ANNUAL RESEARCH ACTIVITY REPORT

July 2004 – June 2005

Science Division

Discovering the nature of WA
http://www.naturebase.net/science/science.html

Government of Western Australia

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

guidelines, and 938 species accounts. A list of these documents is available online at http://science.calm.wa.gov.au/papers/ or from CALM's Woodvale library.

In addition to this body of knowledge generated by the Division, highlights of the activities of the Division that have made a significant contribution to conservation and land management in Western Australia over the last 20 years include:

- Systematic biological surveys of the Nullarbor, Kimberley Rainforests, Southern Carnarvon Basin and Wheatbelt, and commencement of a biological survey of the Pilbara bioregion. In addition to regional surveys, more than 30 sub-regional and local surveys have been completed over the period. Biological surveys are vital for understanding and documenting the composition and distribution of the State's biodiversity, for assisting with the implementation and management of a comprehensive, adequate and representative conservation reserve system and for informing resource development decisions. About 25-30% of the State has now been surveyed.
- The highly successful fauna conservation program 'Western Shield' was a direct outcome of research that identified the Red Fox as a major threat to native mammals and some birds in south-west Australia. In conjunction with fox control, other key elements of Western Shield's success include fauna translocations and captive breeding programs, which for many species, were pioneered by CALM scientists working in partnership with scientists from other agencies such as Perth Zoo.
- Development and implementation of FORESTCHECK, one of the world's most comprehensive forest biodiversity monitoring programs consistent with best practice in ecologically sustainable forest management.
- Science-based investigations into the effects of disturbances such as logging and fire on forests and other ecosystems, generating knowledge important for appropriate management of these disturbances. Well known examples include the Gray forest Karri avifauna study, the Kingston Jarrah foest integrated study, and the long-term fire impact study at Lindsay, McCorkhill and Yendicup Jarrah forests.
- Development of effective broad-scale aerial baiting strategies to control feral Cats in the interior arid zone.
- Development of integrated strategies for the control of *Phytophthora cinnamomi* using phosphite.
- Establishment of the WA Threatened Flora Seed Centre in partnership with Kew Gardens, Millennium Seed Bank Project.
- Preparation of the first Threatened Flora species list and ongoing systematic assessment of the conservation status of WA flora listed as poorly known but considered to be rare.
- The first formal experimental translocations of critically endangered native plants.
- Addition of more than 300 000 specimens to the CALM Herbarium collection, which now stands at 614 020.
- 84 herbaria are now participating in the Regional Herbaria Network program.
- Development of Florabase, an electronic flora information system widely accessible via the internet for finding out information about the distribution, description and identity of the State's flora.
- Sponsorship of a symposium on fire ecology and management and the editing of a book synthesizing knowledge of fire behaviour and fire ecology in south-west ecosystems.
- Significant advances in understanding fire danger forecasting and fire behaviour prediction in dry sclerophyll forests, heathlands and hummock grassland ecosystems.
- Analysis and reporting on the results of 23 years of monitoring water depth and salinity of significant wetlands in south-west Australia.
- Development of site assessment guidelines for the establishment of hardwood plantations and tree crops in south-west Australia.
- Numerous contributions by Divisional officers to the preparation and implementation of 217 fauna

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EXTERNAL PARTNERSHIPS

Biological component

Partnership Name i.e. CRC, Govt Depts, Universities, Industries, Other (sponsorships etc)	**Project**	**Cash funding and source ($)**	**CALM Involvement (in kind)**
ABRS	Taxonomy of Stylidium: 1 Scientist	$72k for 3 yrs	Curatorial (0.05)
ABRS	Taxonomy of Baeckea: 1 Scientist	$36k for 3 yrs	B Rye (0.5), Curatorial (0.05)
ABRS	Taxonomy of Asteraceae: 1 Scientist	$20k	Curatorial (0.05)
Alcoa	Diversity in Dieback Resistant Jarrah (DRJ) clones	$13k;	M Byrne (0.1)
Alcoa	Dieback Forest Rehabilitation - Jarrah (DRJ) re-establishment trials	Alcoa contribution (3 yrs from 2003) $18k in 2003; $10k in 2004	M Stukely (0.3)
ANU	Pilbara biological survey groundwater mapping, ostracod identification and shell chemistry as habitat indicator, Prof P De Deckker, Dr J Reeves	CALM contribution $15k	S Halse (0.05)
ANU	Pilbara Biological Survey: I scientist	$10k for 4 yrs	Taxonomic and authorship - P de Dekker
ANZEC / CRC for Australian Weed Management	Technical Group for weeds of conservation significance	Nil	G Keighery (0.05)
ARC Linkage University of Queensland, University of WA	Broadening the spatio-temporal scope of ecological studies to anticipate change in Australian forested ecosystems	External: 120k for 3 yrs CALM $20k for 3 yrs	N Burrows (0.05), B Ward (0.2) G Lidelow (0.2) R Cranfield (0.1) J Farr (0.1) A wills (0.1) P Van Heurck (0.1) T Burbidge (0.1) R Robinson (0.1) B Smith (0.1) K Bain (0.0-5) D Green (0.05) T Middelton (0.05) L Shu (0.05)
Assessment of the emission of dioxins from bushfire activity in Australia	Work is being conducted as part of Environment Australia's National Dioxins Program, co-ordinated through CSIRO Division of Atmospheric Research.	$10k funding made available from Environment Australia to cover costs of sampling emissions from bushfires in south-west WA	L McCaw, R Smith, J Neal; Total 0.3 FTE pa. Other collaborators include National Research Centre for Environmental Toxicology and University of Melbourne.
BHP Billiton Iron Ore Ltd	Pilbara biological biological bibliographical database	$7.5k – CALM in 2004	S van Leeuwen (0.0)
Bushfires CRC	Managing fires in forest landscapes SW Australia	$40k pa over 7 yrs 2003-10 contributed by CALM. $94k for next 4 yrs to fund PhD	L McCaw (0.4), R Robinson (0.2), J Farr (0.2), B Ward (0.2), G Liddelow (0.2), B Smith (0.2), J Neal (0.2), F Metcalfe (0.2), Li Shu (0.2), R Smith (0.1) (2.1 FTE pa)
Chevron-Texaco	Monitoring mammals on Barrow Island	$6k pa for 5 yrs	K Morris (0.05), A Burbidge (0.05)
CMAE / AGWA/ Gascoyne Murchison Project	Gascoyne Murchison Strategy	2002-03 - $180k 2003-04 - $150k	K Tinley (1.0), J Richardson (0.6), G Burke (0.5), J Richardson (1.0) for 25 days
CRC for Greenhouse Accounting	Project A2 Developing carbon accounting systems		R McKellar (0.1), 1.3 FTE
CRC for Plant Based Management of Dryland Salinity	Biodiversity Program Project - Management of weed and genetic risk in perennial landuse systems	$756 200 over 4 yrs (2004-2008)	M Byrne, M Lyons, S Halse, N Gibson
CSIRO	Pilbara Biological Survey: 2 scientists	$30K for 4 yrs	Curatorial, taxonomic and authorships - T Weir and other staff as relevant.
Dampier Salt Pty Ltd	Pilbara biological survey	$4k for airfares in 2004 – similar amount expected in 2005	S van Leeuwen

Partnership Name i.e. CRC, Govt Depts, Universities, Industries, Other (sponsorships etc)	**Project**	**Cash funding and source ($)**	**CALM Involvement (in kind)**
Netherlands Institute for Sea Research (NIOZ)	PhD – T Compton	$5k from Stipend funds (CALM)	G Pearson (0.05)
Newmont Australia and Gindalbie Gold NL	Genetic structure in the Priority One Species Genus sp. Yalgoo (JM Ward s.n. 11/7/1999)	$26k	D Coates (0.05), M Byrne (0.05), B Macdonald (0.05)
NHT	Western bristlebird research plan	$99 387	AH Burbidge (0.1), J Rolfe (0.05)
NHT	Western ground parrot recovery	$150k	AH Burbidge (0.1), B Barrett (1.0)
NHT	Pilbara biological survey, especially stygofauna	$500k	S Halse (0.7), N McKenzie (0.5), A Burbidge (0.8), S van Leeuwen (0.7)
NHT	Regional assessment of the conservation status of vegetation units throughout WA (Beard)	$31 525	A Hopkins (0.1)
NHT	Review and update of Ramsar Information Sheets for WA	$6900	S Elscot (0.2), J Lane (0.05)
NHT	Nomination and improved documentation of nationally important wetlands in under-represented IBRA regions in WA	$70k for 2003-05	S Elscot (0.25), G Pearson (0.1), A Clarke (0.2), J Lane (0.15)
NHT 2	Pilbara Biological Survey	$500k in 2004/05, a separate application has to be made each year	Funding – N McKenzie (0.5), S Halse (0.7) , AH Burbidge (0.8), S van Leeuwen (0.7), N Gibson (0.3), G Keighery (0.2), L Gibson (1.0), M Lyons (0.5), D Pearson (0.5), B Maslin (0.1), K Morris (0.1), S Patrick (0.3).
NHT2	Dibbler recovery program	$40 500	T Friend (0.1)
NHT2	Gilbert's potoroo recovery program	$73k	T Friend (0.75)
Nickol Bay Naturalists' Club (funded by Woodside)	Botanical survey of selected Dampier Archipelago islands	$5k	S van Leeuwen (0.01)
Nickol Bay Naturalists' Club (WWF/NHT funded)	Botanical Survey of Dampier Archipelago	$5k in 2005 from Environment Minister's Community Grant Program	S van Leeuwen (0.01)
PEST Animal Control CRC	Honours project: Fox re-invasion rates	Nil	N Marlow (0.05)
Pilbara Iron Pty Ltd	Pilbara biological bibliographical database	$7.5k – CALM in 2004	S van Leeuwen (0.0)
Portman Iron Ore and Botanical Gardens and Parks Authority	An integrated research program focused on practical outcomes for the *in-situ* and *ex-situ* conservation, restoration and translocation of the DRF *Tetratheca paynterae* (Tremandaceae)	$101k pa for 2004, 2005 and 2006	C Yates (0.4), D Coates (0.05)
Robe River Iron Associates (West Angelas Coondewanna West Envion Offsets)	Botanical survey of Tussock Grassland communities in the Pilbara biogeographical region	$20k for 2003	Now incorporated into Pilbara Biological Survey - S van Leeuwen (0.2), B Bromilow (0.2)
Robe River Iron Associates (West Angelas Coondewanna West Environmental Offsets)	Fire-Mulga study: post burn monitoring	$20k pa 2002-05 $103k 2006-2011	S van Leeuwen (0.1), T Start (0.05), B Bromilow (0.1)
Robe River Iron Associates (West Angelas Coondewanna West Environmental Offsets)	Wattles of the Pilbara	$135k received between 2003-2005	Now incorporated into Pilbara Biological Survey - B Maslin (0.1), S van Leeuwen (0.05), B Bromilow (0.05)

SIGNIFICANT ACHIEVEMENTS ANTICIPATED for 2005/06

ALIGNED WITH CALM's KEY RESULT AREAS

Key Result Area	Anticipated outcomes or achievements
KRA 1. Establishment of a comprehensive, adequate and representative (CAR) terrestrial and marine conservation reserve system	**Biological survey**: Continue the field program of systematic terrestrial biological survey with emphasis on the Pilbara Bioregion. Promote the SW Agricultural Zone biological survey findings, including communication of results to key stakeholders. Complete analysis and write-up of some 12 sub-regional biological surveys. Commence floristic surveys of Whicher Range and banded ironstone ranges in the goldfields. Prepare proposal for Kimberley Islands survey.
	Information management: Employ database manager to progress the development of biodiversity information management systems that provide extensive support for systematic biological inventory and decision-making including NatureBase and CALM's Perth Herbarium information systems.
KRA 2. Maintenance of a terrestrial / marine protected area network (IUCN management categories I to VI)	Ongoing program of biological survey and protected area network gap analysis. Commence planning for biological survey of Kimberley Islands and parts of the south-west forest region. Represent WA in NLWRA's Biodiversity Audit mark2 – Australia-wide project awaiting final approval for funding from NHT before milestones can be defined. Compile recent sub-fossil lists from Napier & Oscar Ranges (SW Kimberley). Also to audit WA biodiversity and conservation activities as part of NLWRA program, producing IBRA sub-regional synopses, IBRA bioregional summaries, case studies for two sub-regions, and analysis of mammal, Acacia, Eucalypt and bird status by bioregion. Participate and contribute to the National Reserves System program and IBRA. Herbarium Identification facilities service research, operations and Nature Conservation Division staff, and CALM consultants undertaking surveys of conservation reserves and forests; survey of conservation taxa completed in southern forests.
KRA 3. Conservation of landscape /seascape scale ecological systems and processes (integrating reserve and off-reserve conservation)	**Adaptive Experimental Management:** Progress adaptive experimental management by embedding Science Division staff in priority operational programs, e.g. managing fire and feral animals on Lorna Glen (Goldfields Region); managing fire for biodiversity in the Walpole Wilderness Area (Frankland District); feral predator control and Mallee fowl recovery on Mt Manning Nature Reserve (Goldfields region); fire regimes for mainland Quokka populations; weed control. With Nature Conservation and Sustainable Forest Management

Key Result Area	Anticipated outcomes or achievements
	Divisions, identify other corporate priority projects that will benefit from this approach. **Fire:** Appoint fire research ecologist, Kimberley region. Coommence investigation into Kimberley fire and mammals. Complete fire management plan, hummock grasslands, Lorna Glen case study. Commence field program of Bushfire CRC-funded fire and biodiversity project to investigate fire effects in south-west ecosystems over 50 years. Implement mosaic burn treatments, Walpole Fire Mosaic project. Analyse data on long-term effects of fire regimes on Jarrah forest tree health and growth. Draft revised fire behaviour model, dry sclerophyll forests, Project Vesta. **Feral animals:** Maintain development and field trialling of feral Cat bait at Lorna Glen. Complete Probait non-target trials. Initiate mesopredator release studies (fox/dog/cat interactions) (pending funding from IA CRC). Investigate introduced predator control in the lower Murchison rangelands and Dirk Hartog Isl. Benchmark survey of feral camel populations in WA arid zone. Initiate feral Pig impact studies, south-west ecosystems (ARC Link). Initiate pre-arrival monitoring of cane toads. **Disease:** Ongoing investigations into the effective use of phosphite to control the impacts of Phytophthora cinnamomi. Determination of the susceptibility of a range of threatened flora to Phytophthora cinnamomi. Maintain monitoring of wandoo decline. Assist Tuart Response Group. Maintain watching brief Mundulla Yellows. Animal diseases – Western barred bandicoot **Salinity:** Provide support/advice/data to maintain and recover biodiversity with emphasis on recovery catchments under the State Salinity Strategy. Participate in NRM planning at State and Regional levels and to provide technical support/advice. Model impacts of climate change on south-west biodiversity. **Monitoring:** Continue to monitor wetlands as part of the State Salinity Strategy. Other wetlands being monitored include Peel-Harvey Estuary (waterbirds), Vasse-Wonnerup. Reports produced, findings communicated to land managers and decision makers. Participate in development of Rangelands monitoring protocol. Ongoing monitoring and reporting on forest vertebrates Perup), benthic invertebrate communities, mammals on Barrow Island, Bernier and Dorre Islands, wheatbelt wetlands, Vasse-Wonnerup wetlands, Peel-Harvey estuary waterbirds, rare arid zone dasyurids, wildfire impacts, previous translocations (Bristlebirds, Ground parrots, Numbats, Chuditch, Western ringtails, Dibbler, Western barred bandicoot, Shark Bay mouse. Develop protocol for monitoring Rock-wallabies, sea turtles. Monitoring translocations of threatened flora. **Information management:** Develop a framework for managing (warehouse, disseminate, value add) critical biophysical information to support biodiversity conservation and decision making (Naturebank). Assist WWF Woodland Watch Project, provide education and support for conservation of private lands; identification of key species for development of

Context
In 1982 an extensive outbreak of *Uraba lugens* occurred on Jarrah throughout the southern Jarrah forest and persisted for nearly 10 yrs.

In line with Corporate Strategy 1.5 (protect biodiversity from threatening processes), Corporate Priority 12, KRA 2 and 3 and sub output SFM 3K.

Aim
To understand the biology of GLS in WA and monitor population levels of the outbreaking insect.

Summary of progress and main findings

- Data on population levels (using a cherry picker) are yet to be incorporated into an internal report.

Management implications

- Although an outbreak of GLS has occurred only once in the history of Jarrah forest management, this insect has the potential to increase in population to 110 larvae per kg dry weight of host foliage or more. This can cause serious defoliation in the Jarrah forest. Two consecutive warm winters can induce a 2-generation per year population which contributes to a rapid population increase and thus a potential for population outbreak.

Future directions (next 12-18 months)

- Prepare an internal report to enable finalization of the project. This achievement has been given low priority.
- To incorporate findings from this study into the development of a forest health surveillance program.

CALM Region
Warren.

IBRA Regions
Jarrah Forest, Warren.

NRM Regions
South Coast, South West.

State Salinity Strategy wetland monitoring

SPP # 1998/0018

Team members
Fauna - S Halse (0.1), D Cale (0.5), K Sutcliffe (0.2); Flora - M Lyons (0.4), N Gibson (0.05), D Mickel (0.5); Surface water - J Lane (0.35), G Pearson (0.1), A Clarke (0.2), S Elscot (0.1), Y Winchcombe (0.3), B Johnson (0.05); Groundwater - S Halse (0.05), contracts; Total (3.3).

Context
Substantial loss of biodiversity is known to have occurred across the Wheatbelt of Western Australia over the past 100 yrs. The most pronounced physical changes at wetlands have been associated with clearing and salinization. Clearing has more or less ceased but salinization will continue to be expressed or many decades. While it is known that salinization is a major threat to wetland biodiversity, the relationship between its physical expression and loss of biodiversity are poorly documented and understood. This project began in 1997 and is intended to be a long-term project.

It addresses Corporate Priority 3, KRA 2 and 3 and Sub-outputs NC 2D and 3NC E, F and G.

Aim
To monitor changes in biodiversity, surface water quantity and quality, and groundwater levels at selected Wheatbelt wetlands in relation to increasing dryland salinity and land-use changes to provide information that will lead to better decision-making.

Summary of progress and main findings.

- Program summary presented at Wetlands Co-ordinating Committee in March resulted in WCC statement of support and intra-departmental review of program at workshop in April endorsed continuation of the project in current form.
- Fauna monitoring – 2004 monitoring completed, A4 sheets on waterbird results to date circulated, work began on scientific paper reporting whole of project results for Paperbark Swamp and Eganu Lake.
- Surface water monitoring – 2004 monitoring completed; report on 1978-2000 depth and salinity data from 151 wetlands completed, compilation of draft 1981-2000 pH monitoring report well advanced, analysis of depth, salinity and pH data to 2004 well advanced.
- Wetland bathymetry – field surveys of lake bed, shoreline, inflow and outflow contours of Lakes Taarblin (north section), Ardath, Wallambin North, Campion, Mollerin and Cowcowing completed, and maps and depth-volume calculators prepared.
- Vegetation monitoring for 2004 completed, vegetation history at Paperbark and Eganu documented from aerial photographs as part of scientific paper, another scientific paper on 5 yrs monitoring of vegetation monitoring in the Lake Muir-Unicup wetland system published in the *Journal of the Royal Society of Western Australia*..
- Ground water monitoring for 2004 completed, shallow groundwater monitoring bores and vegetation quadrated surveyed to DLI benchmarks and thereby to depth gauges.
- Management – contributed to Bryde, Buntine-Marchagee, Drummond, Muir, and Toolibin TAGs and provided advice to Warden Biodiversity Recovery Catchment, put together scheme for assessing the suitability of wetlands to receive drainage for Wetlands Co-ordinating Committee (endorsed by Cabinet Sub-Committee for the Environment).

Management implications

- Analyses of trends in depths, salinities and pH of 60 wetlands monitored for 20 or more years have revealed a number of wetlands undergoing diverse changes that warrant further investigation and corrective management.
- The loss of vegetation is continuing even at long-saline wetlands where the physical expression of salinity in water is more or less stable. Such wetlands also show declines in faunal use.
- Surface water management is as important in some wheatbelt wetlands (such as Coomalbidgup Swamp) as groundwater management in maintaining wetland health and greater focus on surface water is required.

Future directions (next 12-18 months)

- Continue monitoring according to current protocols.
- Reports on trends in depth, salinity and pH (acidity/alkalinity) of monitored wetlands from 1978-2004 to be completed.
- Investigations into causes of changes in depths and/or salinities of several monitored wetlands to be initiated.
- Complete paper analysing trends in surface and groundwater salinities, vegetation condition and fauna at Paperbark Swamp and Eganu Lake
- Arrange to publicize results of the monitoring to date through media and presentation to NRM groups.

CALM Regions
Midwest, South Coast, Wheatbelt, South West, Swan, Warren.

IBRA Regions
Avon Wheatbelt, Esperance Plains, Geraldton Sandplains, Jarrah Forest, Mallee.

NRM Regions
Avon, Northern Agricultural, South West, South Coast.

catchment and an average 0.41 m in the hillslopes and 0.12 m in the valleys in the standard-treatment catchment.

- The treatments have had no measurable effect on water quantity or quality in either the intensive- or the standard-treatment catchments.

Management implications

- The results will enable an informed assessment of the adequacy of Jarrah forest silvicultural practices in protecting water quality from the impact of timber harvesting and a sound basis on which revision of the practices can be made.

Future directions (next 12-18 months)

- Continue monitoring of groundwater levels, stream flow, stream salinity, stream turbidity and rainfall for at least another year and until the responses to the treatments have peaked.
- Apply WEC-C hydrological model to simulate hydrological responses to alternative timber harvesting and silvicultural treatments, and to different climate patterns.
- Commence write-up following monitoring of 2005 wet season.

CALM Region
Swan.

IBRA Region
Jarrah Forest.

NRM Regions
South West, Swan.

Directory of important wetlands in Australia: revised editions

SPP # 1999/0014

Team members
J Lane (0.15), G Pearson (0.2), A Clarke (0.6), S Elscot (0.25); Total (1.2).

Context
The first edition of *A Directory of Important Wetlands in Australia* was published in 1993, as a co-operative project between the State, Territory and Commonwealth Governments of Australia. Second and third editions were published in 1996 and 2001. The *Directory* provides a listing of wetlands identified as being of national significance. It is an ongoing project; more wetlands are added as knowledge of Australia wetlands and their many values grows and as circumstances change. The *Directory* provides a basis, but not the only basis, for prioritizing wetland conservation activities in Western Australia and nationally. The Team leader has had responsibility for this project in WA since its inception.

This study aligns with Corporate Priorities 5, 6, KRA 3 and sub-output NC 3C. Current work (commenced 2003) is on wetlands of remote and under-represented IBRA Regions of WA.

Aims

- To prepare revised editions of the Western Australian Chapter of *A Directory of Important Wetlands in Australia*, incorporating additional wetlands and information as knowledge increases and circumstances change.
- To periodically update the national database of Directory wetlands.

Summary of progress and main findings

- Site managers and others with substantial relevant knowledge of remote wetlands have been contacted and site visits and surveys conducted to collect field data and other information to support site listings.
- Aquatic invertebrate specimens are being sorted in preparation for specialist taxonomic

identification.

- Botanical specimens are being identified and mounted for lodgment in the WA Herbarium collection.
- Waterbird data has been analysed and synthesized for inclusion in site descriptions.
- Information concerning cultural values, site management, threats and related issues has been collated.
- Preparation and enhancement of descriptions of candidate and existing remote Directory sites has commenced.
- The Western Australian component of the national Directory will be updated in 2005 to include new sites and enhanced site descriptions.

Management implications

- Literature search, field survey results and interviews will lead to identification of nationally important wetlands, values and threats and provide a basis for conservation and wise management of these wetlands.

Future directions (next 12-18 months)

- Identification of aquatic invertebrate and botanical specimens of remote wetlands will be completed, data analysed and information synthesized.
- Descriptions of proposed new sites for the Directory will be prepared, together with enhanced descriptions of existing sites.
- The Western Australian component of the Directory will be updated in 2005 to include new sites and enhanced site descriptions.

CALM Regions
The Directory is an important resource document for all CALM Regions. Current work is focused on the Kimberley, Pilbara, Goldfields, Midwest, South Coast and Wheatbelt CALM Regions.

IBRA Regions
The main focus at present is on Central Ranges, Coolgardie, Gibson Desert, Great Victoria Desert, Hampton, Little Sandy Desert, Mallee, Nullarbor, Ord Victoria Plains, Tanami and Yalgoo.

NRM Regions
The Directory is an important resource document for all NRM Regions. Current work is focused on the Rangelands NRM Co-ordinating Group.

Management of the Vasse - Wonnerup wetlands

SPP # 1999/0017

Team members
J Lane (0.15), Y Winchcombe (0.1), Total (0.25).

Context
There is a long history of mass fish deaths in the lowest reaches of the Ramsar-listed Vasse-Wonnerup wetland system. The incidence and severity of deaths can be reduced by timely openings of the entrance sandbar and two sets of floodgates. Careful management of flows and water levels is needed to prevent adverse impacts on fringing vegetation, waterbirds and adjoining properties. Following a mass fish kill in 1997, CALM led the establishment of an inter-agency technical working group to co-ordinate relevant agency activities. This lead role is being maintained.

This project aligns with Corporate Priorities 3, 5 and 12, KRA 2 and sub-output NC 2D.

Aims

- To perform a lead role in the management of water levels, flows and salinities in the Vasse-Wonnerup wetland system.
- To undertake monitoring programs that will enable impacts of Vasse-Wonnerup water level,

flow and salinity regimes to be assessed. The principal issues of interest in this project are impacts on waterbird populations, fringing plant communities and adjoining properties and the occurrence of mass fish deaths.

Summary of progress and main findings

- A meeting of the inter-agency Vasse Estuary Technical Working Group was convened to decide arrangements for 2003/04 summer opening of the sandbar at the wetland system mouth; for water level, water quality and fish monitoring, and for floodgate openings to release fish and manage water levels.
- The sandbar was opened several weeks earlier than usual due to high concentrations of hydrogen sulphide from rotting seagrass in Wonnerup Inlet and the threat this posed to fish life.
- Monitoring of fish activity and water levels at the floodgates was undertaken by team members with CALM Blackwood District backup during 2004/05. The Vasse estuary floodgates 'fish gate' was opened for long periods in summer-autumn to maintain the target water level, allow fish to pass and, in December, kill a potentially toxic algal bloom. The Wonnerup estuary floodgates fish gate was opened for long periods to maintain a minimum level sufficient to allow fish to be released if necessary.
- Advice was supplied in response to public queries about management of the wetland system and places to see waterbirds. Scientific advice was provided to the Busselton Shire concerning its proposal to establish a Busselton Wetlands Interpretive Centre and associated wetland experiences.

Management implications

- Water levels, flows and fish movements were successfully managed throughout summer-autumn of 2004/05. There were no mass fish deaths, and adverse impacts on waterbird populations and fringing plant communities that would result from excessive water levels and salinities were avoided.

Future directions (next 12-18 months)

- The VETWG will be convened as necessary to decide on management, monitoring and other responsibilities during 2005/06.
- Monitoring of water levels and fish activity during summer-autumn will continue. Gates will be opened as necessary to manage water levels and release fish.
- Public enquiries concerning management of the wetlands will continue to be responded to.
- A concise report will be prepared, recording water levels, floodgate openings, fish releases and mass fish death incidents in the Vasse-Wonnerup system since the December 1997 report of Lane, Hardcastle, Tregonning and Holtfreter.

CALM Region
South West.

IBRA Region
Swan Coastal Plain.

NRM Region
South West.

Monitoring post-fire effects from the 2001 Nuyts wildfire
SPP # 2004/004

Team members
G Liddelow (0.1), B Ward (0.05), R Cranfield (0.05) P Van Heurck (0.1) L McCaw (0.05), R Smith (0.05) Frankland District Staff as required; Total (0.4).