Risk assessment approach for identifying nature conservation management priorities (state/pressure/response model) for the Walpole Wilderness Area Management Plan.

INTRODUCTION:

One of the key steps in facilitating improved natural resource management is the assessment of the degree to which performance measures and targets achieve goals (ANZECC, 1997). Management plans require performance measures and targets for reporting purposes. These are also a source of focus for management actions. A more focussed risk assessment approach is used to identify, rank and compare key biophysical assets and threatening processes, so that management and performance monitoring can be directed to areas that protect assets of high public value, where pressures are high and/or where a management response is feasible. Setting priorities using this approach is not new, and has partially borrowed from the approach used for planning other state marine and terrestrial parks and by the State's Salinity Investment Framework (Department of Environment, 2003).

A number of principles underpin the risk assessment and priority setting:

- the process is a 'threat-based' approach to planning, and does not examine opportunities. It is a tool that is used as part of a mix of planning measures.
- the process is subjective, and outcomes may differ between individuals depending on their level of knowledge and the goals that people have for the various classes. The goal for a particular asset may differ for an individual who is looking from the state, regional or local perspective. The more that people can independently complete and input into the assessment, the greater will be the robustness of the assessment. The assessment process may benefit from input by an expert panel or informed public input.
- the process is indicative and can be used for various outputs. The outputs in this particular case are (i) to provide an indication of areas where Key Performance Indicators (KPIs) could be focussed, and (ii) to provide an overview/snapshot of the assets, pressures and feasibility of management actions.
- the process focuses on assessing and comparing environmental assets, and not social and economic assets.
- the process is robust enough to be adaptive in its application.
- the descriptions for the various characteristics (eg asset value) is difficult and not quantitative, and is split into a minimum number of categories for simplicity. The importance lies within the relativity between the categories when assessing the assets or pressures.
- more detailed risk assessment may be required for individual assets, pressures (eg dieback risk assessment) or areas, and this is better completed at the broader regional level outside of the management planning process.

METHODOLOGY:

The consideration of the three characteristics (assets, pressures and responses) can lead to identification of priorities for KPIs. One axis shows the ranking of asset items for their value, the second axis shows the ranking of the degree of pressure, and the third axis shows the ranking of the ability to address the pressures.

The highest priority for focussing KPIs would be for those assets with the highest value that have the most pressure but where the threats can be successfully managed. However, the process is not necessarily additive, and the matrix can also show important areas within the asset, pressure and feasibility assessments where it would also be of value to measure

performance. For example, it may be important to also focus on a high value asset that may be under less pressure.

The broad risk assessment approach involves scoring values and pressures for each asset, against a series of criteria in order to rank them. Scoring for each criterion is dependent on the expertise, knowledge and experience of the people involved in the assessment process. This will be robust if a sufficiently large group with a broad range of expertise and knowledge of the area is used. This approach, with all its inherent imperfections, provides at the very least a transparent expression of the logic and a record of the outcomes of the prioritisation process.

Highest priorities for management are those assets with high value and high pressure rankings. A feasibility assessment has been added to determine which pressures can be realistically managed. This matrix considers whether we have adequate knowledge and resources and the political will to ensure a successful management outcome. It also assesses if the asset being managed has the capacity to recover.

[A]. VALUES ASSESSMENT

Assets are valued because they assist people to achieve goals (Department of Environment, 2003). For example, rare flora has high value because it contributes to the goal of conserving biodiversity. The focus of this risk assessment tool is on the 'environmental' values of the natural resource assets in the planning area. However, criteria are included which consider the 'social' value of these assets. As the maintenance of healthy ecosystems generally underpins human use and not vice versa, the environmental values are intrinsically of greater importance than social values. This natural hierarchy is reflected in the greater number of environmental values relative to social ones.

Scoring for each criterion is based on a relative assessment of each value:
High score =3;
Medium score = 2;
Low score = 1.

The environmental values assessment criteria are:

National significance: An asset with unique attributes at the national scale that is recognized as significant will score high, such as Threatened Flora and Fauna, Owingup Swamp.

Regional significance: An asset with unique attributes at the regional scale that is recognized as significant will score high, such as Mt Frankland.

Areal extent/biomass: An asset of the planning area that is widespread/abundant in its distribution, such as jarrah woodland, will score high against this criterion. Those with relatively localised distributions will score low.

Habitat diversity: Assets with a high diversity of communities, habitats and species will score high. Those with few habitats or low species diversity will score low.

Vulnerability: Assets that are highly susceptible to degradation by natural events and/or human pressures will score high against this criterion and vice versa.

Condition: Assets that are in an undisturbed natural condition, with no identifiable alteration, will score high. Assets with some disturbance or degradation, but still maintaining natural species, will score medium. Those with significant alteration and loss of original structure will score low.

The social values assessment criteria are:

Cultural: Assets with existing or potential importance to the local, regional, national or international communities because of their indigenous, historical, traditional and aesthetic qualities will score high against this criterion.

Economic: Assets that have existing or potential economic importance will score high against this criterion. Examples would be any values that support or contribute to important commercial activities such as nature-based tourism.

Education/Scientific: Assets that have particular significance for scientific and educational study at local, regional, national and international scales will score high against this criterion.

Recreational: attributes that have existing or potential importance as resources for recreational activities will score high against this criterion.

A ranking matrix for various values is illustrated in Table 1. Overall ranking of values is determined through a summation of un-weighted criteria scores. It is considered that the predominance of environmental compared to social criteria provides sufficient weighting.

Table 1. Example of an Asset-Values ranking matrix

Value	Areal Extent/biomass	Habitat diversity	Vulnerability	Regionally Significant	Nationally Significant	Condition	Cultural Significance	Economic significance	Education/scientific significance	Recreational Significance	Total	Ranking
Ancient Paleochannels	2	1	1	3	1	1	3	1	2	1	16	M
Endemic Flora	1	2	3	3	2	3	2	2	3	1	22	M
Mangroves	1	3	2	3	3	3	1	3	3	2	24	H

Scoring: 3=High, 2=Medium , 1=Low.

The maximum total threat score is 30 and the minimum value is 10 (ie if each of the 10 values scores 1) so that a score of 10-16 represents a low overall threat, 17-23 is a medium threat and 24-30 is a high threat. The rank of H (high), M (medium) or L (low) is then placed in the ranking column, which relates to the rank of the total.

[B]. PRESSURE ASSESSMENT

Factors that pose a threat to each asset are identified and combined to provide an overall assessment of pressure. These can be natural physical and biological processes or those associated with human activities. Where objective information on human usage and its effects on values is limited, assessment of threats is largely subjective. The ranking is done by determining the relative likelihood and consequence of each threat using the following criteria:

Spatial scale: this criterion acknowledges that, the greater the spatial extent of a threat to each asset, the greater the management concern (i.e. widespread impacts versus localised impacts). Larger scale threats will score high for this criterion.

Temporal scale: this criterion acknowledges that threats that are on-going (i.e. chronic), or with high rate of spread, are generally of greater management concern than threats that are short-lived, or slow rate of spread. Chronic or high frequency threats will score high whereas low frequency threats will score low for this criterion.

Biological consequence: this criterion acknowledges that different threats have different biological consequences. A high biological consequence, affecting a large number of species or communities, will score high and vice versa for this criterion.

Social/political consequence: this criterion acknowledges that different threats have different social and political consequences. A high social/political consequence, with significant financial loss or social disturbance, will score high and vice versa for this criterion.

Probability: this criterion addresses the probability of a threat occurring within the time frame of the management plan. Existing pressures or a high probability that a threat will occur within 10 years will score high, in 10 – 20 years will score medium, and more than 20 years or with a low probability will score low.

Table 2. Example of an Asset-Pressure ranking matrix

Threat	Spatial scale	Temporal scale	Biological consequence	Socio/Political consequence	Probability	Total	Ranking
Ancient paleochannels	1	1	1	1	1	5	L
Endemic Flora	2	3	2	2	2	11	M
Mangroves	2	3	3	3	2	13	H

Scoring: 3=High, 2 =Medium , 1=Low.

The maximum total pressure score is 15 and the minimum value is 5 (ie if each of the 5 values scores 1), so that a score of 5-7 represents a low overall pressure, 8-11 is a medium pressure and 12-15 is a high pressure.

Threatening processes

The threats to natural resource assets in the planning area have been grouped according to management issues (after Wallace *et al.*, 2003). Only the most important or potential threat has been included:

1. Altered hydrological processes: includes impacts due to altered groundwater level due to clearing of vegetation, increased salinity and waterlogging, altered nutrient cycles, eutrophication, negative aspects of drainage, and soil and water acidification.

2. Introduced plants and animals: includes competitive impacts of noxious, declared and environmental weeds, and competitive and predatory impacts of feral and domestic animals on flora and fauna and their habitats.

3. Problem native animals and insects: Altered habitats or environmental conditions may lead to changes in species composition and outbreaks of some native species, which can

competitively exclude other species from food or shelter, eg twenty-eight parrots, scarab beetles

4. Disease: Impacts associated with loss of health of species or communities due to disease, such as *Phytophthora cinnamomi*, or due to outbreaks of new diseases or disorders.

5. Inappropriate fire regimes: Impacts associated with fire frequency, seasonality or intensity that are not conducive to long term survival and reproduction of all species present in a community, particularly for fire sensitive species.

6. Pollution: Includes impacts from chemical sprays used in operations eg herbicides, pesticides, fertilizers, fire retardants, surfactants and from spray drift from adjoining properties. Also includes impacts of oil and other chemical spills.

7. Competing land uses: Includes impacts associated with recreation and tourism, such as erosion of sand dunes, compaction of tracks, aversion of fauna from feeding, as well as off site impacts from adjoining properties, construction of infrastructure and public facilities, mining and exploration, wildflower and wildlife harvesting, firewood and timber cutting, and illegal activities.

[C]. RESPONSE ASSESSMENT

Once the assets have been evaluated and the pressures on each asset prioritized, then the feasibility of managing the threats to protect the asset needs to be considered. The criteria used to assess the feasibility of a successful response include:

Technical knowledge: A high level of knowledge and technical capacity to successfully manage the threat will score high. If the level of knowledge is being developed, and will be adequate within 10 years, then it will score medium. An inadequate level of knowledge to manage the threat will score low.

Availability of resources: If there are adequate resources presently available, then this will score high. If there are no resources and it is unlikely to secure the resources needed to manage the threat within 10 years, then it will score low.

Capacity to recover: Recovery potential can be measured in terms of stability (measured as the rate of recovery from a stress). Attributes with a high recovery potential will score high for this criterion and vice versa.

Socio-political capacity: Management actions that have a high level of social and political support will score high. If it is likely that this support will be available within 10 years, then it will score medium. Significant socio-political barriers to effective management will score low.

Established procedures: Where there are existing policies, guidelines and procedures in place to guide management, then this will score high and vice versa.

Table 2. Example of an Asset-Response ranking matrix

Threat	Technical knowledge	Availability of resources	Capacity to recover	Sociopolitical capacity	Established procedures	Total	Ranking
Ancient paleochannels	1	1	1	1	1	5	L

Endemic Flora	2	3	2	2	2	11	M
Mangroves	2	3	3	3	2	13	H

Scoring: 3=High, 2 =Medium , 1=Low.

The maximum total pressure score is 15 and the minimum value is 5 (ie if each of the 5 values scores 1), so that a score of 5-7 represents a low overall pressure, 8-11 is a medium pressure and 12-15 is a high pressure.

[D]. OVERALL ASSESSMENT

The priority for management actions indicates those areas where it would be important to focus on future performance measurement in the management plan (ie KPIs). The ranks for the asset, pressure and response assessments are then combined in a three-way matrix to **determine the priorities for management actions** based on asset value.

		Rank of asset value		
Rank of Consequence	**Rank of Feasibility**	**High**	**Medium**	**Low**
H	H	1	2	3
M	H	2	3	4
H	M	2	3	4
M	M	3	3	4
H	L	3	3	4
L	H	4	4	5
L	M	4	4	5
M	L	4	4	5
L	L	5	5	5

Apart from this comparative outcome, each assessment can also identify areas of higher importance where KPIs can also be focussed. Many planning processes often derive KPIs purely for state/condition/assets, pressures or response characteristics.

REFERENCES:

ANZECC (1997). Best practice in performance reporting in natural resource management. ANZECC Working Group on National Parks and Protected Area Management – Benchmarking and Best Practice Program. 34pp.

Department of Environment (2003). Salinity Investment Framework Interim Report – Phase 1. Department of Environment, Salinity and Land Use Impacts Series No. SLUI 32.

		ASSET/VALUE ASSESSMENT														PRESSURE ASSESSMENT								RESPONSE ASSESSMENT							
			ENVIRONMENTAL SIGNIFICANCE						SOCIAL SIGNIFICANCE								CONSEQUENCE							FEASIBILITY						PRIORITY
NATURAL RESOURCE	ASSETS	Nationally significant	Regionally significant	Areal extent/ biomass	Habitat Diversity	Vulnerability	Condition	TOTAL	Cultural significance	Economic significance	Education/scientific significance	Recreational significance	TOTAL	TOTAL VALUE	RANKING	THREATS	Spatial scale	Temporal scale	Biological consequence	Social/political consequence	Probabilty of impact	TOTAL THREAT	RANKING	Technical knowledge	Availability of resources	Capacity to recover	Socio/political capacity	Established procedures	TOTAL FEASIBILITY	RANKING	Priority for Management actions
Wilderness	Roe/Peak/Crossing/Long															Introduced plants and animals														
																Disease														
																Inappropriate fire regime														
	Wilmott/Quindinillup															Introduced plants and animals														
																Disease														
																Inappropriate fire regime														
	Nuyts															Introduced plants and animals														
																Disease														
																Inappropriate fire regime														
Geomorphology	Mt Frankland, Mt Roe, Mt Lindesay															Competing land use														
	Granite outcrops															Competing land use														
	Coastal limestone ridge															Competing land use														
																Introduced plants and animals														
	Coastal limestone reefs															Competing land use														
																Climate change														
																Pollution														
	Coastal dune systems															Competing land use														
																Introduced plants and animals														
Soils	Humus peaty podzols															Altered hydrology														
																Inappropriate fire regime														
																Climate change														
	Deep Karri loams and clays															Competing land use														
	Shallow gritty podzols with granite outcrops															Competing land use														
	Ironstone plateau sandy laterites															Competing land use														
	Calcareous coastal sand dunes															Competing land use														
																Inappropriate fire regime														
	Tamala limestone cliffs															Competing land use														
	Alluvial silts and loams															Altered hydrology														
																Competing land use														
Rivers	Shannon, Deep, Weld, Walpole, Mitchell rivers															Climate change														
																Competing land use														
																Introduced plants and animals														
	Denmark, Styx, Bow rivers															Altered hydrology														
																Introduced plants and animals														
																Competing land use														
																Pollution														
																Climate change														
																Fragmentation														
	Frankland, Kent, Hay rivers															Altered hydrology														
																Competing land use														
																Introduced plants and animals														
																Pollution														
																Climate change														
																Fragmentation														
Inlets	Walpole-Nornalup Inlets															Altered hydrology														
																Competing land use														
																Pollution														
																Climate change														
																Introduced plants and animals														
	Irwin and Parry Inlets															Altered hydrology														
																Competing land use														
																Pollution														
																Climate change														
																Introduced plants and animals														

		ENVIRONMENTAL SIGNIFICANCE							SOCIAL SIGNIFICANCE							PRESSURE ASSESSMENT	CONSEQUENCE							RESPONSE ASSESSMENT	FEASIBILITY							PRIORITY
NATURAL RESOURCE	**ASSETS**	Nationally significant	Regionally significant	Areal extent/ biomass	Habitat Diversity	Vulnerability	Condition	TOTAL	Cultural significance	Economic significance	Education/scientific significance	Recreational significance	TOTAL	TOTAL VALUE	RANKING	**THREATS**	Spatial scale	Temporal scale	Biological consequence	Social/political consequence	Probability of impact	TOTAL THREAT	RANKING	Technical knowledge	Availability of resources	Capacity to recover	Socio/political capacity	Established procedures	TOTAL FEASIBILITY	RANKING	Priority for Management actions
Wetlands	Owingup Swamp and Boat Harbour Lakes															Altered hydrology						0							0		
																Climate change						0							0		
																Introduced plants and animals						0							0		
	Mt Soho Swamps															Altered hydrology						0							0		
																Climate change						0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regime						0							0		
	Coastal swamps															Altered hydrology						0							0		
																Climate change						0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regime						0							0		
																Competing land use						0							0		
	Peat swamps															Altered hydrology						0							0		
																Climate change						0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regime						0							0		
	Groundwater															Altered hydrology						0							0		
																Climate change						0							0		
	Paleochannels															Altered hydrology						0							0		
	Coastal freshwater aquifers															Altered hydrology						0							0		
																Climate change						0							0		
																Pollution						0							0		
																Competing land use						0							0		
Flora	Declared rare and priority flora															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regime						0							0		
																Competing land use						0							0		
																Climate change						0							0		
																Fragmentation						0							0		
	Endemic, disjunct and relictual flora															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regime						0							0		
																Climate change						0							0		
																Fragmentation						0							0		
Fauna	Threatened and priority mammals - Chuditch, WRP, quokka, brushtailed phascogale, Western brush wallaby, quenda, wovlie, Western flase pipnestrelle bat, water rat.																					0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
	Threatened and priority birds - Western ground parrot, Baudin's black cockatoo, Carnaby's black cockatoo, Peregrine falcon, forest red-tailed black cockatoo, masked owl, crested shrike-tit																					0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
	Threatened and prioity frogs - Sunset frog, Nornalup frog															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Pollution						0							0		
																Fragmentation						0							0		
																Climate change						0							0		
	Threatened and priority invertebrates - Tingle Trapdoor spider, freshwater crustacean. *Engaewa walpoleii*															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
																Climate change						0							0		
	Endemic, disjunct and relictual fauna - fish, mammals, reptiles, frogs and invertebrates															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
																Climate change						0							0		
																Pollution						0							0		
	Migratory wetland and shoreline birds															Altered hydrology						0							0		
																Climate change						0							0		
																Pollution						0							0		

		ENVIRONMENTAL SIGNIFICANCE							SOCIAL SIGNIFICANCE							PRESSURE ASSESSMENT	CONSEQUENCE							RESPONSE ASSESSMENT	FEASIBILITY							PRIORITY
NATURAL RESOURCE	ASSETS	Nationally significant	Regionally significant	Areal extent/ biomass	Habitat Diversity	Vulnerability	Condition	TOTAL	Cultural significance	Economic significance	Education/scientific significance	Recreational significance	TOTAL	TOTAL VALUE	RANKING	THREATS	Spatial scale	Temporal scale	Biological consequence	Social/political consequence	Probability of impact	TOTAL THREAT	RANKING	Technical knowledge	Availability of resources	Capacity to recover	Socio/political capacity	Established procedures	TOTAL FEASIBILITY	RANKING	Priority for Management actions
Vegetation Communities	Granite Outcrop communities															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Climate change						0							0		
																Fragmentation						0							0		
	Wetland vegetation															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Climate change						0							0		
																Fragmentation						0							0		
	Riparian vegetation															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Climate change						0							0		
	Bryophyte/cryptogram communities															Inappropriate fire regimes						0							0		
																Climate change						0							0		
	Sphagnum communities in Tingle forest															Inappropriate fire regimes						0							0		
																Climate change						0							0		
																Introduced plants and animals						0							0		
	Coastal heathlands															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Fragmentation						0							0		
	Swamp heathlands															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Climate change						0							0		
	Ecologically mature ("old-growth") forest															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
	Tingle Forests															Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
																Climate change						0							0		
	Loamy Karri forests															Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
	Sandy laterite Jarrah woodlands															Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Disease						0							0		
																Competing land use						0							0		
	Banksia/Agonis woodlands															Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Disease						0							0		
	Islands															Introduced plants and animals						0							0		
																Competing land use						0							0		
																Climate change						0							0		
																Fragmentation						0							0		

			ENVIRONMENTAL SIGNIFICANCE							SOCIAL SIGNIFICANCE							PRESSURE ASSESSMENT	CONSEQUENCE							RESPONSE ASSESSMENT	FEASIBILITY							PRIORITY
NATURAL RESOURCE	ASSETS	Nationally significant	Regionally significant	Areal extent/ biomass	Habitat Diversity	Vulnerability	Condition	TOTAL	Cultural significance	Economic significance	Education/scientific significance	Recreational significance	TOTAL	TOTAL VALUE	RANKING	THREATS	Spatial scale	Temporal scale	Biological consequence	Social/political consequence	Probability of Impact	TOTAL THREAT	RANKING	Technical knowledge	Availability of resources	Capacity to recover	Socio/political capacity	Established procedures	TOTAL FEASIBILITY	RANKING	Priority for Management actions
	Areas of high flora species richness - shrub, herb and sedgelandsand mixed tingle forest Shannon River-Denmark															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Climate change						0							0		
	Centres of endemic, disjunct and relictual flora - between Frankland River and Denmark															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Climate change						0							0		
	Mt Lindesay- Little Lindesay Threatened Ecological Community															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Climate change						0							0		
	Reedia swamps threatened ecological community															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Competing land use						0							0		
																Climate change						0							0		
																Fragmentation						0							0		
	Coastal grasslands threatened ecological community- Quarrum															Introduced plants and animals						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
	Diverse ecotype zones															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
	Special fauna habitat areas - quokka, bristlebird, tammar wallaby, hooded plover, chuditch, wovlie															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Fragmentation						0							0		
	Aquatic fauna breeding areas															Altered hydrology						0							0		
																Introduced plants and animals						0							0		
																Disease						0							0		
																Competing land use						0							0		
																Pollution						0							0		
																Climate change						0							0		
	Drought refugia for wetland birds															Introduced plants and animals						0							0		
																Competing land use						0							0		
																Pollution						0							0		
																Climate change						0							0		
	Remnant vegetation															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Pollution						0							0		
																Fragmentation						0							0		
	Nature reserves															Introduced plants and animals						0							0		
																Disease						0							0		
																Inappropriate fire regimes						0							0		
																Competing land use						0							0		
																Fragmentation						0							0		