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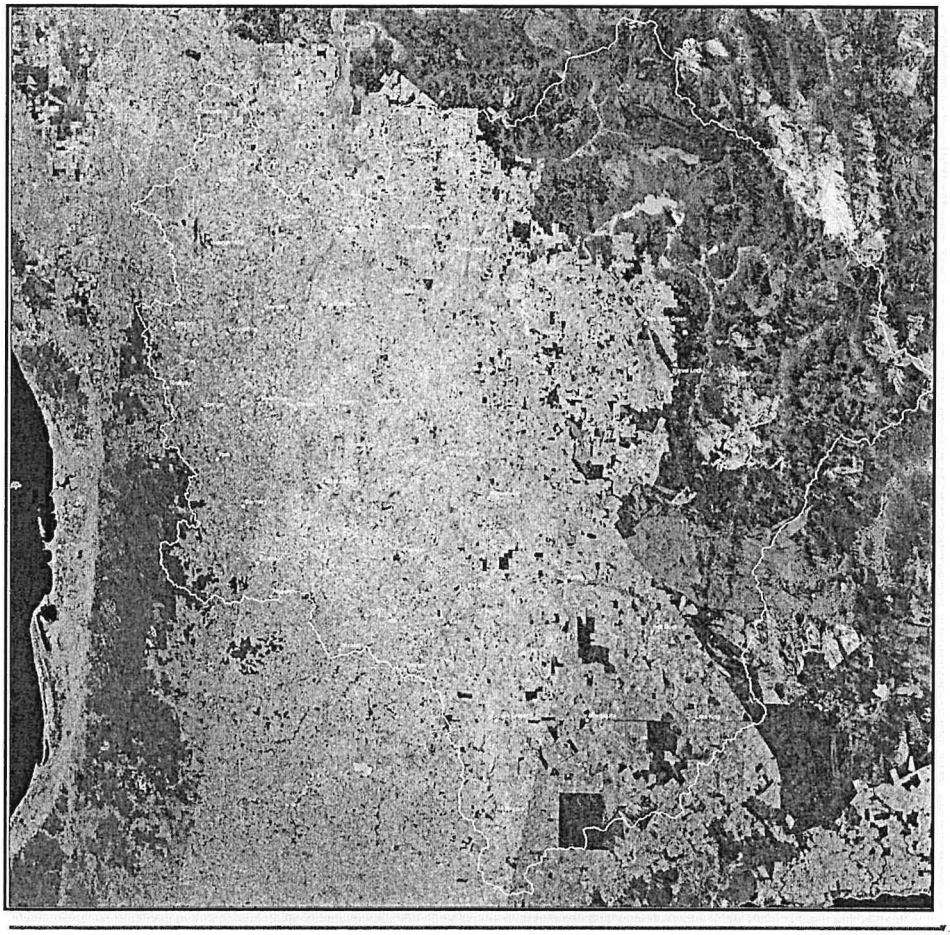
NATURE CONSERVATION OUTPUT

WHEATBELT REGION PLAN
2006-2009



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ENDORSEMENTS

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ACKNOWLEDMENTS

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PREFACE

The State wide Nature Conservation Output as currently described consumes c. 46% ($72m) of the Department of Conservation and Land Management's 2005/06 budget, and is principally aimed at achieving the goal of conserving Western Australia's biodiversity. The Wheatbelt Region Plan is one of nine Nature Conservation Output plans that will provide the basis for the delivery of the Output at a regional scale over the next three years for the Divisions of Nature Conservation, Science and Regional Services.

It is widely understood[1] that there is increasing landscape scale trend in decline and loss and that the current State wide linear management model is not effective in mitigating threats. A quantum leap in funding is required – invest now to reduce the increasing trends in resources demand.

If fully implemented, it would represent a major movement within the Department towards outcome-based management, and recognition of the place of active adaptive management (AAM). AAM is a process in which research is integrated with, and helps inform, operational aspects of conservation management, and monitoring and evaluation of biodiversity status and condition is utilised to determine the effectiveness of activities in achieving desirable outcomes. Consequently, there will need to be a significant recognition and increase in regional activity aimed at the design and establishment of suitable condition monitoring and evaluation programs, rather than continuing to implement management prescriptions in the absence of an experimental management framework and without knowing whether outcomes are being achieved, or if management intervention is successful.

In line with modern trends in conservation management a Department wide paradigm shift is needed and will require active leadership and improved technical capacity across all three Divisions and will need to build on the successes of the past. To be successful, the AAM approach entails enhanced co-operation among Divisions and the development of new monitoring systems for many of the proposed regional outcome targets within this plan.

The basis of the process used has been to examine the pervasive processes that threaten biodiversity at a regional scale. While there has been an attempt at describing three year outcome-targets for landscape and protected area assets, and ecosystem (inc. wetlands) and species, to be effective these will need to be refined and made more specific once sufficient knowledge and information has been gained from appropriate monitoring systems and benchmark biological surveys. For the most part, condition trends are currently unknown and are unlikely to be detected over the next three years. Nevertheless, it is critical that suitable monitoring systems are developed and initiated during this plan so that the Department is better positioned to predict likely changes and threats to biodiversity, rather than to react to situations or problems some years, or even decades, after an observational trend has been detected. Future plan iterations should also be expanded to include performance measures and management targets to provide an indication on progress of candidate actions.

The nine regional plans collectively provide the basis for greater integration and coherence of Departmental activities and functions and a better focusing of effort to address major biophysical and social threats to biodiversity, as well as a basis for pursuing opportunities. They will help inform State-wide priorities in the delivery of conservation activities, particularly knowledge-building requirements, Threatened taxa and Threatened Ecological Communities listing priorities, and assist in identifying gaps in administration processes and

[1] (Page 81 of the Biodiversity Audit Summary)

planning framework to aid effective and consistent delivery of the Output at a high professional standard.

The plan describes the Wheatbelt Region's biodiversity and processes that threaten it; establishes three year regional nature conservation target outcomes; and lists and describes in detail the candidate actions that need to be implemented over the term of the plan in order to achieve the preferred outcomes.

SYNOPSIS

The Nature Conservation Output Wheatbelt Region Plan provides a summary of key biodiversity values within the Wheatbelt Region and major threats to those values. It outlines 18 priority three year outcome targets for the Nature Conservation Output, and 53 associated candidate actions for the Divisions of Science, Nature Conservation and Regional Services at a range of scales for 2006-2009.

18 three year Regional Nature Conservation Target Outcomes for the Wheatbelt Region were identified for those biodiversity assets and values that need to be actively managed if the Nature Conservation Output Aspirational Outcome is to be achieved. Candidate actions were developed on the basis of including only those actions that would make a direct and measurable improvement in meeting the three-year nature conservation target outcomes. Current management responses being delivered under the Nature Conservation Output that do not directly contribute to meeting the regional outcome targets or the Output's aspirational outcome of reducing the rate of decline in biodiversity and ecosystem condition, such as wild dog control on unallocated Crown lands, where not included but have been identified in Appendix 4 – Resource Analysis.

Seven IBRA Regions are represented in the Wheatbelt Region, although Geraldton Sandplains, Yalgoo and Esperance Sandplains constitute only three percent of the regional area. The Avon Wheatbelt and Mallee IBRA Regions compromise the majority of the Wheatbelt Region: the former is the most highly degraded IBRA Region in the State with over 90% cleared and the remainder in very poor condition. Numerous remnants are scattered throughout the Region, some are of a considerable size (>10,000 ha) and many are in very good condition and contain very high levels of biodiversity. Land managed by the Department comprises a very small, but significant part of the landscape that is strongly influenced by processes and management actions on adjoining lands and necessitates engaging major liaison, negotiation and partnership development to bring to effect conservation of biodiversity outcomes.

The focus of this plan is to firstly address threatening processes impacting on a variety of priority assets including landscapes, protected area system, wetlands, ecosystems and species. Secondly to address regional scale threatening processes that are driving the increasing numbers of individual species and ecological communities that are threatened as well as maintaining and where appropriate enhancing the very large number of existing threatened ecosystems (including wetlands) and species.

Analysis of major threats against biodiversity assets and existing management responses revealed salinity and fragmentation were overriding threatening process across all assets (landscape, protected area system, ecosystem and species) within the Wheatbelt region. As a consequence of the scale of past clearing of the landscape inappropriate fire regimes, introduced animals (predominantly the introduced predators foxes and cats), grazing (in particular of remnants on private property) and gravel extraction are major threats to the integrity of the protected area system and ecosystems and species in all the IBRA subregions of the Wheatbelt Region. *P. cinnamomi*, changed hydrology (drainage), loss of remnants, including lack of recruitment, and exotic weeds are major threats in all but the Coolgardie

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IBRA subregion. Other challenges include a wider community that does not value biodiversity conservation or the conservation of natural areas leading to collection of firewood, rubbish dumping, uncontrolled access, and extraction of quarry materials. Roadside vegetation clearing remains a threat to large numbers of individual species.

A review of the candidate actions proposed in the Wheatbelt Region Plan highlights the need for the following priority strategic changes to be made, including some that will require an integrated management and inter-Departmental working group response:

LANDSCAPES

- Identify and prioritise landscapes that best represent and are able to retain biodiversity, including additional natural diversity recovery catchments.
- Continue the implementation of recovery actions within existing priority landscapes including natural diversity recovery catchments.
- Quantify and priorities threats at a regional scale; classification, inventory and mapping of ecosystems, including condition as the basis for implementing threat amelioration and acquisition for incorporation into the protected area network.
- Develop indicators, design and establish ecological reference and monitoring sites to enable the analysis of trends as the basis for adaptive management.
- Develop fire biodiversity conservation guidelines as the basis for developing fire biodiversity and wildfire management programs.
- Undertake a regional scale weed and feral animal risk assessment and develop and implement strategic control programs.
- Enhance the conservation reserve system through off reserve mechanisms.
- Continue the promotion and development of new industries based on woody perennial native species.
- Provide leadership in the development and implementation of drainage governance, impact evaluation methodologies and processes.
- Ensure relationships with key stakeholders are maintained (including regional nature resource management groups, local government authorities, reserve neighbours, indigenous groups, non-government organisations), and develop and implement effective partnerships, engagement processes, and public education and awareness programs.

PROTECTED AREA SYSTEM

- Identify biodiversity assets contained within the protected area system, undertake a threat assessment and feasibility analysis to inform priorities for management.
- Document and describe current fire regimes and practices, quantify fire impacts on reserve condition, collate data on vital attributes and fire responses of indicator flora and fauna and develop fire biodiversity management plans, including identifying and reserves to be managed as functional fire management units or in isolation.
- Gain an understanding of the interaction between fire, exotic weeds and native animal browsing as the basis for the adaptive management of reserves.
- Review effectiveness and priorities of the current weed control program and implement control programs including monitoring outcomes.
- Implement priority actions to address the threat of salinity.

- Develop seed resource management plans for harvesting seed and suitability of seed for revegetation programs.
- Develop a response plan to reduce the impact of unsustainable (legal and illegal) use of a range a natural resources.

WETLANDS

- Identify, characterise and benchmark the condition of major salt lakes and other wetlands of regional significance basis for implementing other NRM projects focussed on maintaining and enhancing biodiversity;
- Prepare a management plan and characterisation for Lake Toolibin under the Ramsar Convention.
- For the six *Directory of Important Wetlands of Australia* listed wetlands without recovery plans, review existing management (with regard to those elements for which each wetland is listed), undertake a value threat analysis to identify other regionally significant wetlands and identify future management requirements and responsibilities;

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ECOSYSTEMS AT RISK

- Continue to implement Recovery plans and Interim Recovery plans for two Threatened Ecological Communities and Prepare recovery plans for 4 priority Threatened Ecological Communities;
- Monitor the condition and extent of the eight Threatened Ecological Communities without Recovery Plans and plan and implement urgent recovery actions; and
- Assess threatening processes for priority ecological communities and priority ecosystems such as granite outcrops and laterite breakaways, develop indicators and design and establish long-term ecological reference and monitoring sites to provide baseline data and enable assessment of trends in condition and extent for priority ecological communities as the basis for adaptive management.

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SPECIES AT RISK

- Develop a strategic plan for the management of 'at risk' species.
- Maintain or improve the distribution and abundance of:
  - 450 plant taxa and 350 fauna species at risk from rising groundwater and salinity;
  - Endangered and Vulnerable Flora to ensure these species do not become Critically Endangered and Endangered respectively; and
  - 12 Threatened fauna species;
- Identify and maintain ex-situ collections of Threatened Flora Species where in-situ conservation is currently unlikely to succeed; and
- Maintain stable populations of 4 Conservation Dependent mammal fauna species.

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RESOURCES

- Full implementation of all 53 candidate actions in this plan will require $19,367,690 in the first year (includes some one off projects) with a slightly lesser amount required each year to fund the ongoing actions in second and third years;

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- Current allocations (2005-2006) total $7,029,518 and are derived from seven Purchasers (including external investors), with the Nature Conservation Output providing $1,966,026 (30%);
- 62.3% of candidate actions are currently funded or partly funded from within existing allocations (Total $5,660,289);
- The Purchasers provide $1,369,229 for activities that support the actions that directly conserve the region's biodiversity, including wild dog control, wildfire suppression, recreation and maintenance of facilities such as offices; and
- Implementation of all the candidate actions would require a significant increase in capacity (staff and their skills) in the Wheatbelt Region.

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In conclusion, there is a considerable gap between the scale and composition of current management responses aimed at biodiversity conservation and what is required across the region. Significant research is required to support management decision making. Information acquisition (including targeted benchmarking and monitoring of key indicators) and management (Reserves database and data sets) is being considered within the Region but the approach needs to be viewed in the context of the need for statewide consistency. The current level of resources in the Region (in terms of the level of funding, technical capabilities and physical capacity) is significantly short of those needed to address candidate actions and meet this Plan's proposed outcome-targets.

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1. INTRODUCTION AND SCOPE

1.1 SCOPE AND PURPOSE OF PLAN

- To describe three year regional scale Nature Conservation Output outcome targets, priorities, and actions integrated across bioregions and Divisions that will contribute towards the Nature Conservation Output Aspirational Outcome (see Section 3 below);
- To provide a framework for Nature Conservation Output investment, with a view to maximising resource use and sharing and to integrate delivery where practical and is recognised and embedded in the Service Provision Agreements; and
- To clarify roles and responsibilities for Nature Conservation Output actions for Regional Services, Science Division and Nature Conservation Division.

1.2 NATURE CONSERVATION OUTPUT DESCRIPTION

"*The development and implementation of programs for flora and fauna conservation for threatened species and ecological communities and for commercially exploited species according to the principles of ecological sustainability; the acquisition, conservation and protection of representative ecosystems; and encouraging public awareness, understanding and support for nature conservation.*"

1.3 NATURE CONSERVATION OUTPUT ASPIRATIONAL OUTCOME

Within 25 years (2005-2030) the rate of human-induced extinction of local populations of species will be reduced to near zero, and deterioration in the condition of ecosystems resulting from human activity will be reversed through management intervention by:

- A network of conservation reserves to protect and manage biodiversity in-situ surrounded by sympathetically managed lands/waters where conservation is incorporated into integrated land/resource use and ecological linkages to maximise conservation of biodiversity;
- Identification and management for biodiversity of intact, functional landscapes and habitat;
- Better decision-making for biodiversity conservation based on improved knowledge of biodiversity patterns and status, trends and threatening processes; and
- Increased awareness and understanding of biodiversity and conservation requirements in order to gain long-term support and change in behaviour.

1.4 REGIONAL DESCRIPTION AND BIODIVERSITY ASSETS/VALUES

The Wheatbelt Region makes up 6% of Western Australia, and is biogeographically extremely diverse comprising a large proportion of two Interim Biogeographic Regionalisation for Australia (IBRA) bioregions (Avon Wheatbelt and Coolgardie) and three IBRA Subregions (Avon Wheatbelt Ancient, Avon Wheatbelt Re-juvenated Drainage and Southern Cross). An

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additional five IBRA regions (Esperance Plains, Geraldton Plains, Jarrah Forest, Mallee and Yalgoo) and six IBRA Subregions have minor occurrences within the region (Fitzgerald, Leseur Sandplain, Southern Jarrah Forest, Northern Jarrah Forest, Western Mallee and Yalgoo) (See Figure 1.)

The variability in both geology and landform has given rise to a rich diversity in landscape and vegetation assemblages. More than 165 Beard vegetation associations are described for the Region.

The Region is botanically rich, South West Botanical Province has an estimated 8000 vascular flora species, so best estimate for the CALM Wheatbelt Region is 3500-4000 taxa.

Other biodiversity values include the following:

- More than 280 vertebrate taxa are known for the Region that represents XX% of known taxa for WA and XX% of Australian taxa. Numbers of invertebrate species are beyond estimation;
- Currently there are 15 fauna species that are considered threatened and a further 4 species that are specially protected;
- 116 species of Declared Rare Flora; 488 Priority Flora; 46 Threatened Ecological Communities (including Priority-listed)
- The Wheatbelt Region is currently responsible for the management of 1.09 million ha of conservation reserves in 660 separate tenure blocks and reserves. There are numerous proposed new conservation reserves and a further approximately 6000 ha of proposed 2015 pastoral lease excisions.

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Figure 1. Map of Wheatbelt Region showing six IBRA sub-regional boundaries, and lands managed by the Department of Conservation and Land Management.

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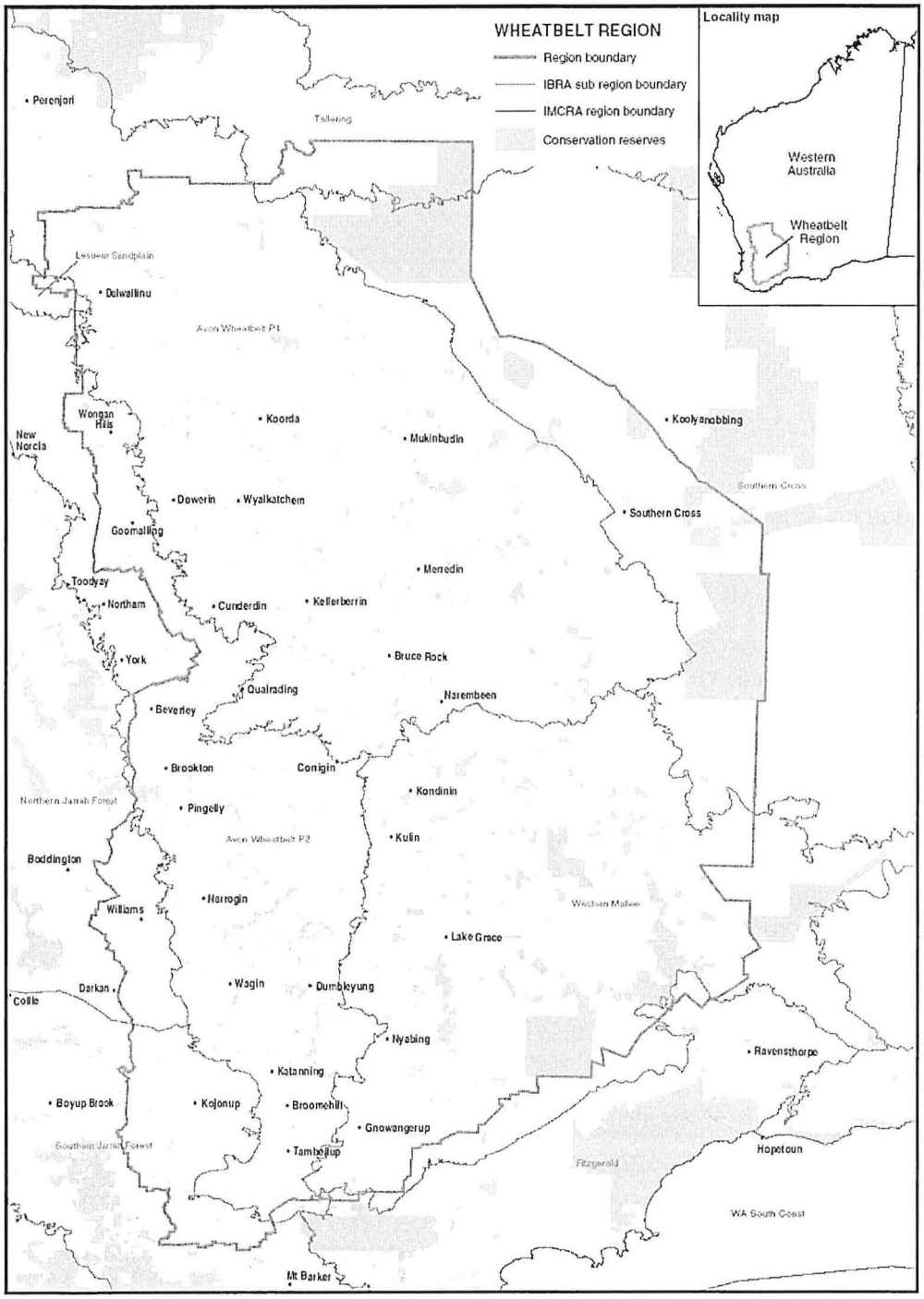

1.5 MAJOR THREATS TO BIODIVERSITY AND BARRIERS TO CONSERVATION

The matrix at Appendix 1 shows the relativity of major biophysical threats against broad biodiversity conservation values of landscape, ecosystem, species and wetlands/riparian across the Wheatbelt Region's conservation management zones.

Major processes that threaten biodiversity and which could cause a failure in meeting CALM's 25 year Nature Conservation Aspirational Outcome include the following issues:

1. altered biogeochemical processes (at landscape or larger scales);
2. impacts of introduced plants and animals;
3. impacts of problem native species;
4. impacts of disease;
5. detrimental regimes of physical disturbance;
6. impacts of pollution;
7. impacts of competing land uses;
8. an unsympathetic culture; and
9. insufficient ecological resources to maintain viable populations.

These threats apply across all spatial management scales and to all categories of biodiversity assets.

1. Altered Biogeochemical Processes

The impacts of salinity on agriculture, service infrastructure (e.g. roads) and native vegetation have been well documented elsewhere, and vary across the wheatbelt according to the time since clearing, land-use and geology. A summary of the cause and extent of salinity is contained in the 1996 document *Salinity: A Situation Statement for Western Australia*, available from the Department of Agriculture Western Australia.

Initially salinity expresses itself low in the landscape, and as a consequence vegetation types most at risk are woodland communities associated with valley floors. This vegetation type has already been subjected to widespread clearing and is now restricted in distribution.

Changes in the soil nutrient status caused by agricultural fertilisers have been shown to have dramatic effects on the composition and growth of Australian plant communities, including the degradation of these communities through invasion of non-local plant species. Many remnants are particularly susceptible to elevations in soil nutrients because of their close proximity to agricultural areas and their high perimeter:area ratio. Nutrient levels decline over short distances from the edge of bushland towards the interior.

The increase in nutrient levels can also lead to eutrophication in wetlands. Increased levels of nutrients can come about through a number of land use activities, including clearing of native vegetation, especially riparian vegetation; use of organophosphates and other fertilisers on adjacent land; and input of large amounts of organic material following storm events (e.g. sheep and cow manure).

2. Impacts of Introduced Plants and Animals

In the Wheatbelt, heathlands and shrublands are far more resistant to weed invasion than woodlands due to the poorer nutrient status of the soils. Disturbed communities are most vulnerable. Unfortunately, most Wheatbelt remnants are highly disturbed - one study in the central Wheatbelt revealed that only 3 per cent of the pre-European landscape could be considered in good condition. Grazing is the most common form of disturbance, particularly on farmland remnants, although fire and roadworks can also have an impact. Disturbance from

fire, and subsequent weed invasion, is a particular problem along reserve boundaries where autumn stubble burns escape into reserves. Increased nutrient levels from fertiliser drift exacerbate this. Roadside disturbances include fire access track construction, fire, drainage control and road widening.

Introduced animals have the potential for serious impact on natural ecosystems, through direct effects such as predation, habitat destruction, competition for food and territory or generally through environmental degradation by selective grazing and the spread of weeds and diseases. The main pest animals in the Region are European red foxes, feral cats, wild dogs, rabbits and, in some localities, feral pigs.

Wild dogs can be a significant problem in the eastern agricultural parts of the region, especially areas adjoining unallocated Crown land. Damage to both crops and revegetation (including perennial crops, amenity and biodiversity plantings) by rabbits can be locally significant. A number of introduced insects also damage revegetation (including perennial crops, amenity and biodiversity plantings). These include the leaf blister sawfly (*Phylacteophaga froggatti*) and the Autumn gum moth (*Mnesampela privata*), with both affecting certain species of eucalypts.

3. Impacts of Problem Native Species

Native animals can become pests, most noticeably affecting agricultural production. Baiting to control foxes has lead to the significant recovery of populations of native animal species such as tammar wallabies and rock wallabies. Without proper management through translocations or changes to management regimes, these species can affect agricultural production.

Damage to both crops and revegetation (including perennial crops, amenity and biodiversity plantings) by native wildlife can be locally significant. Native species known to have caused damage include twenty-eight parrots, western grey kangaroos, black-flanked rock wallabies and tammar wallabies.

Some herbivorous insects occur in such numbers that they contribute to vegetation decline. Under natural conditions many outbreaks were probably controlled by predators such as birds but once the balance is upset this is not as effective. Locust plagues provide an extreme example of the damage that can be done by large numbers of leaf-eating insects.

The area of land revegetated in recent years has been extensive. The species selected for revegetation have included native species from eastern States such as river red gum (*E. camaldulensis*). This species inter-breeds with local native tree species and the impact on biodiversity of these cross-breeds is mostly unknown. Similarly plants from other areas of Western Australia are being planted across the region with little consideration of how these plants might interact genetically with local species.

4. Impacts of Disease

Although the majority of the Wheatbelt Region is too dry to support *Phytophthora*, the disease may survive under certain conditions (e.g. after significant summer rain) or within a micro-habitat (e.g. around granite outcrops). More typically, *Phytophthora* is restricted to the western and southern-most shires in the Wheatbelt Region.

Although Honey Fungus (*Armillaria luteobubaline*) has a wide host range, Wandoo (*Eucalyptus wandoo*) is particularly susceptible with 97 per cent of infected trees dying. Infected areas are typically quite small (less than 8 ha), but can have a significant impact on the vegetation structure and composition of small reserves. These changes, in turn, impact on fauna.

Mundulla Yellows symptoms have been observed in a wide range of native eucalypts including salmon gum (*Eucalyptus salmonophloia*) and York gum (*E. loxophleba*), as well as in sheoaks (*Allocasuarina* spp.), banksias (*Banksia* spp.) and wattles (*Acacia* spp.) which suggests that the disease may not be confined to eucalypts. Mundulla Yellows symptoms have been observed around Williams and York.

Wandoo Crown Decline and Death (WCDD) is a decline event rather than a disease, and affects wandoo (*Eucalyptus wandoo*) and to a limited extent powderbark wandoo (*E. accedens*). Exact information on distribution is not known. It is especially noticeable in the north-eastern section of the Helena River catchment and farmland west of York, Beverley, Brookton and Pingelly. The widespread rapid defoliation and branch death leads to some tree deaths, with more as decline persists. Over a period of 3-5 years the tree may move from apparently unaffected to dead.

Diseases in wildlife can be a major contributing factor to poor population health, reduced fertility and local extinctions. The discovery of symptoms of two diseases in both wild and captive populations of the Western barred bandicoot has caused concern in relation to proposed translocation of this and other mammal species. One disease, an ocular disease or conjunctivitis was first noted in animals in October 2000. The other disease, wart-like growths, is currently without effective treatment. This takes the form of wart-like lesions on feet, around eyes, cloaca and ears particularly, but can occur anywhere on the body.

Chytridiomycosis is an infectious disease affecting amphibians worldwide and is caused by the amphibian chytrid fungus *Batrachochytrium dendrobatidis*. This is a highly virulent fungal pathogen capable at the minimum of causing sporadic deaths in some frog populations and 100% mortality in other populations. Surviving individuals are believed to be carriers. Some species appear highly susceptible to developing the disease, progressing to death, while other species appear less susceptible to disease manifestations.

5. Detrimental Regimes of Physical Disturbance (Fire)

Fragmentation of native vegetation by clearing for agriculture has disrupted patterns of fire ignition and spread and as a result fire management in fragmented landscapes is very complex. Fire management must be considered with other threats that affect fire or are affected by fire, such as weed invasion. Fire management in fragmented landscapes must also consider the significant impact that a single fire event can have on biodiversity and the ecological processes that maintain it.

The condition of many Wheatbelt reserves, particularly those smaller than 500 ha, are degrading due to the impact of external threatening processes. These reserves do not lend themselves to active fire management for biodiversity conservation except that which is focused at single or a limited number of species. On these reserves a conservative fire strategy of fire exclusion is most appropriate.

While for some species reproduction and regeneration are cued or enhanced by fire, some species are vulnerable to fire, or particular fire regimes, and no single fire regime is optimal to all species. Fire sensitive species are usually confined to areas of habitat that are naturally burnt less frequently than the surrounding landscape and include riparian zones, granite outcrops, wetlands and woodlands.

6. Impacts of Pollution

The use of herbicides in normal farm operations can impact on adjacent remnant vegetation if inappropriate application practices are applied. The impact is mostly caused by spray drifting from the paddock onto the native vegetation. Unfortunately, some native plants, such as

orchids and everlastings, are not only susceptible to herbicides but may be growing vigorously at exactly the same time as paddock weed control occurs. They can easily be eliminated from small remnant patches of vegetation unless careful and appropriate application methods are used.

Herbicides directly affect vegetation and, thereby, their associated fauna, but also have indirect effects on vegetation composition through qualitative and quantitative change in litter composition. It has been shown that by restricting herbicide use, a significant increase in alternative invertebrate prey becomes available for predator species. Insecticides are transferred through food chains and leave residues. Insecticides impact on reptiles, frogs and insectivorous birds.

7. Impacts of Competing Land Uses

There are many land uses that impact or 'compete' with biodiversity conservation including impacts from agriculture, consumptive and productive uses, recreation and tourism activities, mining, gravel extraction and illegal activities.

8. Fostering a Culture Sympathetic to Conservation

For many rural people conservation of natural biodiversity is an abstract idea disconnected from their lives and well being. Some people see the land solely for its productive capacity, resulting in a conflict with a conservation culture. Developing community understanding of the linkages between human and biodiversity values will result in greater support for conservation.

9. Insufficient Ecological Resources to Maintain Viable Populations

Given sufficient management of the threats discussed above, there may still be insufficient ecological resources (e.g. food, shelter, breeding sites) to maintain the long term viability of populations of plants and animals or communities. Clearing of native vegetation exceeds 90 per cent of its pre-European distribution. Whilst relatively few species are known to have become extinct through habitat loss alone in the Wheatbelt Region, many species have undergone substantial declines in their range and abundance. Even though the broad-scale clearing of vegetation ceased during the early 1980s, local and regional decline and extinction continues.

Broad-scale land clearing in the Wheatbelt has not only vastly reduced the area of native vegetation, it has also fragmented the remainder into discontinuous remnants. The main consequences of fragmentation have been changes to the number and type of species found across the landscape, and changes to ecological processes both within and external to remnants.

Key points include:

- Small, isolated, populations are more prone to extinction than large populations.
- Many of the impacts on remnants are initiated outside the remnant, which are exacerbated by the high perimeter to area ratio of many Wheatbelt reserves.
- Many remnants in the Wheatbelt can be expected to experience more species loss as populations 'relax to equilibrium'.
- Areas of remnant vegetation that are isolated from other remnants have a low capacity to re-establish populations after detrimental events have occurred.
- Broad-scale revegetation often comprises single species, which may help to reduce external pressures on remnants but may be of limited use in helping some species to survive.
- Many species nor presently listed as threatened are likely to become threatened within the Region due to the lack of ecological resources.

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2. REGIONAL NATURE CONSERVATION THREE YEAR OUTCOME TARGETS

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For the Nature Conservation Output Aspirational Outcome is to be achieved the three year regional target outcomes for those biodiversity assets and values that need to be actively managed are:

LANDSCAPES	T1	Reduce the rate of decline in the extent and condition of the natural diversity (species, natural ecological communities, ecosystems, landforms) across the Wheatbelt Region.
	T2	Maintain or improve the extent and condition of the natural diversity (species, natural ecological communities, ecosystems, landforms) within 12 landscapes/ecoscapes which best represent the natural diversity of the Wheatbelt Region.
PROTECTED AREA SYSTEM	T3	Maintain the extent and condition of the natural diversity within existing and proposed protected areas and non-fragmented areas of Crown land that are greater than 10,000 ha and not under threat from salinity.
	T4	Reduce the rate of decline of natural diversity within existing and proposed protected areas that are less than 10,000 ha and/or under threat from salinity.
WETLANDS	T5	Maintain or improve the natural diversity within Lake Toolibin, East Lake Bryde, Lake Bryde, Lake Cronin, Yorkrakine Rock Pools, Lake Coyrecup, Lake Dumbleyung, Lake Yearlering, Lake Grace System (Directory of Important Wetlands of Australia), Cowcowing System, Mollering Lake System, Mortlock River System (sub-regionally important wetlands) and other wetlands listed in the Biodiversity Audit of the Wheatbelt.
	T6	Maintain or improve the natural diversity within other priority wetlands (to be identified).
ECOSYSTEMS AT RISK	T7	Maintain or increase the extent and condition of 10 Threatened Ecological Communities within the Wheatbelt Region (see appendix X for list).
	T8	Resolve the conservation status of 20 Priority Ecological Communities and regionally significant ecological communities within the Wheatbelt Region.
	T9	Maintain the extent and condition of priority ecosystems such as granite outcrops and laterite breakaways (see Safstrom et al 2000).
SPECIES AT RISK	T10	Maintain or improve the distribution and abundance of 450 plant taxa at risk from rising groundwater and salinity.
	T11	Maintain or improve the distribution and abundance of 44 Critically Endangered Flora within the Wheatbelt Region. [undertake prioritisation process and distinguish between DRF requiring immediate recovery action versus others - under actions].
	T12	Maintain the distribution and abundance of Endangered and Vulnerable Flora within the Wheatbelt Region to ensure these species do not become Critically Endangered and Endangered respectively.
	T13	Maintain ex-situ collections of Threatened Flora Species where in-situ conservation is currently unlikely to succeed.
	T14	Resolve the conservation status of 60 (25%) Priority 1 and 2 Flora Taxa.
	T15	Maintain or improve the distribution and abundance of 350 fauna species at risk from rising groundwater and salinity.
	T16	Increase or maintain the distribution and abundance of 12 Threatened fauna species within the Wheatbelt Region.
	T17	Maintain stable populations of XX Conservation Dependent mammal fauna species (see appendix X for list).

	T18	Resolve the conservation status of 5 Priority 1 and 2 fauna species.

3 LIST OF REGIONAL THREE YEAR CANDIDATE ACTIONS

The following section lists priority actions that need to be undertaken to meet the three year expected outcomes of Section 2.

Deleted: fall within the following broad criteria:

The candidate actions have been arranged according to the scale of the assets.

3.1 LANDSCAPES

Target Three Year Outcome – T1: Reduce the rate of decline in the extent and condition of the natural diversity (species, natural ecological communities, ecosystems, landforms) across the Wheatbelt Region.

Candidate Actions:

1. Continue active participation in Natural Resource Management (NRM) processes at a regional, sub-regional and local scale to ensure biodiversity conservation is integrated into NRM planning processes.

   Primary Responsibility: Regional Manager
   Regional Operations Manager
   District Managers

   Support: Regional Ecologist
   Information Management Branch and Science Division to contribute to updating and maintaining currency of the database and data sets.

   Status: On-going

   Indicative Cost: $150,000 p/a

   Completion Date: 2008

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2. Quantify and prioritise threats that need to be addressed at bioregional scales, such as high water tables, altered hydro-periods, habitat loss and fragmentation, declining water quality, sedimentation, weeds, pests and diseases. For example this will provide a basis for implementing other NRM projects (such as ACC Investment Plan ND002 Species and Communities, ND003 Ecosystems and ND004 Ecoscapes) and Regional based projects. Ensure maintenance of databases produced as part of the above project is undertaken.

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Primary Responsibility: Regional Manager
Regional Operations Manager

Support: Regional Ecologist
Information Management Branch and Science Division to contribute to updating and maintaining currency of the database and data sets.

Status: New

Indicative Cost: $250,000 p/a (in addition to $720,000 to be invested by ACC in 05/06 which will contribute to the candidate action above)

Completion Date: 2006

3. Participate in NRM and other processes in the Wheatbelt Region to develop an agreed classification of ecosystems, and an inventory and map of the distribution, extent/condition/integrity of vulnerable and threatened ecosystems, species and communities. This will provide a basis for implementing some NRM projects (such as ACC Investment Plan ND002 Species and Communities, ND003 Ecosystems and ND004 Ecoscapes) and CALM Wheatbelt Regional based projects.

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Primary Responsibility: Regional Operations Manager
Regional Ecologist

Support: Information Management Branch and Science Division to contribute to updating and maintaining currency of the database and data sets.

Status: New

Indicative Cost See 1 above

Completion Date: 2007

4. Identify and acquire priority ecosystems and priority locations to add to the formal conservation reserve system and secure through off reserve measures priority ecosystems and locations, by:
   a) undertaking a gap analysis (refer to Candidate Action 1 under T3 and T4); and
   b) reviewing and developing criteria and tools for identifying priority ecosystems and locations.

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Primary Responsibility: Regional Manager,
District Managers,

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Support: Regional Operations Manager
Regional Ecologist
Nature Conservation Directorate to ensure criteria is consistent Statewide
Science Division for advice
Information Management Branch for GIS analysis

Status: Identify/survey priority ecosystems – new

Acquisition and off reserve conservation of priority ecosystems - ongoing

Indicative Cost: $100,000 p/a for analysis
$500,000 for land purchases p/a

Completion Date: Identify/survey priority ecosystems – 2007
Acquisition and off reserve conservation of priority ecosystems - ongoing

5. Participate in the development of perennial plant-based enterprises and industry development programs based on perennial plant species to contribute to protection of priority assets (eg. search program, CRC for plant based management of dry land salinity). Formatted: Bullets and Numbering

Primary Responsibility: Regional Manager
Regional Revegetation Officer

Support: Natural Resources Branch to provide framework and strategy
Deleted: Rural Advisory Officer

Status: Ongoing

Indicative Cost: $150,000 p/a

Completion Date: Ongoing

6. Enhance the conservation reserve system through off reserve measures including the use of market based instruments, conservation covenants, providing advice, section 16a agreements, integration of biodiversity conservation requirements with property management planning and complimentary management of private conservation lands. Formatted: Bullets and Numbering

Primary Responsibility: Regional Operations Manager to coordinate program

Support: Species and Communities Branch to develop suitable market based instruments, provide on-ground negotiations and ensure integration/coordination across Department
Natural Resources Branch to provide advice
District Managers to provide on-ground consultations, negotiations and provide advice
Land For Wildlife Officers

Status: Ongoing

Indicative Cost: $500,000 p/a to support coordination and development and implementation of suitable market based instruments Deleted: l

Completion Date: Ongoing

7. Participate in weed risk assessment through programs and processes such as the CRC for plant based management of dryland salinity in relation to the introduction of perennial species. Formatted: Bullets and Numbering

Primary Responsibility: Regional Ecologist and Regional Revegetation Officer

Support: Science Division in relation to CRC participation
Evironmental Management Branch to provide advice

Status: Ongoing

Indicative Cost: $50,000 p/a to participate on CRC and provide advice on specific projects

Completion Date: Ongoing

8. Develop, implement and extend fire biodiversity conservation guidelines for Avon Wheatbelt 1, Avon Wheatbelt 2, Coolgardie 2 and Mallee 2 IBRA sub-regions (also refer to ACC ND006 Fire Management and Biodiversity Project).

Primary Responsibility: Regional Operations Manager

Support: Regional Fire Coordinator
District Managers

Regional Ecologist
Science Division

Status: New

Indicative Cost: $160,000 p/a (in addition to $80,000 ACC funding committed for 05/06)

Completion Date: 2006

9. Develop and commence implementation of regional monitoring programs for high water tables, altered hydro-periods, habitat loss and fragmentation, declining water quality (nutrient, acidity, salinity and sediments), sedimentation, weeds, pests and diseases. This will provide a basis for implementing some NRM projects (such as ACC Investment Plan ND002 Species and Communities, ND003 Ecosystems and ND004 Ecoscapes) and CALM Wheatbelt Regional based projects and an integral component of adaptive management.

Primary Responsibility: Regional Ecologist
Regional Hydrologist

Support: District Managers
Regional Fire Coordinator
Science Division

Status: New

Indicative Cost: $150,000 p/a for ongoing implementation (in addition to $720,000 ACC funding committed for 05/06 which will contribute to part of this action)

Completion Date: development – 2006
implementation – ongoing

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10. Provide leadership in the development and implementation of drainage governance, impact evaluation methodologies and processes through;

- Initiation and management of key partnership projects (Narembeen-Seagroatt Nature Reserve);
- Involvement in other regional scale projects (Yenyening Lakes & Coblinine River);
- Development of biodiversity impact assessment procedures.

Primary Responsibility: Regional Manager
Regional Hydrologist

Support: District Managers
Nature Conservation Division (N R Branch & Wetland Coordinator)
Science Division (Stuart Halse)

Status: New

Indicative Cost: $500,000 p/a for ongoing implementation (in addition to $300,000 ACC funding committed for 05/06 which will contribute to part of this action)

Completion Date: development – 2006
implementation – ongoing

11. Develop and implement a communications plan to ensure relationships with key stakeholders are maintained (including regional nature resource management groups, local government authorities, reserve neighbours, indigenous groups, non-government organisations), and develop and implement effective partnerships, engagement processes, and public education and awareness programs.

Primary Responsibility: Regional Manager
Regional Leader PVS
Regional Operations Manager
District Managers

Support: All Regional staff
Strategic Development and Corporate Affairs Division

Status: New

Indicative Cost: $400,000 p/a for ongoing implementation

Completion Date: development – 2006
implementation – ongoing

Target Three Year Outcome – T2: Maintain or improve the extent and condition of the natural diversity (species, natural ecological communities, ecosystems, landforms) within 15 landscapes/ecoscapes which best represent the natural diversity of the Wheatbelt Region (this will include the current (two) and proposed (three) natural diversity recovery catchments).

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Candidate Actions:

1. In partnership with the Avon Natural Diversity Alliance and others:
   a) identify 2 landscapes/ecoscapes (a mosaic of ecosystems and landforms that spans the topography from one ridge to another) for each IBRA sub-region that best represents the natural diversity (species, ecological communities and ecosystems) and are best able to retain the natural diversity contained in each sub-region as a basis for developing management plans for conserving the natural diversity of these landscapes/ecoscapes, for land purchase, or providing advice to landholders;
   b) assess threatening processes for selected landscapes/ecoscapes with results and feasible management options for threat amelioration incorporated into biodiversity conservation plans for each landscape/ecoscape;
   c) develop indicators and design and establish long-term ecological reference and monitoring sites to provide baseline data and enable assessment of trends in condition for representative landscapes/ecoscapes. This could include the ability to detect measured increase in the integrity of the natural diversity and processes for retaining viable populations and communities, restoring threatened populations and communities, conserving regionally significant biodiversity assets, and enhancing landscape-scale connectivity; and
   d) implement actions identified in conservation plans for representative landscapes/ecoscapes (including fencing, regeneration, revegetation, weed and animal pest management, and other actions).

Primary Responsibility:	Regional Manager Regional Operations Manager District Managers
Support:	Implementation Team members include Recovery Catchment staff, Regional Hydrologist and Regional Revegetation Officer. Regional Ecologist and Science Division to provide advice
Status:	New
Indicative Cost:	$2.5 M pa (in addition to ACC funds committed for 05/06)
Completion Date:	On-going

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3.2 PROTECTED AREA SYSTEM

Target Three Year Outcome – T3: Maintain the extent and condition of the natural diversity within existing and proposed protected areas and non-fragmented areas of Crown land that are greater than 10,000 ha and not under threat from salinity.

Target Three Year Outcome – T4: Reduce the rate of decline of natural diversity within existing and proposed protected areas that are less than 10,000 ha and/or under threat from salinity.

Candidate Actions:

1. Identify biodiversity assets contained within the protected area system through comprehensive biological surveys, undertake a threat assessment and feasibility analysis to inform priorities for management.

Primary Responsibility: Regional Ecologist
Science Division

Support: Nature Conservation Division
District Managers

Status: New

Indicative Cost: $150 000 pa (in addition to central costs)

Completion date: December 2008

2. Develop a Reserve Management Database to record biophysical data, management actions and to monitor the success of management actions in protecting and maintaining reserve condition.

Primary Responsibility: Regional Services Division

Support: Regional Ecologist
District Nature Conservation Officers

Status: New

Indicative Cost: $30 000 pa (in addition to central costs)

Completion date: December 2008

3. Document and describe the current (last three decades) fire regimes and practices, quantify the impacts on reserve condition, and collate available data on vital attributes and fire responses of key (indicator) flora and fauna to prioritise and inform the development of fire management plans.

Primary Responsibility: Regional Operations Manager

Support: Regional Fire Coordinator
Regional Ecologist
Science Division

Status: New

Indicative Cost: $50 000 pa

Completion date: December 2008

4. Based on outcomes of candidate action 2 above and using fire biodiversity conservation guidelines, develop and implement fire management plans, including reserve condition monitoring, for priority existing and proposed protected areas and non-fragmented areas of Crown land that are greater than 10,000 ha and not under threat from salinity.

Primary Responsibility: Regional Operations Manager
Regional Fire Coordinator
District Managers

Support: Regional Ecologist
Science Division

Status: New

Indicative Cost: $300 000 pa

Completion date: On-going

5. Based on outcomes of candidate action 2 above, for single and/or groups of priority existing and proposed protected areas that are less than 10,000 ha and/or under threat from salinity:
   a) develop decision theory and rule sets for identifying groups of reserves that could be managed as functional fire management units or in isolation;
   b) investigate the interaction between fire and other threatening processes such as weeds, browsing animals to ensure other threatening processes are not compounded by inappropriate fire regimes, in partnership with universities;
   c) use fire biodiversity conservation guidelines to develop and implement fire management plans, including reserve condition monitoring, to maintain or enhance reserve condition;

Primary Responsibility: Regional Operations Manager
Regional Fire Coordinator
District Manager

Support: Regional Ecologist
Science Division

Status: New

Indicative Cost: $500 000 pa

Completion date: On-going

6. Review current priorities and management actions, conduct a regional scale survey of weeds, undertake value/threat analysis, and continue a costed/prioritised weed control program. Revise current weed control program with an additional emphasis on post-control survey and analysis of effectiveness.

Primary Responsibility: Regional Operations Manager
District Managers

Support: Environmental Management Branch to provide risk analysis framework and advice on control techniques and ensure standards and consistency of approach across CALM
Science Division to provide advice on design of monitoring program and assist in predictive modelling
Regional Ecologist to provide technical support.

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5. . Continue to implement Western Shield over 250 000XX ha, including monitoring assets and threatening processes, fox control, and relevant fauna reconstruction activities. . ¶
¶
Primary Responsibility: . Regional Operations Manager – Regional CoordinationEnvironmental Management Branch to coordinate and ¶
District ManagersDistricts to - implementation Western Shield . ¶
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Support: . Environmental Management Branch coordinate at state level¶
Science Division to carry out research and provide direction on appropriate baiting regimes, non-target affects, meso-predator interactions and ecosystem processes¶
Species and Communities Branch to provide advice on fauna reconstruction sites¶
Regional Ecologist to provide analysis of Western Shield data for Region¶
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Status: Ongoing ¶
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Indicative Cost: . $500 000 (in addition to centrally funded activities) ¶
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Completion date: . ongoing with a review in December 2008¶
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Status: Ongoing

Indicative Cost: $400 000 pa

Completion date: ongoing with a review in December 2008

7. T4 – Develop a prioritisation process based on assets and feasibility of recovery. Manage the impact of salinity on individual high priority Crown reserves by engineering works or biological options.

Primary Responsibility: Regional Operations Manager
District Managers

Support: Regional Hydrologist and Regional Ecologist to provide relevant technical support
Natural Resources Branch and Science Division to provide advice

Status: Ongoing

Indicative Cost: $1 M pa

Completion date: ongoing with a review in December 2008

8. Develop seed resource management plans for the harvesting of seed from the protected area network and the source and suitability of seed used for revegetation programs (to reduce risk of weed invasion, hybridisation and revegetation failure).

Primary Responsibility: District Wildlife Officers
Regional Revegetation Officer

Support: Species and Communities Branch (licensing)
Science Division (weed invasion, hybridisation)
District Managers (assisting with the development of plans)

Status: New

Indicative Cost: $150 000 pa

Completion date: ongoing with a review in December 2008

9. Develop and implement a response plan including benchmarking impacts, monitoring, education and compliance to address the potential impact on condition of the protected area system caused by unsustainable use of resources (legal and illegal) such as firewood removal, craft wood collection (didgeridoo, broombush), wildflower picking and apiculture.

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Deleted: Implement the Salinity Strategy Crown Reserves program in the Wheatbelt Region as applied to the protected area network. Priority Actions for the Salinity Strategy Crown Reserves program include: collation of reserve values and condition data to allow development and prioritisationameliorating threats that impacts on the condition of crowns reserves hence affect their water using potential or where salinity is directly or works programs that deal with threatening processes affecting reserve condition and hydrological function.
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Deleted: develop a response plan including benchmarking impacts, monitoring, education and compliance

Primary Responsibility: Regional Operations Manager in conjunction with District Wildlife Officers to develop plan

Support: Science Division to provide advice on ecological/biodiversity impacts, design of monitoring
Species and Communities Branch to provide advice on wildlife industries standards and compliance and education and framework for response plan so it has Statewide applicability

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Status: New

Indicative Cost: $250 000 pa

Completion date: ongoing with a review in December 2008

10. Minimise the decline in condition and extent of the protected area network from exploration and mining by:

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a) continuing to implement government policy on exploration and mining, including the endorsements and conditions detailed in the *State Guidelines for Mineral Exploration and Mining within Conservation Reserves and Other Environmentally Sensitive Lands in Western Australia* (Department of Minerals and Energy 1998);
b) ensuring that any additional conditions and endorsements for Department-managed lands are subject to CALM's input and include agreed working arrangements for planning, clearing, mining, rehabilitation, monitoring, maintenance, disease risk management and fire protection;
c) consolidating mining operations with agreed long-term strategies, aiming to reduce the range of ages of rehabilitation, therefore allowing more efficient protection and future management;
d) evaluating rehabilitation after mining and where acceptable standards are not met, preparing a program of post-rehabilitation management; and maintaining effective liaison with mining companies, either through regular and direct contact or through established committees; and
e) monitoring of exploration and mining activities to ensure compliance with conditions.

Primary Responsibility: District Managers

Support: Environmental Management Branch

Status: Ongoing

Indicative Cost: $50,000 p/a

Completion date: Ongoing

11. Minimise the decline in condition and extent of the protected area network from disturbance from competing land use (clearing and maintenance related to Utility infrastructure, eg. Western Power), monitor outcomes and ensure compliance with Statutory obligations and management plans.

Primary Responsibility: Regional Manager to ensure appropriate input. Regional Operations Manager to provide advice.

Support: Environmental Management Branch to provide advice
District Flora Conservation Officers

Status: Ongoing

Indicative Cost: $50 000 (in addition to centrally funded costs)

Completion date: Ongoing

12. Ensure all protected areas are covered by a current management plan (IMG, Regional or individual area plan)

Primary Responsibility: Regional Manager to ensure appropriate input. PVS Regional Leader

Support: Planning Branch

Status: Ongoing

Indicative Cost: $200,000

Completion date: Ongoing

13. Review current priorities and management actions, conduct a regional scale survey of feral animal populations, undertake value/threat analysis, and continue a costed/prioritised feral animal control program (not Western Shield).

Primary Responsibility: Regional Operations Manager
District Managers

Support: Environmental Protection Branch
Regional Ecologist
Science Division

Status: Ongoing

Indicative Cost: $200,000 pa

Completion date: Ongoing

14. Review current priorities and management actions, conduct a regional scale survey of disease locations, undertake value/threat analysis, and continue a costed/prioritised control/hygiene management program.

Primary Responsibility: Regional Operations Manager
District Managers

Support: Environmental Protection Branch
Regional Ecologist
Science Division

Status: Ongoing

Indicative Cost: $50,000 pa

Completion date: Ongoing

15. Informed by the outcomes of candidate action of T3/4 – 1, develop and implement a rehabilitation/revegetation program on a priority basis.

Primary Responsibility: Regional Operations Manager
District Managers

Support: Environmental Protection Branch
Regional Ecologist
Science Division

Status: Ongoing

Indicative Cost: $300,000 pa

Completion date: Ongoing

3.3 WETLANDS/RIPARIAN

Target Three Year Outcome – T5: Maintain or improve the natural diversity within Lake Toolibin, East Lake Bryde, Lake Bryde, Lake Cronin, Yorkrakine Rock Pools, Lake Coyrecup, Lake Dumbleyung, Lake Yearlering, Lake Grace System (Directory of Important Wetlands of Australia), Cowcowing System, Mollering Lake System, Mortlock River System (sub-regionally important wetlands) and other wetlands listed in the Biodiversity Audit of the Wheatbelt.

Target Three Year Outcome – T6: Maintain or improve the natural diversity within other priority wetlands of regional significance (refer to Keighery et al 2004).

Candidate Actions:

1. Participate in NRM and other processes in the Wheatbelt Region to identify, characterise and benchmark the condition of major salt lakes and other wetlands of regional significance based on hydrological, geomorphological and ecological criteria (refer to Avon Catchment Council (ACC) Investment Plan ND001 Baselining Project). This will provide a basis for implementing other NRM projects (such as ACC Investment Plan ND002 Species and Communities, ND003 Ecosystems and ND004 Ecoscapes) and CALM Wheatbelt Regional based projects.

Primary Responsibility: Regional Operations Manager
CALM State Wetlands Coordinator
Science Division

Support: Regional Ecologist

Status: New

Indicative Cost: $250 000

Completion date: December 08

2. Prepare a management plan and characterisation for Lake Toolibin under the Ramsar Convention.

Refer to candidate action T2-1.

3. Continue to implement existing recovery plans (Lake Toolibin, East Lake Bryde and Lake Bryde).

Refer to candidate action T2-1.

4. T5 - Based on Candidate Action 1 above, for the 6 Directory of Important Wetlands of Australia without recovery plans, review existing management (with regard to those elements for which each wetland is listed) and identify future management requirements and responsibilities.

Primary Responsibility: State Wetland Coordinator
Regional Operations Manager

Support: Regional Ecologist
Regional Hydrologist
Science Division
Natural resource Branch

Status: New

Indicative Cost: $250 000

Completion date: December 2008

5. T6 - Based on Candidate Action 1 above, undertake a risk assessment and feasibility analysis to identify other regionally significant wetlands, review existing management and identify future management requirements and responsibilities.

Primary Responsibility: State Wetland Coordinator
Regional Operations Manager

Support: Regional Ecologist
Regional Hydrologist for advice
Science Division
Natural resource Branch

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District Recovery Catchment Officer¶
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Status: . New . ¶
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Indicative Cost: . ¶
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Completion date: . December 2007¶

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Support: . Environmental Management Branch ?¶
District Recovery Catchment Officers¶
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Completion date: . December 2008¶

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District Recovery Catchment Officers

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Status: New

Indicative Cost: $150 000

Completion date: December 2008

6. Ensure that the Department's response to Notices of Intent to dispose of ground/surface water are consistent with legislation, Department policies and ensure protection of nature conservation values.

Primary Responsibility: Regional Manager

Support: Regional Hydrologist for advice/assessment
District Managers for advice

Status: Ongoing

Indicative Cost: $250 000

Completion date: December 2008

3.4 ECOSYSTEMS AT RISK

Target Three Year Outcome – T7: Maintain or increase the extent and condition of 10 Threatened Ecological Communities within the Wheatbelt Region (see appendix X for list).

Candidate Actions:

1. Continue to implement Recovery plans and Interim Recovery plans for Threatened Ecological Communities (2 communities).

Primary Responsibility: Regional Operations Manager (Regional Coordination)
District Managers (implementation)

Support: Regional Ecologist
Regional Hydrologist
Recovery Teams for providing advice on priority actions
District Recovery Catchment Officers
District Flora Conservation Officers

Status: Ongoing

Indicative Cost: Refer to candidate action T2-1.

Completion date: Ongoing

2. Prepare and implement recovery plans for four priority Threatened Ecological Communities.

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Primary Responsibility: Regional Operations Manager (Regional Coordination)
District Managers (implementation)

Support: Recovery Teams advising on priorities and preparation of plans
District Flora Conservation Officers
District Nature Conservation Officers

Deleted: District Threatened Flora Recovery Teams for setting priorities and coordination and writing plans¶

Status: New

Indicative Cost: $500 000 pa

Completion date: Plans prepared and implementation commenced by December 2008

3. Monitor the condition and extent of the 8 Threatened Ecological Communities without Recovery Plans and implement urgent recovery actions as required.

Primary Responsibility: Regional Operations Manager
District Managers for implementation

Deleted: District Threatened Flora Recovery Teams for setting priorities and coordinating

Support: Recovery Teams advising on priorities
Regional Ecologist
District Nature Conservation Officers
District Flora Conservation Officers

Status: New

Indicative Cost: $500 000

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Completion date: Ongoing

Target Three Year Outcome – T8: Resolve the conservation status of 20 Priority Ecological Communities and regionally significant ecological communities within the Wheatbelt Region.

Candidate Actions:

1. In partnership with the Avon Natural Diversity Alliance and others:
   a) assess threatening processes for priority ecological communities identified under T1 Candidate Action 3 with results and feasible management options for threat amelioration incorporated into biodiversity conservation plans for each priority community;
   b) develop indicators and design and establish long-term ecological reference and monitoring sites to provide baseline data and enable assessment of trends in condition and extent for priority ecological communities; and
   c) implement actions identified in conservation plans for priority ecological communities.

Primary Responsibility: Regional Operations Manager

Support: Regional Ecologist
District Managers

Recovery Teams
Science Division

Deleted: District Flora
Deleted: District Fauna Recovery Teams (to be established)

Status: New

Indicative Cost: $100 000 in addition to ACC funding (year 1 funds $ confirmed)

Deleted: $XX

Completion date: December 2008

Target Three Year Outcome – T9: Maintain the extent and condition of priority ecosystems such as granite, Banded Ironstone Formation and Greenstone outcrops, and laterite breakaways (eg. see Safstrom et al 2000).

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Candidate Actions:

1. In partnership with the Avon Natural Diversity Alliance and others:
   a) assess threatening processes for priority ecosystems identified under T1 Candidate Action 3 with results and feasible management options for threat amelioration incorporated into biodiversity conservation plans for each ecosystem;
   b) develop indicators and design and establish long-term ecological reference and monitoring sites to provide baseline data and enable assessment of trends in condition and extent for priority ecosystems; and
   c) implement actions identified in conservation plans for priority ecosystems (including fencing, regeneration, revegetation, weed and animal pest management, and other actions).

Primary Responsibility: Regional Operations Manager

Support: Regional Ecologist
District Managers
District Flora Recovery Teams
District Fauna Recovery Teams (to be established)

Status: New

Indicative Cost: $300 000 pa in addition to ACC funding,

Deleted: $XX
Deleted: (year 1 funds confirmed)

Completion date: December 2008

3.5 SPECIES AT RISK

Target Three Year Outcome – T10: Maintain the distribution (extent of occurrence, area of occupancy), abundance (number and size of populations) and genetic diversity of the 450 plant taxa at risk from rising groundwater, salinity and other threatening processes.

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Candidate Actions:

1. Prepare a strategic plan and implement strategic actions for the management of threatened and at risk flora species including the 450 species identified as at risk from extinction from rising ground water. Confirm the identity and the location of all

populations of the 450 flora species at risk of extinction. Undertake a risk analysis, genetic resource study (for species/populations at high risk of extinction), identify feasible conservation management actions and implement critical actions (such as ex-situ seed collection for populations where in-situ recovery is not feasible) as required.

Primary Responsibility: Regional Manager
Regional Operations Manager

Deleted: Natural Resources Branch – coordination through SAP

Support: Regional Hydrologist
Science Division
District Flora Conservation Officers
Regional Ecologist
Natural Resources Branch

Status: New

Indicative Cost: $2 M pa in addition to the Avon $163845 (year 1 for strategic plan), Millennium Seed Bank $$, genetic analysis across catchments/populations

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Completion date: December 2008

Target Three Year Outcome – T11: Maintain or improve the distribution and abundance of 44 Critically Endangered Flora within the Wheatbelt Region.

Target Three Year Outcome – T12: Maintain the distribution and abundance of Endangered and Vulnerable Flora species within the Wheatbelt Region to ensure these species do not become Critically Endangered and Endangered respectively.

Candidate Actions:

1. Implement priority recovery actions within 33 Interim Recovery Plans that maintain current distribution and abundance of Critically Endangered, Endangered and Vulnerable Flora.

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Primary Responsibility: Regional Operations Officer
District Managers

Deleted: District Flora Recovery Teams .

Support: District Flora Conservation Officers
Flora Recovery Teams
Regional Ecologist

Deleted: District Managers

Status: Ongoing

Indicative Cost: $1.6 M pa

Completion date: Ongoing

2. Prepare Interim Recovery Plans for 19[Acacia cochlocarpa subsp. Velutinosa, Acacia subflexuosa subsp. Capillata, Acacia vassalii, Acacia volubilis, Caladenia melanema, Caladenia williamsiae, Calothamnus accedens, Dryandra ionthocarpa subsp. chrysophoenix ms, Frankenia conferta, Gastrolobium diabolophyllum, Gastrolobium glaucum, Guichenotia seorsiflora ms, Haloragis platycarpa, Hemiandra rutilans, Isopogon robusta ms, Lysiosepalum

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abollatum ms, Philotheca basistyla, Pityrodia axillaris, Verticordia fimbrilepis subsp. fimbrilepis] Critically Endangered Flora while implementing urgent recovery actions to maintain current distribution and abundance of 64 species of Endangered and Vulnerable flora [Acacia ataxiphylla subsp. Magna, Acacia brachypoda, Acacia denticulosa, Acacia depressa, Acacia insolita subsp. Recurve, Acacia lanuginophylla, Acacia leptalea, Acacia lobulate, Adenanthos pungens subsp. Pungens, Adenanthos velutinus, Allocasuarina fibrosa, Allocasuarina tortiramula, Anigozanthos bicolor subsp. Minor, Banksia oligantha, Banksia sphaerocarpa var. dolichostyla, Boronia adamsiana, Boronia capitata subsp. Capitata, Boronia revolute, Caladenia christineae, Caladenia dorrienii, Calectasia pignattiana, Centrolepis caespitose, Conostylis drummondii, Conostylis lepidospermoides, Conostylis rogeri, Conostylis seorsiflora subsp. Trichophylla, Conostylis wonganensis, Darwinia acerose, Eremophila resinosa, Eremophila ternifolia, Eremophila vernicosa ms, Eremophila virens, Eucalyptus brevipes, Eucalyptus crucis subsp. Cruces, Eucalyptus recta, Eucalyptus steedmanii, Eucalyptus synandra, Frankenia parvula, Gastrolobium graniticum, Gastrolobium lehmannii, Grevillea christineae, Grevillea dryandroides subsp. hirsute, Grevillea involucrate, Hakea aculeate, Jacksonia quairading ms, Jacksonia velveta ms, Lasiopetalum rotundifolium, Lechenaultia laricina, Lepidium aschersonii, Melaleuca sciotostyla, Microcorys eremophiloides, Muelleranthus crenulatus, Myriophyllum lapidicola, Philotheca wonganensis, Ptilotus fasciculatus, Pultenaea pauciflora, Rhagodia acicularis, Roycea pycnophylloides, Stylidium merrallii, Thelymitra stellata, Thomasia montana, Tribonanthes purpurea, Verticordia hughanii, Verticordia staminosa subsp. cylindracea var. cylindracea].

Primary Responsibility: Regional Operations Officer
District Managers

Support: District Flora Conservation Officers
Flora Recovery Teams
Regional Ecologist

Status: New

Indicative Cost: $380 000 to prepare plans
$1.5 M pa to implement actions

Completion date: Ongoing

3. Continue to provide input into Environmental Impact Assessments and Notices of Intent to Clear, manage disturbance associated with land use (clearing and maintenance related to Utility infrastructure, eg. Western Power), monitor outcomes and ensure compliance with Statutory obligations and management plans to maintain current distribution and abundance of Declared Rare Flora.

Primary Responsibility: Regional Manager to ensure appropriate input. Regional Operations Manager to provide advice.

Support: Environmental Management Branch to provide advice
District Flora Conservation Officers

Status: Ongoing

Indicative Cost: $50 000 (in addition to centrally funded costs)

Completion date: Ongoing

4. Review and update District Declared Rare and Poorly Known Flora Management Plans in relation to Endangered and Vulnerable Taxa.

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3. . Implement priority recovery actions from Interim Recovery Plans to increase current distribution and abundance of X[list species] Critically Endangered Flora that are at greatest risk of extinction over the next three years.[I think this is the same as 1 above]¶
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Primary Responsibility: . District Flora Recovery Teams¶
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Support: District Flora Conservation Officers¶
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Refer to candidate action T10-1.

5. Based on Candidate Action 4 above implement key actions in the District Declared Rare and Poorly Known Flora Management Plans to prevent a decline in conservation status of Endangered and Vulnerable Taxa.

Refer to candidate action T10-1

6. Develop a population based Declared Rare Flora management database to assist with prioritisation and works programming.

Primary Responsibility: Species and Communities Branch to develop database system to ensure Statewide consistency

Support: District Flora Conservation Officers to maintain database
District Managers
Science Division to provide advice
Information Management Branch for GIS component

Status: New (but building on existing work)

Indicative Cost: $20 000 pa (in addition to central costs)

Completion date: database developed and released by December 2008

Target Three Year Outcome – T13: Maintain ex-situ collections of Threatened Flora Species where in-situ conservation is currently unlikely to succeed.

Candidate Actions:

1. Identify those CR flora at greatest risk of extinction, where in-situ conservation is unlikely to succeed, and implement ex-situ conservation strategies, including germplasm collection for storage.

Primary Responsibility: Regional Operations Manager
District Managers
District Flora Conservation Officers

Support: CALM Threatened Flora Seed Centre, Science Division
Regional Ecologist

Status: New (but building on existing work)

Indicative Cost: $200 000 pa

Completion date: Ongoing

Target Three Year Outcome – T14: Resolve the conservation status of 60 (25%) Priority 1 and 2 Flora Taxa.

Candidate Actions:

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. District Managers¶

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District Managers¶
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Completion date: Ongoing¶
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1. Field survey and map populations of 60 species of Priority 1 and 2 flora as a basis for the review of conservation status.

Primary Responsibility: Regional Ecologist
District Flora Conservation Officers

Support: Threatened Flora Recovery Teams
Regional Ecologist
Species and Communities Unit
Threatened Species Scientific Committee

Status: New

Indicative Cost: $200 000

Completion date: 2009

Target Three Year Outcome – T15: Maintain or improve the distribution and abundance of 350 fauna species at risk from rising groundwater, salinity and other threatening processes.

Candidate Actions:

1. Prepare a strategic plan and implement strategic actions for the management of threatened and at risk fauna species including the 350 species identified as at risk from extinction from rising ground water. Confirm the identity and the location of representative populations of the 350 invertebrate species at risk of extinction. Undertake a risk analysis, genetic resource study (for species/populations at high risk of extinction), identify feasible conservation management actions and implement critical actions (such as the establishment and maintenance of ex-situ populations for populations where in-situ recovery is not feasible) as required.

Primary Responsibility: Regional Manager
Regional Operations Manager

Support: Science Division
District Fauna Recovery Teams (to be established)
Regional Ecologist
Regional Hydrologist
Natural Resources Branch

Status: New

Indicative Cost: $2 M pa

Completion date: Ongoing

Target Three Year Outcome – T16: Maintain or increase the distribution and abundance of 12 Threatened fauna species within the Wheatbelt Region.

Candidate Actions:

1. Implement Western Shield program for CWR mammals

   Primary Responsibility: Regional Operations Manager
   District Managers

   Support: Science Division
   Regional Ecologist

   Status: New

   Indicative Cost: $2 M pa

   Completion date: On-going

2. Implement priority actions for other (non CWR) threatened fauna that have Recovery Plans/IRPs (list species Malleefowl, Carnaby's Black-cockatoo, Minnivale Trapdoor Spider).

   Primary Responsibility: Regional Operations Manager
   District Managers

   Support: Regional Ecologist

   Status: New and Existing

   Indicative Cost: $500 000 pa

   Completion date: 2009

3. Develop District Fauna Management Plans, establish District Fauna Recovery Teams and implement priority management actions.

Refer to candidate action T15-1

Target Three Year Outcome – T17: Maintain stable (distribution and abundance) populations of 4 [woylie, tammar, western brush wallaby, quenda etc.] Conservation Dependent mammal fauna species (see appendix X for list).

Candidate Actions:

1. Implement priority actions as identified in the strategic plan under candidate action T15 – 1.

   Primary Responsibility: Regional Operations Manager
   District Managers

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Support: Science Division
Regional Ecologist

Status: On-going

Indicative Cost: $200 000 pa

Completion date: On-going

Target Three Year Outcome – T18: Resolve the conservation status of 5 Priority 1 and 2 fauna species.

Candidate Actions:

1. Field survey and map distribution and abundance of populations of Priority 1 and 2 fauna as a basis for the review of conservation status

Primary Responsibility: Regional Ecologist
District Nature Conservation Officers

Support: Science Division

Status: New

Indicative Cost: $200 000 pa

Completion date: December 2008

4. RESOURCE ANALYSIS

In order to make strategic change and implement the new and ongoing supporting actions a resource gap analysis has been completed as the basis of a feasibility study.

1. Key question investigated were (Appendix 4 Details of Resource Analysis):

- What is the actual or estimated cost (includes salaries, wages, plant, materials, contract and overheads) pa and over 3 years of each candidate action?
- What is the total annual cost (includes salaries, wages, plant, materials, contract and overheads) from each of those candidate actions or part of a candidate action that are currently being implemented?
- What are the actions and their estimated cost for those actions that are currently undertaken in the Region that do not contribute to the completion of a candidate action(s) or part thereof?
- Comparing items 2 and 3 what actions (if any) and what total savings (includes salaries, wages, plant, materials, contract and overheads) arise from any actions that could be dropped out of the current Nature Conservation SPA?

- What are the sources of funds (specify e.g. Western Shield, SAP, NRM, CALM Recurrent, Other Outputs etc) and the amounts used to implement the candidate actions?

2. Full implementation of all candidate actions in this plan will require $19,367,690 in the first year with a substantial but lesser ongoing amount once the one off projects are completed.

3. Current allocations (2005-2006) total $6,921,534 and are derived from seven sources:

- $1,966,026 from Nature Conservation Output
- $134,200 from Unallocated Crown land funds
- $2,236,100 from Salinity Action Plan
- $2,183,318 from NRM
- $53,890 from Western Shield funds
- $50,000 from Indigenous Employee funds
- $298,000 from additional fire funds

4. 62.3% of the candidate actions are currently funded or partly funded (total $5,660,289) from within the existing allocations.

5. The Output Purchasers provide $1,369,229 for activities that support the nature con servation actions in the region:

- Wild dog control under the Department's good neighbour policy $104,582
- Wildfire suppression (normal time $108,479
- Maintaining facilities (offices, workshops etc.) $37,439
- Recreation $2,072
- General management costs $1,116,657

5. MEASURING EFFECTIVENESS AND PROGRESS OF PLAN

Progress against each of the three year outcome targets listed in the table, Section 3, above will be used to indicate whether or not the management actions implemented have been effective.

Efficiency will be evaluated through the Service Provider Agreement process and will examine the levels of resources used to achieve each target outcome and outline performance measures.

Progress with implementation of the candidate actions will be reported biannually in conjunction with the Service Provider Agreement.

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The plan will be reviewed annual to validate new and ongoing candidate actions, provide for emerging issues and inform the development of each annual Service Provider Agreement.

Appendix 1 Matrix of values/assets and threats and relative importance for regional Scale Actions for CALM Wheatbelt Region

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