

# Parks and Wildlife Commission



Planning Services

# **Integrated Conservation Strategies (ICS)**



# Parks and Wildlife Commission

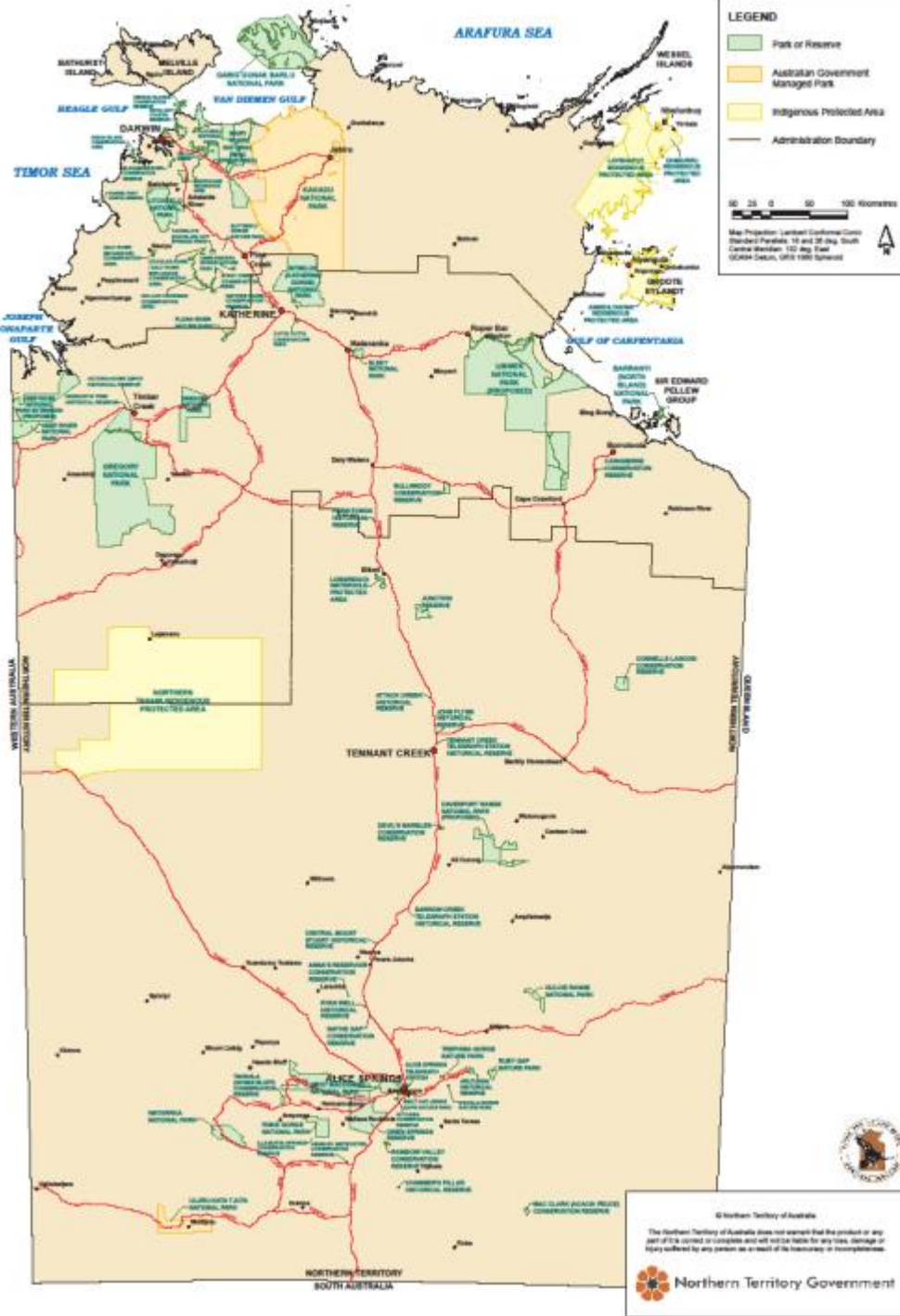
## Our Purpose:

To deliver high quality and sustainable environmental, cultural and visitor outcomes for Northern Territory parks, reserves and wildlife.

### 87 Parks and Reserves

### All Parks Are Not Equal

How do we get the best 'bang for buck'?



+ TRIAGE +



# Priority is based on a Park's Contribution to Biodiversity Conservation

## **(1) CAR Subcomponents – *contribution to a comprehensive, adequate and representative system of reserves.***

- *Representation of Bioregions (**Comprehensiveness**)*
- *Sole Representation of Bioregion*
- ***Adequacy of reservation of NT Vegetation Types***
- *No. of Vegetation Types included*
- ***Sole Representation of Vegetation Types***

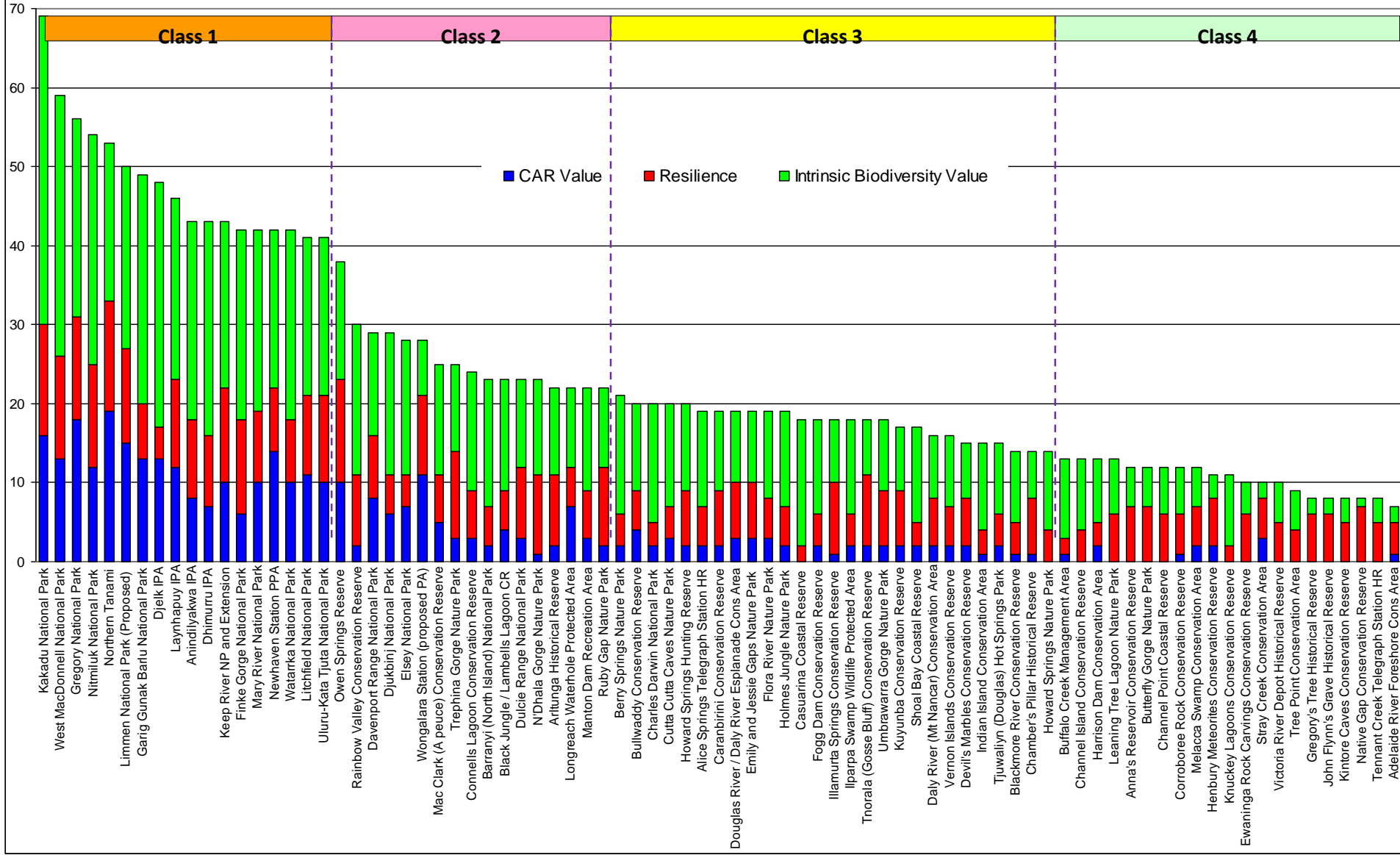
## **(2) Intrinsic Biodiversity Value Subcomponents**

- *Wetlands*
- *Wildlife Aggregations*
- *Reserve Endemicity*
- *Species Richness*
- *Threatened Species*

## **(3) Resilience Subcomponents**

- *Area / Shape Index*
- *Neighbouring Land Use*

# Priority for Biodiversity Management



# The PWCNT's Biodiversity Class 1

## Parks include:

- *West MacDonnell NP*
- *Garig Ganuk Barlu NP*
- *Finke Gorge NP*
- *Litchfield NP*
- *Nitmiluk NP*
- *Watarrka NP*
- *Limmen NP*
- *Gregory NP*
- *Mary River NP*
- *Keep River NP*

# Our most valuable for conservation.

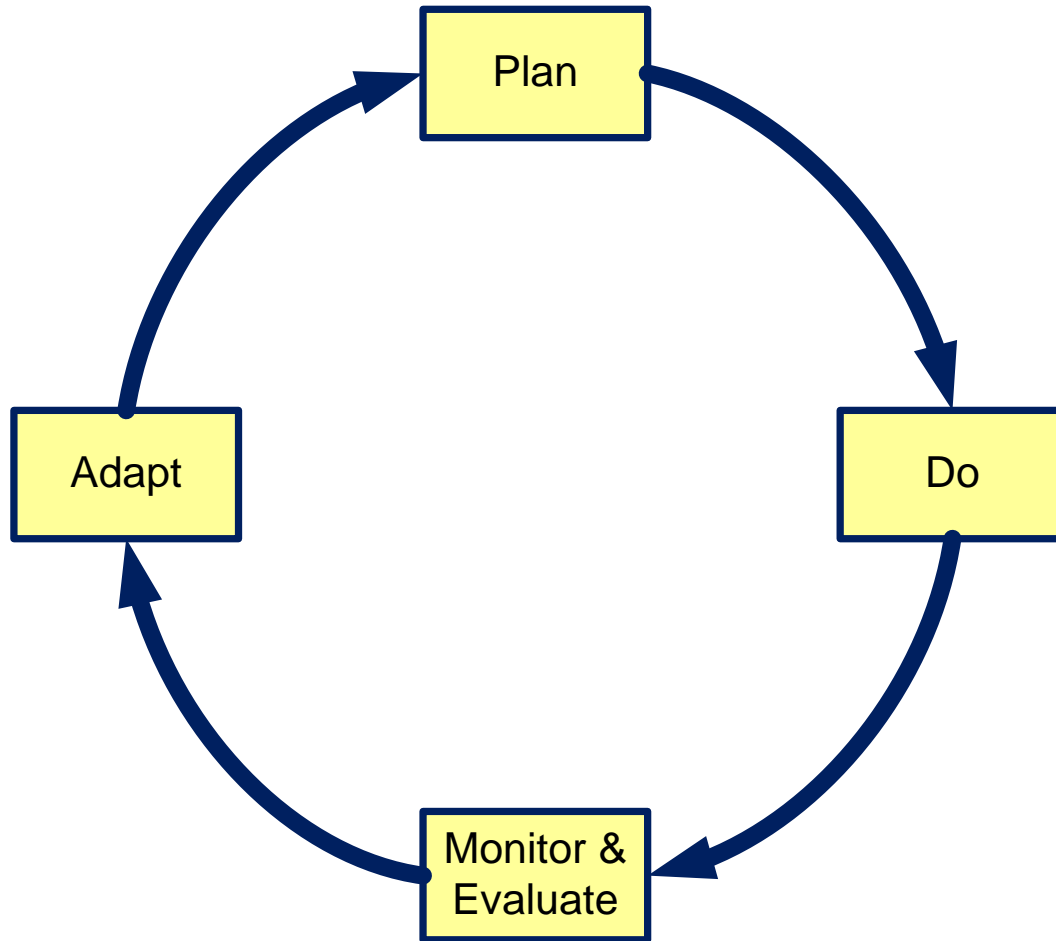
- 90% NT-managed protected area system.
- **Long-term objective is to maintain and improve known key values, and to maintain (and where possible improve) landscape condition through landscape-scale responses to threats.**
- Without holistic thinking and planning this overarching objective will probably fail .



Planning links **where I am**  
to  
**where I want to be**



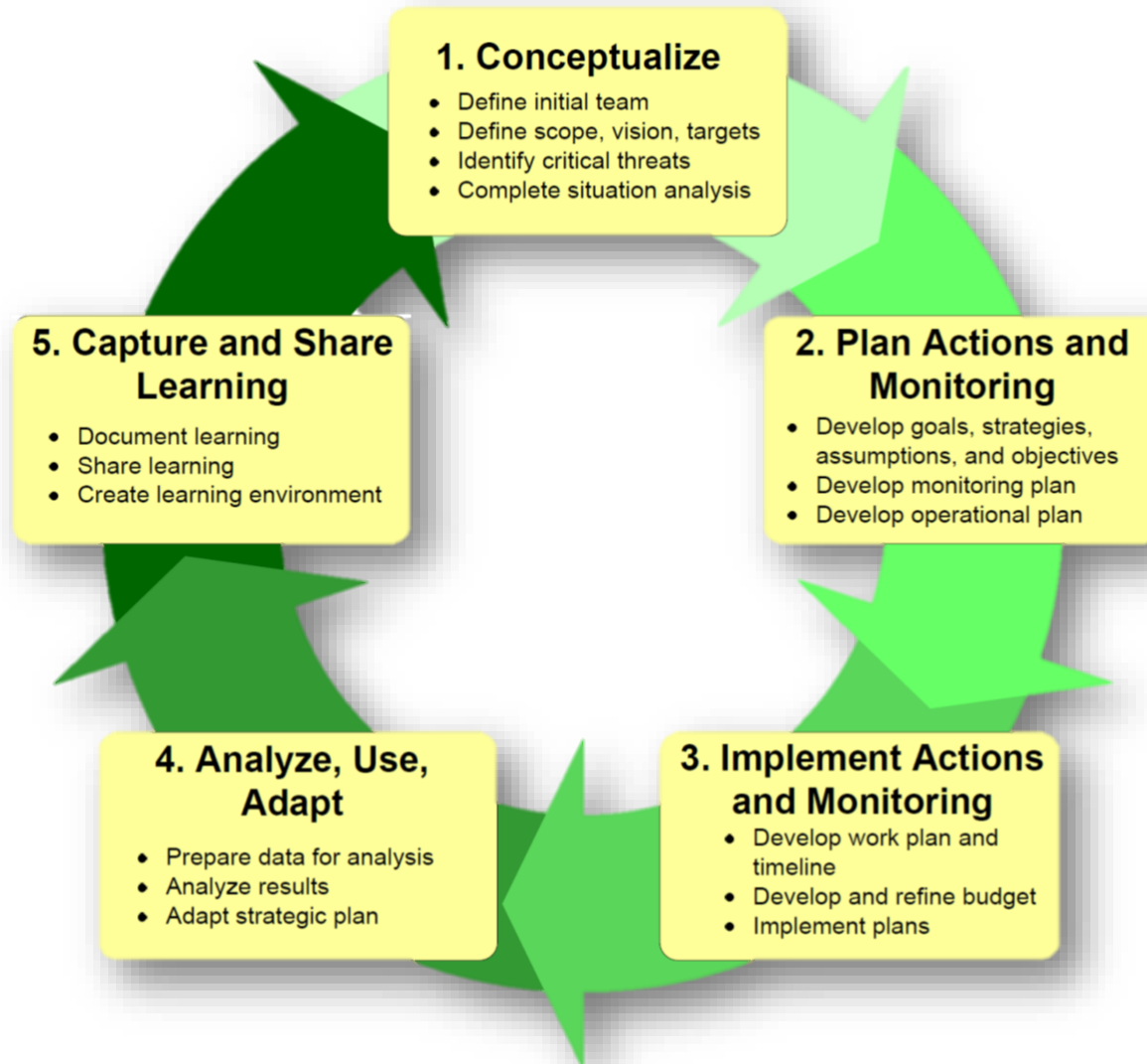
# Adaptive management based on project management cycle



Time	10 years
<b>Planning</b>	Statutory Plans
<b>Purpose</b>	Defines the Parks values/ what is most important;
<b>Review</b>	Sets vision and key directions for management;
<b>Reporting</b>	

1 year
Action Plans
Identifies & prioritises actions for implementation;
Defines inputs to achieve success
Annual Reports

# Open Standards

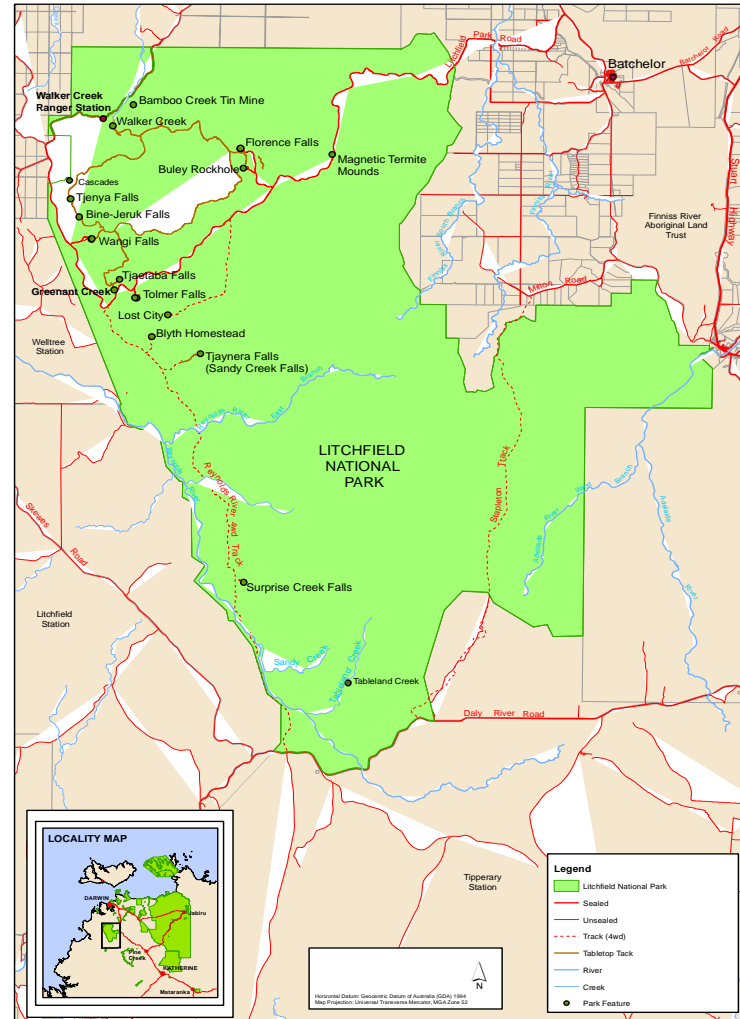


# The Adaptive Management Loop

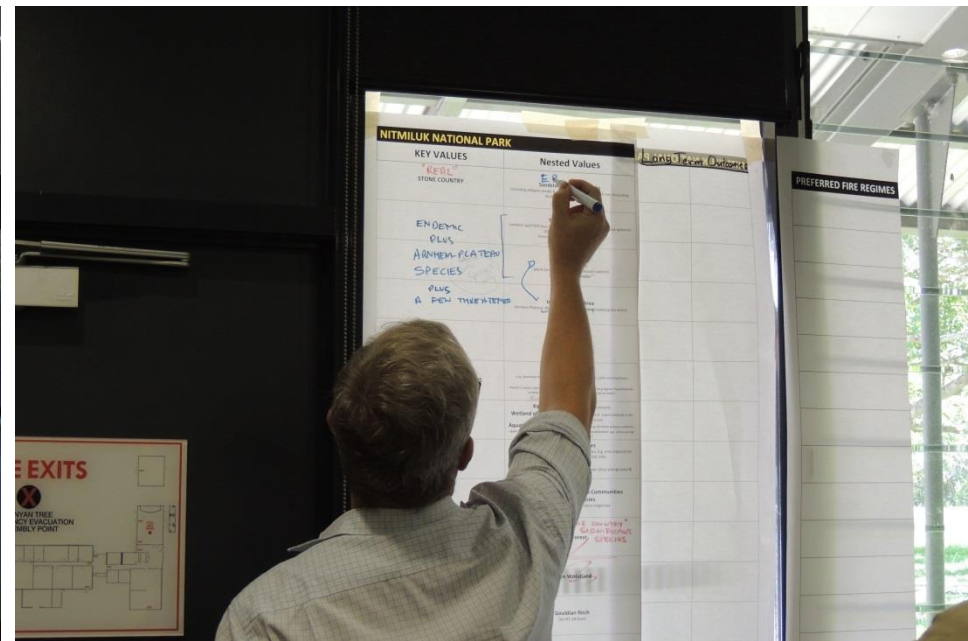


# Litchfield National Park

## Integrated Conservation Strategy (ICS)



# (STEP 1) DETERMINE THE PRIORITY CONSERVATION VALUES



Key Conservation Values	Nested values
<p><b>1. Sandstone Plateaus</b></p>	<p>Table Top Open Forest; Table Top Woodland; Sandstone Woodlands; Table Top Spring Communities; Dry Heathlands; Callitris Stands.</p> <p>Habitat for species of concern: <b><i>Cycas armstrongii</i></b> (VU NT) ; <b><i>Cycas calcicola</i></b> (PoM); <b>Northern Quoll</b> (EN Aus); <b>Northern Brush-tailed Phascogale</b> (VU NT); <b>Brush-tailed Rabbit-Rat</b> (VU Aus);</p>
<p><b>2. Monsoon Rainforest and Swamps</b></p>	<p>Monsoonal Forest; Riparian Forest; Upland Swamps; Sedge Communities; Wet Heathlands.</p> <p>Habitat of species of concern: <b>Mertens water monitor</b> (VU NT); <b>Arnhem Leaf-nosed Bat</b> (VU NT);</p>
<p><b>3. Melaleuca Woodlands</b></p>	<p>Melaleuca Woodlands; Drainage Woodlands</p> <p>Habitat for species of concern: <b>Floodplain monitor</b> (VU NT);</p>
<p><b>4. Lowlands and Alluvial Plains</b></p>	<p>Lowland Woodlands; Alluvial Grasslands.</p> <p>Habitat for species of concern: <b>Red Goshawk</b> (VU Aus), <b>Partridge Pigeon</b> (VU Aus);</p>



# (STEP 2) DETERMINING MEASURABLE INDICATORS OF HEALTH & (STEP 3) EVALUATE CURRENT & FUTURE STATE

LITCHFIELD NATIONAL PARK		LITCHFIELD NATIONAL PARK								
KEY VALUES	Nested Values	What tells us it's healthy (Attributes)	How do we measure it's health (Indicators)	Very Poor	Poor	Fair	Good	Current State	Achievable State	
SANDSTONE PLATEAU, EDGES & HILL SLOPES	HABITAT OF SPECIES OF CONCERN	SANDSTONE PLATEAU & HILLSLOPES	Veg Structure	Eye ball structure composition	dominant <i>Sorghum nasipifex</i> or only small clumps veg height low			large clumps <i>S. pifex</i> old growth high diversity or multiple sizes		
	SANDSTONE WOODLAND (+ CALLITRIS)		Species composition	Indicator species grevillea, callitris, boronia, caustic vine	None	Very few	Some	A variety of fire sensitive plants		
	TABLE TOP SPRING COMMUNITIES		Fire regime	Formal survey (photo point)	TO be determined					
DRY HEATHLANDS		NAFI	Area Freq.	> 150	40	30	20			
		Prop burnt per yr	Time since unburnt	Prop burnt/yr	Prop burnt/yr	Prop burnt/yr	Prop burnt/yr			
TABLE TOP OPEN FOREST	TABLE TOP WOODLAND / TABLE TOP OPEN FOREST	TABLE TOP O/Forest presence of midstorey	Proportion of sites with a diverse mid-storey	100%	65%	50%	35%			
		AREA BURNT PER YEAR % > 3yrs unburnt	AREA BURNT PER YEAR % > 3yrs unburnt	0% > 3yrs unburnt	10% > 3yrs unburnt	20% > 3yrs unburnt	30% > 3yrs unburnt			
MONSOONAL & RIPARIAN FOREST & UPLAND SWAMPS	HABITAT OF SPECIES OF CONCERN	MONSOONAL FOREST RIPARIAN FOREST UPLAND SWAMPS	Presence/disturbance from ferns	Proportion swamps/springs with no impact or significant impact	High proportion significant damage/disturbance of measured sites	Proportion of measured sites (Sign present)	High proportion with no significant of measured sites			
	MON SOONAL & RIPARIAN FOREST		Lack of damage/disturbance/change from weeds	weed presence/encroachment	full cover of weeds w. few natives	some weeds some natives	few weeds most natives	no weeds all natives		
	UPLAND SWAMPS			> 20%	10-20%	5-10%				

2019



## Litchfield National Park - Indicators for each Value

KEY VALUES	ATTRIBUTES	MEANS	INDICATORS	Very Poor	Poor	Fair	Good	CURRENT STATE	ACHIEVABLE STATE (2019)	
SANDSTONE PLATEAU, ESCARPMENTS & HILL SLOPES	Species composition Vegetation structure Fire Regimes Preferred fire regime - Obligate seeders (patchy burns and free of fire > 5 years)	On-ground/Field Measures (easily seen by Rangers)	Species composition – Eyeball indicator species (Grevillia, Callitrus, Boronia, Caustic Vine) against pre-set field templates	None – no fire sensitive plants in designated sites	Very few fire sensitive plants in designated sites	Some fire sensitive plants in designated sites	A variety of fire sensitive plants in designated sites	Very few fire sensitive plants	Some fire sensitive plants	
			Veg Structure – Eyeball structure & composition against pre-set field templates	Dominant sorghum, no spinifex – small clumps. Veg height low in designated sites	TBD	TBD	Large clumps of spinifex & old growth. High diversity of shrubs in multiple sizes in designated sites	Poor	Fair	
		Formal Survey	Fire plots, photo points, species survey (in development)	To Be Advised						
		Remote Measures - NAFI	NAFI – Area Burnt, Frequency, Time of Year, Patchiness? Intensity? (NB Intensity doesn't matter- seasonality), Years unburnt - Mosaic of fire ages (1) Proportion Burnt of Sandstone Plateau/Season	>50% Sandstone Plateau burnt/year	50%-30% Sandstone Plateau burnt/year	30%-20% Sandstone Plateau burnt/year	<20% Sandstone Plateau burnt/year	50%-30% Sandstone Plateau burnt/year	30%-20% Sandstone Plateau burnt/year	
			(2) Proportion of Sandstone Plateau Unburnt (Mosaic of fire ages) (ieTime since unburnt % > 5 years unburnt)	0% >5 years unburnt	<10% >5 years unburnt	<20% >5 years unburnt	>30% >5 years unburnt	10% >5 years unburnt	20% >5 years unburnt	
TABLE TOP OPEN FOREST	Species composition Vegetation structure Fire Regimes Preferred fire regime - Obligate seeders (patchy burns and free of fire > 5 years)	On-ground/Field Measures (easily seen by Rangers)	Species composition – Eyeball indicator species (Grevillia, Callitrus, Boronia, Caustic Vine) against pre-set field templates	None – no fire sensitive plants	Very few fire sensitive plants	Some fire sensitive plants	A variety of fire sensitive plants	Very few fire sensitive plants	Some fire sensitive plants	
			Veg Structure – Eyeball structure & composition against pre-set field templates	Dominant sorghum, no spinifex – small clumps. Veg height low.	Few	Some	Large clumps of spinifex & old growth. High diversity of shrubs.	Few	Some	
		Presence of a mid-storey – Proportion of sites with a diverse – mid storey.	100% mid storey burnt / year of measured sites	65% mid storey burnt / year of measured sites	50% mid storey burnt / year of measured sites	35% mid storey burnt / year of measured sites	65% mid storey burnt / year of measured sites	50% mid storey burnt / year of measured sites		
		Formal Survey	Fire plots, photo points, species survey (in development)	To Be Advised						
		Remote Measures - NAFI	NAFI – Area Burnt, Frequency, Time of Year, Patchiness? Intensity? (NB intensity doesn't matter- seasonality), Years unburnt - Mosaic of fire ages (1) Proportion Burnt Table Top Open Forest /Season	100% Table Top Open Forest burnt/year	65% Table Top Open Forest burnt/year	50% Table Top Open Forest burnt/year	35% Table Top Open Forest burnt/year	50% Table Top Open Forest burnt/year	50% Table Top Open Forest burnt/year	
(2) Proportion of Table Top Open Forest Unburnt (Mosaic of fire ages) Areas burnt per year % >3 yrs unburnt	0% >3 years unburnt		10% >3 years unburnt	20% >3 years unburnt	30% >3 years unburnt	20% >3 years unburnt	20% >3 years unburnt			
MONSOON RAINFOREST, RIPARIAN FOREST & UPLAND SWAMPS	Species composition Vegetation structure Feral Animals Weeds Fire Regimes Preferred fire regime – Fire Intolerant (no fire) – How successful are we of keeping fire out of these communities	On-ground/Field Measures (easily seen by Rangers)	Eye Ball Veg Structure/Composition (Photo Categories to develop) eg. Large Melaleuca fire damage to over storey.	To Be Advised						
			Ferals Presence/ disturbance / disturbance/change - Eye Ball Veg Structure/Composition Presence/ disturbance from Ferals – proportion of swamps with no impact or significant impact from feral animals	Significant prop swamps/springs with significant damage/disturbance of measured sites	Significant proportion swamps/springs with disturbance of measured sites	Significant proportion swamps/springs with feral sign in measured sites	Significant proportion swamps/springs with NO sign in measured sites	Significant proportion swamps/springs with feral sign in measured sites	Significant proportion swamps/springs with feral sign in measured sites	
			Weeds Presence/ disturbance / disturbance/change - Eye Ball Veg Structure/Composition Weed incursion, Ground coverage diversity.	Full coverage of weeds with few natives	Some weeds, some natives	Few weeds, most natives	No weeds all natives	Few weeds, most natives	Few weeds, most natives	
		Remote Measures - NAFI	Proportion of patches burnt	>20% proportion of defined patches burnt/year	>10-20% proportion of defined patches burnt/year	>5-10% proportion of defined patches burnt/year	0-5% proportion of defined patches burnt/year	>10-20% proportion of defined patches burnt/year	<5-10% proportion of defined patches burnt/year	
LOWLAND WOODLANDS AND ALLUVIAL PLAINS	Weeds Fire Regimes Structural diversity Preferred fire regime – Fire Tolerant North East Lowlands (Hazard Reduction Only)	On-ground/Field Measures (easily seen by Rangers)	Fire Regime - Field measurement/eyeball (presence of fire tolerant spp (hakea & euc)	None	Very Few	Some	Abundant	Very Few	Very Few	
			Weed incursions	Full coverage of weeds with few natives	Some weeds, some natives	Few weeds, most natives	No weeds all natives	Some weeds, some natives	Some weeds, some natives	
		Ferals Presence/ disturbance / disturbance/change - Eye Ball Veg Structure/Composition Presence/ disturbance from Ferals	Significant proportion swamps/springs with significant damage/disturbance of	Significant proportion swamps/springs with disturbance of measured sites	Significant proportion swamps/springs with feral sign in measured sites	Significant proportion swamps/springs with NO sign in measured sites	Significant proportion swamps/springs with feral sign in measured sites	Significant proportion swamps/springs with feral sign in		

# (STEP 4) EVALUATE & PRIORITISE THREATS





Figure 4. Park-Wide Threats

Priority	Threat
#1	<b>Wildfire</b>
#2	<b>Gamba Grass</b>
#3	<b>Inappropriate Fire Regimes</b>
#4	<b>Arson</b>
#5	Mission Grass
#6	Mimosa
#7	Humidicola
#8	Pigs
#9	Buffalo
#10	Cattle
#11	Olive Hymenachne
#12	Other weeds
#13	Cane Toads
#14	<b>Cats</b>



# (STEP 5) DEFINE SMART GOALS & OBJECTIVES USING MEASURABLE INDICATORS OF HEALTH

PRIORITY OF THREATS	Weed, Fire, Feral Mgt (SMART) Objectives	STRATEGIES
Wildfire #1	<p>20%<sup>?</sup></p> <ul style="list-style-type: none"> <li>No more than 15% of the Park burnt by high intensity wild fire per yr</li> </ul>	<ul style="list-style-type: none"> <li>Pre-season plan</li> <li>Work w. neighbours</li> <li>ACB's</li> <li>On-ground</li> <li>data gather / input</li> <li>Training - informed Level 1</li> <li>Firebreaks</li> <li>Foot</li> <li>vehicle</li> <li>Reporting</li> <li>watch NAFL</li> <li>wildfire control - mostly visitor related</li> </ul>
Cats & Cane toads #2	<ul style="list-style-type: none"> <li>Obtain more info on impacts</li> <li>Encourage research if permits come in</li> </ul>	<ul style="list-style-type: none"> <li>Be accommodating</li> <li>Drop the hint</li> <li>Reg. M. liaising with relevant stakeholders</li> <li>DLRM etc</li> <li>Trapping as req.</li> </ul>
Gamba	<ul style="list-style-type: none"> <li>Monitor &amp; eradicate</li> </ul>	<ul style="list-style-type: none"> <li>Liaise Weeds Branch on surveys</li> <li>Monitor survey points - visitor zone</li> <li>Install/monitor survey points - Lelign</li> </ul>
Staff & funding	<p>Maintain current staffing with the eye on increasing to achieve management objectives</p>	<ul style="list-style-type: none"> <li>Keep dialogue w. LT &amp; Board on staffing req.</li> </ul>
Current fire regime	<p>Maintain <del>not</del> current levels burning % ?? + early not late</p>	<ul style="list-style-type: none"> <li>Keep accurate records on what we do &amp; why</li> <li>Involve all staff in program</li> </ul>
Traditional knowledge	<p>More joint projects (Jawoyn Rangers + others)</p> <p>↳ walk Jatbula → art w. Elders</p>	<ul style="list-style-type: none"> <li>walk Jatbula w. Jawoyn</li> <li>joint burning projects</li> <li>Ask JA to help move people to do on country trips</li> </ul>
Ferals - pigs & buff	<ul style="list-style-type: none"> <li>Gain understanding of no's to work out a control program</li> <li>Liaise w. neighbours</li> </ul>	<ul style="list-style-type: none"> <li>Liaise w. DLRM to undertake survey (no's)</li> <li>Undertake targeted control (opportunistic)</li> <li>every 2-4 year</li> <li>Link w. reg. programs - Jawoyn &amp; K</li> </ul>
Access to Country	<ul style="list-style-type: none"> <li>More joint projects</li> </ul>	
New development	<ul style="list-style-type: none"> <li>Strong &amp; robust operational agreements</li> </ul>	<ul style="list-style-type: none"> <li>Cont. to liaise w. Reg. M on need for strong agreements</li> </ul>



# Sandstone Plateaus

## Conservation Targets for 2020

- Less than 30% of this habitat will burnt/year.
- More than 20% of this habitat remains unburnt over 5 years
- Rangers will observe “Fair” conditions for Fire Indicator Species in field assessments
- Rangers will observe “Fair” conditions for Burn Severity rates in field assessments
- Rangers will observe “Good” conditions for Gamba/Mission Grass Absence in field assessments
- Rangers will observe “Fair” conditions for Weeds absence in field assessments
- Rangers will observe “Fair” conditions for Feral Animal disturbance in field assessments.



# (STEP 6) EVALUATE STRATEGIC OPTIONS

THREATS TO THE PARK		( 1.) WILDFIRE	( 2.) GAMBA GRASS	( 3.) FIRE REGIMES	( 4.) ARSON	( 5.) MISSION GRASS	( 6.) MIMOSA	( 7.) HUMIDICOLA	( 11.) OLIVE HYMENACHNE	( 12.) OTHER WEEDS	( 8.) PIGS	( 9.) BUFFALO	( 10.) CATTLE	CA
PARK WIDE OBJECTIVES		No more than 20% of the Park burnt by High Intensity Wildfire per year	The spread of Gamba Grass across the Table Top <=2014 aerial survey estimates	Habitat Fire Regime Targets are met	The estimated number of arson caused ignitions >2014 estimates	The spread of Mission grass is contained to the western portion of the Park and <=2014 aerial survey estimates	The spread of Mimosa is contained to the Reynolds Catchment	Humidicola is eradicated from the Table Top and road corridors	The spread of Olive Hymenachne is contained & <=2014 aerial survey estimates	Observations of other weeds are documented and controlled within visitor areas	No visitors threatened. No complaints. Disturbance meets Habitat Field Assessment Targets	No visitors threatened. No complaints. Disturbance meets Habitat Field Assessment Targets	No visitors threatened. No complaints. Disturbance meets Habitat Field Assessment Targets	Ran grei und of c eco dist imp
	PARK VALUES	HIGHER PRIORITY STRATEGIES					MEDIUM PRIORITY STRATEGIES				LOWER PRIORITY STRATEGIES			
PARK INTEGRITY	PRIORITY 2. STRATEGIES – PARK INTEGRITY	<ul style="list-style-type: none"> <li>Protect the Park using Boundary and Internal Strategic Fire Breaks – Networks of strategic firebreaks will be created or reinforced                             <ul style="list-style-type: none"> <li>Establish bare earth firebreaks along boundary fence lines where possible</li> <li>Aerial Spray sections of the Eastern, Western and Northern boundaries with Glyphosate and pre-emergent</li> <li>Create Strategic Fire Breaks along roads, service tracks and 4WD tracks</li> <li>On-Ground burning Eastern and Western Boundary fire breaks</li> <li>Aerial burning all Boundaries and/or reinforce internal Fire Breaks - Aerial burning to follow-up On-Ground burning</li> </ul> </li> <li>Control fuel loads from infestations of Gamba Grass and Mission Grass on Road sides, existing service tracks / 4WD tracks and Gravel Pits to minimize Gamba Grass spreading onto the Table Top Range and Table Land Range.</li> <li>Aerial spray large gamba infestations – reduce loads from gamba grass along eastern escarpment.</li> <li>Gamba Grass eradication zone – all isolated and localised populations of gamba grass are eradicated in these zones.</li> <li>Gamba Grass containment zone – the further spread of Gamba Grass on the Table Top and Tableland Plateau is prevented in these zones. Containment involves preventing spread beyond the boundaries of core infestations too large to eradicate and controlling and eradicating outlying infestations (where visible)</li> </ul>									<ul style="list-style-type: none"> <li>Fence Maintenance - While undertaking chemical breaks.                             <ul style="list-style-type: none"> <li>High Priority Fences</li> <li>Low Priority Fences</li> </ul> </li> <li>Public Notification - Notify neighbour removal of cattle.</li> </ul>			
<p>Conservation Target for 2020:</p> <p>No more than 20% of the Park burnt by High Intensity Wildfire per year</p> <p>All known infestations of Gamba Grass are eradicated within the eradication zone.</p> <p>Gamba Grass infestations &lt;=2014 aerial survey estimates within the containment zone.</p>														

# (6) EVALUATE STRATEGIC OPTIONS (cont.)

THREATS TO THE PARK		( 1.) WILDFIRE	( 2.) GAMBA GRASS	( 3.) FIRE REGIMES	( 4.) ARSON	( 5.) MISSION GRASS	( 6.) MIMOSA	( 7.) HUMIDICOLA	(11.) OLIVE HYMENACHNE	( 12.) OTHER WEEDS	( 8.) PIGS	( 9.) BUFFALO	( 10.) OTHER	
PARK WIDE OBJECTIVES		No more than 20% of the Park burnt by High Intensity Wildfire per year	The spread of Gamba Grass across the Table Top <=2014 aerial survey estimates	Habitat Fire Regime Targets are met	The estimated number of arson caused ignitions >2014 estimates	The spread of Mission grass is contained to the western portion of the Park and <=2014 aerial survey estimates	The spread of Mimosa is contained to the Reynolds Catchment	<del>Humidicola</del> is eradicated from the Table Top and road corridors	The spread of Olive <del>Hymenachne</del> is contained & <=2014 aerial survey estimates	Observations of other weeds are documented and controlled within visitor areas	No visitors threatened. No complaints. Disturbance meets Habitat Field Assessment Targets	No visitors threatened. No complaints. Disturbance meets Habitat Field Assessment Targets	No visitors threatened. No complaints. Disturbance meets Habitat Field Assessment Targets	
	PARK VALUES	HIGHER PRIORITY STRATEGIES					MEDIUM PRIORITY STRATEGIES				LOWER PRIORITY STRATEGIES			
HABITAT MAINTENANCE	PRIORITY 3 STRATEGIES – HABITAT MAINTENANCE	<ul style="list-style-type: none"> <li>Habitat Strategic Fire Breaks – burns may be set around the boundary of nominated sensitive areas to minimise the chance of unwanted fires.</li> </ul>												
MONSOON RAINFOREST & SWAMPS <u>Conservation Targets for 2020:</u> <u>Fire</u> – Fire History: <5-10% proportion of habitat burnt within year. >80% >10 years unburnt. Habitat Field Assessments: Burn Severity rates Fair. Gamba/Mission Grass absence rates Good. <u>Weeds</u> – Habitat Field Assessment: Weed absence rates Fair <u>Ferals</u> - Habitat Field Assessment: Feral Animal disturbance rates Fair		<ul style="list-style-type: none"> <li>Create a mosaic pattern of fire breaks and patch burns consistent within preferred fire frequency thresholds –low intensity burning of ground fuels will be implemented using aerial incendiaries, vehicle and foot based on previous year’s fire scars and history.                             <ul style="list-style-type: none"> <li>Monsoon Thicket Rainforest, Upland Swamps, Sedges &amp; Wet Heathlands (Fire Intolerant Communities) Ideal Fire Frequency Thresholds within selected Fire Intolerant Communities:                                     <ul style="list-style-type: none"> <li>&lt;0-5% burnt per year</li> <li>&gt;90% &gt;10 years unburnt</li> </ul> </li> </ul> </li> </ul>												
SANDSTONE PLATEAUS <u>Conservation Targets for 2020:</u> <u>Fire</u> – Fire History: <30% Habitat burnt/year. >20% >5 years unburnt Habitat Field Assessments: Fire Indicator Species rates Fair Burn Severity rates Fair Gamba Mission Grass absence rates Good <u>Weeds</u> –Habitat Field Assessment: Weed absence rates Fair <u>Ferals</u> - Habitat Field Assessment : Feral Animal disturbance rates Fair		<ul style="list-style-type: none"> <li>Create a mosaic pattern of fire breaks and patch burns consistent within preferred fire frequency thresholds                             <ul style="list-style-type: none"> <li>Table Top Open Forest, Sandstone Plateau, Escarpments &amp; Hill-slopes (Obligate seeder communities) Ideal Fire Frequency Thresholds:                                     <ul style="list-style-type: none"> <li>&lt;20% burnt per year</li> <li>&gt;30% &gt;5 years unburnt</li> </ul> </li> </ul> </li> </ul>												
MELALEUCA WOODLANDS <u>Conservation Targets for 2020:</u> <u>Fire</u> - Fire History: <65% burnt/yr. >30%>3 year unburnt Habitat Field Assessments: Burn Severity rates Fair Gamba/Mission Grass absence rates Good		<ul style="list-style-type: none"> <li>Create a mosaic pattern of fire breaks and patch burns consistent within preferred fire frequency thresholds                             <ul style="list-style-type: none"> <li>Melaleuca Woodlands (Fire tolerant communities) Ideal Fire Frequency Thresholds:                                     <ul style="list-style-type: none"> <li>&lt;50% burnt per year</li> <li>&gt;40% &gt;3 years unburnt</li> </ul> </li> </ul> </li> </ul>					<ul style="list-style-type: none"> <li>Mimosa Control along the Reynolds River - Contract out the Mimosa Management Program. Contain Mimosa to the Reynolds Catchments. Outlying infestations will be recorded and controlled according to legislative requirements and available resources.</li> </ul>				<ul style="list-style-type: none"> <li>Ground Shooting - Ground shooting on an opportunistic basis by Parks</li> </ul>			



# (STEP 7) DEFINE A MONITORING & DATA MANAGEMENT FRAMEWORK FOR THE MEASURABLE INDICATORS OF HEALTH

## 1. REMOTE SENSING (NAFI)

- YEARLY ½ DAY (CHEAP)

## 2. RANGER FIELD MEASURES (Plots & CyberTracker)

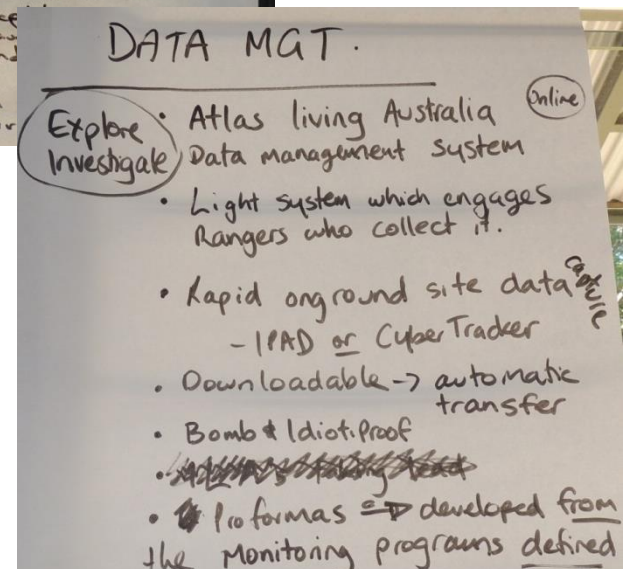
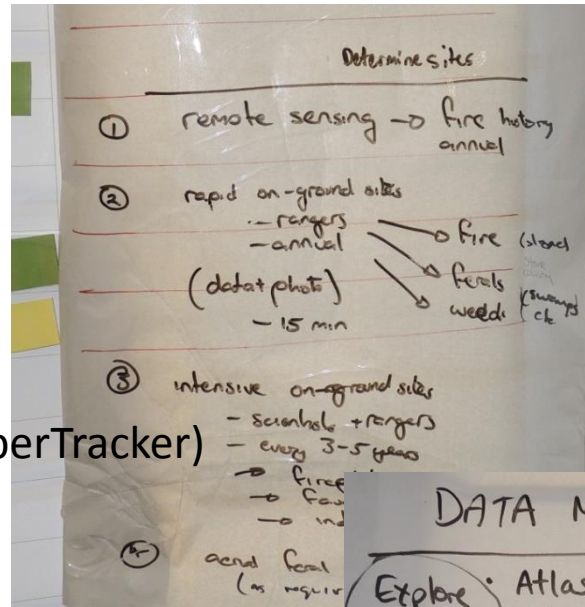
- YEARLY 3 DAYS (CHEAPISH)

## 3. INTENSIVE SCIENTIFIC PLOT SURVEYS

- 5 YEARS WEEKS (EXPENSIVE & EXTERNAL)

## 4. INTENSIVE AERIAL SURVEYS (Eg GAMBA)

- 5 YEARS (EXPENSIVE & EXTERNAL)





## What are our limitations?

### Litchfield National Park

= 16,100ha managed per ranger

### Ranger Time

In total, 1.8 ranger positions work on the parks biodiversity programs over 12 months. The break-down is as follows:

- **Fire**                      **0.8 of a ranger position per year**
- **Weeds**                    **0.5 ranger positions per year**
- **Feral Animals**        **0.3 of a ranger position per year**

### Budget

# Steps to create a monitoring framework

- How to make it real?
- Who does it? When does it happen? Where? How is it collated? How much time? What cost codes? Who is responsible? Who makes the decisions to change inputs? Who can help if its not working?

The image shows a handwritten monitoring framework on a grid background, organized into four rows corresponding to different habitats:

- TABLE TOP OPEN FOREST, SANDSTONE PLATEAU, ESCARPMENTS & HILLSLOPES:** FIRE SEVERITY, LAMBA WEEDS. Annotations: "ALL 18-12 sites", "12 year", "work program", "office", "need to develop", "14-15", "On the", "Ternate", "PERFORMANCE AGREEMENTS", "Entrench System".
- MONSOON RAINFOREST, BOGAWAN FOREST & UPLAND SWAMPS:** PERALS, WEEDS, FIRE SEVERITY. Annotations: "10-15 sites", "NEED TO BE TERNATE SITE", "Biodiversity cost code", "Entrench System", "Direction + Priorities".
- MALALEUCA WOODLANDS:** PERALS, WEEDS, FIRE SEVERITY. Annotations: "Good external support", "Standardisation".
- LOWLAND WOODLANDS AND ALLUVIAL PLAINS:** PERALS, WEEDS, FIRE SEVERITY.

At the bottom, there are two starburst notes:

- ★ NEED A GOOD ANNUAL REPORT TEMPLATE - MEANINGFUL
- ★ REVIEW IN 12 months Time the costs for the hours for monitoring

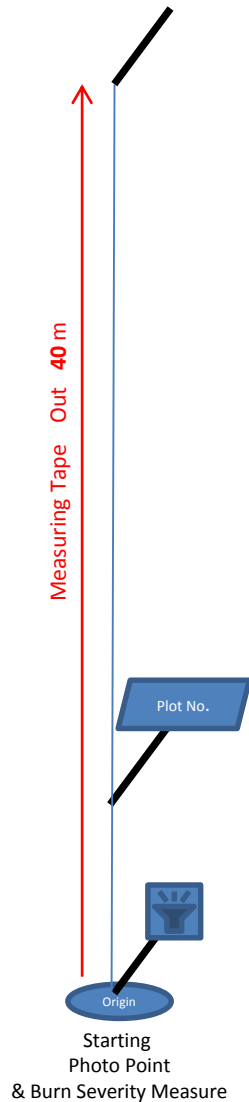


## Selecting sites for on-ground monitoring

- Suitable sites for on-ground monitoring?
- Double with existing work?
- Who does it?
- How often?
- When?

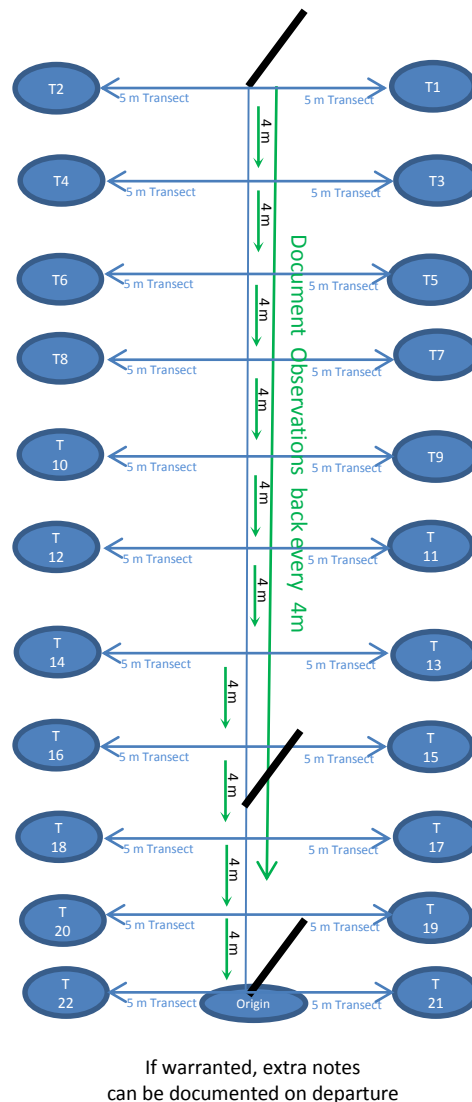


## Step 2.



## Step 1.

## Step 3.



## Step 4.

# ICS Field Monitoring Method

## Step 1. Find the Plot

- Document the plot number
- Take a photo of the plot along the origin
- Document the plots Burn Severity

## Step 2. Measure out 40m

- Using a tape measure, step out 40m along the origin
- Turn around and re-face the origin line

## Step 3. Document Observations Back

- Look to the LEFT first. Measure out 5m.
- Define / Visualise the Transect Line out to 5m
- Document observations which the line cuts through (not next to it)
- Look to the RIGHT second. Measure out 5m.
- Define / Visualise the Transect Line out to 5m
- Document observations which the line cuts through (not next to it)
- Walk out along the tape measure 4m to the next transect
- Repeat and document each transect returning along the origin

## Step 4. Withdraw the tape measure

- Document any extra notes if warranted
- Withdraw the tape measure and walk away

DECISIONS are dependent on this information  
Links value to them + the park.



## Attachment 1- Litchfield National Park –Ranger Field Monitoring Measures

KEY VALUES	2020 CONSERVATION TARGETS	INDICATORS OF HEALTH	METHODS OF MONITORING	Very Poor	Poor	Fair	Good
<b>SANDSTONE PLATEAUS</b>  <b>Obligate Seeders (patchy burns and free of fire ≥ 5 years)</b>  <b>18-12 x Monitoring Plots for the Table Top Open Forest Sandstone Plateau (x2-3 monitoring plots for each habitat)</b>	<b>FIRE</b>						
	Fire Indicator Species Habitat rates "Fair"	<b>FIELD MEASURE:</b> Fire-sensitive indicator species (To Be Determined) presence/absence in plot  <b>HABITAT MEASURE:</b> Proportion of Table Top/Sandstone Plateau plots with fire-sensitive indicator species	<b>Indicator species presence / absence measured standing at one point</b> looking across the entire plot (40mx20m in size), conducted at each plot;  Presence/absence also noted around the outside of the plot	<b>FIELD MEASURE:</b> No indicator species present.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate very poor for fire-sensitive indicator species presence.	<b>FIELD MEASURE:</b> Plot has defined indicator species present less than (≤) 5% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate poor for fire-sensitive indicator species presence. Less than (≤) 50% of plots rate Fair.	<b>FIELD MEASURE:</b> Plot has defined indicator species present less than (≤) 50% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate fair for fire-sensitive indicator species presence. Less than (≤) 50% of plots rate as Good.	<b>FIELD MEASURE:</b> Plot has indicator species present in greater than (≥) 50% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate good for fire-sensitive indicator species presence.
<b>NESTED VALUES</b> <ul style="list-style-type: none"> <li>Habitat of species of concern (including: <i>Cycas armstrongii</i> (VU NT) and <i>Cycas calcicola</i> (PoM), Northern Quoll (EN Aus), Northern Brush-tailed Phascogale (VU NT), Brush-tailed Rabbit-Rat (VU Aus))</li> <li>Table Top Open Forest</li> <li>Table Top Woodland</li> <li>Sandstone Woodlands</li> <li>Table Top Spring Communities</li> <li>Dry Heathlands</li> <li>Callitris Stands</li> </ul>	Burn Severity Habitat rates "Fair"	<b>FIELD MEASURE:</b> Burn severity (Edwards, 2009) within Table Top/Sandstone Plateau plot  <b>HABITAT MEASURE:</b> Proportion of Table Top/Sandstone Plateau plots with a set assessment of fire effect on vegetation	<b>Burn severity measured standing at one point</b> looking across the entire plot (40x20m in size), conducted at each plot	<b>FIELD MEASURE:</b> High to Extreme Burn Severity – Complete Scorch or Char- all ground is affected by fire; - all mid-storey canopy leaves are scorched; - all upper-canopy leaves are charred / scorched  <b>HABITAT MEASURE:</b> Greater than (≥) 50% plots with high to extreme fire damage.	<b>FIELD MEASURE:</b> Moderate Burn Severity – Scorch Height ≥2m - all ground material is affected by fire; - leaf scorch height ≥2m but ≤ 5m; - all or most mid-storey canopy is scorched; - upper canopy may be partially scorched  <b>HABITAT MEASURE:</b> Greater than (≥) 50% plots with moderate fire damage. And less than (≤) 50% plots with high to extreme fire damage.	<b>FIELD MEASURE:</b> Low Burn Severity – Scorch Height ≤2m - ground material is partially / all affected by fire; - height of scorched leaves is no higher than 2m  <b>HABITAT MEASURE:</b> Less than (≤) 50% plots with moderate fire damage, the remainder with No Burn, Patchy or Low fire severity. And no plots with high to extreme fire damage	<b>FIELD MEASURE:</b> No Burn or Patchy Burn Severity – Scorch Height ≤2m - ground - A patchy fire of low severity where the ground material was not all affected by fire; height of scorched leaves is no higher than 2m  <b>HABITAT MEASURE:</b> Less than (≤) 25% plots with moderate fire damage, the remainder with No Burn, Patchy or Low fire severity. And no plots with high to extreme fire damage.
	Gamba Mission Grass Absence Habitat rates "Good"	<b>FIELD MEASURE:</b> Gamba and Mission grass (annual & perennial) presence / absence transect within a Table Top/Sandstone Plateau plot  <b>HABITAT MEASURE:</b> Proportion of Table Top/Sandstone Plateau plots containing gamba & mission grasses	<b>Gamba Grass or Mission Grass presence / absence transect at each plot</b> (40x20m in size), walking along the 40m length of a plot and stopping every 4m (10 stops measured at every plot); presence / absence across the 20m width of the plot; Presence/absence also noted around the outside of the plot	<b>FIELD MEASURE:</b> Plot has Gamba or Mission Grass present, which is occurs in greater than or equal to (≥) 10% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate very poor for Gamba Grass or Mission Grass presence.	<b>FIELD MEASURE:</b> Plot has Gamba Grass or Mission Grass present, which occur in less than (≤) 10% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate poor for Gamba Grass or Mission Grass presence. Or less than (≤) 50% of plots rate Fair.	<b>FIELD MEASURE:</b> Plot has Gamba Grass or Mission Grass present, which occur in less than (≤) 5% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate fair weed presence. Or less (≤) 100% plots rate as Good.	<b>FIELD MEASURE:</b> Plot has Gamba Grass or Mission Grass present, which occur in less than (≤) 5% of stops.  <b>HABITAT MEASURE:</b> 100% of plots rate good for Gamba Grass or Mission Grass presence
< 30% of the Sandstone Plateaus is burnt within year. > 20% of the Sandstone Plateaus remains unburnt over 5 years	<b>REMOTE SENSING – NAEL &amp; Landsat</b>	<b>Annual fire history and fire scar data</b> downloaded, mapped and analysed. Arson Ignition Points recorded in GIS.	Habitat burnt within the year is greater than (>) 50%. 0% of Habitat with more than (>) 5 Years unburnt	Habitat burnt within the year is between 50-30%. Less than (<) 10% of Habitat with more than (>) 5 Years unburnt	Habitat burnt within the year is between 30-20%. Less than (<) 20% of Habitat with more than (>) 5 Years unburnt	Habitat burnt within the year is less than (<) 20%. Less than (<) 30% of Habitat with more than (>) 5 Years unburnt	
	<b>WEEDS</b>						
Weed Absence Habitat rates "Fair"	<b>FIELD MEASURE:</b> Other weeds presence / absence transect within a Table Top/Sandstone Plateau plot  <b>HABITAT MEASURE :</b> Proportion of Table Top/Sandstone Plateau plots containing other weeds	<b>Weed presence / absence transect measured at each plot</b> (40x20m in size), walking along the 40m length of a plot and stopping every 4m (10 stops measured at every plot); presence / absence across the 20m width of the plot; Presence/absence also noted around the outside of the plot	<b>FIELD MEASURE:</b> Plot has weeds present, which occur in greater than (≥) 50% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate very poor for Weed presence.	<b>FIELD MEASURE:</b> Plot has weeds present, which occur in less than (≤) 50% of stops.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate poor for weeds presence. Or less than (≤) 50% of plots rate Fair.	<b>FIELD MEASURE:</b> Plot has less than (≤) 5% of stops with weeds.  <b>HABITAT MEASURE:</b> Greater than (≥) 50% of plots rate fair weed presence. Or less (≤) 100% plots rate as Good.	<b>FIELD MEASURE:</b> Plot has No (0%) of stops with Weeds present within the plot.  <b>HABITAT MEASURE:</b> 100% of plots rate good for weed presence.	
	<b>REMOTE SENSING – NERP (CDU/DLRM) Aerial Surveys</b>	<b>Other weed observations – Olive <i>Hymenachne</i>, Mimosa NERP (CDU/DLRM) Aerial Surveys</b>	TBD	TBD	TBD	TBD	
<b>FERALS</b>							
Feral Animal Disturbance Habitat rates "Fair"	<b>FIELD MEASURE:</b> Feral animal disturbance presence / absence transect within a Table Top/Sandstone Plateau plot	<b>Feral animal disturbance presence / absence transect measured at each plot</b> (40x20m in size), walking along the 40m length of a plot and stoppage every 4m (10 stops measured at	<b>FIELD MEASURE:</b> Plot has greater than (≥) 50% of stops with feral animal disturbance.	<b>FIELD MEASURE:</b> Plot has less than (≤) 50% of stops with feral animal disturbance	<b>FIELD MEASURE:</b> Plot has less than (≤) 5% with feral animal disturbance.  <b>HABITAT MEASURE:</b> Greater than (>) 50% of	<b>FIELD MEASURE:</b> Plot has No (0%) of stops with feral animal disturbance.  <b>HABITAT MEASURE:</b> 100% of plots rate good	

# (STEP 8) REPORTING, GOVERNANCE & REVIEW FRAMEWORK

- Governance & Review Framework
- Purpose + Indicators + Targets = 5 year cycle?
- How do we make this resilient?

Support & Leadership - Strategic Level - How to keep it working?	
Why do these things fail?	<p><u>Replicable</u>            Relevant to <u>risk Mgt</u> - senior officers responsibilities.            Link KPI of Park with Senior Staff. <u>KPIs</u></p>
What support is needed to make it resilient?	<p>Tight feedback mechanisms of reporting to staff to public to senior staff.            Engage - Staff feedback loop, Public &amp; stakeholders, Senior Politicians.            Field Test &amp; review &amp; tweak &amp; Adjust. <u>Public Engagement</u> - highlight the value.            Sell the results → <u>Promote</u>.  <u>KCS + Targets to be endorsed &amp; signed off by Leadership Team</u></p>
Ideal structure? • What its role?	<p><u>@ Park level</u></p> <pre>           graph TD             DM[District Mgr.] --&gt; TfTs[Tf/Ts]             DM --&gt; Driver[Driver - care duties.]             DM --&gt; PC[Project coordinators]             TfTs --&gt; W((W))             TfTs --&gt; F((F))             TfTs --&gt; Fire((Fire))             TfTs --&gt; PG[Planning GIS]           </pre>
<ul style="list-style-type: none"> <li>• Who needs to contribute to it?</li> <li>• How do they contribute?</li> <li>• When do they contribute?</li> <li>• Who pays for it?</li> <li>• What cost codes?</li> <li>• Who administrates?</li> <li>• Who coordinates?</li> <li>• Who manages communication?</li> <li>• Who is Responsible?</li> </ul>	<p>Review in 12 months.  <u>12 months REVIEW</u> - EARLY DECEMBER</p>
<p><u>Set up costs</u>            3 star project - ? - Site No.s</p>	<p>Next 12 months → Rationalising Plots - next few weeks (L)            - Next 12 months (N)</p>

# The Adaptive Management Loop



# What's next?

***Litchfield NP - completed***

***Nitmiluk NP - completed***

***Finke Gorge NP – draft circulated with participants***

***Watarrka NP – draft soon to be circulated***

***Garig Ganuk Barlu NP – In process***

***Limmen NP – In process***

***West MacDonnell NP - In process***

***Gregory NP – 2016?***

***Mary River NP - 2016***

***Keep River NP – 2017?***

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## Planning Services

The Planning Services Division provides professional advice, support, and services for the Commission.

- park planning and policy,
- land administration,
- spatial data management,
- performance monitoring and reporting, and
- supporting major programs such as joint management, at the policy level.