SECTION 2
PROGRAMS

- Addressing Threats
- Supporting Ecologically Sustainable Development
- Managing Environmental Assets
- Making it Happen

Jim Jim Falls in 'the wet', Kakadu National Park, Parks Australia

ADDRESSING THREATS

- **Program 1:** Harnessing fire
- **Program 2:** Controlling weeds at the catchment scale
- **Program 3:** Reducing feral animal impacts
- **Program 4:** Strengthening biosecurity surveillance and response
- **Program 5:** Understanding climate change

Bushfire, Michael Barritt

Program 1: Harnessing fire

The aim of 'Harnessing Fire' is to support coordinated fire management to strengthen culture, protect biodiversity, maximise production and abate greenhouse gas emissions.

Fire mapping and monitoring will continue to inform adaptive fire management, and be improved to allow more accurate assessment of the areas that have been burnt and those that need burning. Ecological and cultural work will be undertaken to identify appropriate fire regimes for maintaining landscape health. This program will contribute to the health of Aboriginal culture by increasing opportunities for Indigenous people to work on country.

The issue

Fire is a natural part of the Territory. Aboriginal people have used fire for millennia, so that fire is important for maintaining species and habitats. However, changes in land use and species have meant fire is not and cannot be managed as it was in the past. Fuel loads have decreased in some areas because of grazing by domestic and feral livestock, but increased in areas where exotic grasses have become dominant. Fewer people traversing the country and burning patchily as they go means that late dry season wildfires in the north can burn out hundreds of square kilometres of native vegetation and pasture and in central Australia extensive summer fires burn out the country in years following good rainfall. These large-scale fires can eliminate species such as small mammals, reptiles and ground-dwelling birds from vast areas. They can also have a devastating impact on pastoral enterprises. Rarely life-threatening in the past, fire hazard is now dangerously high in some areas that have been invaded by introduced grasses. Burning vegetation is the Territory's main source of greenhouse gas emissions.

Management of fire requires accurate information on the impacts of fires, where fires have burnt in the past, the condition of fuel, and the success of efforts invested in fire management. Much of this information in the north is being provided by the North Australian Fire Information (NAFI) website, but as fire managers become more adept they are demanding better, faster and more accurate information.

Coordinated approaches to fire management are needed to ensure that fire is harnessed so that it positively shapes environmental conditions for biodiversity, maintains pastoral productivity, moderates our greenhouse gas emissions and provides ongoing employment opportunities for Indigenous Territorians, and in so doing, strengthens cultural connections to the land.

What we plan to do

This program supports better coordination of fire management in each of the four NRM regions in the Territory, each with a different emphasis relevant to its people, environments and industries. In line with the philosophy of this plan, these activities will be developed in collaboration with, and based on the aspirations of, the relevant stakeholders and their representative bodies.

MA-01 will support better coordination of fire management in Arnhem Land, by providing opportunities to build and share knowledge and experience, and to improve communications across remote areas. It will also increase the number of Indigenous rangers employed in fire management, and build in more targeted biodiversity and cultural benefits to fire management. **MA-02** will promote understanding among landholders about fire as a land management tool and encourage more strategic and collaborative fire management in the Gulf Savanna region. **MA-03** will support collaborative efforts to manage fire on the Barkly Tablelands to reduce wildfires, improve pastoral productivity or protect conservation values. **MA-04** will support efforts by Aridlands managers, especially Traditional Owners, to extend their fire management efforts in order to restore and protect cultural values, biodiversity condition and pastoral productivity, and to improve relations between adjacent landholders with different approaches to fire management. It emphasises the need for a collaborative approach across the region by extending the work into adjoining states.

It is important for approaches to fire management to be based on the best available information. Accordingly, it is important to collect new information to fill current knowledge gaps on the best ways to burn. **MA-05** will provide ongoing support for the North Australian Fire Information program for it to provide an essential service to fire managers of the Northern Territory and the rest of northern Australia. It will also see the development of new user-driven functions, including fire-mapping products that can be used in portable GPS devices, and higher resolution mapping to assist in fire management of fire-sensitive vegetation communities and cultural sites. Better information is also required about the impacts of fire on cultural and ecological values, and the best ways to burn to maintain these values.

MA-06 therefore aims to improve our knowledge of how sensitive species and country respond to different fire regimes, allowing best fire management approaches to be adopted for maintaining landscape health.

The Harnessing Fire program will benefit from management actions in other programs that support fire management training (**MA-81**) and capacity (**MA-82**), and the general pursuit of economic opportunities provided by the conservation economy (**MA-29 & MA-30**). Several management actions in this program are also essential for pursuing savanna-burning greenhouse gas abatement (**MA-32**).

Targets/Management Actions (MAs)

Fire-1 By 2030, Territorians are working together to manage fire, based on knowledge of cultural, biodiversity and production values, threats and the best management options

Fire-1.1 By 2015, collaborative landscape-scale fire management is being undertaken in all NRM regions

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)***	**Priority**
MA-01	Strengthen collaborative fire management in Arnhem Land	TE*	H
MA-02	Support collaborative fire management in the Gulf Savanna region	GS	H
MA-03	Improve coordination and management of wildfires on the Barkly Tablelands	BT	M
MA-04	Support fire management in central Australia	AL	VH
See also:			
MA-29	Investigate, progress and communicate emerging NRM-based economic opportunities on Aboriginal and pastoral lands (with emphasis on the conservation economy)		
MA-30	Participate in national, Northern Territory and regional initiatives to develop carbon market programs		
MA-32	Support greater involvement in savanna-burning greenhouse gas abatement programs		
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management		
MEASURES OF ACHIEVEMENT			
•	No. of collaborative regional fire management programs		
•	No. of people and organisations involved in collaborative regional fire management programs		
•	Trends in fire extent and seasonality in areas with collaborative fire management programs		

Fire-1.2 By 2015, fire occurrence across the Territory is being monitored using remote sensing, and reported, together with implications for greenhouse gas emissions

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-05	Maintain and extend the North Australian Fire Information website	NT	VH
MEASURES OF ACHIEVEMENT			
•	Trends in fire extent and seasonality monitored and reported (at regional-scale and for project areas)		
•	Improvements made to North Australian Fire Information website in response to user needs		
•	Frequency and extent of fire mapping available at 30 m pixel resolution		
	Trends in fire-related greenhouse gas emissions monitored and reported (at regional-scale and for project areas)		

Fire-1.3 By 2015, fire management is being informed by regionally-appropriate cultural and environmental considerations

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-06	Develop fire regimes based on culturally important and/or fire-sensitive indicators	NT	VH
MEASURES OF ACHIEVEMENT			
•	No. of regional action plans in which optimum fire regimes (frequency, patchiness, intensity, season etc) based on cultural and environmental considerations have been developed		
•	No. of regions implementing optimum fire regimes		

*Region codes TE: Top End, GS: Gulf Savanna, BT: Barkly Tablelands, AL: Arid Lands, CM: Coastal Marine, NT: NT wide.

Weeds awareness, Ian Rowbottom

PROGRAM 2: Controlling weeds at the catchment scale

The 'Controlling weeds at the catchment scale' program supports the coordination and on-ground management of significant weeds in the Northern Territory.

Specific management actions address priority weeds identified at the national or Territory level, namely Gamba Grass (and other high fuel load grasses), as well as Mimosa, Parkinsonia, Bellyache Bush and Athel Pine. Four emerging weed threats are also addressed - Neem, African Mahogany, Prickly Acacia and Mesquite. The program also addresses weed issues that were identified to be of concern through community consultation - Rubber Bush on the Barkly Tablelands and Mexican Poppy in the Arid Lands. The program emphasises sustained, strategic management, using evidence-based approaches, and ensuring all efforts are monitored, with the results being used to inform future control efforts. It also emphasises the importance of collaborative efforts and the sharing of resources and information about weeds, their occurrence and their control.

'Greening Australia NT (GANT) recognises that we need healthy, diverse and productive landscapes – underpinned by our native vegetation. We believe this will only be achieved by engaging the community in vegetation management. The INRM plan has provided a robust and structured approach to ensuring we get the NRM priorities right and direct critical resources to these priorities. GANT welcomes the revised plan and looks forward to an active involvement in the on-ground actions.'

Dr Greg Leach, CEO, Greening Australia NT.

The issue

Weeds have had a significant, and in some cases irreversible, impact on the Northern Territory's natural environment and its agricultural industries.

Although native plants dominate most of the Territory landscape, exotic plants are now a major component of some environments. Among the worst weeds in the Territory are 12 that are recognised as 'Weeds of National Significance' (WoNS). These include Olive Hymenachne and Athel Pine, as well as Mimosa and 'prickle bushes' (Parkinsonia, Prickly Acacia and Mesquite). Additional weeds that are considered highly problematic in the Territory include Bellyache Bush and Gamba Grass. Gamba Grass, along with several other introduced grasses, has been classified by the Australian Government as a 'key threatening process' to biodiversity conservation. These grasses change the environment by out-competing native plants, increasing fire hazards and preventing native vegetation from growing back after fire, clearing or other disturbances. It is possible to spend an enormous amount on weed management, so it is important to make sure any investment made is effective. The cheapest and most effective option, but often the hardest to justify, is to prevent weeds from becoming established before they cause significant loss to environmental values or agricultural production, and not only become expensive, but often impossible, to eradicate.

For already established weeds, the most strategic approach is to remove isolated weed infestations and to begin controlling larger infestations at their source - most often at the upstream end of catchments. Although some weeds, such as Prickly Acacia, are also transported in the fur and dung of animals, most of the significant weeds in the Territory are spread along waterways. Starting eradication at the top of the catchment minimises the chances of the weeds re-establishing. It is also important to return to treated areas frequently in order to control any missed patches or new outbreaks. A catchment-scale approach ensures best use of time and resources.

For weed management to be effective, it must also be coordinated, bringing together all landholders in a catchment to work collaboratively in a strategic manner. This may also mean addressing weed threats that are of concern to the community, even where their environmental or agricultural impacts have not been identified as of priority concern at the Territory or national level. Weed management must also be sustained; stop-start funding cycles and control efforts often erode any gains made.

Finally, effective weed management requires good information about identifying weeds, and knowing where they occur and the best methods for controlling them. Information is also needed on what control efforts have been made and whether these have been successful. This information is required both for reporting purposes and for adapting management approaches to take advantage of what worked and discarding what didn't.

What we plan to do

Controlling weeds at the catchment scale aims to both support overall coordination of weed management and address priority weed issues in each of the four NRM regions in the Territory.

MA-07 will therefore support Territory-level weed management coordination and the continued strategic control of Territory priority weeds (including the 12 Weeds of National Significance) that are not covered by other specific management actions. It will also support production and dissemination of information on weed identification and control, and the two-way exchange of information about where weeds are found, where control has been undertaken and the effectiveness of control efforts. This information sharing will assist in breaking down barriers between different sectors, landholders and agencies, and facilitate collaborative approaches to natural resource management across the Territory. Two-way sharing of species information will be assisted by the development of mechanisms for the exchange of biodiversity information (**MA-56**).

Preventing new weeds from becoming established wherever possible is the focus of a separate program -Strengthening biosecurity surveillance and response. Most of the actions in the current program focus on the control of established weeds. However, **MA-08** will identify and remove isolated stands of Neem and African Mahogany that are already scattered through the Top End and Gulf Savanna before they become a serious environmental problem, as they have elsewhere in northern Australia.

Gamba Grass is a weed of particular concern because it replaces the ground layer vegetation and builds up fuel loads that result in fires that not only destroy the tree canopy, but also pose significant threats to human safety. This program supports continued efforts to manage Gamba Grass and other introduced grasses that replace native vegetation and increase fuel loads. These include Para Grass, Olive Hymenachne and Aleman Grass in aquatic environments, and Mission, Grader and Guinea Grass in terrestrial environments. **MA-09** will therefore strengthen collaborative efforts to reduce the impact of high fuel load grasses on environmental values and property in the Top End. **MA-10** is aimed at mitigating the impacts of Gamba Grass through ongoing implementation of the Gamba Grass Management Planning project in the Darwin Harbour catchment. This is the area in which it poses the greatest threat to life and property.

Considerable effort has been invested into the control of Mimosa on Top End floodplains. While control has been achieved where there has been a sustained effort, elsewhere stop-start funding has hampered management of this WoNS weed. **MA-10** will therefore continue efforts to control Mimosa in the Top End, by supporting and extending existing collaborative efforts within each infested catchment in order to protect and restore wetland habitat and production values.

Considerable effort has also been invested into the control of 'prickle bushes' found in the Northern Territory. Of these, Prickly Acacia is the least established, and there is still potential to eradicate this WoNS weed. **MA-12** will therefore strengthen efforts to eradicate Prickly Acacia in the Victoria River District. Three prickle bushes are found on the Barkly Tablelands, where most effort has been spent on control of Parkinsonia from Sites of Conservation Significance. However, there is potential to eradicate both Mesquite and Prickly Acacia from the Tablelands, as these species occur in isolated stands across the landscape. **MA-13** therefore extends efforts to control prickle bushes on grazing lands of the Barkly Tablelands in order to protect pastoral values and internationally significant conservation values. It focuses on eradication of isolated infestations of Prickly Acacia and Mesquite and containment and control of Parkinsonia.

Bellyache Bush is a transformer weed that takes over riparian areas, reducing both conservation and pastoral values. It is extensive along both the Daly and Roper Rivers, but only just emerging as a weed threat in the Victoria River District. **MA-14** therefore aims to reduce the extent of Bellyache Bush in the Roper River and upper Daly and support eradication of this weed in the Victoria River District through integrated control programs in parts of the Gulf Savanna region.

Athel Pine is arguably the most significant weed in the Arid Lands, where it grows along watercourses, displacing native trees, disrupting water flow, promoting erosion, lowering water tables and causing salinisation of the surface soils and water. **MA-15** will support the further management of Athel Pine along priority watercourses in central Australia in order to maintain and restore riparian condition.

Two weeds were identified through consultation as being of priority to the community, even though they do not appear on priority lists of either the Territory or Australian Governments. These are Rubber Bush in the Barkly Tablelands, where it is impacting on pastoral production, and Mexican Poppy in the Arid Lands, where it is spreading along watercourses and road and rail corridors. Rubber Bush is the subject of an impact and control management study funded by Meat and Livestock Australia. **MA-16** will therefore ensure that pastoralists have the opportunity to implement measures identified in this study in order to restore and protect the productivity of grazing lands on the Barkly Tablelands; and **MA-17** will address community concerns over the spread of Mexican Poppy in the Alice Springs area by identifying and implementing control options.

This program will also benefit from management actions addressing weed threats to cultural sites (**MA-64**) and Sites of Conservation Significance (**MA69**, **MA70**, **MA-72 - MA-74**), as well as from the weed control undertaken by Landcare and Coastcare groups (**MA-84** & **MA-86**). It will also benefit from management actions that support training (**MA-81**) and capacity building (**MA-82**) in weed management.

Targets

Weeds-1 By 2030, Territorians are working together to manage weeds at the catchment scale, based on knowledge of cultural, biodiversity and production values, threats and the best management options

Weeds-1.1 By 2015, weeds are being strategically controlled at the catchment-scale, with effective sharing of information and resources regions

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-07	Control priority Northern Territory and WoNS weeds at a catchment scale	NT	M
MA-08	Map naturalised Neem and African Mahogany and develop and implement control measures	TE & GS	H
MA-09	Manage high fuel load grasses in the Top End to minimise fire hazard and environmental impact	TE	M
MA-10	Manage Gamba Grass in the Darwin Harbour catchment to minimise fire hazards and environmental impact	TE	VH
MA-11	Undertake sustained strategic management of Mimosa across the Top End floodplains	TE	H
MA-12	Work towards eradicating Prickly Acacia from the Victoria River catchment	GS	H
MA-13	Continue managing prickle bushes on the Barkly Tablelands	BT	VH
MA-14	Manage Bellyache Bush in the Roper River and the upper Daly and eradicate from the Victoria River District	GS	H
MA-15	Continue to manage Athel Pine along priority watercourses	AL	H
MA-16	Implement management recommendations from Barkly Tablelands Rubber Bush program	BT	M
MA-17	Identify and implement management options for Mexican Poppy	AL	M
See also:			
MA-22	Strengthen biosecurity coordination, communication and rapid response		
MA-23	Control and minimise spread of new and emerging weeds in the Top End		
MA-24	Maintain surveillance along the Queensland border for Rubber Vine, and eradicate if detected		
MA-56	Enhance biodiversity data collection and exchange		
MA-69	Minimise Buffel and Couch Grass impact at Sites of Conservation Significance and on threatened species populations		
MA-70	Minimise the risk of Buffel Grass invasion in the gulf region		
MA-72	Address critical threats to the internationally significant values of the Arafura Swamp		
MA-73	Address critical threats to the internationally significant values of Lake Woods		
MA-74	Protect conservation values of significant wetlands on the Barkly Tablelands through collaborative management and monitoring programs		
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management		
MA-84	Provide support to the Landcare and Coastcare movement, including pastoral, Indigenous, urban and peri-urban groups, and other NRM-oriented volunteer organisations		
MA-86	Reduce significant weeds in the Katherine River corridor		
MEASURES OF ACHIEVEMENT			
•	No. of priority weed species being strategically managed at the catchment scale		
•	No. of priority weed species with Territory-wide management plans		
•	Availability of simple language profiles for weeds that include information about identification, impact, prevention and control		
•	Implementation and uptake of community weed mapping/reporting scheme		
•	Availability of weed distribution data to appropriate natural resource managers		

*Region codes TE: Top End, GS: Gulf Savanna, BT: Barkly Tablelands, AL: Arid Lands, CM: Coastal Marine, NT: NT wide.

PROGRAM 3: Reducing feral animal impacts

The 'Reducing feral animal impacts' program supports the management of feral animals to improve environmental conditions and production values through collaborative efforts that take into account the different perspectives on the place of feral animals in the Territory environment. It will lead to coordinated and collaborative control of feral animals in areas where the environmental impact is most significant, and where control is most likely to be effective and lead to improved environmental and economic outcomes.

The issue

Feral animals are having a devastating effect on soil, native vegetation and wildlife and are an ongoing cost to Territory agriculture. Buffalo, camels, donkeys, horses, cats, wild dogs and cane toads out-compete, eat or poison native animals and domestic livestock, harbour diseases or change the environment through overgrazing and trampling. There is no doubt that their control is needed if we are to improve environmental conditions and maximise primary productivity in the Territory.

Some feral animals can be successfully controlled using methods such as baiting, fencing, shooting or the release of pathogenic diseases. The cost of these methods can be inhibitive, so it is important that control programs are well targeted around both the asset to be protected and the animals to be controlled. Control also needs to consider a range of species in an area, particularly if the niche left by removing one feral animal species is simply filled by another that causes similar environmental degradation. (Some believe this may have been the case when pig numbers increased in the Top End after buffalo were controlled in the Brucellosis and Tuberculosis Eradication Campaign late last century.) Lack of sustained effort may also render control attempts futile if animals are allowed to return to previous levels. It is therefore important to ensure that feral animals are reduced to densities from which they will be slow to recover, and at which they no longer cause significant damage. Control efforts may suffer from complacency when animal numbers are low, and their impacts minimal, as they are now with rabbits in the south. However, control efforts are most likely to be successful at such times, before populations once again expand out of control.

There are also limited options for controlling some feral animals. Efforts to control feral cats and pigs are constrained by the impacts control factors could have on domestic and commercial animals. Feral animals may themselves make a significant contribution to the economic well-being of a community, providing either food or income - pigs and buffalo providing both; even the control of camels without taking advantage of market opportunities has caused considerable consternation in some quarters. Moreover, control of some feral animals, including cats and horses, can be problematic for animal lovers. Control programs therefore need to be sensitive to the different perspectives held in the community about feral animals, and develop management options that are both effective and enduring.

Buffalo, Julian Murphy

What we plan to do

In keeping with the principles of this Plan, this program of feral animal management will be undertaken in consultation and collaboration with the community.

MA-18 will assist in the development of a shared understanding of the importance of feral animals to the community and their impact on the environment. This information sharing is designed to break down barriers between different sectors, landholders and agencies, and facilitate collaborative approaches to natural resource management across the Territory. It should pave the way for participatory feral animal management programs to improve environmental conditions, production values and community economic well-being.

Three management actions in this program will sustain previous gains made in feral animal control:

Following on from many years of collaborative management, **MA-19** will support strategic control of horses and donkeys in the Victoria River District to protect both conservation and pastoral values.

Foreshadowing the decline of Rabbit Calicivirus Disease in the Northern Territory, **MA-20** aims to avert an explosion of rabbit numbers and resultant damage to environmental, cultural and production values, by re-establishing rabbit control as a regular land management activity in the Arid Lands.

Cane Toad busting at Marlows Lagoon

Feral Cat, Michael Barritt

what we plan to do cont...

As funding for the Camel Action Plan is due to expire in the course of this plan period, **MA-21** aims to ensure continuity of effective camel control to minimise the impact of camels on environmental, cultural and production values in the Arid Lands.

These actions will be supported by management actions in other programs aimed at reducing feral animal impact on threatened species (**MA-76** & **MA-77**), cultural sites (**MA-64**) and Sites of Conservation Significance (**MA-65**, **MA-66**, **MA-72**, **MA-73**). They will also benefit from actions that support training (**MA-81**) and build capacity (**MA-82**) in feral animal management, and develop mechanisms for two-way sharing of information about feral animal densities and population trends (**MA-56**). The plan will also pursue opportunities for land managers to earn incomes from feral animal management and surveillance for new pests (**MA-22** & **MA-29**). Preventing and responding to outbreaks of marine pests is addressed in the 'Strengthening biosecurity surveillance and response' program.

'Effective sustainable land and sea management are the primary conservation actions across the vast area of the Territory. The Plan helps Territorians by identifying priority threats requiring funding and action, supporting communities and landholders to collaborate, and identifies much needed wildlife and habitat conservation actions. The environment movement looks forward to helping implement the Plan.'

Dr Stuart Blanch, Director, Environment Centre NT

Feral Pig damage, Fiona Peek

Targets

Ferals-1 By 2030, Territorians are working together to manage feral animals, based on knowledge of cultural, biodiversity and production values, threats and the best management options

Ferals-1.1 By 2015, feral animals are being strategically managed at the landscape scale, with effective sharing of information and resources

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-18	Build community understanding of the impacts of feral animals and support for their control through engagement	NT	VH
MA-19	Reduce impact of horses and donkeys in the Victoria River District	GS	H
MA-20	Reinvigorate rabbit control by Arid Lands land managers	AL	VH
MA-21	Maintain advances made by the Camel Action Plan	AL	VH
See also:			
MA-22	Strengthen biosecurity coordination, communication and rapid response		
MA-29	Investigate, progress and communicate emerging NRM-based economic opportunities on Aboriginal and pastoral lands (with emphasis on the conservation economy)		
MA-56	Enhance biodiversity data collection and exchange		
MA-64	Support best practice management of Indigenous culturally significant sites and landscapes		
MA-65	Reduce pig impact on priority NT islands and other Sites of Conservation Significance		
MA-66	Reduce buffalo impact in Arnhem Land and on Cobourg Peninsula		
MA-67	Reduce impact of pigs and buffalo on Sites of Conservation Significance in the Gulf-Savanna region		
MA-68	Identify and address significant feral herbivore impacts on wetland values in Arid Land Sites of Conservation Significance and other wetlands		
MA-76	Improve understanding of, and implement measures to address, the decline of Top End small mammals		
MA-77	Reduce fox and cat predation of significant populations of Arid Land threatened species		
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management		
MEASURES OF ACHIEVEMENT			
•	Community support for feral animal management programs		
•	No. of landscape-scale feral animal management programs		
•	Trends in feral animal distribution as a result of management programs		
•	Availability of simple language profiles for feral animals that include information about impact, prevention and control		
•	Availability of feral animal distribution data to appropriate natural resource managers		

'Natural resource management is the management of our environment (land, water and air) and the organisms that inhabit it (flora and fauna). The aim of our group is to protect, conserve and manage the natural and cultural resources that exist within the Anindilyakwa IPA, hence it is of great importance to us.'

Land Management section, Anindilyakwa Land Council

PROGRAM 4: Strenghtening biosecurity surveillance and response

Exotic weeds, pests and diseases can have devastating effects on our soil, native vegetation, wildlife, crops and livestock. The 'Strengthening biosecurity surveillance and response program' aims to prevent the introduction of new weeds, pests and diseases through ensuring intentional introduction of new species are subject to a favourable risk assessment, and to minimise the risk of accidental introductions by enhancing surveillance by ranger groups and the wider community. It also aims to ensure a rapid response to all exotic species that are detected to prevent them from degrading Territory environments or threatening primary industries.

The issue

New weeds are a continual treat to Northern Territory environments and primary industries. One such weed is Parthenium, which invades disturbed areas and degrades pasture. So far, Parthenium outbreaks have either been eradicated or contained. This has been made possible by early detection of the weed followed by dedicated control efforts. Pond Apple and Rubber Vine also pose significant threats to the Territory, being found just over the Queensland border. Surveillance is required to ensure that none of these species becomes a serious weed in the Territory.

Insects are the pest animals that pose the greatest potential risk to the Territory's terrestrial environments and primary production. Exotic ants can replace native species and prevent seedling establishment. For this reason, ranger groups have been working with CSIRO scientists to eradicate Yellow Crazy Ants from Arnhem Land and Big-headed Ants from the Daly region. The introduction of cattle ticks in the 1800s is not only an ongoing cost to the cattle industry, but has also imposed extra work for every animal raised. This could have been avoided had current quarantine procedures been in place in the late nineteenth century.

African Big-headed Ant project , Joye Maddison

The issue cont...

Diseases also pose a major threat to the Northern Territory. Many of our natural landscapes could be drastically altered should Myrtle Rust became established. This fungal disease, found in New South Wales, devastates paperbarks, bottlebrushes and many of their relatives. The threat of this disease is considered so serious that a law was passed in September 2010 to prohibit the introduction of potential host plants to the Territory, whether or not they have been infected. Plant diseases can also affect important crops. Grapevine Leaf Rust, which poses a threat to the entire Australian grape and wine industry, has recently been eradicated from the Territory. Livestock industries are also on the lookout for new diseases, such as Bluetongue, which can be present in cattle with little effect, but would be devastating if certain strains got into Australian sheep flocks.

Pond Apple

Marine environments are not immune to exotic species. The costly eradication of a Black-striped Mussel outbreak in 1999 in Darwin Harbour highlights the threat posed to the Territory by marine pests and also the importance of early detection and intervention measures. Fisheries officers are on the lookout for several other species of marine pests.

There are many potential sources of introduction of new weeds, pests and diseases. New species can be carried from Asia on currents and winds, or be washed along waterways draining catchments from adjoining states. Others may come in through the movement of boats, livestock or hay or just spread by cars and trucks driving along national roads. The globalisation of trade and commerce has accelerated the spread of some invasive species widely beyond their area of origin. Other problem species have been introduced intentionally, some for the purpose of increasing pastoral production, others as garden plants. Good risk assessment procedures should prevent this happening, but also allow the introduction of new crops that could be economically important to the Territory.

Some exotic species (such as Pond Apple) may also have been present in low numbers for many years, but can still pose a threat should conditions change or their seeds spread into more favourable habitat. Detection of such plants requires a good community-based reporting network. Once they are detected, a rapid response is essential to prevent them from becoming established. This can be an expensive exercise, but will save far more than will need to be spent on management of a wider problem down the track, and could save millions of dollars a year in lost production or irreversible environmental degradation.

What we plan to do

It's not easy to stop the impacts of established weeds, pest animals or diseases, and years of planning and research are needed to do the job properly. Prevention is the preferred approach; accordingly this program makes sure we have systems in place to prevent the introduction and establishment of new weeds, pests and diseases wherever possible. This will be underpinned by a robust risk assessment process, to ensure detection of new threats, especially in remote locations, and by concerted efforts to control emerging threats while they can still be eradicated. The program will also pursue opportunities for land managers to earn incomes from biosecurity surveillance for new weeds, pests and diseases, as well as for the control of species that are detected.

MA-22 will strengthen the coordination and delivery of biosecurity surveillance and response. It will support biosecurity measures to prevent the establishment of significant diseases, weeds and pest animals in the Northern Territory. It will strengthen collaboration and coordination of biosecurity-related activities through partnerships between agencies, ranger groups, communities, and industry. It will ensure thorough risk assessments are undertaken of all new species before they can be introduced, as well as to identify the most significant threats posed by species on our doorsteps. It will build the capacity of the NRM community to detect new and emerging pests, weeds and diseases, and respond appropriately to prevent their establishment, in order to ensure the ongoing protection of the Territory's unique flora, fauna and production industries.

MA-23 aims to prevent the spread of weeds into the relatively weed-free areas of the Top End and to eradicate isolated infestations of significant weeds before they become unmanageable. It combines three activities – early detection and response to new weed threats; targeted control of small infestations of high fuel load grasses; and assessment and, subject to appropriate cost-benefit analysis, installation of wash down bays for vehicles entering Arnhem Land.

MA-24 will maintain surveillance for Rubber Vine, a Weed of National Significance, along the Queensland border and rapidly eradicate any infestations detected. It will continue collaborative arrangements with relevant organisations to control Rubber Vine in Queensland sections of catchments that drain into the Northern Territory. (It will also keep a watching brief along the WA border.)

NT highway, Ben Nottidge

'The Duck Pond', Darwin, Nigel Weston

Targets

Biosecurity-1 By 2030, collaborative biosecurity programs are in place to reduce the likelihood of new weeds, pests and diseases becoming established in the Northern Territory

Biosecurity-1.1 By 2012, Territory natural resource managers are fully engaged in detecting the arrival and preventing the establishment of new weeds and pest animals, and we are routinely assessing the pest potential of all proposed plant and animal introductions to the Northern Territory

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-22	Strengthen biosecurity coordination, communication and rapid response	NT	VH
MA-23	Control and minimise spread of new and emerging weeds in the Top End	TE	VH
MA-24	Maintain surveillance along the Queensland border for Rubber Vine, and eradicate if detected	GS	VH
MEASURES OF ACHIEVEMENT			
•	Systems to involve natural resource management community in pest and disease detection and eradication in place		
•	Availability of simple language profiles for potential weeds, pests and diseases that include information about identification, impact, prevention and control		
•	Response rate to newly detected invasive species		
•	Control success rate for newly detected invasive species		
•	Percentage of proposed plant introductions assessed using weed risk assessment		
•	Pest animal risk management processes in place		
•	Percentage of proposed animal introductions assessed using pest animal risk assessment		

PROGRAM 5: Understanding climate change

The emphasis of the 'Understanding climate change' program is to support Territory natural resource managers to adopt a range of options to better cope with climate change impacts. It will do this by identifying the most significant climate change risks to the Territory environment, along with options for addressing them.

The issue

The Territory is often faced with hot temperatures, rainfall extremes and cyclonic winds. These conditions are liable to become even more challenging as a consequence of climate change caused by greenhouse gas emissions. We know that the earth is warming and that sea levels are rising, but we still don't know exactly how the Territory will be affected. Current predictions are that some areas will heat up more than others, and that saltwater will flood coastal and estuarine areas to different extents. Changes in rainfall are even more uncertain, and are again likely to be patchy and highly variable. Despite recent increases in rainfall in the Top End, drier conditions are expected across the Territory in the longer term. Extreme events, particularly cyclones, droughts and floods, are expected to be more frequent in the future.

These possible climate change impacts will influence our natural resources in a number of ways, such as through the acidification of oceans, and by changing the composition of natural ecosystems. These potential impacts have implications for natural resource management, for example the potential distribution of weeds, pests and harvested native species; the suitability of country for different purposes; and the fire regimes needed to manage country. Natural resource managers in the Northern Territory need to consider climate change impacts in their decisions about both seasonal activities and longer term directions and develop management approaches that can adapt to a wide range of potential conditions.

As well as adjusting to climate change, Territorians share the global responsibility to minimise our greenhouse gas emissions by reducing our consumption of fossil fuels. Improved natural resource management can also make a significant contribution to the Territory's stated aim to reduce greenhouse gas emissions by 60% by 2050.

Mandorah storm cloud, Nigel Weston

Daly River in flood, Nauiyu Community, Joye Maddison

What we plan to do

In order to assess climate change impacts we need a good understanding of the current nature of the Territory's species and environments. We therefore need baseline information on species' distributions and environmental tolerances, as well as about current environmental conditions. This program is therefore heavily reliant on the collection and interpretation of baseline data and information that will be collected in other programs to support NRM decision-making (**MA-05**, **MA-36** - **MA39**, **MA-53** - **MA-58**, **MA-63**, **MA-71**, **MA-72** & **MA-81**).

We then need to know how these species and environments will be affected by climate change and identify those that are most at risk. To this end, **MA-25** aims to provide information on terrestrial species and habitats at risk from climate change in the Territory and to identify the best things to do about protecting them; with **MA-26** providing a detailed assessment of the climate change sensitivity of several species that are only found on the hilltops of the MacDonnell Ranges in the Arid Lands. **MA-27** will identify and monitor marine and coastal areas and species most at risk of climate change.

The uncertainty over the rate and direction of climate change means that the best approach to natural resource management may be to develop flexible management systems that can respond to a wide range of conditions as these occur. **MA-28** will identify and assist management responses needed to adapt to the likely impacts of climate change in order to sustain natural resources in the Northern Territory. Information on the likely impacts of climate change and the best ways to deal with them will be shared with NRM practitioners in management actions undertaking extension and training (**MA-36** - **MA-39** & **MA-81**).

Global concerns about climate change also raise opportunities to make a living out of reducing of greenhouse gas emissions through soil, vegetation and fire management. These opportunities will be pursued in the 'Entering the conservation economy' program.

Targets

Climate change-1 By 2030, Territory natural resource managers have adopted a range of options to better cope with climate change impacts

Climate Change-1.1 By 2015, the most significant climate change risks to the Territory environment have been identified, along with options for addressing them

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-25	Undertake targeted assessments of likely climate change impacts on environmentally sensitive terrestrial species and environments to inform their management	NT	M
MA-26	Investigate the implications of climate change on hilltop species in the MacDonnell Ranges	AL	M
MA-27	Assess climate change risks to coastal and marine environments and begin monitoring sensitive areas	CM	M
MA-28	Undertake targeted assessments of potential climate change impacts on sustainable natural resource management to inform adaptive management strategies	NT	M
See also:			
MA-05	Maintain and extend the North Australian Fire Information website		
MA-36	Support best practice grazing management through delivery of regional extension programs		
MA-37	Support best practice horticulture and broadscale agriculture through delivery of regional extension programs		
MA-38	Support ecologically sustainable fisheries management through monitoring and improved technologies		
MA-39	Increase community understanding of Ecologically Sustainable Development through industry partnerships for education		
MA-53	Improve land, vegetation, soil and cultural mapping to inform land management		
MA-54	Commence marine habitat and key species mapping to inform planning, management and monitoring		
MA-55	Foster the use of up-to-date scientific and local knowledge to inform native vegetation clearing practice that underpins land development		
MA-56	Enhance biodiversity data collection and exchange		
MA-57	Enhance the Territory's natural resource monitoring activities as the basis of a landscape health reporting program		
MA-58	Undertake baseline catchment health assessments and identify at-risk waterways, and restore and protect at-risk riparian areas		
MA-63	Develop a framework for assessing and minimising impact of mining and development on coastal and marine environments, using Darwin Harbour as a pilot area		
MA-71	Develop a strategic plan to address preventable saltwater intrusion into coastal Sites of Conservation Significance		
MA-72	Address critical threats to the internationally significant values of the Arafura Swamp		
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MEASURES OF ACHIEVEMENT			
•	Criteria for assessing climate change impacts identified		
•	Baseline information collected for climate assessment of: o terrestrial biodiversity o fire regimes o sustainable production o wild-caught species (e.g. fish, Magpie Geese) o wetland and riparian systems o marine and coastal systems		
•	Climate impact review prepared assessing likely impacts and mitigation opportunities for: o terrestrial biodiversity o fire regimes o sustainable production o wild-caught species (e.g. fish, Magpie Geese) o wetland and riparian systems o marine and coastal systems		
•	Identification of priority areas for climate change mitigation		
•	Percentage of priority areas with climate change mitigation action programs		
•	Incorporation of information on climate change impacts and adaptation into extension and training programs		

SUPPORTING ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Windmill, Michael Barritt

PROGRAM 6: Entering the conservation economy

The 'Entering the conservation economy' program aims to increase the contribution of the conservation economy to the livelihoods and well-being of rural and remote Territorians. It will do so by investigating and progressing conservation economy opportunities, with a particular emphasis on those already identified as of particular relevance to the Territory. This includes carbon markets, wildlife harvest, rehabilitation of degraded lands and, potentially, monitoring and removal of marine debris.

The issue

In a conservation economy, payment is made for services that maintain or improve environmental conditions. This can include activities as diverse as savanna burning for greenhouse gas abatement; building up soil carbon through more sustainable grazing practices; biosecurity surveillance; biodiversity conservation and monitoring; and sustainable harvest of wildlife. Implicit in arrangements made under the conservation economy is that these activities will not only benefit the environment, but will also have real and enduring social and cultural benefits to those who provide the services. On top of financial payment made at market rates, the conservation economy aims to provide participants with improved lifestyles and well-being.

The aim of this program is for the conservation economy to stand alongside mining, pastoralism and tourism as the significant sectors providing employment and contributing to the economic wealth and wellbeing of rural and remote parts of the Northern Territory.

There are several good reasons for pursuing the conservation economy. The first is that it provides funds for groups and individuals to make a real contribution to the state of the environment and progress natural resource management objectives. The second is that it offers the opportunity for Indigenous people to live and work on country in remote areas where there may be few other job options. Thirdly, it should assist pastoralists and other primary producers to bolster the economic viability of their enterprises while enhancing environmental values of their land.

Many Indigenous people wish to remain on their traditional lands in order to fulfil their obligations to kin and country. For many, natural and cultural resource management is a high priority, and includes keeping country in good condition using fire, controlling weeds and feral animals and the sustainable harvest of bush tucker. Such activities are already contributing to the livelihoods of remote communities in a number of ways, from small-scale local projects through to multi-million dollar greenhouse gas abatement projects. There is the potential to increase the area being managed for greenhouse gas abatement within savanna landscapes. Some ranger groups are also working with the Australian Quarantine and Inspection Service undertaking surveillance (biosecurity, illegal fishing boats) or being contracted to government agencies to undertake weed, feral or fire management. There is a need to look for funding models to support marine rangers undertaking collaborative marine debris and ghost nets monitoring and removal projects.

Coastal clean up, Belyuen Community, Chantal Bramley

The issue cont...

Other opportunities tapping national markets are also being explored, such as honey production from native hives, wild harvest of wattle seed and billygoat plums, and various forms of agroforestry. At present, non-Indigenous people dominate the markets for these products. While such ventures may be hampered by a lack of capacity in Indigenous communities, they are also often impacted by the onerous paperwork needed for permits and monitoring and reporting requirements.

Benefits of the conservation economy are not just restricted to remote Indigenous communities. There is particular interest in both improving soil carbon and growing biofuels as options for improving the viability of pastoral enterprises. Another option for improving profitability is paying landholders for environmental stewardship, thereby expanding the effectiveness of the conservation estate.

Undertaking these activities in some of the most intact natural environments in the country not only benefits the Territory, but is also recognised as being of national, and in some cases, international significance.

Information about conservation economy options should be considered when making decisions about the best uses of land, including when identifying priority areas for conservation management, and should be incorporated into primary industries strategies.

> '*For Aboriginal people, natural resource management includes cultural resource management. Local knowledge, practices, and institutions are intrinsically part of caring for country in the right way.*'
>
> Caring for Country Unit, Northern Land Council

Lily Pily fruit, Nicholas Smith

What we plan to do

While projects tapping emerging economic opportunities have now been operating successfully in the Territory for several years, more work is needed to identify which of these and other economic opportunities have real promise, where they will work, and who can benefit from them. Planning for involvement in these new economies needs to include widespread consultation so that, wherever possible, benefits are delivered across the community, as well as to the primary industries that underpin the Territory's rural economy.

MA-29, to investigate, progress and communicate emerging NRM-based economic opportunities on Aboriginal and pastoral lands, aims to make sure that the Northern Territory NRM community benefits from, and helps to shape, new jobs and business opportunities for conserving and restoring the environment and undertaking sustainable land management practices. This program also contains several management actions investigating and progressing conservation economy initiatives in areas already identified as of particular relevance to the Territory.

MA-30, to participate in national, Northern Territory and regional initiatives to develop carbon market programs, aims to ensure that the Territory NRM community benefits from developing carbon markets and has a role in shaping them. **MA-31** will assist us to understand enough about soil carbon storage across the Territory, and about the effects of different land management practices on carbon storage, in order to develop saleable carbon-based land management products and benefit from the carbon economy. **MA-32** will foster the development of new greenhouse gas abatement projects in the tropical savannas of the Northern Territory and improve abatement monitoring and reporting methods to be both more accurate and simple to produce. It is limited to the savannas because this is the region for which fire management has proven green-house gas benefits.

Development of Indigenous business based on the harvest of wildlife products has long been impeded by the amount of red tape required to get the necessary permissions. **MA-33** aims to reverse this situation, thereby increasing the opportunities for Indigenous people to remain on country by making a living from their natural resources, and in doing so help to maintain the country in good environmental condition. This will be achieved through the provision of institutional and business support for the harvest and sale of products based on traditional ecological knowledge, including a simplified system for permitting, management planning, monitoring and accreditation. **MA-34** supports the creation of long term jobs for Indigenous people through development of local native plant nurseries to supply plants for mine site rehabilitation and build the capacity of Indigenous rangers to provide fee-for-service mine site rehabilitation.

What we plan to do cont…

MA-35 supports efforts to re-commence community-based collaborative marine debris and ghost nets monitoring and removal projects on an ongoing basis, in line with threat abatement and recovery plans, in recognition of the impact marine debris has on marine species. While some of this work will inevitably be done by volunteers, funding provided to ranger groups to monitor and remove marine debris should be commensurate with the level of the work undertaken.

The benefits of industry adopting conservation-sensitive practices should not only be recognised, but also contribute to the viability of enterprises, either through direct payment for environmental services or through providing a premium for produce. Several actions in other programs support the incorporation of conservation practice into enterprises, including development of offset and off-reserve conservation management (**MA-51** & **MA-52** & **MA-90**), extension programs (**MA-36** - **MA-39**), and the on-ground implementation and monitoring of conservation works (**MA-73** & **MA-74**).

Involvement in the conservation economy not only requires a supportive framework, but also needs skilled land and sea managers to undertake the work under the coordination of functional Indigenous ranger and Landcare and Coastcare groups. To this end, the plan also includes a program to build natural resource management capacity (**MA-81**-**MA-83**).

NT jelly and honey , Tida Nou

*'**The Northern Territory Seafood Council's vision is for a profitable, sustainable seafood industry supporting the economic growth of the Northern Territory, as such the NTSC is supportive of NRM initiatives and keen to see the NT INRM plan result in increased relevance to marine resources.'***

Katherine Sarneckis, Chief Executive Officer, Northern Territory Seafood Council

Sea Rangers, King Ash Bay, Nigel Weston

Targets

Conservation Economy-1 By 2030, the conservation economy is an integral part of natural resource businesses in the Northern Territory providing employment and enhancing enterprise viability

Conservation Economy-1.1 By 2013, Territory natural resource managers understand the broader range of opportunities for gaining livelihoods from emerging economies in natural resource management

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-29	Investigate, progress and communicate emerging NRM-based economic opportunities on Aboriginal and pastoral lands (with emphasis on the conservation economy)	NT	VH
MEASURES OF ACHIEVEMENT			
•	Economic assessment of conservation economy opportunities prepared, considering options for each sector and subregion		
•	Availability of information on conservation economy opportunities and benefits to livelihoods and enterprise viability to natural resource managers		
•	Response to biennial NRM surveys assessing understanding of conservation economy opportunities		

Conservation Economy-1.2 By 2012, options for greenhouse gas abatement and carbon storage are identified and promoted to NRM managers

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-30	Participate in national, Northern Territory and regional initiatives to develop carbon market programs	NT	H
MA-31	Quantify soil carbon in relation to land type and land use and identify related economic opportunities	NT	H
MA-32	Support greater involvement in savanna-burning greenhouse gas abatement programs	TE & GS	VH
MEASURES OF ACHIEVEMENT			
•	Economic assessment of greenhouse gas abatement opportunities, considering options for each sector and subregion, completed		
•	Baseline information for assessing carbon storage potential of soil collected to inform product development		
•	Economic assessment of carbon storage opportunities, considering options for each sector and subregion, completed		
•	Area of extent of savanna burning programs for greenhouse gas abatement		
•	No. of communities, organisations and individuals involved in savanna burning programs for greenhouse gas abatement		
•	Refined verification methods for greenhouse gas abatement from savanna burning developed and implemented		

Saltwater crocodile, Ben Nottidge

Targets cont...

Conservation Economy-1.3 By 2015, Indigenous enterprises based on harvest of native products and landscape management are benefiting from a more supportive planning and policy environment, and ethical and sustainable credentials

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-33	Facilitate Indigenous wildlife-based industries	NT	H
MA-34	Develop Indigenous capacity for rehabilitation of mine sites and other disturbed land	NT	VH
MEASURES OF ACHIEVEMENT			
•	No. of Indigenous enterprises wild-harvesting species for commercial use, and monitoring impacts on harvested populations and their habitats		
•	Trends in condition of harvested species and their habitats		
•	No. of Indigenous people employed in wild-harvest enterprises		
•	No. of Indigenous enterprises providing landscape rehabilitation services		
•	No of Indigenous people employed in landscape rehabilitation enterprises		

Conservation Economy-1.4 By 2015, sustainable production practices and the management of key biodiversity assets are contributing to industry income directly or through environmental certification

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
There are no management actions that address this target in isolation. However, the following actions are integral to its achievement:			
MA-36	Support best practice grazing management through delivery of regional extension programs		
MA-37	Support best practice horticulture and broadscale agriculture through delivery of regional extension programs		
MA-38	Support ecologically sustainable fisheries management through monitoring and improved technologies		
MA-39	Increase community understanding of Ecologically Sustainable Development through industry partnerships for education		
MA-51	Develop a framework for landscape scale conservation management, both on- and off-reserve, including prioritisation, identification, management and protection of conservation assets		
MA-52	Develop and implement a framework for supporting biodiversity stewardship through offset programs		
MA-73	Address critical threats to the internationally significant values of Lake Woods		
MA-74	Protect conservation values of significant wetlands on the Barkly Tablelands through collaborative management and monitoring programs		
MA-91	Support development of green tourism programs that engender an understanding of Territory environments and cultures and offer involvement in NRM activities		
MEASURES OF ACHIEVEMENT			
•	No. of industry environmental accreditation schemes operating in the Northern Territory		
•	Volume of product sold under environmental accreditation schemes		

Targets cont...

Conservation Economy-1.5 By 2015, marine debris monitoring and removal is ongoing, adequate and consistent, and contributes to the viability or marine ranger groups

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-35	Reinvigorate management and systematic long-term monitoring of marine debris and ghost nets	CM	H
MEASURES OF ACHIEVEMENT			
•	Volume of marine debris collected		
•	Area of sea country covered by marine debris monitoring and removal programs		
•	No. of NRM organisations and individuals employed in marine debris monitoring and removal		
•	Trends in marine debris volume		
The following management actions will also contribute to the achievement of the long-term target Conservation Economy-1, but their contribution to targets is assessed in a separate program:			
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management		
MA-83	Support and further develop sea ranger capacity to plan for and deliver coordinated sea country NRM management		

Fire, Stuart Blanch

PROGRAM 7: Supporting industry adoption of sustainable practices

The 'Supporting industry adoption of sustainable practices' program aims to build on good relations with industry bodies and draw on the good intentions of industry members to ensure primary industries are managed sustainably, efficiently and profitably. It will do this by delivering best practice industry extension programs across the Northern Territory and by identifying and communicating solutions to conflicts between pastoral production and conservation.

The issue

Primary industries are important to Northern Territory natural resource management as well as to the Territory at large. In 2009-10, they contributed $548 million to the Territory economy and provided nearly 3,000 jobs, mostly in regional or remote locations. The pastoral sector is the largest of the primary industries, and is responsible for managing around half of the Territory's land area. Cropping and horticulture are smaller, but rapidly growing sectors, producing field crops and a diverse range of fruits and vegetables for local, southern and Asian markets. Forestry operations have been established on the Tiwi islands and in the Katherine-Daly region. In addition, the Territory has substantial commercial fin-fish and prawn fisheries. Efficient management of primary industries based on sustainable practices should contribute to the long-term conservation of key natural resources and habitats, while still underpinning the prosperity and growth of Territory enterprises and communities.

The Northern Territory Cattlemen's Association, Northern Territory Horticultural Association, Northern Territory Agricultural Association, Northern Territory Seafood Council, are all taking lead roles in promoting sustainable practices in their industries. These efforts are getting results. Many pastoralists, farmers and fruit growers are adopting more sustainable practices as a result of attending industry-supported extension programs, and recent assessments have shown that most Territory fisheries are sustainably managed.

The key natural resource management objective for primary industries is to identify where sustainable practices can improve both profitability and environmental health. For livestock production, horticulture and broadscale agriculture, sustainable practices mean ensuring efficient production or harvesting; avoiding overuse of resources such as land, soil, water or grass; managing fire, weeds and feral animal threats; wise use of agricultural chemicals; and minimising and managing waste production. For fisheries, sustainable practices mean the efficient harvest of target species; avoiding bycatch or damaging seabed habitats; and minimising and managing waste.

The issue cont...

In many cases, the sustainable management objectives of primary producers align with those of conservation. However, there are also areas of conflict. At a regional scale, these can largely be avoided through good planning processes that identify the most appropriate uses for marine habitats, land and other natural resources. At the operational level, they can be addressed through enterprise planning that identifies values, risks and opportunities. Particular challenges face the pastoral industry, which is charged with both managing pastures and maintaining natural wildlife and landscape values. Pastoral issues with particular relevance to conservation include the management of dingoes, wallabies and woody thickening.

Mining and tourism are also major Territory industries that impact and/or rely on our natural resources. Although these sectors may currently have limited involvement in natural resource management, both make valuable contributions to regional and remote economies by providing jobs and purchasing goods and services. The mining industry aims to operate under principles of ecologically sustainable development, making considerable efforts to restrict impacts to within mine sites, and to rehabilitate their mining leases as extraction is completed. The tourism industry also aspires to minimising its ecological footprint, and recent developments are beginning to see tourists contributing to environmental projects.

Urban, industrial and infrastructure development are also sectors that can have major impacts on the natural environment. Good development is essential to enable us to live and work across the Territory. Moreover, roads, railways, bridges, dams, fences and fire-trails all contribute to our ability to manage natural resources. However, they can also be the source of land degradation and water siltation and aid the spread of weeds. Incorporating principles of ecologically sustainable development into infrastructure planning, development and maintenance can help to minimise these problems.

This program will support industry efforts to improve the sustainability of operations to both minimise adverse environmental impacts and to make a positive contribution to NRM in the Territory. Sustainable practices are a priority area of the national Caring for our Country program and will contribute to the Territory 2030 Strategic Plan's objective to increase adoption of the principles of Ecologically Sustainable Development.

Edith Falls, Hannah Seward

'Tourism NT appreciates the opportunity to provide input into the review of how natural resources will be managed in the Northern Territory. The tourism industry relies heavily on nature based, outdoor attractions and activities, therefore the sector has a strong interest in ensuring that the Territory's natural and cultural assets are protected and maintained.

Territory Natural Resource Management, as the primary distributor of funding for natural resource management in the Northern Territory, in partnership with Tourism NT can play a pivotal role in supporting the growth in the engagement of the tourism industry in conservation and land management initiatives and cultural heritage management initiatives, for mutually beneficial outcomes.'

Tourism NT

Ranger uranium mine, Hannah Seward

What we plan to do

'Supporting industry adoption of sustainable practices' will support industry-driven extension programs to promote best practices and demonstrate that there can be both economic and environmental incentives to adopting sustainable practices. As well as assisting in the development and delivery of these programs, it will improve our understanding of what constitutes sustainable practices.

Extension programs that develop understanding of the ecosystems that support primary production and show how their sustainable management is an important part of running a profitable enterprise will be supported for the pastoral sector (**MA-36**), horticulture and agriculture (**MA-37**) and fisheries (**MA-38**), as well as more generally (**MA-39**). This program also proposes a number of management actions aimed at providing solutions to conservation management issues on pastoral lands:

MA-40 will try to reconcile the different perspectives about the place of dingoes in pastoral landscapes, with the aim of reducing wild dog and dingo impacts on cattle enterprises while still allowing dingoes to continue to perform the important role of reducing cat and fox predation of other native wildlife.

MA-41 will investigate the causes and impacts of woody thickening and develop management options, and communicate these findings to pastoral land managers. **MA-42** aims to identify the best options for managing high densities of Agile Wallabies in agricultural areas.

Most other programs in this plan will further assist industry adoption of sustainable practices. 'Managing land and sea country based on sound information' will help to identify environmental values that need protection and support good soil management practices. 'Policy & Planning for sustainable use' will ensure that the best decisions are made about land use in newly developed areas, and provide frameworks for the forestry industry, mine operation and rehabilitation, and to support off-reserve conservation. 'Minimising environmental footprints' will assist in the management of water, energy, pollution and waste. Other programs support land and/or sea managers to address biosecurity, weed, fire and feral animals; to adapt their practices to a climate change environment; and to incorporate aspects of the conservation economy into their enterprises.

Targets

Sustainable Practices-1 By 2030, Territory livelihoods and environmental conditions are benefiting from more efficient and sustainable practices

Sustainable Practices-1.1 By 2015, best practice industry extension programs delivered across the Northern Territory

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-36	Support best practice grazing management through delivery of regional extension programs	NT	M
MA-37	Support best practice horticulture and broadscale agriculture through delivery of regional extension programs	NT	H
MA-38	Support ecologically sustainable fisheries management through monitoring and improved technologies	CM	VH
MA-39	Increase community understanding of Ecologically Sustainable Development through industry partnerships for education	NT	M
MEASURES OF ACHIEVEMENT			
•	No. of industry-driven extension programs for improving sustainability and profitability developed and delivered		
•	Attendance at, and feedback from, industry-driven extension programs		
•	Follow-up surveys of participants of industry-driven programs about influence on practices		

Sustainable Practices-1.2 By 2015, solutions to conflicts between pastoral production and conservation are identified and communicated to pastoralists

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-40	Reconcile conflicting management objectives for wild dogs and dingoes	NT	M
MA-41	Improving knowledge about causes and management of woody thickening on pastoral lands	NT	M
MA-42	Identify management options for Agile Wallabies in the Gulf Savanna	GS	M
MEASURES OF ACHIEVEMENT			
•	Management options identified and communicated to pastoralists		
•	Response to survey of pastoralists indicating knowledge and adoption of management options		

Darwin Harbour, Hannah Seward

PROGRAM 8: Minimising ecological footprints

This program is about 'Minimising ecological footprints' of Territorians by supporting measures to increase water and energy efficiency; reduce the impact of new and existing residential and industrial developments on natural values; and reduce the entry of pollutants to the environment. It will implement measures to reduce water and energy consumption; and, by increasing efficiency, assist in fair and sustainable water management planning. It supports environmental planning and management to minimise the impact of Territory growth centres on the broader environment, and to build the capacity of local people to undertake environmental management in their own communities. Finally, it will assist in protecting our environment, particularly our waterways, from toxic substances by assessing the handling and disposal of toxic substances and reduce the use of lead shot for hunting.

The issue

The Territory is recognised and valued for its relatively intact natural environments. Its water, beaches and air are less contaminated than are those of more populous and developed parts of Australia; our landscapes and waterways retain much of their integrity. Nevertheless, the future prosperity of the Territory depends upon continuing economic and infrastructural development, which, if not carefully managed, could result in degraded environmental conditions.

Already there are growing concerns about the quality of water entering Darwin Harbour both from Buffalo Creek, which has been contaminated by treated wastewater discharge from the Sanderson sewage plant, and from stormwater run-off during the wet season. There have also been concerns about contamination arising from material spills at Darwin and other harbours and port facilities such as at Gove and Bing Bong. Other pollution risks include the contamination of water systems with chemicals or heavy metals from mine sites, nutrients from agriculture, wastewater and pollutant discharges and debris from marine vessels. Furthermore, controversy surrounds plans to establish a large nuclear waste repository on Muckaty station near Tennant Creek.

The Territory does not have a good record when it comes to energy and water efficiency. Our per person water and energy consumption are the highest in the country. There is clearly scope for improving efficiency to reduce the drain on water resources and our contribution to greenhouse gas production. We need a fair process for using water based on need and availability. While three quarters of the water taken from surface water is used for domestic purposes, we have little information about water usage from aquifers.

Discarded beer cans, Cox Peninsula, Hannah Seward

The issue cont...

The size of the Territory and remoteness of its settlements also presents a number of challenges for the collection and management of domestic waste, and this may also pose a threat to some of our natural habitats and species. There are concerns in small communities about contamination of groundwater supplies caused by poor waste management. The relative lack of disposal facilities or services in the Territory presents problems for small and large communities alike.

Urban expansion, with the new housing developments in Darwin, Palmerston and Weddell, along with the expansion of Territory Growth Towns will place more demands on resources, and pressures on the natural environments. However, these developments also present the opportunity to use best practice planning and design. Weddell is being established as a 'world-class green city', with a particular focus on energy and water use efficiency, minimising pollution and waste, and conserving biodiversity. The Territory Government also aims to provide sustainable water, sewerage and electricity services in the Territory Growth Towns. Beyond this, minimising environmental footprints also means developing urban subdivisions and towns using best practice soil conservation measures and ensuring that they do not become sources of weeds.

With appropriate planning and implementation of strategies for best practice and remediation, together with heightened community awareness, the potential impact of waste and pollution on the environment can be significantly reduced.

Alice Springs, Michael Barritt

What we plan to do

'Minimising environmental footprints' supports the implementation of measures to increase water and energy efficiency and assist in water management planning. In order to allocate resources well and fairly, we need to know what water resources are available and the demands of different industrial and agricultural developments. **MA-43** will therefore quantify the availability of water resources in aquifers and streams, and the impact of different land uses on water availability as the first step in ensuring sustainable and equitable use of water in the Northern Territory. **MA-44** will support the development and implementation of strategies to ensure more efficient and conservative use of water and energy in order to minimise adverse environmental impacts.

Cullen Bay, Darwin

This program also supports environmental planning and management to minimise the impact of Territory growth centres on the broader environment, and to build the capacity of local people to undertake environmental management in their own communities.

MA-45 therefore encourages best practice management of urban and regional centres to prevent them from becoming sources of environmental degradation. It promotes minimisation of weeds, feral animals and waste, good waste disposal, efficient use of water and energy, and good soil conservation practices in the construction of roads and other infrastructure. It will also encourage community ownership of local environmental management and build the capacity of residents to undertake this management. The following actions will also assist in protecting our environment, particularly our waterways, from contamination by toxic substances:

MA-46 aims to improve and increase facilities for the safe disposal of a wide range of toxic substances and to respond to emergency spills in the Territory, especially Darwin, as well as address any inadequacies in the regulatory framework.

MA-47 aims to reduce the amount of toxic lead entering waterways, environment and human food chain by explaining to hunters the adverse impacts, and by supporting a staged transition to firearms that do not use lead shot. These actions will contribute to a healthy Territory environment and a community that has the capacity to manage its resources well into the future.

Targets

Ecological Footprints-1 By 2030, domestic and commercial water and energy use is sustainable, with minimal environmental impact

Ecological Footprints-1.1 By 2015, water availability and demands are understood and per capita consumption has decreased over 2010 levels

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-43	Further quantify water resources, needs and impact of different users to assist in water management planning	NT	M
MA-44	Develop and implement water and energy demand management strategies	NT	H
MEASURES OF ACHIEVEMENT			
•	Assessment of water needs of major agriculture, horticultural, pastoral and industrial consumers undertaken		
•	Percentage of Territorians that have adopted water-saving measures		
•	Trends in per capita consumption of water by domestic and commercial users		
•	Trends in per capita consumption of energy by domestic and commercial users		
•	No. of water allocation plans implemented for targeted Water Control Districts		
•	No. of catchments/districts with sustainable water allocation plans		

Ecological Footprints-2 By 2030, Territory towns, suburbs and regional centres are environmental show cases of good environmental planning and management

Ecological Footprints-2.1 By 2015, development of urban and regional centres adheres to principles of Ecologically Sustainable Developments

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-45	Minimise the environmental footprint of Territory Growth Towns and other urban and regional centres	NT	H
MEASURES OF ACHIEVEMENT			
•	No. of Territory towns and suburban subdivisions implementing integrated environmental management plans		

McArthur River mine, Stuart Blanch

Targets

Ecological Footprints-3 By 2030, the entry of toxic chemicals into the environment from private and commercial activities has been reduced

Ecological Footprints-3.1 By 2015, procedures are in place for the handling of toxic chemicals and waste and for rapid responses to excess release to the environment

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-46	Assess current hazardous substance handling and emergency response procedures and improve where necessary	NT	H
MEASURES OF ACHIEVEMENT			
•	Toxic chemical and waste handling procedures prepared and implemented		
•	Toxic chemical and waste release response procedures prepared and implemented		

Ecological Footprints-3.2 By 2015, lead is no longer entering the environment and human food chain through use of lead shot

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-47	Phase out use of lead shot	TE & GS	VH
MEASURES OF ACHIEVEMENT			
•	Percentage of Indigenous hunters surveyed using lead shot		
•	Indigenous community understanding of the impacts of lead		
•	Indigenous community support for restricting the use of lead shot		

Remote recycling, Shenagh Gamble

PROGRAM 9: Policy & planning for sustainable use

The 'Policy and planning for sustainable use' program will progress the establishment of a policy, planning and legislative framework that is more supportive of sustainable natural resource management. It will extend the consultative planning processes used in the Daly River region to other areas that are subject to development pressures to ensure good land and water planning based on scientific evidence, economic assessments and community input. It will revise planning and legislative frameworks to improve the sustainability of forestry and mining operations. It will also develop a framework for landscape-scale conservation management that enhances biodiversity conservation through stewardship agreements and biodiversity offset arrangements.

The issue

The first step in sustainable natural resource management is to make sure that only suitable activities are undertaken on the appropriate country. This requires good planning processes involving best practice community consultation and based on scientific evidence and assessments of economic viability. Such processes have been implemented well in the Daly River region, overseen by the Daly River Management Advisory Committee. Other areas of the Northern Territory that are subject to development pressure would benefit from similar planning processes to avoid inappropriate development that causes irreversible environmental degradation or unsustainable use of resources.

Poor industry frameworks and legislation can also lead, not only to inappropriate development decisions, but also to poor operations that in turn can lead to irreversible environmental decline. Erosion problems in some areas cleared for forestry are a case in point. Better guidelines are needed for where forestry is appropriate if further investment in the industry is to be both viable and not cause unjustifiable environmental degradation.

There is considerable public disquiet over the impact of mining operations on the environment, particularly on water resources, and the adequacy of mine rehabilitation requirements. In the past, poor mine management, permitted by inadequate legislative controls, has left the legacy of some heavily polluted mine sites. Current mining operations follow principles of ecologically sustainable development (ESD) and are regulated by the Northern Territory Government. A review of the Mining Act 2003 was undertaken in 2004, but no amendments were recommended with respect to rehabilitation or water extraction or monitoring. An assessment of environmental controls is warranted to address the commitment of the Australian and Territory Governments to ESD principles of Ecologically Sustainable Development.

the issue cont…

Policy and planning is also required to support innovative developments in biodiversity conservation management. The last decade has seen a shift away from depending on conservation reserves alone to protect biodiversity, to ensuring conservation management across country of varying tenures. This multi-tenure approach makes it easier to ensure maintenance of landscape-scale processes (such as migration, population integrity and catchment flows), particularly in the face of climate change.

A framework is therefore required that not only stresses the importance of conserving all ecosystems and species, but that also allows strong connectivity across the landscape and supports stewardship arrangements on Aboriginal and pastoral lands.

Another recent innovation in conservation management is the emergence of offset schemes. Offset schemes ensure that where a development cannot avoid causing environmental degradation, this degradation is offset by an investment in programs to improve environmental conditions elsewhere. As part of adopting ESD principles, the Northern Territory Government has also committed to the development of an environmental offsets policy, producing a draft in October 2010. Finalisation and implementation of this policy will enhance the capacity to secure improvements in the quality of Territory environments for biodiversity conservation.

Lagoon water monitoring, Howard Sandsheets

'The NTCA membership see natural resource management as fundamental to their lives and livelihoods. Cattle production is a land-based rural industry, and so depends upon maintaining the productive values of the land. The NTCA recognise that wise management of water, vegetation and soil underpin the productivity of the pastoral industry, its sustainability and its profitability into the future. The NTCA welcomes the opportunity to make this submission to the review of the INRM plan and looks forward to an ongoing relationship with the TNRM and other partners in delivery its outcomes.'

Luke Bowen, Executive Director, Northern Territory Cattleman's Association

'As a framework to guide the future management of Territory natural resources, the new NT INRM Plan represents a positive, inclusive and integrated approach to dealing with the issues to achieve a sustainable future and I commend everyone involved in its development. The plan complements the NTG 2030 Strategic Plan and the Greening the Territory initiative - which is about engaging government, community and individuals to work together towards the common goal of contributing to a cleaner, greener Territory.'

Jim Grant - Chief Executive of the Department of Natural Resources, Environment and the Arts.

What we plan to do

'Policy and planning for sustainable use' will progress the establishment of a policy, planning and legislative framework that is more supportive of sustainable natural resource management. It will extend the consultative planning processes used in the Daly River region to other areas that are subject to development pressures. **MA-49** will ensure that future land and water use in the Roper River Valley and Victoria River District will be based on the best available information on resource availability and capability. It will develop land use plans using best practice consultative process following the model developed for the Daly River area.

Before deciding to use land for production or urban or industrial development, we need to understand its values and how suitable it is for the intended purpose. This work will therefore be informed by resource mapping and assessment undertaken in Managing landscapes and seascapes based on sound information, as well as the assessment of water resources, needs and impact of different users (**MA-43**). Planning and legislative frameworks overseeing forestry and mining operations will also be scrutinised and improved where necessary.

MA-48 aims to ensure that forestry operations are only established in appropriate areas of the Northern Territory, and use best practice management in order to cause minimal environmental degradation and provide sustainable economic benefit.

MA-50 will review mining legislation and recommend changes that support efforts of the mining industry and government to comply with ESD commitments and ensure best practice mine management.

Policy and planning will also aid the development of an effective and internationally recognised conservation estate. It will do this by ensuring representative examples of all of the Territory's plants, animals and habitats are protected under conservation management in a connected conservation estate, aided by stewardship arrangements for conservation management on Aboriginal and pastoral lands. A biodiversity offset framework will also be developed to ensure unavoidable environmental degradation is counterbalanced by environmental works elsewhere in the Territory.

MA-51 aims to ensure the best bits of country are included in an expanded conservation estate. It will do this by supporting a range of conservation management approaches, including Indigenous Protected Areas and stewardship arrangements on private land.

MA-52, to finalise the development of, and implement a framework for supporting biodiversity stewardship through offset programs, will assist Traditional Owners and other land managers to undertake conservation management to provide biodiversity offset benefits to be set against development-related losses.

These plans, policies, programs and legislative changes will support on-ground efforts to manage the Territory's natural resources more sustainably.

Targets

Policy & Planning-1 By 2030, the Territory's policy, planning and legislative framework supports more sustainable natural resource management

Policy & Planning-1.1 By 2015, the Territory's policy, planning, and legislative framework supports sustainable land use planning and natural resource use

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-48	Undertake land use planning for Roper River Valley and Victoria River District	GS	M
MA-49	Develop and implement a forestry management and assessment framework	TE & GS	M
MA-50	Assess current requirements for mine licensing and rehabilitation and improve where necessary	NT	M
See also:			
MA-33	Facilitate Indigenous wildlife-based industries		
MA-43	Further quantify water resources, needs and impact of different users to assist in water management planning		
MA-53	Improve land, vegetation, soil and cultural mapping to inform land management		
MA-54	Commence marine habitat and key species mapping to inform planning, management and monitoring		
MA-55	Foster the use of up-to-date scientific and local knowledge to inform native vegetation clearing practice that underpins land development		
MA-63	Develop a framework for assessing and minimising impact of mining and development on coastal and marine environments, using Darwin Harbour as a pilot area		
MEASURES OF ACHIEVEMENT			
•	No. of Policy & Planning documents that have been written or revised to enhance sustainable land use planning		
•	No. of regional land use plans based on Ecologically Sustainable Development principles		
•	Mining assessment process addressing environmental impacts under current conditions and climate change scenarios developed		
•	Policy framework supporting Indigenous wild-harvest of species for commercial use simplified		

Policy & Planning-1.2 By 2015, mechanisms are in place to support conservation management both on and off reserves

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-51	Develop a framework for landscape scale conservation management, both on- and off-reserve, including prioritisation, identification, management and protection of conservation assets	NT	H
MEASURES OF ACHIEVEMENT			
•	Area of land and sea managed for conservation purposes (assessed by bioregion)		
•	Percentage of each 1:1,000,000 vegetation type under secure conservation management arrangements (assessed by bioregion)		
•	Progress of Eco-link		
•	No. of parks and reserves with management and monitoring plans that address Indigenous aspirations, landscape-wide management		
•	No. of Territorians undertaking best practice land and sea management through stewardship and other incentive programs		

targets cont…

Policy & Planning-2 By 2030, the Territory's planning, policy and legislative framework supports employment in conservation stewardship activities

Policy & Planning-2.1 From 2010, increasing numbers of people are employed in stewardship roles on all land tenure types

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-52	Develop and implement a framework for supporting biodiversity stewardship through offset programs	NT	H
MEASURES OF ACHIEVEMENT			
•	Biodiversity offset framework developed		
•	No. of stewardship and other management programs in place and attracting community uptake (Assessed by sector and NRM subregion)		
•	No. of people employed in stewardship and other conservation incentive programs		

Delamere soil workshop, Madonna Wuttke

MANAGING ENVIRONMENTAL ASSETS

- **Program 10:** Managing land and sea country based on sound information
- **Program 11:** Protecting significant sites
- **Program 12:** Recovering species through adaptive management

Uluru-Kata Tjuta National Park, Parks Australia

PROGRAM 10: Managing land & sea country based on sound information

The 'Managing land and sea country based on sound information' program supports the collection of information about the distribution, characteristics and tolerances of ecosystems and species, as well as the ongoing monitoring of the condition of landscapes and seascapes. It will provide for mapping of the Territory's ecosystems and research into the distribution and status of the Territory's species to meet planning needs and better inform decisions made at the property scale. It will emphasise the importance of condition monitoring of landscapes, catchments and waterways, and, where the evidence suggests, the introduction of measures to address causes of deterioration and degradation. Finally, it will allow for the identification of significant threats to the Territory's coastal and marine environments and the development of systems to manage these.

The issue

The Northern Territory is known for its magnificent natural landscapes and seascapes, and spectacular displays of wildlife. Our deserts, savannas, woodlands, monsoon forests and wetlands are still largely in a natural state, with little clearance and relatively few weed species. However, few places are in the condition that existed prior to European settlement, and many of the plants and animals that these environments once contained have disappeared.

The Territory is at the forefront of a changing approach to managing natural environments. We still recognise the place of parks and reserves for the management of iconic areas, but we now understand that all landholders have an interest in, and responsibility for, maintaining the Territory's good environmental condition, whether they are Indigenous people managing their land to maintain cultural values or pastoralists wanting to turn-off cattle. This change is seeing an increasing number of landholders being supported to manage their country for wildlife conservation.

It is one thing to decide to manage for conservation, but quite another to know what this entails. The old mantra of 'weeds, ferals and fire' still holds true, but we need more information on which weeds, how many ferals and what fires we need to manage. We also need to know if our management is being effective, and when we are wasting our time.

This plan supports the development of an evidence-based approach to land and sea management that includes a mix of dedicated conservation areas and conservation principles across the broader Territory landscape.

What we plan to do

In order to plan and manage landscapes and seascapes, we need to know what's there. Mapping of habitats, land types, vegetation and soils is therefore a high priority in this plan:

MA-53 aims to improve mapping of terrestrial natural resources to inform better land management decision making, particularly to help in conservation management, pastoral and other agricultural production, fire management, management of cultural sites, and decisions about land use and land clearing. **MA-54** will support collaborative collection mapping of marine species and habitat needed to progress marine planning and management.

The highest level of detail is required when deciding what parts of a landscape can be cleared for agricultural, horticultural or industrial development. As well as identifying whether the land is needed for conservation purposes because of its unique values, the suitability of the land for clearing and the purposes for which it is to be cleared needs to be determined.

MA-55 will therefore develop catchment-based vegetation management planning processes based on community consultation and the best available information to identify which parts of the catchment can be cleared and for what purposes. Plans will be individually tailored to each region and draw on information about threatened species, soils, vegetation and land capabilities. Planning and management of landscapes and seascapes must also take into account the needs of individual species. **MA-56** will therefore improve knowledge of where species are, whether they are declining, their habitat requirement and their management needs. It will also ensure that biodiversity information collected by different groups is stored in a central location from which it is freely accessible by the entire Territory NRM community.

Whatever the primary purpose land is to be used for, principles of ecologically sustainable development stipulate that it should be maintained in a healthy and productive condition. We need to be able to report on the trends in environmental condition to demonstrate that our management practices are indeed sustainable. **MA-57** will therefore support the development of a multipurpose landscape-monitoring system to track trends in environmental condition in the Northern Territory. This will not only help land managers decide whether their management practices are sustainable or need improving, but will facilitate reporting on the delivery of environmental management agreements (such as offset programs). **MA-58** will also provide information needed to identify watercourses in need of restoration as well as threats facing waterways, and will support restoration efforts. This assessment will form the basis of addressing river health in the Territory.

Maintenance of land and soil condition will be advanced by providing land managers with information about soil characteristics, hazards and conservation management:
MA-59 will map areas that are prone to acidification in the Northern Territory and promote appropriate management to prevent further degradation.

what we plan to do cont…

MA-60 will support adoption of best practice soil management through publications and extension services. It will identify management needed to ensure soil resources are protected and maintained in good condition, and provide this information to land managers, infrastructure developers and construction workers.

MA-61 will reduce soil loss by encouraging adoption of practices to prevent and manage soil erosion, including the stabilisation of existing eroding areas.

As well as managing to maintain and improve the condition of country, we also need to correct the mistakes of the past, by restoring degraded landscapes and cleaning up legacy mines. Even if the habitat values of these areas can never be fully recovered, restoration will help to minimise the spread of erosion gullies, toxic chemicals and weeds to adjacent areas. Landscape restoration will be a significant component of **MA-61**.

MA-62 will support efforts to clean up significant environmental problems left when old mines were abandoned, with a particular emphasis on preventing water contamination, and encourage best practice environmental management in mining to avoid the creation of further legacy mines.

MA-63 aims to provide mechanisms for assessing mining and development impacts on marine environments by developing water quality and ecological (including noise) indicators specific to Territory marine environments; to apply these indicators in monitoring marine and coastal environments, and to adjust regulation of activities with adverse impacts. It uses Darwin Harbour as a pilot area, but extends this work to other sensitive marine areas. Land managers will be encouraged to adopt best practice management of land by establishing the linkages between profitability and sustainability. Where conservation management goes beyond sustainable practices needed to improve production efficiency, opportunities for fee-for-service conservation management will be pursued.

The next step is to ensure that landscape planning at both the regional and property scale protects the best areas of wildlife habitat, while still taking into account the need for people to make a living off the land. Good off-reserve conservation management will contribute to the aim of including a greater area of the Territory, and a wider range of habitats, in a connected protected area estate. This aim will be advanced by the Territory 2030 Strategic Plan commitment to expanding the area managed for conservation and a move to the declaration of Indigenous Protected Areas; and is expressed in the Territory Government's Eco-link vision. Planning for marine protected areas will also be progressed through the identification of priority areas for conservation management.

Targets

Land & Sea-1 By 2030, use of land and sea country is based on sound information about the distribution, characteristics and tolerances of ecosystems and species

Land & Sea-1.1 By 2015, mapping of the Northern Territory's ecosystems meets land and sea country planning needs and is better informing decisions made at the property scale

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-53	Improve land, vegetation, soil and cultural mapping to inform land management	NT	H
MA-54	Commence marine habitat and key species mapping to inform planning, management and monitoring	CM	VH
MA-55	Foster the use of up-to-date scientific and local knowledge to inform native vegetation clearing practice that underpins land development	TE & GS	VH
MEASURES OF ACHIEVEMENT			
•	Percentage of the extensive use areas of the Northern Territory with land type, soil and vegetation mapping at 1:250,000		
•	Percentage of the intensive use areas of the Northern Territory with land type, soil and vegetation mapping at 1:100,000		
•	Percentage of catchments where aquatic assets have been mapped and described at 1:25,000		
•	Percentage of marine habitat mapped and described at appropriate scales		
•	Availability of land type, soil, vegetation and marine habitat mapping to land and sea managers		
•	Usage of land type, soil, vegetation and marine habitat mapping by land and sea managers		

Land & Sea-1.2 By 2015, knowledge of the distribution and status of the Northern Territory's species meets land and sea country planning needs and is better-informing decisions made at the property scale

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-56	Enhance biodiversity data collection and exchange	NT	VH
See also:			
MA-54	Commence marine habitat and key species mapping to inform planning, management and monitoring		
MEASURES OF ACHIEVEMENT			
•	No. of systematic regional surveys undertaken to address information gaps and management priorities		
•	Density of current (last decade) fauna and flora records per bioregion and degree square		
•	No. of floral specimens lodged with the Northern Territory Herbarium annually		
•	No. of faunal specimens lodged with the Northern Territory Museum and Art Gallery annually		
•	Availability of species data to land and sea managers		
•	Availability of system enabling land and sea managers to contribute species records to Northern Territory species database		
•	Usage of Northern Territory species database		

targets cont...

Land & Sea-2 By 2030, condition of landscapes and seascapes is being regularly monitored, and any identified deterioration is being addressed

Land & Sea-2.1 By 2015, information is being collected about the condition of landscapes, catchments and waterways to inform management needs

MA	Title	Region(s)	Priority
MANAGEMENT ACTIONS			
MA-57	Enhance the Territory's natural resource monitoring activities as the basis of a landscape health reporting program	NT	H
MA-58	Undertake baseline catchment health assessments and identify at-risk waterways, and restore and protect at-risk riparian areas	NT	VH
See also:			
MA-34	Develop Indigenous capacity for rehabilitation of mine sites and other disturbed land		
MA-63	Develop a framework for assessing and minimising impact of mining and development on coastal and marine environments, using Darwin Harbour as a pilot area		
MEASURES OF ACHIEVEMENT			
•	Extent of intact native vegetation being assessed by catchment or bioregion		
•	Agreed set of regionally appropriate land condition indicators developed, applied and reported		
•	Agreed set of regionally appropriate marine condition indicators developed, applied and reported		
•	Agreed set of regionally appropriate catchment health indicators developed, applied and reported		

Land & Sea-2.2 By 2015, soil loss and land degradation are being prevented and, where necessary, addressed

MA	Title	Region(s)	Priority
MANAGEMENT ACTIONS			
MA-59	Identify and manage areas at risk of soil acidification	TE & GS	H
MA-60	Increase adoption of best practice soil conservation	NT	H
MA-61	Support land management practices that prevent soil erosion and restore the condition of degraded lands	NT	M
MEASURES OF ACHIEVEMENT			
•	Soil conservation management manuals developed for: o Pastoral lands o Broadacre agriculture o Horticulture o Urban and infrastructure development		
•	Soil acidification risk areas mapped		
•	No. of soil management extension officers/programs		
•	No. of land managers/machinery operators adopting best practice soil management as a result of engagement in extensions programs		
•	Area of soil conservation work addressing soil erosions and land degradation		

targets cont…

Land & Sea-2.3 By 2015, remediation of priority legacy mines has begun and other legacy mine rehabilitation of other mine sites has been prioritised

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-62	Progress remediation of legacy (abandoned) mines to protect water quality and other environmental values	NT	H
MEASURES OF ACHIEVEMENT			
•	Priority legacy mines for rehabilitation identified		
•	Percentage of priority legacy mines with active or completed remediation programs		
•	Water quality monitoring sites identified and monitored and reported		
•	Percentage of marine habitat mapped and described at appropriate scales		
•	Trends in water quality as monitored at legacy mines		

Land & Sea-2.4 By 2015, significant threats to the Territory's coastal and marine environments are identified, and their impacts monitored and addressed

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-63	Develop a framework for assessing and minimising impact of mining and development on coastal and marine environments, using Darwin Harbour as a pilot area	CM	VH
MEASURES OF ACHIEVEMENT			
•	Priority sites for marine monitoring management identified		
•	No. of marine priority sites monitored and managed		
•	No. of catchment gauge stations equipped with water monitoring capability		
•	No. of monitoring locations collecting time series data in Darwin Harbour and other identified priority areas		
•	Trend in sediment and nutrient fluxes in Darwin Harbour and other identified priority areas		
•	No. of stormwater management plans or catchment subdivisions within Darwin Harbour catchment with water sensitive urban design features		
•	Darwin Harbour Water Quality Protection Plan developed, endorsed, funded and implemented		

'*The Northern Territory Agriculture Association is pleased to be involved in the review of the Integrated NRM Plan and welcomes TNRM's engagement with industry.*
…The Association and industry are committed to responsible and sustainable development of both land and water resources in the NT…
Natural resource management (NRM) is integral to the sustainability and viability of all primary industries. NRM is what underpins primary production. Good farming, irrigation or grazing practice is the result of good NRM.'

Northern Territory Agriculture Association

PROGRAM 11: Protecting significant sites

The 'Protecting significant sites' program supports the collaborative management of both culturally-significant sites and Sites of Conservation Significance (SoCS)* in the NT. It will emphasise the development of user-driven management programs and support the collection of information needed to assess threats and management requirements. It will provide support for Traditional Owner groups to map, monitor and manage culturally significant sites on their own land. It will address identified weed and feral animal threats across a number of SoCS, and examine ways to prevent saltwater intrusion into significant coastal freshwater systems. Finally, it will provide support for integrated management programs for several priority SoCS, namely Arafura Swamp, Howard Sand Plain and the lakes on the Barkly Tablelands.

The issue

The once-traditional approach to conservation was to lock up the best bits of country (or those left over) into conservation reserves. This approach has many drawbacks in northern Australia, where so much of the landscape has conservation value and there is limited capacity to manage even the designated reserves effectively. A landscape approach to conservation aims to keep the integrity of the landscape, regardless of its primary use. Accordingly, we now try to ensure that landscapes are managed sustainably; and to harness the efforts of all land managers in protecting their values through weed, fire and feral animal management. However, we still need to know where to focus our conservation efforts, i.e. which bits of the landscape are most valuable and most sensitive to damage. To this end, Territory Natural Resource Management funded the development of a study of Sites of Conservation Significance (SoCS) in the NT, which was completed in 2009. The SoCS report identified 67 sites on the basis of their outstanding, and often internationally-recognised, conservation values. The report also recognised known management issues for each site. Like much of the rest of the landscape, SoCS require the management of fire, weeds and feral animals, but are likely to be even more sensitive to the impact of these threats. In some places, protection from over-grazing by domestic livestock, or removal of grazing altogether, may be necessary. Many of the coastal SoCS are also at risk of saltwater incursions, resulting from either sea level rise or breaches of coastal barriers by feral animals or for boat access.

In managing to protect the values of significant sites, it is important that all threats are addressed in an integrated manner, rather than simply relying on the benefits of landscape-scale management of individual threats. Depending on the needs of the individual sites, SoCS management is likely to include combinations of removal of feral animals and weeds, fire management, visitor management, and, in some cases, the fencing of particularly sensitive areas. However, where a threat, such as feral animal damage, operates across a number of SoCS, it may be cost-effective to manage that threat in a number of SoCS at one time in a coordinated manner.

*   Harrison et al. 2009. An Inventory of Sites of International and National Significance for Biodiversity Values in the Northern Territory. Dept. of Natural Resources, Environment, the Arts and Sport, Darwin.

the issue cont...

Most SoCS have multiple interested stakeholders and occur across multiple tenures. So management of these sites also necessitates a collaborative approach, bringing together all stakeholders to develop management programs. The most successful management programs are likely to be those driven by, and addressing the values and concerns of, the landholders, whether these are Traditional Owners or pastoralists.

Northern Territory landscapes are also known for their deeply significant cultural values, with each group of Traditional Owners recognising a suite of culturally significant sites associated with dreaming stories, ceremony and art on their country. Many of these sites (such as shell middens, stone arrangements, rock art sites, rock shelters and occupation sites) are also of archaeological significance. Along with the broader cultural landscapes, culturally-significant sites require fire, weed and feral animal management. Some may also require protection from weather and visitor impacts. Cultural site management therefore involves a range of activities, including interpretive signage, fencing, removal of nearby vegetation, placing drip lines to divert the flow of rainwater from art works, construction of walking tracks to reduce erosion, and oversight of visitor activities.

Before cultural sites can be well-managed, the responsible Indigenous ranger groups need to know where sites are and how they are significant. Mapping of sites is both an important aspect of maintaining cultural knowledge and the basis for maintenance. Several Indigenous groups are mapping, monitoring and maintaining cultural sites, but many cultural sites remain undocumented. Again, it is essential that cultural site management is driven by, and addresses the values and concerns of, the relevant Traditional Owners.

Katherine Gorge boat trip, Madonna Wuttke

What we plan to do

The Protecting significant sites program will support the collaborative management of both SoCS and culturally-significant sites. It will emphasise the development of user-driven management programs and support the collection of information needed to assess threats and management requirements.

MA-64 will protect the cultural values of sacred sites by supporting the mapping, monitoring and management needs identified by the Traditional Owners to minimise visitor impact and damage by fire or feral animals. Through linkages with numerous other management actions, it will also support 'caring for country' activities needed to manage cultural landscapes.

Feral pigs and buffalo pose one of the most significant threats to northern SoCS, by removing vegetation, trampling, turning over and compacting soils, and causing erosion, particularly breaches in coastal barriers that separate freshwater environments from the sea. Three management actions therefore address pig and/or buffalo damage to northern SoCS:

MA-65 will support collaborative efforts between Indigenous communities and land managers to reduce the adverse effects of feral pigs on priority islands and other Top End SoCS.

MA-66 will support collaborative efforts between Indigenous communities and land managers to reduce the adverse impacts of buffalo in Arnhem Land and on Cobourg Peninsula.

MA-67 will support strategic control of feral pigs and buffalo to protect conservation in significant wetlands of the Gulf Savanna region.

Feral animals are also a significant threat to significant Arid Lands wetlands. Of particular concern are feral horses, donkeys, cattle and camels. **MA-68** will investigate the impact of feral animals on the conservation values of wetlands in Arid Lands SoCS and other wetlands and control feral animals to reduce any significant impacts identified.

The most significant threat to Arid Lands SoCS, however, is invasion by Buffel and/or Couch Grass. Buffel Grass is a valued pasture plant, but its ability to replace all native ground layer plants seriously impacts on habitat quality for Arid Lands plants and animals. Couch Grass, with no redeeming pastoral values, has a similar impact on habitats. Both species are particularly rampant in Arid Land wetlands. **MA-69** will therefore identify where Buffel and Couch Grass threaten conservation values, either in SoCS or of threatened species populations, and undertake management to reduce that impact. In order to prevent Buffel Grass becoming an ecological threat of similar proportions in the Gulf region of the Northern Territory, **MA-70** will thoroughly assess the likelihood of Buffel Grass introduced for pastoral purposes becoming a significant problem to conservation in this area; determine if any cultivars are non-invasive; and, if necessary, propose management options to improve pasture productivity while minimising weed risks to conservation values.

what we plan to do cont...

Saltwater intrusion is already a significant problem for a number of SoCS, notably Mary River Coastal Floodplain and Arafura Swamp. While sea-level rise is likely to be at play in this issue, at both sites, the chenier ridges that once separated freshwater and saltwater environments have been heavily degraded by feral animals and/or to assist boat passage. The threat of saltwater intrusion to other SoCS is largely unknown, as is the extent to which preventive measures, such as feral animal control, are needed to avert extensive freshwater wetlands from becoming degraded by saltwater. **MA-76** will therefore investigate options for addressing saltwater intrusion into significant coastal wetlands regardless of its cause. This information will be used as the basis of strategic management programs for coastal SoCS.

An ultimate aim of this program is to have management programs for all SoCS. However, in this first five year period, it will only be possible to progress integrated management for a few priority sites. Each of the selected priority sites has either been recognised or nominated under the Australian Government's Caring for our Country program (e.g. High Conservation Value Aquatic Ecosystems, important ecological and evolutionary regugia), and is already subject to significant management activities:

MA-72 supports efforts to maintain internationally significant values of the Arafura Swamp through management of feral animals, weeds and fire.

MA-73 will extend current conservation efforts at Lake Woods to maintain habitat condition for significant waterbird populations by ensuring water flow and quality are not adversely affected by management practices in the catchment and Parkinsonia is contained and, where possible, eradicated. It will also explore future management directions, including the development of a management program for the vulnerable Australian Painted Snipe.

MA-74 will maintain internationally significant biodiversity values in representative areas of Barkly Tableland wetlands through collaborative programs with landholders.

MA-75 will identify the areas of highest conservation values on the Howard Sandsheet - a distinctive and sensitive vegetation community - and develop a strategic plan for their conservation.

Barkly Tablelands *Coastcare beach protection, Tony Ralph* *Kakadu National Park, Parks Australia*

Targets

Significant Sites-1 By 2030, environmentally- and culturally-significant sites are being managed cooperatively, based on knowledge of values, threats and the best management options

Significant Sites-1.1 By 2015, an increasing number of culturally significant sites and landscapes are being managed to reduce visitor impact and other significant threats

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-64	Support best practice management of Indigenous culturally significant sites and landscapes	NT	VH
See also:			
MA-09	Manage high fuel load grasses in the Top End to minimise fire hazard and environmental impact		
MA-18	Build community understanding of the impacts of feral animals and support for their control through engagement		
MA-19	Reduce impact of horses and donkeys in the Victoria River District		
MA-21	Maintain advances made by the Camel Action Plan		
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management		
MEASURES OF ACHIEVEMENT			
•	Priority cultural sites for management and monitoring programs identified		
•	No. of cultural sites with active management and monitoring programs		
•	Condition reports from cultural site management and monitoring programs		

Significant Sites-1.2 By 2015, fire, weed and feral animal threats to Sites of Conservation Significance have been identified and addressed

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-65	Reduce pig impact on priority NT islands and other Sites of Conservation Significance	TE	H
MA-66	Reduce buffalo impact in Arnhem Land and on Cobourg Peninsula	TE	M
MA-67	Reduce impact of pigs and buffalo on Sites of Conservation Significance in the Gulf-Savanna region	GS	M
MA-68	Identify and address significant feral herbivore impacts on wetland values in Arid Land Sites of Conservation Significance and other wetlands	AL	H
MA-69	Minimise Buffel and Couch Grass impact at Sites of Conservation Significance and on threatened species populations	AL	M
MA-70	Minimise the risk of Buffel Grass invasion in the gulf region	GS	M
See also:			
MA-01	Strengthen collaborative fire management in Arnhem Land		
MA-02	Support collaborative fire management in the Gulf Savanna region		
MA-03	Improve coordination and management of wildfires on the Barkly Tablelands		
MA-04	Support fire management in central Australia		
MA-07	Control priority Northern Territory and WoNS weeds at a catchment scale		
MA-08	Map naturalised Neem and African Mahogany and develop and implement control measures		
MA-09	Manage high fuel load grasses in the Top End to minimise fire hazard and environmental impact		
MA-10	Manage Gamba Grass in the Darwin Harbour catchment to minimise fire hazards and environmental impact		
MA-11	Undertake sustained strategic management of Mimosa across the Top End floodplains		
MA-12	Work towards eradicating Prickly Acacia from the Victoria River catchment		

targets cont...

See also:	
MA-13	Continue managing prickle bushes on the Barkly Tablelands
MA-14	Manage Bellyache Bush in the Roper River and the upper Daly and eradicate from the Victoria River District
MA-15	Continue to manage Athel Pine along priority watercourses
MA-18	Build community understanding of the impacts of feral animals and support for their control through engagement
MA-19	Reduce impact of horses and donkeys in the Victoria River District
MA-20	Reinvigorate rabbit control by Arid Lands land managers
MA-21	Maintain advances made by the Camel Action Plan
MA-56	Enhance biodiversity data collection and exchange
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management
MEASURES OF ACHIEVEMENT	
•	Trends in pig populations and impact indicators at Top End and Gulf Savanna Sites of Conservation Significance
•	Trends in Buffalo populations and impact indicators at Top End and Gulf Savanna Sites of Conservation Significance
•	Trends in Buffel Grass distribution and abundance at Gulf Savanna Sites of Conservation Significance
•	Trends in feral herbivore populations and impact indicators in Arid Lands Sites of Conservation Significance and other wetlands
•	Trends in Buffel Grass distribution and abundance at Arid Lands Sites of Conservation Significance
•	Trends in Couch Grass distribution and abundance at Arid Lands Sites of Conservation Significance
•	Condition of Arid Lands threatened species populations affected by Buffel Grass
•	Condition of Arid Lands threatened species populations affected by Couch Grass

Significant Sites-1.3 By 2015, saltwater intrusion threats to Sites of Conservation Significance have been identified, along with options for addressing them

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-71	Develop a strategic plan to address preventable saltwater intrusion into coastal Sites of Conservation Significance	TE	VH
See also:			
MA-72	Address critical threats to the internationally significant values of the Arafura Swamp		
MEASURES OF ACHIEVEMENT			
•	Strategic plan completed		
•	Priority sites for management intervention identified		
•	Percentage of priority sites with active saltwater intrusion management programs		

Rainbow Valley, Michael Barritt

targets cont...

Significant Sites-1.4 By 2015, integrated management programs are being implemented at an increasing number of Sites of Conservation Significance

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-72	Address critical threats to the internationally significant values of the Arafura Swamp	TE	VH
MA-73	Address critical threats to the internationally significant values of Lake Woods	BT	M
MA-74	Protect conservation values of significant wetlands on the Barkly Tablelands through collaborative management and monitoring programs	BT	H
MA-75	Develop a conservation plan for Howard Sandsheet heath vegetation community	TE	H
See also:			
MA-07	Control priority Northern Territory and WoNS weeds at a catchment scale		
MA-08	Map naturalised Neem and African Mahogany and develop and implement control measures		
MA-10	Manage Gamba Grass in the Darwin Harbour catchment to minimise fire hazards and environmental impact		
MA-11	Undertake sustained strategic management of Mimosa across the Top End floodplains		
MA-12	Work towards eradicating Prickly Acacia from the Victoria River catchment		
MA-13	Continue managing prickle bushes on the Barkly Tablelands		
MA-14	Manage Bellyache Bush in the Roper River and the upper Daly and eradicate from the Victoria River District		
MA-15	Continue to manage Athel Pine along priority watercourses		
MA-18	Build community understanding of the impacts of feral animals and support for their control through engagement		
MA-19	Reduce impact of horses and donkeys in the Victoria River District		
MA-20	Reinvigorate rabbit control by Arid Lands land managers		
MA-21	Maintain advances made by the Camel Action Plan		
MA-56	Enhance biodiversity data collection and exchange		
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices		
MA-82	Support and further develop ranger capacity for weed, feral animal and fire management		
MEASURES OF ACHIEVEMENT			
•	Number of Sites of Conservation Significance with active integrated management programs		

Bare Sand Island, Hannah Seward

PROGRAM 12: Recovering species through adaptive management

The Recovering species through adaptive management program will support targeted surveys to resolve the conservation status and management requirements of marine mammals in the Northern Territory, and undertake research to assess the causes of the recent decline of small mammals in the Top End. It will also trial measures to control cat and fox predation of threatened species in the Arid Lands, as a means of developing long-term management options.

The issue

The Northern Territory is largely in a natural state, with little clearance and relatively few weed species. However, outward appearances mask the decline and loss of many of our native species. Over 200 plant and animal species are considered threatened in the Territory. The most worrying aspect of this environmental deterioration has been the decline of terrestrial mammals, with 22 being considered threatened and 15 known to have gone extinct. Small mammals started disappearing from the Northern Territory in the 19th century. For a long time this decline was thought to be restricted to the Arid Lands, but is now proceeding rapidly in the Top End.

In some cases the reasons for the declines are clear, in others we are only starting to put together the pieces. We do know that foxes and cats (especially in the absence of dingoes), introduced grazing animals, cane toads, weeds, changes in fire management and, possibly, disease all put pressure on native species or their habitats. However, if we are to reverse these declines it will be necessary to tease out the relative importance of individual threats to individual species. In some cases, species may be in decline without us even knowing. Only when we know that a species is in trouble, and why, can we start to do something about it, or begin to determine whether these species are at risk of future threats, such as development or climate change.

Pod of Snubfin Dolphin, Hannah Seward

Lack of adequate knowledge particularly hinders conservation and the management of the marine environment. So little is known of our marine mammals - False Killer Whales were only discovered in Darwin Harbour in 2007, and the conservation status of Indo-Pacific Bottle-nosed and Humpback Dolphins and Australian Snubfins in Territory waters is still uncertain. Establishing the status and vulnerabilities of these species is essential if we are to manage marine waters to protect them or to assess the impacts of mining and gas developments along our shorelines.

What we plan to do

Northern Quoll, Ian Morris

In order to conserve native species, work needs to be done to establish which ones are in trouble, the threats they face and effective management for ensuring their recovery. In particular, we need to establish the causes of the mammal decline and begin trialling actions to see if we can reverse this loss.

MA-76 will therefore investigate reasons for small mammal decline and trial measures to address it, focusing initially on cat predation, but also pursuing other threatening processes as they are identified, as well as any interactions between them.

While the Top End small mammal decline is foremost in our minds as a process that is occurring before our very eyes, the remaining Arid Land mammals also deserve our attention. Cats and foxes are recognised as the most significant threat to most small mammals in central Australia, as well as to a number of threatened lizards. **MA-77** therefore seeks to increase the survival and health of several Arid Land threatened species by controlling foxes and cats in a strategic manner, and monitoring both the effectiveness of this predator control and the recovery of the threatened species populations.

The coastal waters of the Northern Territory support numerous marine mammals, including dugongs, dolphins and false killer whales, yet very little is known about these species. **MA-78** supports work with Indigenous ranger groups and the broader community to enhance the knowledge about the conservation status, habitat and distribution of marine mammals to underpin marine planning and assessment.

To identify other species that are in danger of decline, we need to be monitoring native species and the threats they face, so that we know when management intervention is needed and whether our management efforts are being effective. This will be done as part of Program 1 Managing landscapes and seascapes based on sound information (**MA-56**).

Frillneck Lizard, Tida Nou

Targets

Species-1 By 2030, we have reduced the decline in native species through improved knowledge of threats and management needs

Species-1.1 By 2015, we understand the causes of the Top End mammal decline, and have commenced landscape-scale trials to address it

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-76	Improve understanding of, and implement measures to address, the decline of Top End small mammals	TE	VH
MEASURES OF ACHIEVEMENT			
•	Trends in priority mammals populations		
•	Trials undertaken to assess contribution of a range of causal factors		
•	Percentage of declining mammal species for which threatening processes understood		
•	Percentage of declining mammal species with management programs		

Species-1.2 By 2015, we are successfully reducing the impact of introduced predators on native species

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-77	Reduce fox and cat predation of significant populations of Arid Land threatened species	AL	VH
MEASURES OF ACHIEVEMENT			
•	Cat control measures trialled		
•	Effective cat control measures identified		
•	Fox control measures trialled		
•	Effective fox control measures identified		
•	No. of threatened species populations with successful management of cat and/or fox impacts		
•	Trends in threatened species populations being managed to reduce cat and/or fox impacts		

Species-1.3 By 2015, we understand the status and conservation needs of marine mammals

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-78	Conservation management of the Northern Territory's inshore mammal (dugong, dolphins, whales) population hotspots and critical habitats	CM	H
MEASURES OF ACHIEVEMENT			
•	No. of marine mammals species with good population data/estimates		
•	Trends in marine mammal populations		
•	No. of marine mammals for which conservation status has been determined		
•	No. of marine mammals species for which essential habitat has been mapped and described		
•	No. of marine mammals species for which threats have been documented		
•	No. of marine mammals with conservation management plans		
The following management action also addresses the long-term target Species-1, but its contribution to targets is assessed under other programs:			
MA-56	Enhance biodiversity data collection and exchange		

MAKING IT HAPPEN

- **Program 13:** Building Natural Resource Management knowledge & capacity
- **Program 14:** Engaging the community

Alice Springs Landcare Group, Tanya Howard

PROGRAM 13: Building natural resource management knowledge and capacity

Natural resource management will not be effective without a strong, capable and knowledgeable workforce. This program aims to assist Indigenous elders preserve, transfer, and where appropriate, store traditional ecological knowledge to ensure it remains a vital part of Aboriginal cultural and natural resource management. It will also assist in the preservation and application of other forms of knowledge. It will develop means for collecting and sharing knowledge, information and data to inform natural resource management across the Territory. It will build capacity by supporting formal and informal training programs, and supporting Indigenous ranger groups, industry and Landcare and Coastcare groups, and developing a business environment and policy framework to ensure these groups remain viable.

The issue

Effective natural resource management draws on a wide range of knowledge, information and data. Indigenous Australians built up a detailed understanding of our continent's natural resources over thousands of years of sustainable management. This traditional ecological knowledge (TEK) is valuable in its own right, but also complements and enhances western scientific knowledge.

The major threat to TEK is that it will be lost if it is not actively used. Death of elders, changing lifestyles and shifting populations can prevent the transfer of knowledge, and unless there is a basis for applying that knowledge in meaningful ways it may lose relevance to custodians. Initiatives that value and foster appropriate use of TEK, such as land and sea ranger and 'Working on Country' programs, provide opportunities for this knowledge to be used as the basis of Indigenous enterprises managing natural resources across large areas of land and sea in the Territory. In doing so they create a knowledge-based economy, strengthen and enhance local cultural values and community integrity, providing motivation for communities to maintain TEK.

A related threat to TEK is that it may not be valued or recognised as highly as it should be, with planners and resource managers tending to emphasise the importance of western scientific knowledge. There is also a risk that, under some circumstances, Indigenous knowledge may be inappropriately used without the consent of custodians or without benefit to them.

Although European settlers are comparatively recent arrivals in the Territory, some individuals, families and communities have built up NRM experience over the years or successive generations of working on the land or in other resource-based industries. Even Territorians not dependent upon natural resource-based livelihoods often have valuable knowledge related to their environmental interests such as urban revegetation, fishing, hunting or bushwalking.

Because of the size of the Territory and the limited resources available, community action is fundamental to natural resource management. Valuing and utilising all forms of community knowledge is a direct way of empowering communities and engaging them more actively in natural resource management. This knowledge can also form a foundation for raising awareness and building community capacity.

the issue cont...

Best practice management of natural resources is an ever-changing field, with new information, techniques and opportunities becoming available. Training is essential to keep managers abreast of these changes, as well as to introduce new managers to Territory environments, issues and management methods. Training is a high priority for both Indigenous ranger groups and industry bodies. Several organisations provide training in Indigenous, conservation, fisheries and pastoral land management in the Territory, as well as in specific skills required for effective natural resource management. However, training can be particularly difficult to access in very remote areas. It is also important that training programs are kept up to date to match the changing information base and management needs.

Capacity for natural resource management also depends on there being healthy communities and industries to provide a capable workforce with knowledge, skills, resources and motivation. Northern and remote Australia faces particular challenges to achieve this capacity. These include its small population base; great distances; lack of infrastructure and resources; and climatic extremes. Natural resource managers also face hurdles in building and maintaining capacity because of stop-start funding, short-term projects and high turnover of personnel.

Each sector faces additional specific challenges. Many Indigenous people want to live on their own country so they can carry out their obligations to country and family. To do this they need jobs that allow them to combine paid employment with living off the land. Participation in this 'hybrid economy' not only has environmental benefits, but has also been shown to have health benefits for those involved. However, work options in these remote areas are currently limited. Indigenous ranger groups have been critical to providing work on country, but many struggle financially and to get access to the ongoing support that they need.

Primary industries have a different array of capacity problems, finding it hard to attract staff in remote areas, but also losing knowledge of the industry and property management when staff move on. Primary producers also find it hard to balance their need to make a living with undertaking conservation work. Pastoral Landcare groups have been central to assisting pastoralists to undertake conservation planning and management, and provide access to information and networks. Again, these groups operate under precarious funding arrangements.

Overall capacity for natural resource management in the Territory is limited by the available funds. The Territory receives a small proportion of the nation's investment in natural resource management. This situation is improving with northern and remote dedicated programs for Australia, including the Indigenous Emissions Trading Program and the Ninti One camel project, as well as 'Working on Country' and IPA programs. Development of fee-for-service opportunities for environmental management, in areas such as biosecurity and surveillance of illegal fishing boats, are also contributing to community capacity. Finally, one of the most significant constraints to ongoing natural resource management capacity is an unsupportive policy environment that does not have natural resource management as its core business and is only beginning to develop frameworks to support the conservation economy. Improving the policy environment is essential to embedding natural resource management into the Territory economy and preserving our environmental and production capacity.

What we plan to do

The first part of this program aims to ensure that existing knowledge is preserved as far as possible, while, at the same time, new knowledge, information and data are gathered.

We particularly need to prevent the loss of TEK. In doing so, we need to respect the wishes of those who own the knowledge. This means knowledge holders getting together to discuss and decide the best ways to share, store and incorporate their knowledge into natural resource management. **MA79** will support such approaches to ensure that important knowledge is not lost to the NRM community, and that we continue to build expertise to improve management practices. The expertise of long-term Landcare and Coastcare members will also be captured to ensure their efforts have a lasting legacy (**MA-84**). Acquisition of new knowledge, information and data is spread across several of the programs in this plan. In particular, the plan aims to improve knowledge of marine habitats (**MA-54**), terrestrial landscapes and catchments (**MA-53**, **MA-55**, **MA-57** & **MA-58**), biodiversity (**MA-56**) and fire (**MA-05** & **MA-06**) to inform their management. This information will be fed into the plan's various knowledge management activities to improve decision-making. No additional knowledge building activities are undertaken within this program.

The best way to keep knowledge alive is to ensure that it continues to be used by the appropriate communities or within the relevant industries. However, some of the knowledge of Indigenous cultures is so threatened that its owners wish to record it in forms that can be accessed into the future. **MA-80** will ensure that TEK collected in the course of natural resource management programs is stored appropriately for the long term, according to the wishes of the owners of that knowledge, and is readily accessible to the appropriate people.

While it is important for the transfer of TEK to occur on country, many other forms of knowledge can be exchanged in more formalized learning environments. Certified training will not only provide natural resource management practitioners with the opportunities to develop knowledge-based skills, but to receive formal recognition that may lead to better employment opportunities. Informal training workshops can also provide a useful venue for learning new information and skills.

LfW Alice Springs, Ilse Pickerd

Aboriginal rock art, Ben Nottidge with permission from Parks Australia

what we plan to do cont...

MA-81 will therefore support both formal and informal training programs to ensure that land and sea managers have the necessary knowledge and skills to undertake best practice management. Several other programs in this plan will make sure that knowledge is put to best use. Supporting industry adoption of sustainable practices will support the incorporation of best practice knowledge into industry extension and training programs (**MA-36**-**MA-39**). Engaging the community will help knowledge of our cultural and environmental values and their management needs reach a broader audience (**MA-89** & **MA-91**).

Effective natural resource management, particularly the maintenance of good environmental conditions, requires an active and capable workforce. Therefore, the second part of this program continues the previous plan's philosophy of supporting essential community arrangements This means providing support to land and sea management organisations (particularly Indigenous ranger groups and Landcare and Coastcare groups) to ensure that they remain viable and vital - having access to resources; knowledge, information and data; training and education; and employment and business opportunities. It also means ensuring that there are supportive institutional arrangements and policy settings. **MA-82**, supporting land managers develop capacity for weed, feral animal and fire management, aims to use employment in environmental management as a means of improving economic opportunities in remote areas, especially for Aboriginal people living on country. It will bolster the capacity of active groups to do this work and help the formation of new groups in areas of limited capacity. It will identify opportunities for the provision of fee-for-service fire, weed and feral animal management by linking groups willing to provide these services with those needing the work done. By enabling groups to provide land management services to clients, it will also improve their financial capacity to undertake work on their own lands. **MA-83** similarly supports sea ranger groups in recognition of their fundamental role in looking after the Northern Territory's vast and remote coastlines, where the emphasis is on biosecurity surveillance and response and sea country planning.

The thrust of these actions is that capacity of pastoralists, landholders and community groups, non-government and Indigenous organisations will be better secured through pursuing economic opportunities in environmental management. This is also the thinking behind the 'Entering the conservation economy' program, which will assess the full range of opportunities to derive income from environmental service delivery (**MA-29**), actively participate in the development of carbon markets (**MA-30**), extend savanna-burning programs to abate greenhouse gases (**MA-31**), facilitate Indigenous wildlife harvesting enterprises (**MA-32**) and assist the development of Indigenous businesses to rehabilitate mine sites and other degraded areas (**MA-33**). Each of these actions not only examines the range of market-based options, but also works towards ensuring the institutional arrangements and policy settings needed to make these options viable are in place. These efforts will be advanced through actions aimed at developing frameworks for on- and off-reserve conservation, with an associated environmental stewardship incentive scheme, (**MA-51**) and establishing a biodiversity offset scheme (**MA-52**).

targets cont…

Knowledge & Capacity-1 By 2030, Territory natural resource managers are incorporating the best available knowledge, information and data into their management

Knowledge & Capacity-1.1 From 2010, the diverse knowledge systems held by Territorians are supported, respected, and, where appropriate, incorporated into natural resource management

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-79	Support land and sea managers in the documentation and/or sharing of knowledge	NT	H
MA-80	Build capacity for appropriate storage, access and archiving of IEK materials	NT	VH
See also:			
MA-84	Provide support to the Landcare and Coastcare movement, including pastoral, Indigenous, urban and peri-urban groups, and other NRM-oriented volunteer organisations		
MEASURES OF ACHIEVEMENT			
•	No. of Indigenous groups and individuals involved in natural resource management programs using culturally appropriate Indigenous knowledge and with adequate access to appropriate non-Indigenous knowledge		
•	Contribution of Territorians with exceptional NRM experience to the development and delivery of industry extension programs (Sustainable Practices-1.1)		
•	Response to biennial NRM surveys assessing: o awareness of the role and importance of traditional ecological knowledge o awareness of the role and importance of western scientific knowledge o awareness of the role and importance of natural resource manager experience		

Knowledge & Capacity-1.2 By 2015, there is a coordinated approach to the sharing and application of natural resource management knowledge, information and data in the Northern Territory

MANAGEMENT ACTIONS	
There are no management actions that address this target in isolation. However, the following actions are integral to its achievement:	
MA-36	Support best practice grazing management through delivery of regional extension programs
MA-37	Support best practice horticulture and broadscale agriculture through delivery of regional extension programs
MA-38	Support ecologically sustainable fisheries management through monitoring and improved technologies
MA-39	Increase community understanding of Ecologically Sustainable Development through industry partnerships for education
MA-55	Foster the use of up-to-date scientific and local knowledge to inform native vegetation clearing practice that underpins land development
MA-56	Enhance biodiversity data collection and exchange
MA-57	Enhance the Territory's natural resource monitoring activities as the basis of a landscape health reporting program
MA-88	Encourage environmentally responsible recreational behaviour and good NRM practices through public outreach and educational programs
MA-90	Support development of green tourism programs that engender an understanding of Territory environments and cultures and offer involvement in NRM activities
MEASURES OF ACHIEVEMENT	
•	Information sharing arrangements between government agencies, land councils, industry, land managers and community in place and implemented
•	Availability of appropriate NRM knowledge, information, knowledge and data directly to land and sea managers
•	Ability of land and sea managers to contribute to territory-wide databases
•	Usage of Northern Territory knowledge, information and data management systems
•	Integration of knowledge into extension and training programs

targets cont...

Knowledge & Capacity-1.3 From 2010, support is provided for training in essential natural resource management skills			
MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-81	Support accredited and informal training in land and sea country management and sustainable industry practices	NT	VH
See also:			
MA-36	Support best practice grazing management through delivery of regional extension programs		
MA-37	Support best practice horticulture and broadscale agriculture through delivery of regional extension programs		
MA-38	Support ecologically sustainable fisheries management through monitoring and improved technologies		
MA-39	Increase community understanding of Ecologically Sustainable Development through industry partnerships for education		
MEASURES OF ACHIEVEMENT			
•	No. of accredited NRM courses being delivered, notably those servicing remote locations		
•	No. of informal NRM training sessions delivered, notably those servicing remote locations		
•	Participation rates and participant feedback at training sessions		
•	No. of graduates of accredited NRM courses		
•	Response to biennial NRM surveys assessing adequacy of NRM training opportunities		
The following management actions also address the long-term target Knowledge & Capacity-1, but their contribution to targets is assessed under other programs:			
MA-05	Maintain and extend the North Australian Fire Information website		
MA-06	Develop fire regimes based on culturally important and/or fire-sensitive indicators		
MA-53	Improve land, vegetation, soil and cultural mapping to inform land management		
MA-54	Commence marine habitat and key species mapping to inform planning, management and monitoring		
MA-55	Foster the use of up-to-date scientific and local knowledge to inform native vegetation clearing practice that underpins land development		
MA-56	Enhance biodiversity data collection and exchange		
MA-57	Enhance the Territory's natural resource monitoring activities as the basis of a landscape health reporting program		
MA-58	Undertake baseline catchment health assessments and identify at-risk waterways, and restore and protect at-risk riparian areas		

Ranger planning meeting, Ramingining, Fiona Peek

Targets cont...

Knowledge & Capacity-2 By 2030, environmental stewardship roles on all land and sea tenure types is a major source of employment and income in remote areas

Knowledge & Capacity-2.1 From 2010, increasing numbers of people are employed in environmental stewardship roles on all land and sea tenure types

MANAGEMENT ACTIONS			
MA	**Title**	**Region(s)**	**Priority**
MA-82	Support and develop capacity for weed, feral animal and fire management	NT	VH
MA-83	Support and further develop sea ranger capacity to plan for and deliver coordinated sea country NRM management	CM	VH
See also:			
MA-29	Investigate, progress and communicate emerging NRM-based economic opportunities on Aboriginal and pastoral lands (with emphasis on the conservation economy)		
MA-30	Participate in national, Northern Territory and regional initiatives to develop carbon market programs		
MA-32	Support greater involvement in savanna-burning greenhouse gas abatement programs		
MA-33	Facilitate Indigenous wildlife-based industries		
MA-34	Develop Indigenous capacity for rehabilitation of mine sites and other disturbed land		
MA-51	Develop a framework for landscape scale conservation management, both on- and off-reserve, including prioritisation, identification, management and protection of conservation assets		
MA-52	Develop and implement a framework for supporting biodiversity stewardship through offset programs		
MEASURES OF ACHIEVEMENT			
•	No. active Indigenous ranger and pastoral Landcare groups		
•	No. of people employed and trained in stewardship roles on all land and sea tenure types		
•	No. of fee-for-service contracts being undertaken by Indigenous ranger groups		

Climate change adaptation meeting, Ramingining, Shenagh Gamble

PROGRAM 14: Engaging the community

The 'Engaging the community' program will support community groups, especially volunteers, working to manage the Territory's natural resources. It will facilitate engagement by locals and visitors alike, and lead to greater community awareness, in turn promoting active stewardship of the Territory's natural values.

The issue

The first 2005 INRM Plan recognised the need for 'a holistic approach to environmental and natural resource management that recognises that land, sea, coasts, freshwater systems, their biodiversity, their people and associated land uses are interconnected.' While these environments and issues are now being managed more collaboratively, integration is a challenge we have yet to conquer. Fire, weeds and ferals do not recognise borders, so we need to be able to work with our neighbours both within the Territory and in adjoining states. We need to make sure that decisions made within catchments take into account the possible effects along an entire water course. This plan recognises the need to manage linkages between land, water and seascapes. It also recognizes the importance of supporting community organisations, such as 'Friends of' groups, Indigenous communities, Landcare and Coastcare groups who play a vital role in protecting and restoring the environment.

'The opportunity to contribute to the review of the INRM Plan generated a lot of interest from councils across the Territory. Local government will welcome further opportunities to work with Territory NRM Board on NRM issues.'

Tony Tapsell, Chief Executive Officer, Local Government Association of the Northern Territory

Engaging the community makes a real effort to build linkages between the different sectors managing across the environment, especially with regard to fire, weeds and feral animals that show no respect for these divisions. By strengthening partnerships between natural resource managers we will facilitate more effective landscape scale management of these issues. We will also endeavour to ensure that local concerns are addressed at the Territory and national level, and that national and Territory priorities are considered in local programs.

School children meeting a flatback turtle, Untamed Outback Images

What we plan to do

There are several levels in which this program aims to engage the community, and hence improve integration and collaboration. The most basic first step is to make sure that community groups are supported (**MA-84**) and involved in the development of projects, plans and strategies. This engagement will include making sure that the values and needs of Indigenous and local communities, and stakeholder groups, are addressed. Additionally, special effort will be made to support projects that are identified as important by groups from the start, or that foster respect and understanding between people from different backgrounds.

Darwin Harbour Clean Up Day volunteers

This collaborative approach will flow on to the organisation of projects to monitor biodiversity (**MA-86**) and to manage threats to water courses and other areas of high conservation or community value (**MA-87**), at the same time raising awareness of the importance of these areas through these activities and education locally (**MA-88).** This should provide community ownership of issues and solutions and lead to an increase in the recruitment and retention of volunteers. These projects will aim to bring together industry, conservation and Indigenous land managers from adjoining properties with the relevant groups, local governments and Territory government agencies. Where appropriate, projects will also include land holders and agencies from neighbouring states.

The program aims to increase community awareness of environmental values, particularly in sensitive environments and in doing so, promote active stewardship of the Territory's natural values (**MA-89**). Engagement will range from individual communities concerned about a particular issue (**MA-90**) to the Territory and beyond, by broadening the experience of visitors to enhance their environmental and cultural knowledge and understanding, as well as to provide a more viable income stream to Territory communities (**MA-91**).

This program has obvious links to others in this plan, such as 'Entering the conservation economy' and 'Building natural resource management knowledge and capacity.'

Targets

Community Engagement-1 By 2030, volunteer participation in land and sea management activities and community commitment to principles of ecologically sustainable development have increased

Community Engagement-1.1 By 2015, support for volunteer-based conservation and awareness programs is ongoing, adequate and consistent

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-84	Provide support to the Landcare and Coastcare movement, including pastoral, Indigenous, urban and peri-urban groups, and other NRM-oriented volunteer organisations	NT	H
MA-85	Community engagement in biodiversity monitoring through cane toad control around permanent waterholes	TE & GS	M
MA-86	Reduce significant weeds in the Katherine River corridor	GS	M
MA-87	Raise awareness of the importance of water quality and riverine habitats through community-based water monitoring and education	GS	M
MEASURES OF ACHIEVEMENT			
•	Funded position to support volunteer NRM organisations		
•	No. of active volunteer NRM organisations		
•	No. active participants in volunteer NRM organisations		
•	Survey responses of participants in volunteer NRM organisations regarding adequacy of support		
•	Areas of habitat restoration and maintenance undertaken by volunteer NRM organisations		
•	No. of management plans/programs being implemented by volunteer NRM organisations		
•	No. of water monitoring sites actively monitored by volunteer NRM organisations		
•	Numbers of volunteers involved in habitat restoration		

Community Engagement-1.2 By 2015, respect for natural resource and cultural values is promoted to the general public, and information on practical options for protecting these values is effectively disseminated

MANAGEMENT ACTIONS			
MA	Title	Region(s)	Priority
MA-88	Encourage environmentally responsible recreational behaviour and good NRM practices through public outreach and educational programs	NT	M
MA-89	Manage flying fox populations to minimise disturbance to communities in the greater Katherine area	GS	M
MA-90	Support development of green tourism programs that engender an understanding of Territory environments and cultures and offer involvement in NRM activities	NT	M
MEASURES OF ACHIEVEMENT			
•	Public information programs and their uptake		
•	Schools-based communication programs and their uptake		
•	Response to before and after surveys assessing attitudes of recreational users to NRM issues (e.g. boating speed limits)		
•	Response to surveys assessing support for management of NRM issues (e.g. flying foxes)		
•	No. of accredited green tourism programs		
•	No. of customers participating in green tourism programs		
•	Customer feedback from green tourism programs		