

NATURAL SOLUTIONS TO CLIMATE CHANGE IN THE PACIFIC:

Increasing ecosystem resilience
through the management of invasive
species

David Moverley / Invasive Species Adviser

BEM Division

OUTLINE

- Invasive species in the Pacific
- Methods of managing invasions-what options are available
 - Prevention,
 - Eradication or
 - Control (Asset Management/Restoration, Landscape level)

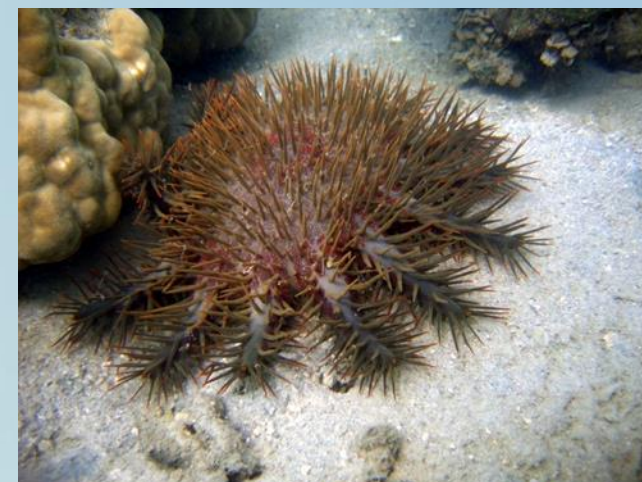


- Worldwide, damage over US\$1.4 trillion/year, amounting to 5% of the global economy
- Economic costs in US alone \$120 billion/ year, with over 40 million hectares, the size of California being affected
- European economic losses over € 12.5 billion/year.

IMPACTS ON ISLANDS ARE FAR WORSE

Invasive species weaken or destroy natural ecosystem processes

- Predators eat fruit and seeds and animals which provide for regeneration and dispersal of native species.
- Weeds compete with and dominate native vegetation.
- Resulting in ecosystem instability and promoting erosion, causing further disturbance and further invasions





SAMOA
Post-disaster Needs Assessment
Cyclone Evan 2012

Government of Samoa
March 2013



GOVERNMENT
OF SAMOA



Operational Plan

**Mt Vaea Ecosystem Resilience and
Forest Restoration Project**
2014-2020



Prepared by
James Atherton
Consultant
March 2014





Mt. Vaea

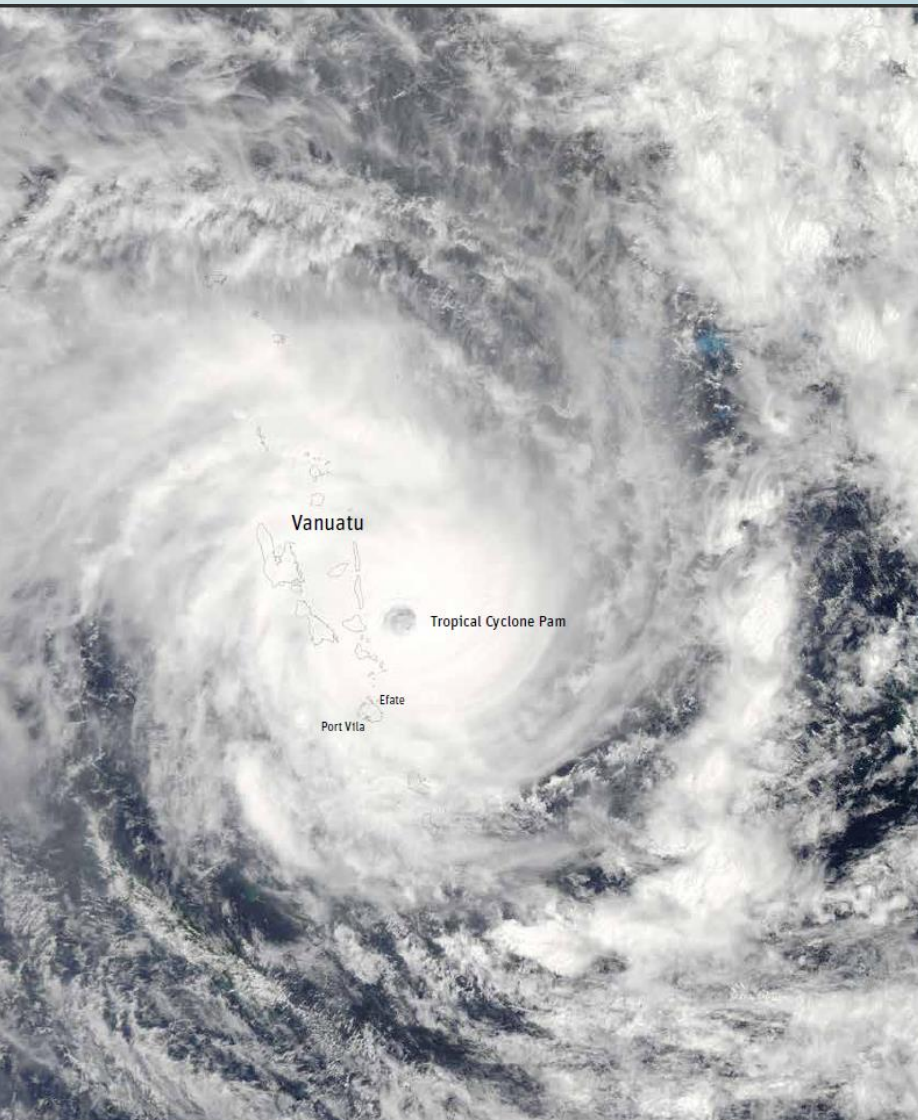
2007 - 62% of all stems were invasive species

=> **2 cyclones**

2013 - 90% of all stems

Increases in most invasive trees except for Tamaligi





Vanuatu

Post-Disaster Needs Assessment

Tropical Cyclone Pam, March 2015



Government of Vanuatu

“Damage in these areas was characterized as uprooting, broken limbs, defoliation, and canopy opening.

Extensive canopy openings have allowed for invasive species to enter and propagate in forest areas. If not properly managed, this invasive growth will substantially restrict the ability of these forests to recover to their pre-cyclone condition.”



Program of Activity	Value (VT 1,000)	Responsible Agency
Manage invasive species in damaged coral reef areas in Tafea and Shefa	15,000	Fisheries
Replant affected mangrove areas in Tafea, Shefa, and Malampa	15,000	Environment, Forestry
Replant (nontimber) native tree species in affected tropical forest areas in Tafea, Shefa, and Penama	20,000	Environment, Forestry
Manage invasive species in damaged tropical forest areas in Tafea and Shefa to increase the success of replanting programs	40,000	Environment
Total	90,000	

Table 61. Medium- to Long-Term Recovery Needs for the Environment Sector

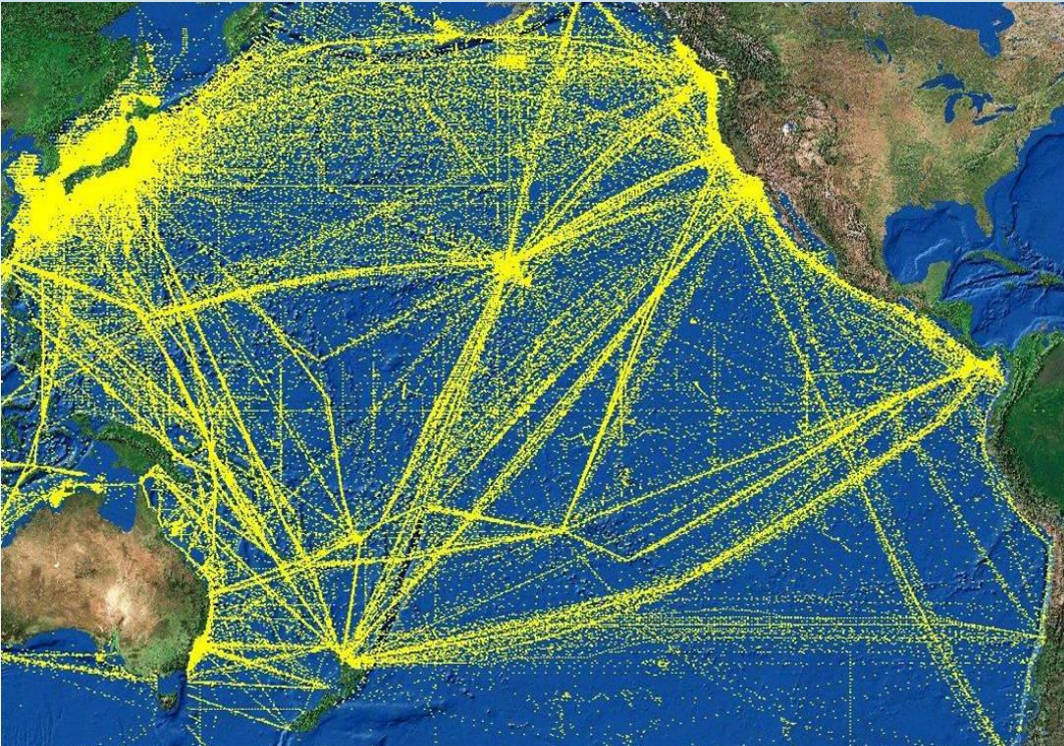
How bad is the invasive species problem in the Pacific ?



State of Conservation in
Oceania 2013

A synthesis of key findings

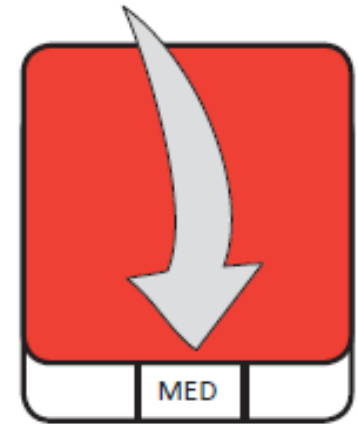




Status
Poor

Trend
Deteriorating

Data confidence
Medium



Number of Introduced Species

Figure P7.1 Numbers of Invasive and Introduced (i.e. invasiveness not specified) species in 22 islands in the Oceania region

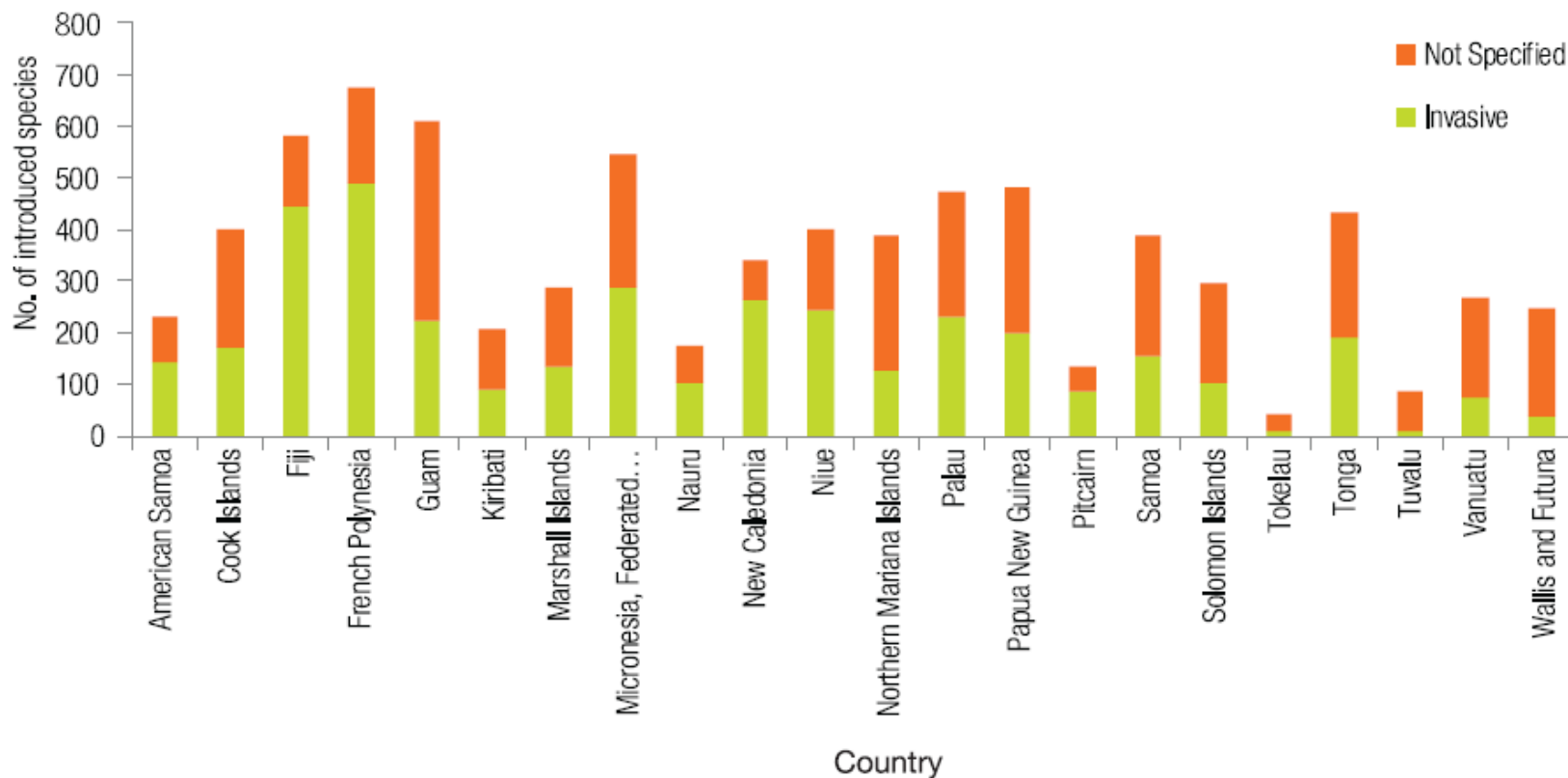


Figure P6.4 Nature and extent of various pressures on all extant Pacific single-country endemic species

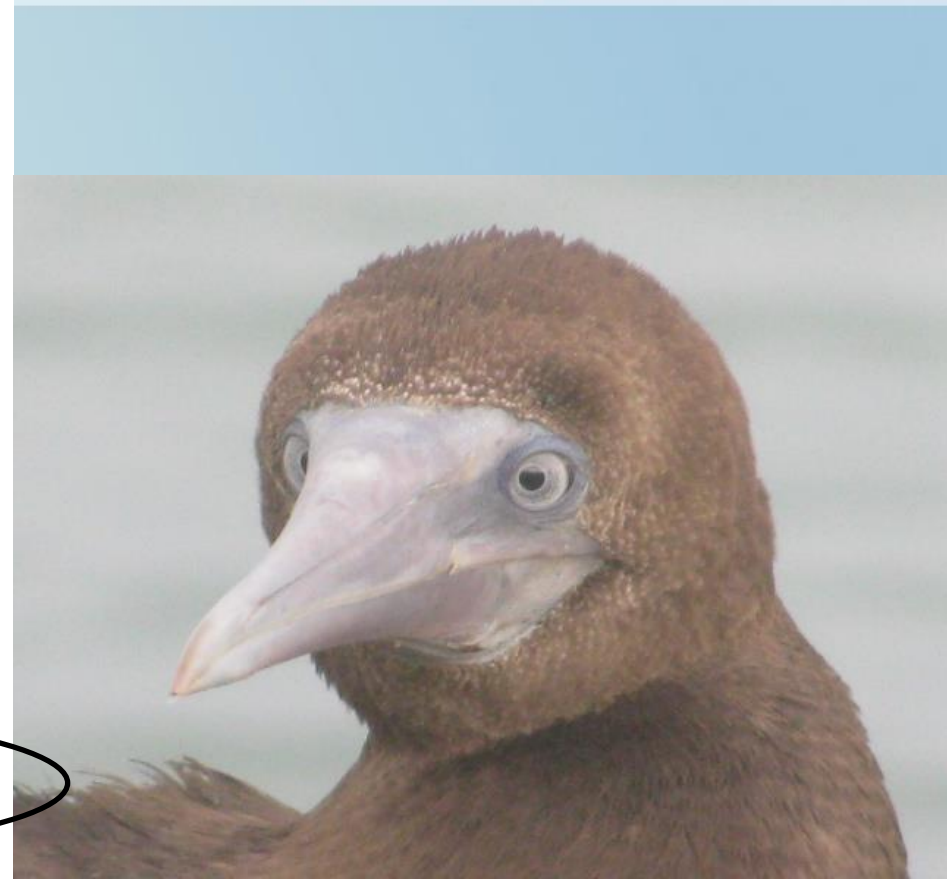
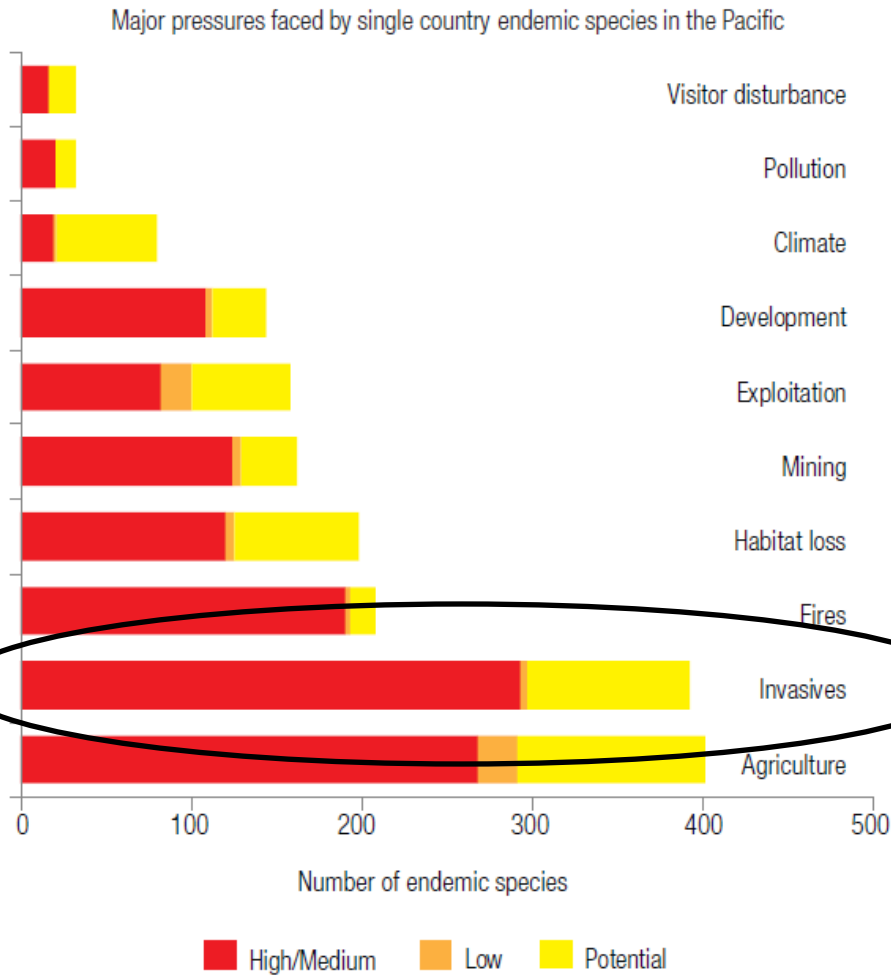


Figure P7.4 Ten most widespread invasive animal species recorded in 22 islands in the Oceania region

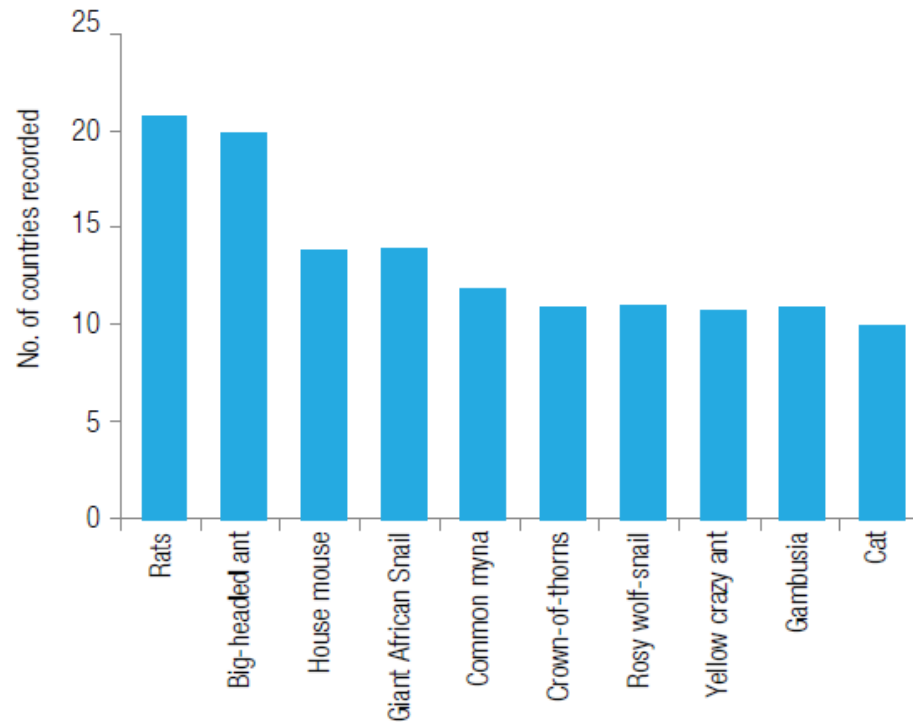
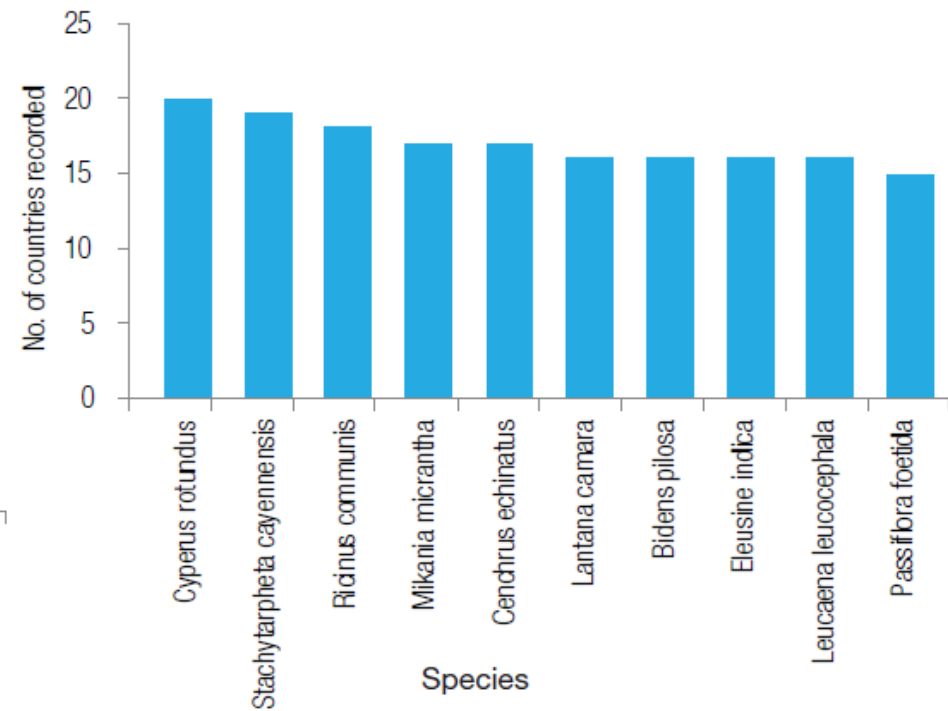


Figure P7.3 Ten most widespread Invasive plant species recorded in 22 islands in the Oceania region



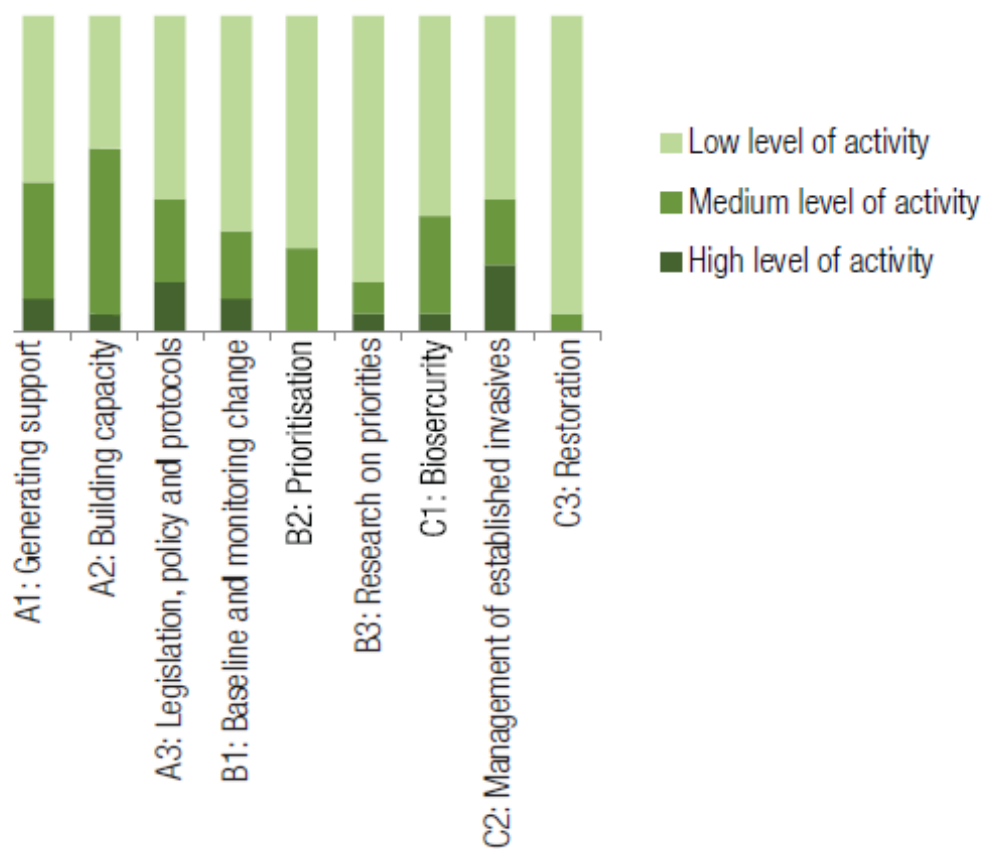
Pacific countries and territories share many of the same problem species and issues

Guidelines for Invasive Species Management in the Pacific



A Pacific strategy for managing pests, weeds and other invasive species

Figure R7.1 Levels of activity in the nine thematic areas of the Guidelines



Methods to Manage Invasive Species

Invasive species management options

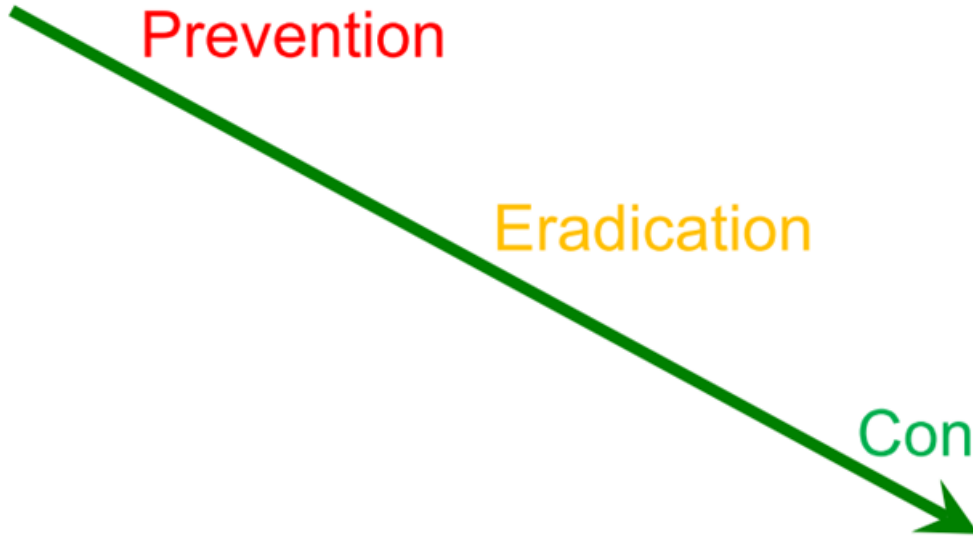
Most preferred

Prevention

Eradication

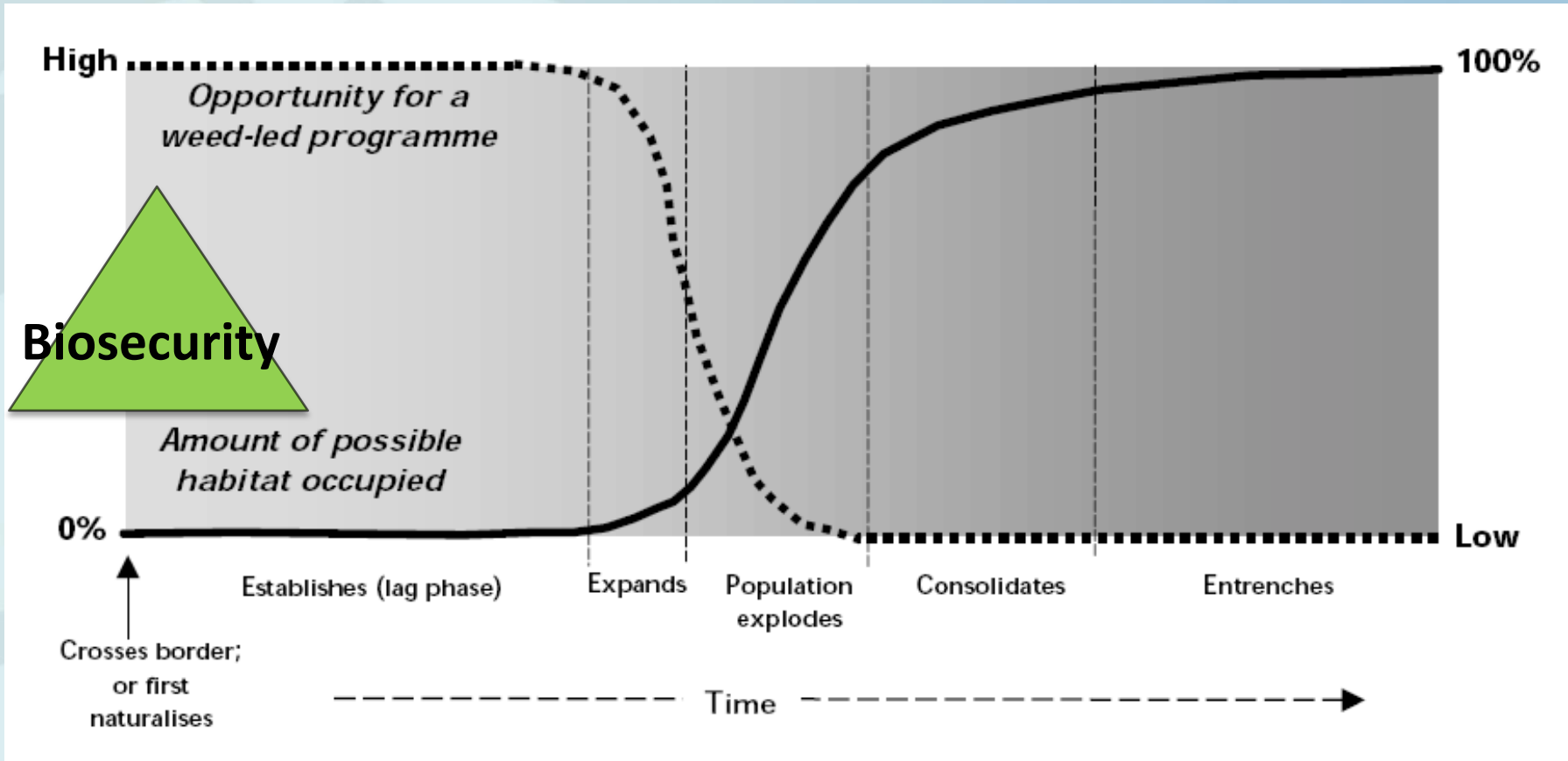
Control

Least preferred



Animals can walk plants cannot



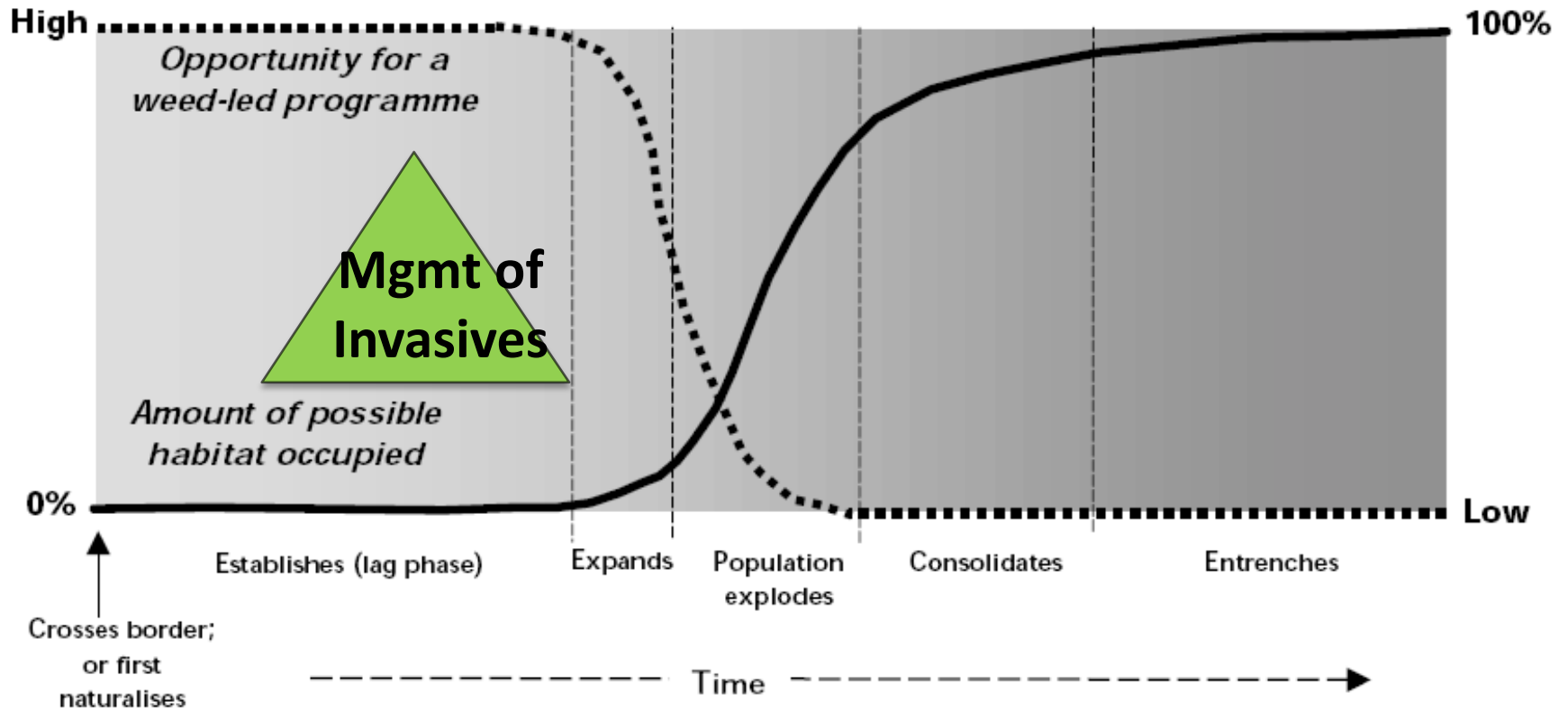


PROTECTION DES ÎLES CONTRE LES ESPÈCES ENVAHISSANTES

Législation & réseau de veille



Prevention
Early Detection Rapid
Response/Surveillance

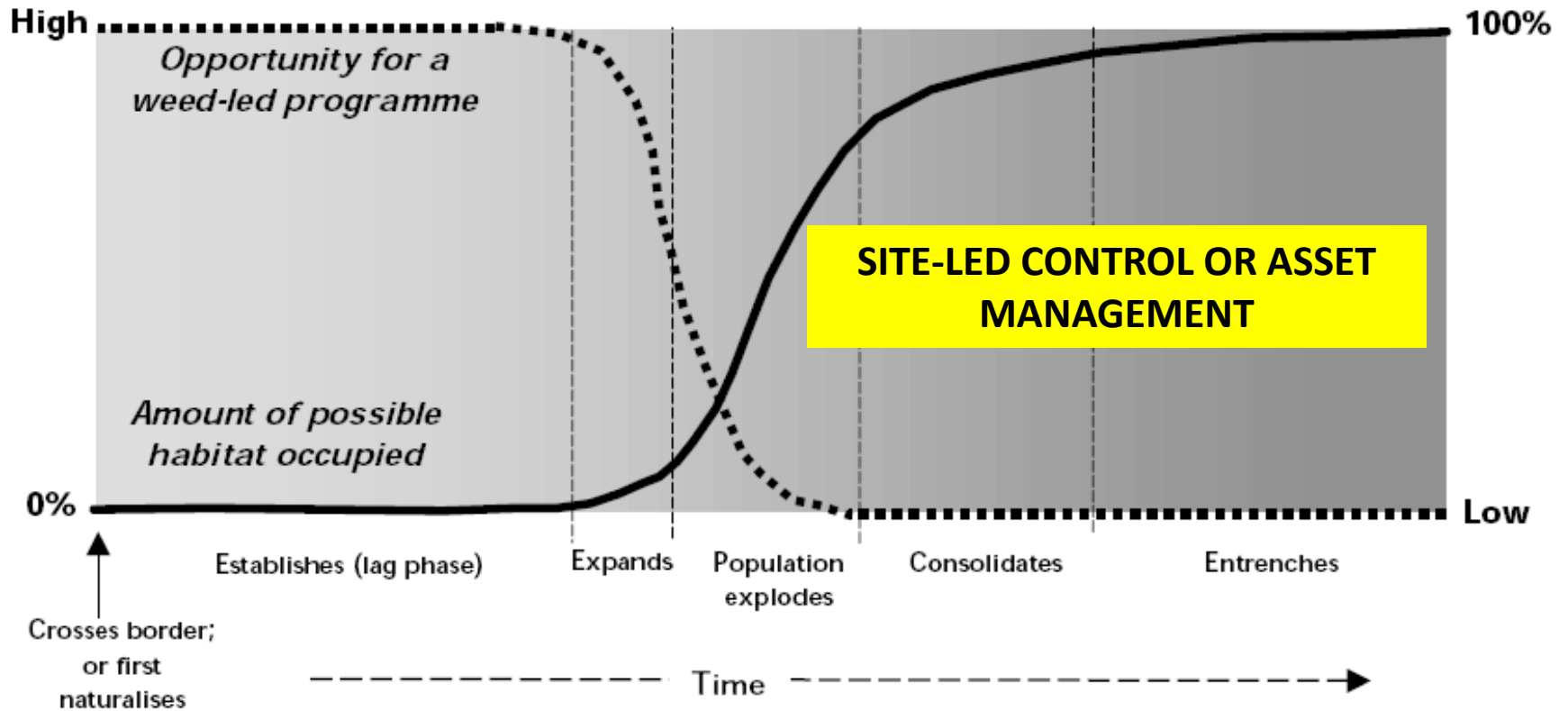




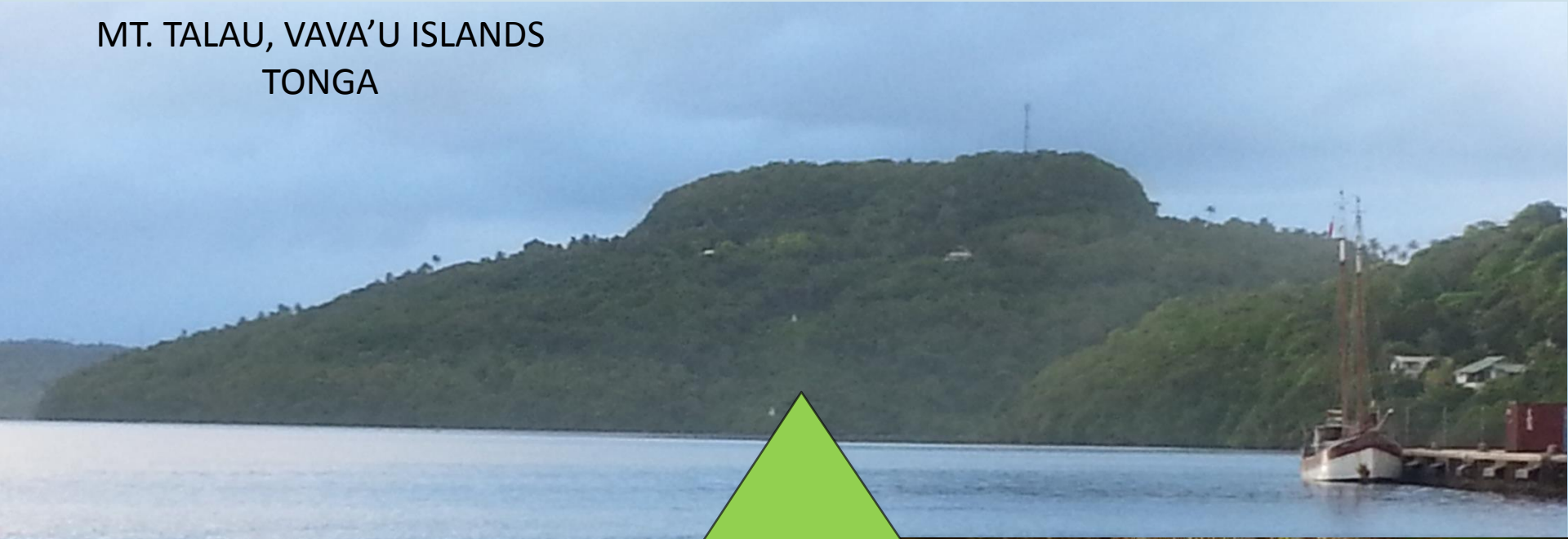
ERADICATION



Mgmt of Invasives

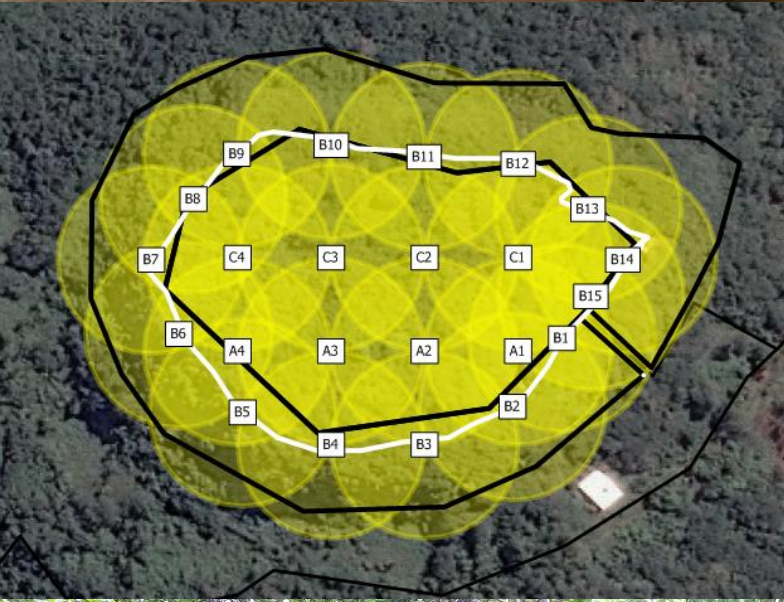


MT. TALAU, VAVA'U ISLANDS
TONGA



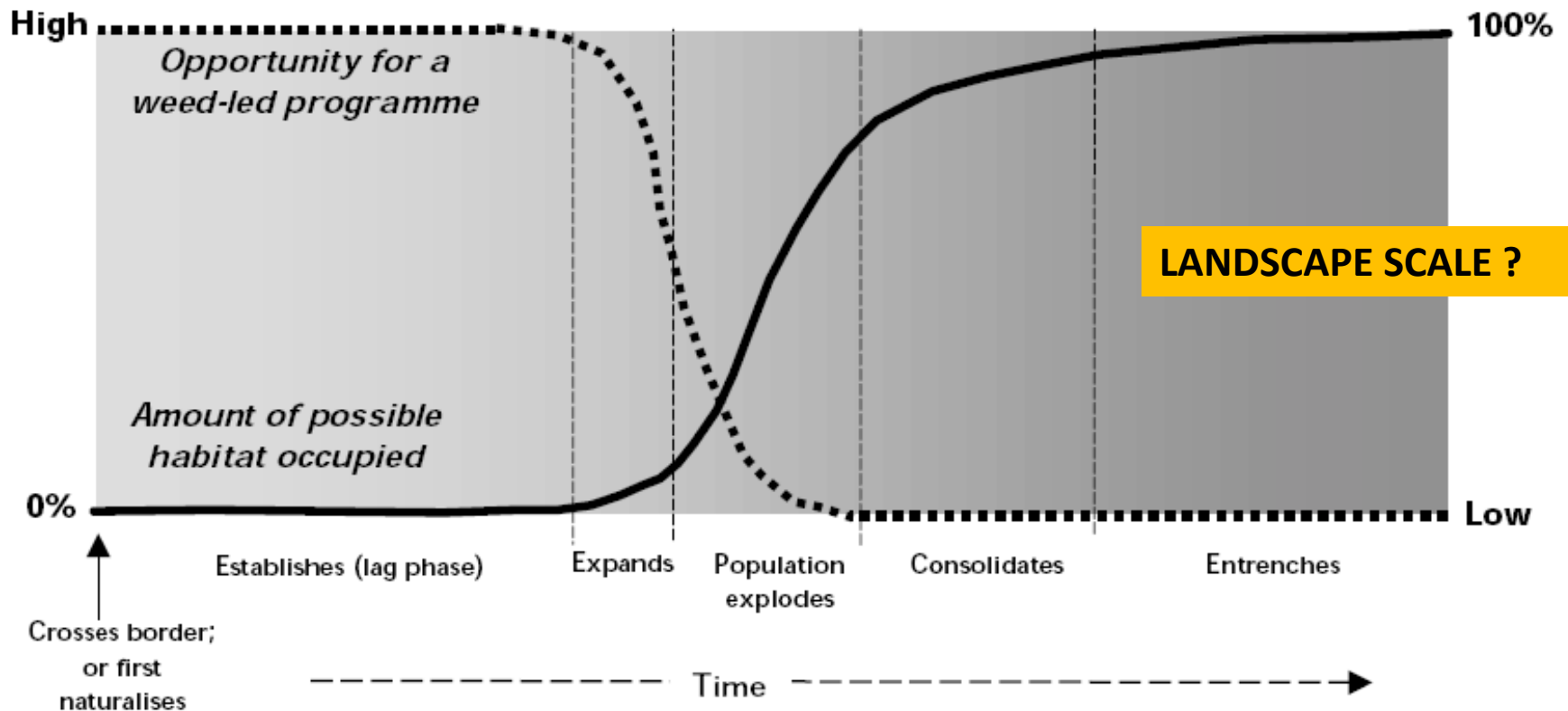
Restoration





Restoration





- When the invaded site or asset is at the landscape scale none of these solutions are feasible

CLASSICAL BIOCONTROL – the use of natural enemies

- Search the plants natural home for enemies that attack the plant and reduce its vigour or abundance to stop its spreading or reduce existing infestations to a level that you can live with (i.e. reduce the effects)
- Most often insects or fungi
- Test all related or useful plants found in the destination country to ensure the natural enemies are host specific
- Gain permission to release the natural enemies



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
	America Samoa	Cook Islands	Federated States	Fiji	French Polynesia	Guam	Kiribati	Marshall Islands	Nauru	New Caledonia	Niue	Northern Mariana	Palaos	Papua New Guinea	Pitcairn Island	Samoa	Solomon Islands	Tokelau	Tonga	Tuvalu	Vanuatu	Wallis and Futuna	Total Countries per			
1																										
40	<i>Lantana camara</i>																									21
41	<i>Lantana montevidensis</i>																									7
42	<i>Leptospermum scoparium</i>																									1
43	<i>Leucaena leucocophala</i>																									21
44	<i>Lehningia adcockiana</i>																									1
45	<i>Lygodium microphyllum</i>																									7
46	<i>Marrubium vulgare</i>																									1
47	<i>Medicago lupulina</i>																									1
48	<i>Muhlenbergia quinqueborvia</i>																									7
49	<i>Muhlenbergia mababotricum</i>																									5
50	<i>Niconia calvescens</i>																									3
51	<i>Niconia micrantha</i>																									20
52	<i>Nimora diplotricha</i>																									16
53	<i>Nimora pigra</i>																									1
54	<i>Opuntia dillenii</i>																									2
55	<i>Opuntia ficus-indica</i>																									1
56	<i>Opuntia monacantha</i>																									13
57	<i>Opuntia spp.</i>																									1
58	<i>Opuntia stricta</i>																									3
59	<i>Parasitanthus leptanthus</i>																									1
60	<i>Passiflora acutata</i>																									5
61	<i>Passiflora ligularis</i>																									3
62	<i>Passiflora alata</i>																									1
63	<i>Passiflora caerulea</i>																									2
64	<i>Passiflora coarctata</i>																									1
65	<i>Passiflora edulis</i>																									14
66	<i>Passiflora foetida</i>																									20
67	<i>Passiflora incarnata</i>																									1
68	<i>Passiflora luteiflora</i>																									10
69	<i>Passiflora ligularis</i>																									3
70	<i>Passiflora molliformis</i>																									11
71	<i>Passiflora pulchella</i>																									2
72	<i>Passiflora quadrangularis</i>																									12
73	<i>Passiflora rubra</i>																									2
74	<i>Passiflora suberosa</i>																									11
75	<i>Passiflora tomentosa</i>																									1
76	<i>Passiflora vitifera</i>																									2
77	<i>Pistia stratiotes</i>																									9
78	<i>Plantago major</i>																									13
79	<i>Pluchea carolinensis</i>																									12
80	<i>Pluchea odorata</i>																									7
81	<i>Prosopis juliflora</i>																									2
82	<i>Psidium cattleianum</i>																									10
83	<i>Rosa multiflora</i>																									1
84	<i>Rubus spp.</i>																									2
85	<i>Rumex crispus</i>																									4
86	<i>Rumex pulcherrimus</i>																									1
87	<i>Schinus molle</i>																									7
88	<i>Schinus torchiifolius</i>																									8
89	<i>Senna zaratonensis</i>																									11
90	<i>Sida acuta</i>																									18
91	<i>Sida rhombifolia</i>																									22
92	<i>Solanum mauritanicum</i>																									6
93	<i>Sonchus oleraceus</i>																									4
94	<i>Spathoglottis campanulata</i>																									20
95	<i>Taraxacum officinale</i>																									7
96	<i>Tecoma stans</i>																									18
97	<i>Troscartanus fluminensis</i>																									2
98	<i>Tribulus terrestris</i>																									8
99	<i>Tribulus terrestris</i>																									2
100	<i>Ulex europaeus</i>																									1
101	<i>Vaccellia nilotica subsp. indica (previously Accacia nilotica)</i>																									4
102	<i>Xanthium spinosum</i>																									3
103	<i>Xanthium strumarium</i>																									7
104	<i>Xanthoxylum</i>																									1
105	<i>Xanthoxylum (part of the Phyllanthaceae family)</i>																									1
106	<i>Xanthoxylum (part of the Phyllanthaceae family)</i>																									1
107	<i>Xanthoxylum (part of the Phyllanthaceae family)</i>																									1
108	<i>Xanthoxylum (part of the Phyllanthaceae family)</i>																									1
109	<i>Xanthoxylum (part of the Phyllanthaceae family)</i>																									1
110																										
111																										

Cheap as chips
What's available right now?



Novel or new species targets

- Pacific-wide *Merremia peltata* DNA analysis
- 5 species project in the Cook Islands

Current Projects

- GEFPAS Invasive Species Project
- Completed LFA project in French Polynesia
- TISSAP and implementation in W&F
- Creating GEF6 Invasive species project
- YCA in Tuvalu

JOIN THE FIGHT



**Protect our islands
from Invasive Species**