

**MONITORING AND EVALUATION:
WESTERN AUSTRALIA REGIONAL TRIALS
PHASE 2 REPORT**

May 2005



**Natural
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The National Land & Water Resources Audit is an initiative of the Natural Heritage Trust. The Audit provides data, information and nationwide assessments of Australia's land, water and biological resources to support sustainable development.

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PHASE II NATIONAL MONITORING AND EVALUATION TRIAL **WESTERN AUSTRALIA**

Summary

Due to the early stage of development of the regional strategies and investment plans not as much could be achieved as in other States. However many of the issues raised during this trial have indicated where the state and regional monitoring and evaluation projects need to focus when being developed.

The target indicator chosen for the trial is a regularly maintained dataset in Western Australia and could be delivered on a statewide basis.

Monitoring, Evaluation and Reporting roles and responsibilities for your region

The state government has traditionally performed these roles with some individual projects under NSCP, NLP and NHT1 carrying out some monitoring and reporting.

The changes to the way funding is now allocated will lead to changes in the roles of groups and government. The regional NRM groups are still coming to terms with the new role that is required under the bilaterals and in the project schedules.

Selection of Trial region Matter(s) for Target to evaluate reporting capacity

Because the state is still developing and approving the Strategies and Investment Plans what the regions will use as matters for targets is still unknown.

The earliest that this will be available will be April 2005 if all are approved in March. Any further comment at this time will be speculation.

The recent release of the investment plans does not allow a picture to be drawn as to the RCT and MAT that will be used for two reasons. Firstly all plans have defined too many MAT's and the projects defined to date in many cases are regional programs, which between now and June are being developed into projects on the ground

Issues for development of info products

In WA as we develop the new NRM component of SLIP these issues will become evident but we have at least \$400,000 available to resolve these issues.

Also there have been other projects' funded under NHT2 which are addressing these issues. For example came across a project totally dedicated to a data trawl of wetlands data.

In planning for SLIP a large number of datasets were listed as required (Appendix 1) the process of defining information products is still to come and will be part of the first phase of SLIP to take place over the remainder of 2005.

Information access and collation

The WALIS policies on their web site (www.walis.wa.gov.au) really set the scene in WA for all these issues and a MOU with the regional groups indicates that they will be treated as a department.

The delivery mechanisms that will take place will be closely linked to the evolution of SLIP and will be by web delivery through the government network at first and then through the internet. All regional groups but one are located with the Department of Agriculture regional offices and so the Client and Natural Resource System (CRIS) will be used to deliver the SLIP solution in 2005.

At present there are no existing reporting pathways and reporting tools between regional and State levels and State to regional. This will be developed in the coming months as the plans are approved. At present there is no formal process in place.

The use/value of national data sets. is variable and will be sorted as we go through the process of matching the regional matters for targets and existing data from whatever source (old regional, state and commonwealth).

Native vegetation case study

Our templates in Appendix 2 cover this and we are setting up a WMS site with the data to test interoperability solutions.

Future Direction

The trials were valuable in that they helped identify issues that had not been considered before. However due to the early stage of development of the regional strategies and investment plans not as much could be achieved as in other States. In addition many of the people spoken to in the trials have moved on, which means that an education process is being undertaken with the new staff.

Greater synergies and value adding will be possible with the new data trawl project as the NRM groups are at a more advanced stage and the SLIP process will have begun. The need for future data collection programs and data/info product delivery mechanisms will evolve over the next six months

APPENDIX 1 Data to be included in SLIP

Category	Data Layer	Access to Data Set Funded By:			
		Enabling Framework	EM and NRM	EM Focus Area	NRM
Administrative & Political Boundaries					
1	CALM Forestry Grid		✓		
2	DOE Administrative Regions				✓
3	EM Agency Admin Boundaries			✓	
4	Local Govt. Authority Boundaries	✓			
5	Locality Boundaries	✓			
6	Marine Nature Reserves		✓		
7	Marine Parks		✓		
8	NRM Regional Boundaries				✓
9	State Boundaries		✓		
Agriculture & Pastoral					
10	Detailed farm catchment plans (eg contour banks)		✓		
11	Fencelines		✓		
12	Homestead Locations	✓			
Atmosphere & Climate					
13	Average annual rainfall isohyets	✓			
14	Dew Point			✓	
15	Fire Weather Forecast Boundaries			✓	
16	Humidity			✓	
17	Rainfall		✓		
18	Temperature			✓	
19	Weather Forecast Boundaries			✓	
20	Weather Stations			✓	
21	Wind			✓	
Base Maps, Scanned Maps & Charts					
22	Airports & landing grounds	✓			
23	AUSLIG 1:100K		✓		
24	CALM Operational Graphics Maps (1:50,000)		✓		
25	Coastal features	✓			
26	Emergency Services Directories		✓		
27	GeoData coast 100K 1992	✓			
28	Gorges, gaps & passes	✓			
29	HEMA Country Road Maps		✓		
30	Major waterbodies	✓			
31	Minor waterbodies	✓			
32	Mountains, peaks & hills	✓			
33	Street Smart Map Grid			✓	
34	Street Smart Map Page Boundaries			✓	
35	StreetSmart Town and City Maps		✓		
36	UBD Cities and Town Maps			✓	
37	GeoData 250K map base	✓			
Biology & Ecology					
38	Beard's vegetation classification	✓			
39	Boundaries of areas inundated or saturated by surface or groundwater	✓			
40	Boundaries of areas of existing vegetation and description		✓		
41	Boundaries of areas of pre-1750 vegetation and description				✓

Category	Data Layer	Access to Data Set Funded By:			
		Enabling Framework	EM and NRM	EM Focus Area	NRM
<u>42</u>	Boundaries of areas of existing vegetation on CALM Estate and description		✓		
<u>43</u>	Boundaries of areas of pre-1750 vegetation on CALM Estate and description				✓
<u>44</u>	Boundaries of natural catchment/ drainage basins	✓			
<u>45</u>	Bush Forever 2000	✓			
<u>46</u>	Bushland and Bushland within Reserves				✓
<u>47</u>	Bushplan				✓
<u>48</u>	Declared Rare Fauna				✓
<u>49</u>	Declared Rare Flora		✓		
<u>50</u>	Dieback Affected Regions		✓		
<u>51</u>	Land Systems		✓		
<u>52</u>	Native Vegetation (Protected)				✓
<u>53</u>	Natural Catchment/ Drainage Areas		✓		
<u>54</u>	RAMSAR sites		✓		
<u>55</u>	Remnant Vegetation on Private Land				✓
<u>Business & Economics</u>					
<u>56</u>	Building Information (from Valuer General – where available through legislation)			✓	
<u>57</u>	FRMA 1994 Management Boundaries				✓
<u>58</u>	Marine and Aquatic Human Impacts				✓
<u>59</u>	Marine and Aquatic Species Biological Information				✓
<u>60</u>	Pearling Act Management Boundaries				✓
<u>61</u>	Pearling and Aquaculture Sites and Leases - Locations				✓
<u>62</u>	Property value		✓		
<u>Cultural</u>					
<u>63</u>	Aboriginal Communities		✓		
<u>64</u>	Built up areas	✓			
<u>65</u>	Commonwealth areas (eg airports)		✓		
<u>66</u>	Locations & Details of Significance	✓			
<u>67</u>	Locations & Details of Significance	✓			
<u>68</u>	Major population centres	✓			
<u>69</u>	Official & Local Names of Cultural & Geographic Features	✓			
<u>70</u>	Town Locations			✓	✓
<u>71</u>	Townsite Boundaries			✓	✓
<u>Demographics</u>					
<u>72</u>	1996 Total population	✓			
<u>73</u>	District boundaries	✓			
<u>Elevation</u>					
<u>74</u>	Digital Elevation Model		✓		
<u>75</u>	Slope Classes		✓		
<u>76</u>	Vertical distance from base height defined by the AHD	✓			
<u>Environmental Monitoring & Modelling</u>					
<u>77</u>	Air Quality				✓
<u>78</u>	Biohazard History		✓		
<u>79</u>	Contaminated Sites		✓		
<u>80</u>	Earthquake risk			✓	
<u>81</u>	Environmental Protection Policy Areas				✓
<u>82</u>	Fire breaks		✓		
<u>83</u>	Fire Hotspots		✓		

Category	Data Layer	Access to Data Set Funded By:			
		Enabling Framework	EM and NRM	EM Focus Area	NRM
<u>84</u>	Fire Scars		✓		
<u>85</u>	Licensed Hazardous Goods sites		✓		
<u>86</u>	Pesticide Residues		✓		
<u>87</u>	Pollution				✓
<u>88</u>	Restricted Areas		✓		
<u>89</u>	Restricted UXO Areas			✓	
<u>90</u>	Special Restrictions (eg quarantine)		✓		
<u>91</u>	Special Risk Plans		✓		
<u>92</u>	Swan River Trust Areas & Regions				✓
<u>93</u>	Waste disposal sites (existing and potential)		✓		
<u>94</u>	Wildfire Threat Analysis			✓	
<u>Facilities, Buildings & Structures</u>					
<u>95</u>	Accommodation (eg hotel)			✓	
<u>96</u>	Building Footprints		✓		
<u>97</u>	Floor plans			✓	
<u>98</u>	Places of worship			✓	
<u>99</u>	Schools	✓			
<u>100</u>	Schools				
<u>Geology & Geophysics</u>					
<u>101</u>	Boundaries & classification of aquifers	✓			
<u>102</u>	Boundaries & classification of soil resources	✓			
<u>103</u>	Groundwater Contours				✓
<u>104</u>	Hydrogeological Maps 1:250,000	✓			
<u>105</u>	Hydrogeology and Groundwater Resources of the Perth Region	✓			
<u>106</u>	Main tectonic subdivisions	✓			
<u>107</u>	State geological divisions	✓			
<u>108</u>	Underground caves		✓		
<u>Human Health & Disease</u>					
<u>109</u>	Contact information for key people in shire		✓		
<u>110</u>	Location of people with disabilities			✓	
<u>111</u>	Surface water temperature		✓		
<u>Imagery & Photographs</u>					
<u>112</u>	3D Perth CBD Model			✓	
<u>113</u>	Aerial Photography	✓			
<u>114</u>	Satellite Imagery	✓			
<u>Land Ownership</u>					
<u>115</u>	Attributes of Land Parcels in the CALM Estate	✓			
<u>116</u>	Boundaries of Freehold & Crown Land	✓			
<u>117</u>	Boundaries of Surveyed & Unsurveyed Tenements	✓			
<u>118</u>	Contact Information for Management		✓		
<u>119</u>	Contact Information for Occupier		✓		
<u>120</u>	Contact Information for Ownership		✓		
<u>121</u>	Crown Land Leases		✓		
<u>122</u>	Details of ownership, vesting	✓			
<u>123</u>	Georeferenced Address of Properties	✓			
<u>124</u>	National Parks	✓			
<u>125</u>	Pastoral Lease and Property boundaries		✓		
<u>126</u>	Rural Street Address		✓		
<u>127</u>	Subdivisions				✓

Category	Data Layer	Access to Data Set Funded By:			
		Enabling Framework	EM and NRM	EM Focus Area	NRM
<u>Oceans & Estuaries</u>					
<u>128</u>	The limit of land features (mean high water level)	✓			
<u>Planning & Development</u>					
<u>129</u>	Activities performed on rural land parcels	✓			
<u>130</u>	Activities performed on urban land parcels	✓			
<u>131</u>	Boundaries showing future land use proposals within Perth Metropolitan Region	✓			
<u>132</u>	Boundaries showing permissible development in a local government area	✓			
<u>133</u>	Clause 42 & 47 Certificates				✓
<u>134</u>	Commercial Development Areas				✓
<u>135</u>	Greater Bunbury Region Scheme				✓
<u>136</u>	Industrial Complexes & Development				✓
<u>137</u>	Land Development & Release Plans				✓
<u>138</u>	Metropolitan Development Scheme				✓
<u>139</u>	Peel Region Scheme				✓
<u>140</u>	Planning Appeals				✓
<u>141</u>	Planning Sectors & Control Areas				✓
<u>142</u>	Recreation Complexes & Development Areas				✓
<u>143</u>	Statement of Planning Policies				✓
<u>144</u>	Structure Plans				✓
<u>Recreation & Tourism</u>					
<u>145</u>	Public open space		✓		
<u>146</u>	Recreational locations (eg stadium, swimming pool)			✓	
<u>Social, Justice & Emergency Services</u>					
<u>147</u>	Aged Care Hostels			✓	
<u>148</u>	Child Care Centres			✓	
<u>149</u>	Community Infrastructure (eg halls, potential evacuation centres)			✓	
<u>150</u>	Fire Stations			✓	
<u>151</u>	Group Houses			✓	
<u>152</u>	Hospitals and medical clinics		✓		
<u>153</u>	Nursing Homes			✓	
<u>154</u>	Police Stations			✓	
<u>155</u>	Prepositioned emergency resources			✓	
<u>156</u>	Prisons			✓	
<u>157</u>	SES Units			✓	
<u>158</u>	St John Ambulance Stations			✓	
<u>159</u>	VMRS Units			✓	
<u>Transportation</u>					
<u>160</u>	Air strips				
<u>161</u>	Boat ramps	✓			
<u>162</u>	Bus routes		✓		
<u>163</u>	HazMat Routes		✓		
<u>164</u>	Jetties	✓			
<u>165</u>	Major roads	✓			
<u>166</u>	Pilbara railways	✓			
<u>167</u>	Ports		✓		
<u>168</u>	Railways	✓			
<u>169</u>	Representation of Centreline of Physical Road	✓			
<u>170</u>	Road Centrelines		✓		

Category	Data Layer	Access to Data Set Funded By:			
		Enabling Framework	EM and NRM	EM Focus Area	NRM
<u>171</u>	Shipping lanes		✓		
<u>172</u>	Southern railways	✓			
<u>173</u>	Stock routes		✓		
<u>174</u>	Tracks		✓		
<u>175</u>	Tracks in CALM Estate		✓		
<u>Utilities & Communication</u>					
<u>176</u>	CCTV Locations			✓	
<u>177</u>	Communications lines			✓	
<u>178</u>	Critical Infrastructure			✓	
<u>179</u>	Drainage networks	✓			
<u>180</u>	Hydrants	✓			
<u>181</u>	KIMA Infrastructure (eg pipes)		✓		
<u>182</u>	Locations of networks & major assets	✓			
<u>183</u>	Locations of networks & major assets	✓			
<u>184</u>	Mobile Phone Coverage			✓	
<u>185</u>	Radio and TV Stations and Coverage			✓	
<u>186</u>	Radio Coverage			✓	
<u>187</u>	Radio Towers			✓	
<u>188</u>	Sewer	✓			
<u>189</u>	Telecom			✓	
<u>190</u>	Telephone Box locations			✓	
<u>191</u>	Water supply	✓			
<u>Water Resources (Inland)</u>					
<u>192</u>	Aquifer information		✓		
<u>193</u>	Dams		✓		
<u>194</u>	Dams				✓
<u>195</u>	Divertible Water Allocation Inventory Database				✓
<u>196</u>	Flood plains		✓		
<u>197</u>	Foreshores				✓
<u>198</u>	Groundwater Salinity				✓
<u>199</u>	Important Wetlands				✓
<u>200</u>	Major rivers	✓			
<u>201</u>	Office of Water Regulation Areas/Zones/Schemes				✓
<u>202</u>	Potable water catchments				✓
<u>203</u>	Public Drinking Water Supply Areas		✓		
<u>204</u>	Representation of watercourses	✓			
<u>205</u>	Ribbons of Blue				✓
<u>206</u>	Rights in Water Irrigation Areas & Districts				✓
<u>207</u>	River Heights		✓		
<u>208</u>	Storm Surge Contours			✓	
<u>209</u>	Storm Surge Heights			✓	
<u>210</u>	Stream Condition				✓
<u>211</u>	Streamlines		✓		
<u>212</u>	Surface water management areas (ASWMA 2000)	✓			
<u>213</u>	Water Resource Licences				✓
<u>214</u>	Curing Indices			✓	
	Total Data Sets 214	60	62	47	45

APPENDIX 2
National Land & Water Resources Audit
Monitoring & Evaluation
Information Product

WESTERN AUSTRALIA

SECTION 1 (standard description)

Info Product – Native Vegetation Extent, Western Australia

Matter for Target	Native vegetation communities integrity
Indicator Heading	Native vegetation extent and distribution
Indicator	The extent of each present native vegetation extent by IBRA sub-region

Name	Native Vegetation Extent
Description	The current spatial distribution and extent of native vegetation in Western Australia
Display	This product can be displayed as a map and/or a table of area, and/or a graph. eg. area by IBRA region

Attributes	Values	Description
MSLINK	1 – 9,999,999	Unique polygon identifier for dataset (all tiles)
POLY AREA	eg. 12.1	Area in hectares calculated to one decimal place
NAME	NORTH, SOUTH,EAST	Tile name (there are three tiles)
ID	1-186,811	Processed polygon ID for each tile (Primary key)

SECTION 2 (the national product)

Delivery Level	State (Western Australia)
Source	A data set containing vegetation extent polygons from the mapping of remnant vegetation in Western Australia. This was originally compiled as part of the vegetation theme of the National Land and Water Resource Audit (NLWRA). The data for the intensive land-use zone (ILZ) in south-western Australia was originally derived from 1995 LandSat TM satellite imagery and has been corrected using digital aerial photography (orthophotos) acquired 1996 to 1999. The extensive land-use zone (ELZ) is presumed to carry vegetation cover except for the major irrigated areas at Kununurra and Carnarvon. These have been removed from extent mapping for the ELZ. The dataset has been progressively updated by the Department of Agriculture post-NLWRA with assistance the Department of Conservation and Land Management.
Area of coverage	Western Australia
Scale	~1:100,000
Dates	1997-2004
Updates planned	2005
Availability	Data available on request
Capacity to deliver	Available through Department of Agriculture WA (Client & Resource Information System).
Format/Location	Currently available as Geomedia Access Warehouse, ESRI Shapefile and GeoTiff
Accessibility	Academic – license only required. WALIS – cost of extraction only with license. Commercial – standard charges apply with license.
Custodian details	Contact Organisation: Client and Resource Information System Project, Department of Agriculture Western Australia

	<div>Contact Person: Damian Shepherd</div> <div>Mail Address: 3 Baron-Hay Ct Rd</div> <div>Locality : South Perth</div> <div>State: Western Australia</div> <div>Country: Australia</div> <div>Postcode: 6983</div> <div>Telephone: (02) 8 9368 3853</div> <div>Facsimile: (02) 8 9368 3939</div> <div>Email Address: dshepherd@agric.wa.gov.au</div>
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National Land & Water Resources Audit Monitoring & Evaluation Information Product

WESTERN AUSTRALIA

SECTION 1 (standard description)

Info Product – Native Vegetation Types, Western Australia

Matter for Target	Native vegetation communities integrity
Indicator Heading	Native vegetation extent and distribution
Indicator	The extent of each present native vegetation extent by IBRA sub-region

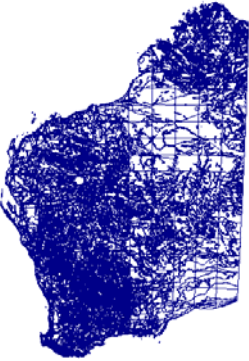
Name	Native Vegetation Types
Description	The pre-European spatial distribution and extent of native vegetation in Western Australia
Display	This product can be displayed as a map and/or a table of area, and/or a graph. eg. area by IBRA region

Attributes	Values	Description
SYSTEM	Text description	Vegetation System
CELL_NO	Text eg. A040034	Polygon identifier from original state dataset
VEG_ASSOC	Integer eg. 101	Vegetation Association Number
ORIG_ID	Integer (1-34,358) Nulls allowed	Second polygon identifier from original state dataset
POLY_AREA	eg. 12.1	Area in hectares calculated to one decimal place
SYSTEM_ASSOCIATION	Text eg. GUILDERTON 949	Vegetation System_Association Number
ID	1-54,932	Processed polygon identifier (Primary key)
SA_CODE	Double eg. 117.2	Vegetation System Association code number

SECTION 2 (the national product)

Delivery Level	State (Western Australia)
Source	<p>A comprehensive database of the vegetation of the State has been developed. The first set of data is a State-wide coverage at the scale of 1:250,000 based on the work of J S Beard, supplemented where necessary to give a uniform standard of mapping detail.</p> <p>This version of the dataset updates a previous version of the dataset (metadata date 08/09/2003). This version of the dataset has been significantly revised. The following changes have been made:</p> <ul style="list-style-type: none"> • Rectification of the dataset to topographic features from the State topographic dataset (primarily using the coastline and lakes), • Correction of dataset attribution of on mapsheet edges, • Correction of boundaries to some map units, • Creation of a new Vegetation Systems map (based on 1:250,000 map unit boundaries) that forms a scale hierarchy with the 1:250,000 scale map units and IBRA (Interim Biogeographic

	<p>Regionalisation of Australia, Thackway & Cresswell eds. 1995) regions and sub-regions.</p> <p>The result of this process is a dataset that is more spatially accurate and allows the integration of more detailed attribute data. Attribute data have been compiled in accordance with the Australian Vegetation Attributes (Version 6.0) making the attributes compliant with the National Vegetation Information System (NVIS).</p> <p>The database includes map linework as design files in a Geographic Information System (GIS), and tabular data about the vegetation in each of the map polygons in ORACLE tables linked through a Data Base Management System (DBMS). There are <i>c</i> 30,000 polygons covering 160 1:250,000 map sheets.</p> <p>Data on the original vegetation of all of Western Australia, with the exception of three map sheets in the south-west corner, were captured from J S Beard's original working drawings, where these were available, or from published maps, all at the scale of 1:250,000. For the three map sheets in the south-west corner, a new data set was compiled in a form consistent with Beard's approach, from existing data (A.J.M. Hopkins, unpublished).</p>
Area of coverage	Western Australia
Scale	1:250,000
Dates	1986-2004
Updates planned	None planned
Availability	Data available on request
Capacity to deliver	Available through Department of Agriculture WA (Client & Resource Information System).
Format/Location	Currently available as Geomedia Access Warehouse, ESRI Shapefile and GeoTiff
Accessibility	Academic – license only required. WALIS – cost of extraction only with license. Commercial – standard charges apply with license.
Custodian details	<p>Contact Organisation: Client and Resource Information System Project, Department of Agriculture Western Australia</p> <p>Contact Person: Damian Shepherd</p> <p>Mail Address: 3 Baron-Hay Ct Rd</p> <p>Locality : South Perth</p> <p>State: Western Australia</p> <p>Country: Australia</p> <p>Postcode: 6983</p> <p>Telephone: (02) 8 9368 3853</p> <p>Facsimile: (02) 8 9368 3939</p> <p>Email Address: dshepherd@agric.wa.gov.au</p>

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