal for field trip within Upolu and Savaii to look at invasive species within their habitat.

3.1.2 Day 2: Friday 10 August

Day two was facilitated by Dr. Jill Keys (Coordinator, Pacific Invasive Learning Network) who gave a presentation on how to write management plans. Three breakout groups were formed to draft management plans for three invasive plants which can be managed and observed to be invasive which cause great impact as they have noticed and experienced in there field of work.

Group 1 Division of Environment & Conservation (DEC) worked on *Coccinia grandis* (Ivy Gourd)

Group 2 Ministry of Agriculture & Fisheries (Crop and Quarantine Divisions) worked on *Sida acuta* (Broomweed)

Group 3 Forestry Division worked on *Merremia peltata* (Merremia vine)

See annex 4 for draft management plans.

Open discussion/ Issues Noted:

- Need to hold a public meeting towards end of September beginning of October to finalize the list of the top 20 invasive species both flora and fauna for management plans.
- Decision made at this meeting will be incorporated into the NIASIAP

4. Recommendations / Next steps

Group 1 Division of Environment & Conservation

- Re-visit some of the acitivities (e.g Public awareness) to fine tune before final copy of management plan is produced.
- Present draft management plant to higher authorities example ACEO and CEO
- Conduct literature research on *Coccinia grandis*
- Look for possible donors wherever possible.
- Work with Mark Bonin – *Coccinia grandis* expert

Group 2 Ministry of Agriculture and Fisheries

- Refinement work on some of the activities

Group 3 Forestry Division

- James and Saya to work with Forestry to redraft some of the objectives and activities of the *Merremia peltata* Management Plan for refinement.

General

- Form a committee – SNITT – technical group
- Important to report on timeframe
- Finalize priority plants and animals
- Public meeting to finalize invasive species
- SNITT to coordinate meetings
- NIASIAP finalized!! Before searching for funds
- Management plans for invasive species to be written up by Environment, Forestry and Agriculture depending on the species.

5. Conclusion

The two day workshop was a success as we managed to fill in the gaps which were in the ranking spreadsheet regarding the preliminary prioritization of twenty (20) most invasive plant species that can be managed. However, further refinement is needed- including adding in invasive weeds of agricultural lands as the spreadsheet currently holds only 64 invasive plant species that are mostly environmental weeds. The next step would then be to use the Galapagos database system to help refine the ranking process and to group the invasive plants into management categories.

Three Management Plans have been drafted for: *Coccinia grandis, Merremia peltata* and *Sida acuta.* These Management Plans need to be refined before final copies are produced.

This workshop is the first step towards identifying the most manageable 20 invasive plants in Samoa. The next step will be to identify the top 10 invasive animals. A public meeting will then be held to get endorsement of the top 20 invasive plants and the top 10 invasive animals for management and for inclusion in the NIASIAP, hopefully in the next two months. Management Plans will be written for each of the invasive species, plants and animals. Once the NIASIAP document has been reviewed it will then be submitted to Government for approval by the end of 2007.

More workshops such as this should be held as it is important to bring people together with shared interested in invasives to share their expertise.

6. Annex

6.1 Annex 1: Participants List

Thursday 9 August 2007

Name	Organization	Email	Phone#
Ministry of Agriculture and Fisheries			
Anoano Seumalii	MAF	techpolicy@samoaquarantine.gov.ws	24322 / 22804
Sooalo A Peters	MAF	apeters@lesamoa.net	22561
Sina Taulealo	MAF	Sina.taulealo@lesamoa.net	21052 / 26529
Billy Enosa	MAF	fbenosa@lesamoa.net	23416
Ministry of Natural Resources and Environment			
Tolusina Pouli	Forestry – MNRE	sprig@samoa.ws	22729
Talie Foliga	DEC –MNRE	tfoliga@yahoo.com	28680
Faleafaga T Tipamaa	DEC – MNRE	nationalparks@lesamoa.net	28680
Afele F Saili	DEC – MNRE	Afele.faiilagi@mnre.gov.ws	31197 / 31198 / 30100
Faumuina Pati Liu	DEC – MNRE	pati.liu@mnre.gov.ws	31197 / 31198 / 30100
Natasha Doherty	DEC- MNRE	natasha.doherty@mnre.gov.ws	31197 / 31198 / 30100
JICA			
Sayaka Tsutsumi	JICA	Conservation_jica@samoa.ws	
FAO			
Aru Mathias	FAO	Aru.mathias@fao.org	22127
SUNGO			
Vaasilufiti M Jackson	SUNGO	sungomanagement@lesamoa.net safuahotel@lesamoa.net faasaosvmj@yahoo.com	7790956
SPREP			
Ana Tiraa	SPREP	anat@sprep.org	20924 / 7783059 / 66276
Tepa Suaesi	SPREP	tepas@sprep.org	21929
Alan Tye	SPREP	alant@sprep.org	21929
Conservation International			
James Atherton	CI	jatherton@conservation.org	21593
Pacific Invasive Learning Network			
Jill Keys	PILN	jillk@sprep.org	21929

Friday 10 August 2007

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Tolusina Pouli	Forestry – MNRE	sprig@samoa.ws	22729
Talie Foliga	DEC –MNRE	tfoliga@yahoo.com	28680
Moeumu Uili	DEC – MNRE		31197 / 31198 / 30100
Afele F Saili	DEC – MNRE	Afele.faiilagi@mnre.gov.ws	31197 / 31198 / 30100
Natasha Doherty	DEC- MNRE	natasha.doherty@mnre.gov.ws	31197 / 31198 / 30100
SPREP			
Alan Tye	SPREP	alant@sprep.org	21929
Tepa Suaesi	SPREP	tepas@sprep.org	21929
Private Sector			
Tuatapola Joe Annandale		director@sinalei.ws	251911 / 7773949
Conservation International			
James Atherton	CI	jatherton@conservation.org	21593
JICA			
Sayaka Tsutsumi	JICA	Conservation_jica@samoa.ws	
Hitofumi Abe	JICA	Hitofumi.abe@samoa.ws	7753150
SUNGO			
Raymond Voigt	SUNGO	Raimunvoigt01@yahoo.com	24322
Pacific Invasive Learning Network			
Jill Keys	PILN	jillk@sprep.org	21929

6.2 Annex 2: Agenda

Samoa – Invasives Prioritization and Management Planning Workshop
9th – 10th August 2007

Meeting Objectives:

- **Complete and cross-check the invasive species prioritization spreadsheets for invasive plants in Samoa**
- **Conduct prioritization to identify the top 20 priority invasive plants for active management in Samoa**
- **Prepare an outline plan of necessary actions to manage the priority invasive plants in Samoa**

Outline Agenda:

Time	*Item*	*Facilitator*
Thursday, 9th August 2007: Complete Invasive Species Prioritization		
9:00- 9:05	Welcome and Prayer	Faumuina
9:05- 9.20	Explanation of meeting objectives	Faumuina
9:20- 9:30	Methodology behind preparation of invasive species spreadsheets and prioritization process	Natasha
9:30-10:00	Galapagos model and categorization scheme and the management feasibility model	Alan Tye
10:00- 10:30	Morning Tea	
10:30- 12:00	Filling in the gaps: completing the spreadsheets	James Atherton
LUNCH 12:00-12:30		
12:30- 15:00	Filling in the gaps: completing the spreadsheets	James Atherton
15:00- 15:30	Afternoon Tea	
15:30- 16:30	Conducting the prioritization. Preparation of priority plant and animal invasive species	James Atherton
Friday, 10th August 2007: Prepare Management Plan for Priority Invasives		
09:00- 09:15	Recap prioritization	James Atherton
09:15- 10:00	Invasive Species Management Planning Process and Examples	Jill Keys
10:00 - 10:30	Morning Tea	
10:30- 12:00	Management Planning for Priority Samoan Invasives	Jill Keys
LUNCH 12:00-12:30		
12:30- 15:00	Management Planning for Priority Samoan Invasives	Jill Keys
15:00- 15:30	Afternoon Tea	
15:30- 16:30	Meeting Wrap-up and concluding comments	James Atherton

Material to bring to the meeting:

1. Reports/books/documents on invasive species and their impacts in Samoa.
2. Your ideas and observations on the impacts of invasive species and what needs to be done about them.

6.3 Annex 3: Presentations

6.3.1 Natasha's Presentation

Samoa- Invasive Plants Prioritization and Management Planning Workshop

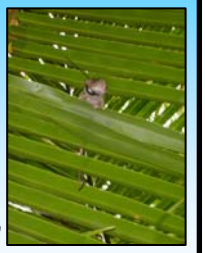
9th – 10th August, 2007
MNRE Conference Room, Matautu-tai

Invasion Pathways

1. Natural – e.g. wind and ocean currents.
2. Intentional introductions – species introduced deliberately for a purpose e.g. Myna bird
3. Accidental introductions – species introduced unintentionally, such as in ships ballast water, on people's clothing and luggage e.g. the giant African snail arrived in Samoa via ship cargo, and has since spread across Upolu.

Invasive Species Globally

- Invasive species are recognized as the biggest threat to global biodiversity, together with habitat destruction.
- The effects of alien invasive species on biodiversity have been described as "immense, insidious and usually irreversible" (IUCN 2000).



Some examples of impact: Agriculture

- Worldwide 67,000 pest species attack crops, most are non-native.
- Global food production is reduced by around 50%
- Estimated costs vary from $7 billion to $345 billion
  - South Africa - $7 billion
  - United Kingdom - $12 billion
  - Australia – $13 billion
  - Brazil - $50 billion
  - India - $116 billion
  - USA - $137 billion
  - New Zealand - $345 billion

What are invasive species?

- *Invasive species are species introduced into an area in which they do not occur naturally, usually as a result of human activities, and which threaten environmental or economic resources, or human health, due to the damage they cause, or are likely to cause (NIASIAP 2004)*

Some examples of impact: Human Health

- Diseases and their vectors
  - For example - Avian Bird Flu, West Nile Virus, cholera, Mosquitoes.
- Pesticide toxicity.

Some examples of impact: Political

- Pests and weeds raise barriers to sustainable development
- They affect international trade
- Bio-terrorism

Where did the species come from?

- Local knowledge of staff – witness in surveys carried throughout Samoa
- Global Invasive Species Database (GISD)
- Pacific Island Ecosystems at Risk (PIER)
- Space & Flynn Report 2002
- Dr. Art Whistler book – Wayside plants of the islands

Damage to biodiversity

- Much harder to estimate!
- Extinctions – birds, molluscs, reptiles
  - One third of island extinctions are due to introduced animals
- Terrestrial and aquatic

Where did the ranking criteria come from?

- PIER
- GISD
- Galapagos Weed Risk Assessment (WRA)

History

- Developed
  - Beginning of 2006
- Why?
  - Find top 20 most invasive plants that are the most easiest to manage.
  - To prioritizes work
  - Create Management Plans for species identified as major concern.
  - Input species into the National Invasive Species Implementation Action Plan (NISIAP)
  - Create awareness

Outcome/Purpose

- Complete NIASIAP document and have it approved by government by end of 2007
- Prioritization of major species of concern.
- Develop awareness materials e.g. posters and information sheets.
- Develop Management Plans for each of the species

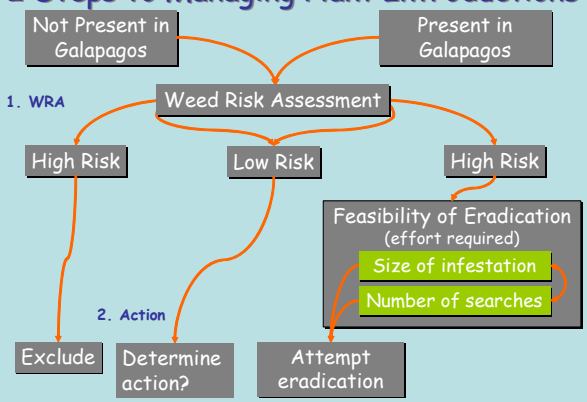
6.3.2 Alan's presentation

Some principles for Weed Risk Assessment and Weed Management

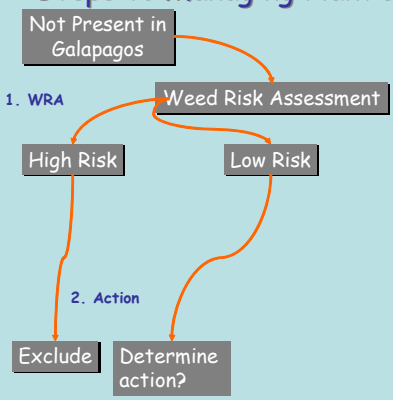
Two-step process:

1. Evaluate invasiveness and impact, or risk of it, for each species.
2. Decide if and how to manage each species.

2 Steps to Managing Plant Introductions



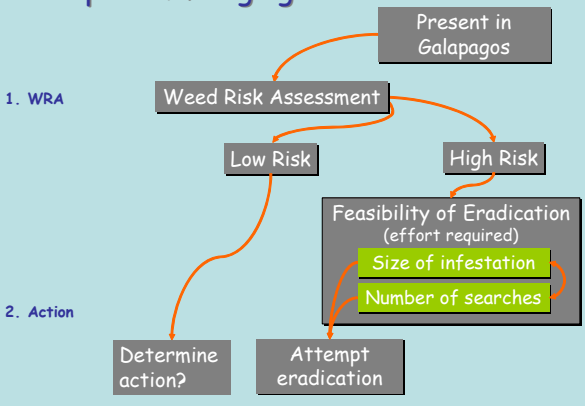
2 Steps to Managing Plant Introductions



Features of the Galapagos WRA:

- Environmental focus (but includes agricultural, forestry, health etc considerations).
- Intended to permit review of all known introduced plants, plus species not yet introduced which could be a quarantine risk.
- Produces an **output score** for each species.
- Classifies each species into one of **five** invasiveness impact/risk **categories**.
- Easily adaptable for any island or archipelago.

2 Steps to Managing Plant Introductions



Five invasive status categories:

A Transformer:
already a habitat **transformer** in Galapagos (includes hybridizers with endemics).

B Potential transformer:
naturalized in Galapagos and **known** as a habitat transformer elsewhere.

C Integrator:
naturalized in Galapagos but **integrating** into native vegetation without causing major habitat change (mainly small weeds).

D Potential invader:
not naturalized in Galapagos but a **potential** invader (based on behaviour elsewhere).

E Probably harmless:
in Galapagos only cultivated (**not naturalized**) and **not** known as **an invader** elsewhere.

Five invasive status categories:

A Transformer:
already a habitat **transformer** in SAMOA (includes hybridizers with endemics).

B Potential transformer:
naturalized in SAMOA and **known** as a habitat transformer elsewhere.

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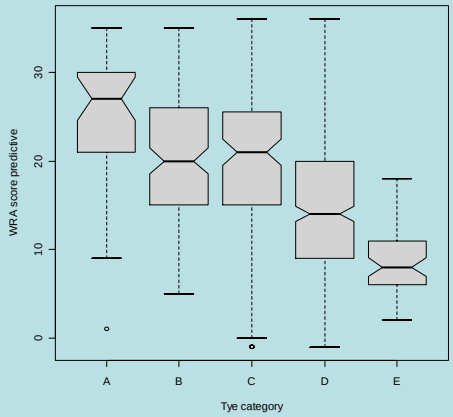

12 (or 9) Key Questions that influence the environmental impact categorization:

Present in Galapagos (Samoa)? [Yes or no]

Behaviour elsewhere:
3.04 Environmental weed that is a transformer in natural areas (elsewhere)
3.05 Other species in same genus are serious invaders elsewhere, or are native or naturalised in Galapagos (Samoa)

Potential environmental impact:
5.04 Climbing or smothering growth habit.
5.05 Forms dense thickets, particularly woody perennials.
5.06 Is a tree, woody perennial shrub, grass or geophyte.

6.03 Capable of interspecific hybridization.
6.04 Endemic congeneric species present in Galapagos (Samoa).

Management options for plants already introduced:

- **Do nothing** – (E Harmless; C Integrators)

For Transformers, Potential Transformers and Potential Invaders:

- **Eradication**
- **Containment/Exclusion**
- **Site-specific control**
- **Biological control**

12 (or 9) Key Questions that influence the environmental impact categorization:

Behaviour in Galapagos (Samoa):
9.01 Viable seed production
9.02 Evidence of seedlings produced without human assistance
9.03 Evidence of two or more generations of adult plants
9.07 Current invasive status [Don't know, Integrator, Transformer, Potential transformer]

9.01–9.03 combined as "Naturalized in Samoa"

Choice 1: Eradication

high initial cost, reduces to zero;
attempt only if probability of success high;
depends on resources available

Choice 2: Containment/Exclusion

can be low-cost, but permanent annual cost

Choice 3: Site-specific control

can be low-cost, but permanent annual cost

Choice 4: Biocontrol

high initial cost, reduces to zero;
at start, low confidence of success;
only for "useless" species

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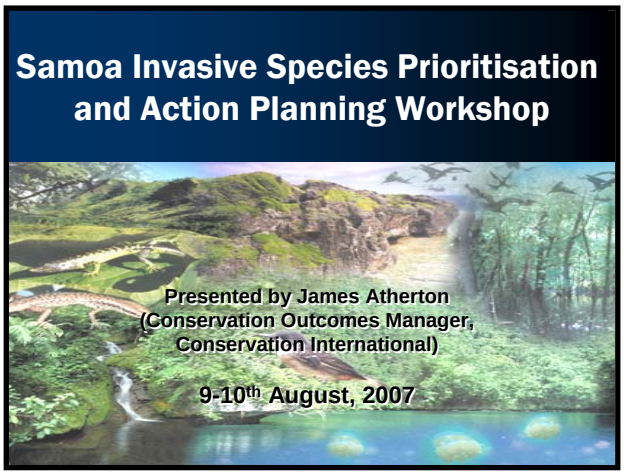
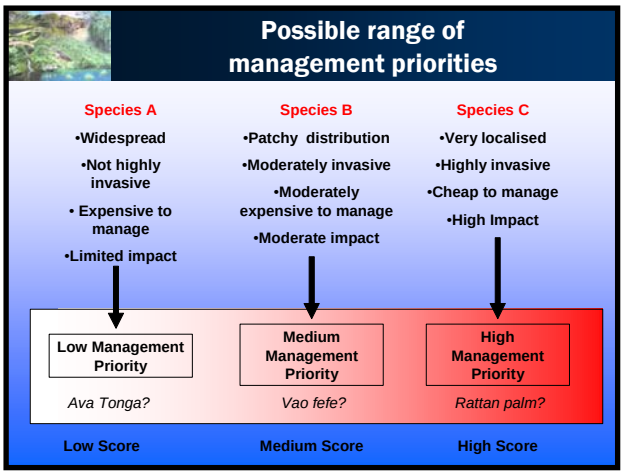
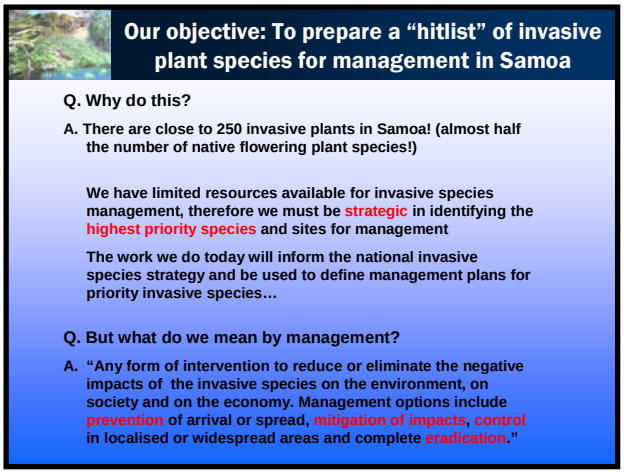
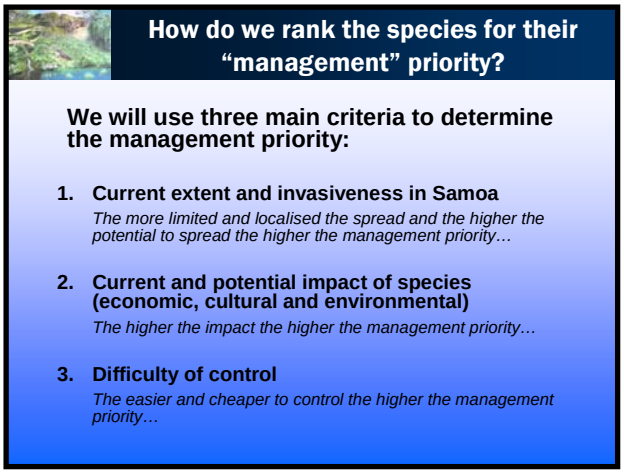
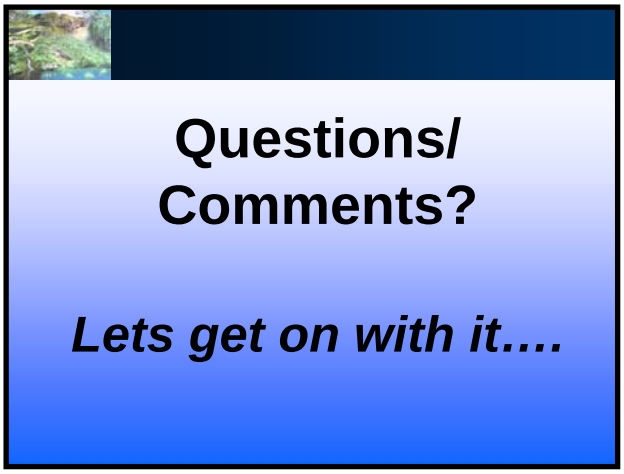
6.3.3 James presentation











6.3.4 Jill's presentation

Samoa National Invasive Species Task-team

Invasive species management plans

10 August 2007

Simple and realistic

- Fight the battles you can win
- Plan for the resources you have – don't make a "wish-list"
- It may be work you want to start – or work you are already doing

Why make a management plan?

- It helps you be clear about:
  - What you are going to do
  - Why you are doing it
  - How you will do it
  - How you will know when you've been successful
  - Who will do it, and how different agencies can coordinate and collaborate

The process of planning

- List the possible priority invasive species
- What management is required? – eradication, control, containment?
- Pick 2 – 3 battles which can be won
- Define the timescale
- Define the goal
- Then do the "road map" – objectives and activities, outputs, partners and resources
- Be SMART

What does a good plan look like?

- A good plan shows:
  - What success looks like – the GOAL
  - The "road map" to get there – the OBJECTIVES and ACTIVITIES
  - Who will do it
  - How you know when you get there – MONITORING and EVALUATION
  - The resources you will need

SMART

- Specific
- Measurable
- Attainable
- Realistic
- Timely

Which species?

- The ones you think priority…
- The ones you think manageable…
- The ones you are tackling, or can tackle now…

Some examples…

- From Kiribati and Pohnpei

Next steps

- SNITT is the national coordination mechanism, and will oversee monitoring progress on the management plans
- There is a lot of help available…

Jill's Handout

Setting good goals and objectives

Look at each goal or objective and evaluate it. Make any changes necessary to ensure it meets the criteria for SMART goals:

S = Specific
M = Measurable
A = Attainable
R = Realistic
T = Timely

Specific

Goals should be straightforward and emphasize what you want to happen. Specifics help us to focus our efforts and clearly define what we are going to do.

Specific is the What, Why, and How of the SMART model.

WHAT are you going to do? Use action words such as direct, organize, coordinate, lead, develop, plan, build etc.

WHY is this important to do at this time? What do you want to ultimately accomplish?

HOW are you going to do it? (By...)

Ensure the goals you set is very specific, clear and easy. Instead of setting a goal to lose weight or be healthier, set a specific goal to lose 2cm off your waistline or to walk 5 miles at an aerobically challenging pace.

Measurable

If you can't measure it, you can't manage it. In the broadest sense, the whole goal statement is a measure for the project; if the goal is accomplished, the is a success. However, there are usually several short-term or small measurements that can be built into the goal.

Choose a goal with measurable progress, so you can see the change occur. How will you see when you reach your goal? Be specific! "I want to read 3 chapter books of 100 pages on my own before my birthday" shows the specific target to be measure. "I want to be a good reader" is not as measurable.

Establish concrete criteria for measuring progress toward the attainment of each goal you set. When you measure your progress, you stay on track, reach your target dates, and experience the exhilaration of achievement that spurs you on to continued effort required to reach your goals.

Attainable

When you identify goals that are most important to you, you begin to figure out ways you can make them come true. You develop that attitudes, abilities, skills, and financial capacity to reach them. Your begin seeing previously overlooked opportunities to bring yourself closer to the achievement of your goals.

Goals you set which are too far out of your reach, you probably won't commit to doing. Although you may start with the best of intentions, the knowledge that it's too much for you means your subconscious will keep reminding you of this fact and will stop you from even giving it your best. A goal needs to stretch you slightly so you feel you can do it and it will need a real commitment from you. For instance, if you aim to lose 20lbs in one week, we all know that isn't achievable. But

setting a goal to loose 1lb and when you've achieved that, aiming to lose a further 1lb, will keep it achievable for you.

The feeling of success which this brings helps you to remain motivated.

Realistic

This is not a synonym for "easy." Realistic, in this case, means "do-able." It means that the learning curve is not a vertical slope; that the skills needed to do the work are available; that the project fits with the overall strategy and goals of the organization. A realistic project may push the skills and knowledge of the people working on it but it shouldn't break them.

Devise a plan or a way of getting there which makes the goal realistic. The goal needs to be realistic for you and where you are at the moment. A goal of never again eating sweets, cakes, crisps and chocolate may not be realistic for someone who really enjoys these foods.

For instance, it may be more realistic to set a goal of eating a piece of fruit each day instead of one sweet item. You can then choose to work towards reducing the amount of sweet products gradually as and when this feels realistic for you.

Be sure to set goals that you can attain with some effort! Too difficult and you set the stage for failure, but too low sends the message that you aren't very capable. Set the bar high enough for a satisfying achievement!

Timely

Set a timeframe for the goal: for next week, in three months, by fifth grade. Putting an end point on your goal gives you a clear target to work towards.

If you don't set a time, the commitment is too vague. It tends not to happen because you feel you can start at any time. Without a time limit, there's no urgency to start taking action now.
Time must be measurable, attainable and realistic.

Everyone will benefit from goals and objectives if they are SMART. SMART, is the instrument to apply in setting your goals and objectives.

6.4 Annex 4: Draft Management Plans

6.4.1 Group 1 – Division of Environment & Conservation

Action Plan: *Coccinia grandis* (vine, climber)
Goal: To fully eradicate *Coccinia grandis* from Samoa by 2012

Objectives	Activities	Outputs	Partners lead / others	Timeframe				Resources available (staff)	Funding sources
				2ND half 07	1ST half 08	2ND half 08	1ST half 09		
Objective 1: To determine distribution of *C. grandis* around Samoa.	✓ Conduct national survey to identify sites of invasion ✓ Establish contact for people to call when *C. grandis* sighted ✓ Revise deadline for eradication	✓ Map of distribution ✓ Database developed	MNRE SPREP CI MAF RDIS NGO's SPC SNITT PILN JICA					MNRE	MNRE (operational budget) Possible funding sources: SPREP CI SPC JICA CEPF ARNHP US Fish and Wildlife Services GEF/UNDP
Objective 2: Conduct literature research on the biology and control of *C. grandis*	✓ Research existing literature on biology and control of *C. grandis*	✓ Adequate information compiled for future actions	MNRE					MNRE	
Objective 3: Reduce the population of *C. grandis* using biological control	✓ Investigate specificity of biocontrol agent (mite) ✓ Apply technique ✓ Monitor population reduction	✓ Control techniques developed ✓ Population reduced	MNRE SPREP CI Community MAF MWCSD USP NUS MESC SNITT	**Biological control used as a last resort if manual and chemical technique fail**				MNRE community	

			PILN JICA					
Objective 4: Reduce population of *C. grandis* to '0' using manual and chemical techniques	✓ Apply manual and chemical technique ✓ Monitor population reduction ✓ Research the legal framework for declaring noxious weed ✓ Threshold point ??	✓ Population reduced to '0' ✓ Access to private property to remove *C. grandis*	MNRE SPREP CI Community MAF (Q) MWCSD					MNRE Community
Objective 5: Increase public awareness on impacts?? *C. grandis (rephrase)*	✓ Develop awareness materials and programs to disseminate information to the general public ✓ Conduct school programs to promote awareness?? (rephrase) ✓ Disseminate project progress in the region	✓ Public fully aware of the dangerous of *C. grandis*	MNRE MESC SPREP CI SPC SNITT PILN					MNRE SPREP CI SPC
Objective 6: Capacity building for staff involved (at least 2) on invasive vine control/eradication	✓ Identify potential country for exchange programs ✓ Exchange program for further training of staff	✓ Increased understanding and required skills	MNRE PILN SPREP CI JICA Guam DoA					

6.4.2 Group 2 – Ministry of Agriculture & Fisheries

Control Plan for *Sida acuta*

Goal:
To reduce by 30% the number of farms in Samoa infested by *Sida acuta* by 2010

Introduction
S.acuta is considered to be one of the major constraints to farming across the Pacific; "It is an invasive weed and is also regarded as a vigorous competitor in degraded pastures, tree plantations, cereals, root crops, vegetables, planted forests, lawns, roadsides and waste places" (Crosby, 2006). S.acuta is one of 2 species of Sida found in Samoa; there are 5 species of Sida found in the Pacific. In Samoa, it is considered to be a "moderately important weed" that can be present at levels that affect yield and profitability in localized areas (Swarbrick, 1997). Seeds are easily spread by machinery, equipment, people, animals & water. Currently the methods of control are physical (weeding), and chemical (Butoxone).

Objectives	Activities	Outputs	Partners lead / others	Timeframe					Resources available (staff)	Funding sources
				3rd qtr 07	4th qtr 07	1st qtr 08	2nd qtr 08	3rd qtr 08		
Objective 1: Conduct research into distribution and abundance and control of S.acuta	Define trigger level (infestation level above which control will be done) Conduct survey to establish number of Sida acuta – infested farms Update database on nationwide Sida acuta infestation Conduct trial on the	Number of Sida-infested farms Degree of infestation of each farm (infestation index) Total infested area on each farm Trial site(s) established as demonstration site(s) for farmers	MAF (lead) SPREP SPC MNRE FAO Pulenuu & village councils Farmers	X X X	 X X	 X	 X		Local expertise: MAF, MNRE, SPREP Field officers from MAF, MNRE	JICA FAO SPC SPREP ACIAR NZAID

	performance of biocontrol and chemical agents under Samoan conditions									
Objective 2: To gain farmer cooperation in S.acuta control activities	Prepare manual on S.acuta control methods for farmers Conduct public awareness to inform public of control program Organize consultations with farmers to be involved in the program Train involved farmers in control methods that will be involved in the program	Farmers manual on Sida control Establishment of farmer groups F	MAF (lead) SPREP SPC MNRE FAO Pulenuu & village councils Farmers	X	X X	X X X X	X X X X	X X	Local expertise: MAF, MNRE, SPREP Field officers from MAF, MNRE	JICA FAO SPC SPREP ACIAR NZAID
Objective 3: To reduce the spread of Sida acuta in Samoa	Implement the 3 control methods: weeding, butoxone herbicide, biological (phytophagous beetle)		MAF (lead) SPREP SPC MNRE FAO Pulenuu & village councils Farmers					X	Local expertise: MAF, MNRE, SPREP Field officers from MAF, MNRE	JICA FAO SPC SPREP ACIAR NZAID

6.4.3 Group 3: Forestry Division

Goal: Reducing ??% of spread of Merremia vine within the O le Pupu Pu'e National Park.
Why: Spreading in major forests and preventing from forest regeneration. One of the major problems in forest ecosystems.

Objectives	Activities	Outputs	Partners lead / others	Timeframe				Resources available (staff)	Funding sources
				1st half 08	2nd half 08	1st half 09	2nd half 09		
Objective 1: Create a barrier corridor/buffer zone to around the NP to prevent further infestations by merremia.	1. Using GIS mapping to identify areas infected with merremia.	✓	Lead – Division of Forestry/MNRE Parthers – MOA, MOF, SUNGO, MWCSD, Local Village Councils, Lands Committee of Falealili, Samoa Hotel Association, JICA, CI, SPREP, Samoa Research & Development Institute, Donors – AUSAID, GEF-SGP-NZAID, EU, etc. **Detail of responsibilities & assignments to be determined in a stakeholder committee of the lead agency & partners.**						
	2. Clear buffer zone area and physically remove merremia around the boundaries of the NP. ?? (revisit this one with Forestry)	✓							
	3. Research on potential biological controls to establish in the barrier corridor.	✓							
	4. Cost benefit analysis of the different types of buffer zones (shades /cleared area / etc.)	✓							
Objective 2: Reduce merremia	1. Research different types of merremia control. 2. Cost-benefit analysis of								

infestations within the NP.	methods to eradicate merremia. 3. Apply combination of methods – manual/chemical/biological.								
Objective 3: Increase national and local stakeholder participation in the program.	1. Implement public awareness raising campaigns to generate interest and support for the program. 2. Establish mechanisms for stakeholder participation in decision-making and contribution of resources for implementing activities. 3. Establish a steering committee of stakeholders (lead agency & partners).								