
National Estate Extensive Natural Values: Eden CRA Region

A report undertaken for the NSW CRA/RFA Steering Committee
28 April 1998

NATIONAL ESTATE EXTENSIVE NATURAL VALUES: EDEN CRA REGION

ENVIRONMENT AUSTRALIA

**A report undertaken for the NSW CRA/RFA Steering Committee
project number NE 36/EH**

28 April 1998

Report Status

This report has been prepared as a working paper for the NSW CRA/RFA Steering Committee under the direction of the Environment and Heritage Technical Committee. It is recognised that it may contain errors that require correction but it is released to be consistent with the principle that information related to the comprehensive regional assessment process in New South Wales will be made publicly available.

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The project has been overseen and the methodology has been developed through the Environment and Heritage Technical Committee which includes representatives from the NSW and Commonwealth Governments and stakeholder groups.

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EXECUTIVE SUMMARY

Development of Regional Forest Agreements (RFAs) is the primary mechanism for implementing the National Forest Policy Statement (NFPS). The NFPS was agreed between the Commonwealth and State Governments (Commonwealth 1992). To implement the NFPS the New South Wales (NSW) and Commonwealth Governments signed a Scoping Agreement in 1996.

The Scoping Agreement commits the State and Commonwealth Governments to undertake a series of comprehensive regional assessments (CRAs) of forested areas to create a comprehensive, adequate and representative (CAR) forest reserve system. A significant conservation aim of the NFPS is the development of a CAR reserve system to protect biodiversity, old growth forests and wilderness. It also requires the assessment of values important for identifying places of national estate significance.

The CRAs provide the scientific basis on which the State and Commonwealth Governments will negotiate regional forest agreements for the major forests of NSW. These agreements will determine the future of the State's forests, providing a balance between conservation and ecologically sustainable use of forest resources.

This report details the work undertaken in the assessment of natural landscapes and undisturbed catchments in the Eden CRA process. Natural landscapes and undisturbed catchments are extensive national estate values, extending broadly across the landscape rather than being confined to single vegetation types or localities.

All the areas identified in this report are considered to have national estate value. However, natural landscapes and undisturbed catchments constitute only two of the values which will be used to identify national estate places for listing in the Register of the National Estate. Areas

identified as National Estate will remain indicative until they have been considered by the Australian Heritage Commission. The Commission will also consider the extent of protection of the identified values under the RFA.

These assessments show that the majority of these values are already protected in existing national parks and nature reserves.

1. INTRODUCTION

Development of Regional Forest Agreements (RFAs) is the primary mechanism for implementing the National Forests Policy Statement (NFPS) agreed between the Commonwealth and State Governments (Commonwealth 1992). In 1996, the NSW and Commonwealth Governments signed a Scoping Agreement to undertake Comprehensive Regional Assessments (CRAs) of NSW forests to achieve RFAs.

Attachment 1 of the Scoping Agreement (Commonwealth, 1996) requires CRAs to identify, assess and document national estate values, including natural and cultural heritage, to satisfy Commonwealth obligations under the *Australian Heritage Commission Act 1975*.

Key points from the Scoping Agreement include:

- Identification, delineation and mapping of national estate values and places;
- Identification of values to be undertaken jointly by the Commonwealth and NSW in accordance with national estate criteria for identifying places of significance;
- Assessment of current levels of protection of national estate values and places;
- Identification of conservation principles for the protection of national estate values and places;
- Methodologies to be jointly agreed between the Commission and NSW;
- Documentation of agreed methodologies; and
- Documentation, sufficient for interim listing in the Register of the National Estate where appropriate.

The Australian Heritage Commission criteria for the Register of the National Estate provide the basis for the identification of national estate values. The criteria are at Appendix 1.

The two criteria of relevance to the assessment of extensive natural values are:

- Criterion A.2: *importance in maintaining existing processes or natural systems at the regional or national scale* ; and
- Criterion B.1: *importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness*.

Extensive natural values extend broadly across the landscape rather than being confined to single vegetation types or localities. While wilderness, old-growth forest and ecosystems can also be considered extensive natural values, under the guidelines of the Scoping Agreement they are dealt with elsewhere (see Commonwealth and NPWS 1997 (wilderness assessment report); Keith and Bedward 1997 (ecosystem assessment report); NPWS 1997 (old growth assessment report)).

Assessment of natural landscapes and undisturbed catchments attempts to identify places important for the maintenance of natural processes (such as hydrological processes) at regional and national scales.

Natural landscapes are large, relatively undisturbed, areas with topographic and catchment integrity where natural processes continue largely unmodified by human intervention. The following are considered natural processes:

- energy flows;
- nutrient cycling;
- hydrological processes;
- ecological processes, such as succession; and
- evolutionary processes, such as speciation and extinction.

Undisturbed catchments are places where natural hydrological processes remain essentially unmodified and unimpeded.

At a national level, natural landscapes and undisturbed catchments are considered rare.

Areas identified in this report have national estate value. However, natural landscapes and undisturbed catchments constitute only two of the values that will be used to identify national estate places for listing in the Register of the National Estate. Areas identified as National Estate will remain indicative until they have been considered by the Australian Heritage Commission.

The Commission will also consider the extent of protection of the identified values under the RFA. All areas proposed for listing will be entered on the Interim List of the Register of the National Estate and then advertised and subjected to the statutory period allowed for public comment. It is anticipated that interim listing of areas identified through the Eden CRA process will occur after the Eden RFA is signed.

2. METHODS

2.1 BACKGROUND

The assessment of natural landscapes and undisturbed catchments was undertaken using the National Wilderness Inventory (NWI), and the River Disturbance Index Database of the Wilderness and Wild Rivers Group, Environment Australia.

2.2 NATURAL LANDSCAPES

The assessment of natural landscapes was based on the biophysical naturalness indicator of the NWI. The NWI is a geographical information system (GIS) which measures remote and natural values to produce a 'Wilderness Quality' continuum. NWI Wilderness Quality is produced from four disturbance indicators, each weighted equally: Remoteness from Access; Remoteness from Settlement; Apparent Naturalness; and Biophysical Naturalness. Each of these indicators is individually updated with the best available data and then combined to measure the Wilderness Quality of an area (see Lesslie and Maslen 1995).

Biophysical Naturalness

Biophysical naturalness (BN), is based upon the assumption that the degree of change sustained by an ecosystem is directly related to the intensity and duration of interference. For the NWI, land use considerations are generally restricted to the grazing of stock and the harvesting of timber. However, where other reliable data is available, information on a range of other disturbances is also included.

The types of disturbance data typically used to derive the BN layer includes information from:

- timber harvesting;
- aerial photography;

- land tenure;
- grazing leases;
- vegetation mapping (i.e. old growth mapping); and
- mining site data.

In the biophysical naturalness rating scheme wildfire is considered a natural process, so that areas affected by wildfire can still be given a high biophysical naturalness rating (i.e. 5), unless other disturbances resulted in a lower rating.

The rating scheme for BN used in the NWI is outlined in Table 1. This rating system is for the 'baseline NWI' and each region has its own rating system applied in consultation with stakeholders.

TABLE 1: BIOPHYSICAL NATURALNESS RATING SCHEME

Indicator Value	NWI Descriptor for Baseline NWI
5 High	Unlogged and ungrazed
4	Unlogged and ungrazed for at least 60* years; excluding clear-felled and intensively grazed areas
3	Selective single logging; irregular grazing within preceding 60* years
2	Light / Moderate grazing; repeated selective logging within preceding 60* years
1 Low	Clear-fell logging operations and / or intensive grazing
0	Agricultural, urban and developed land, pine and other exotic plantations, reservoirs.

* threshold period may vary between regions

The rating scheme adopted for upgrading the BN indicator to assess wilderness values, in the Eden region is shown in Table 2 (Commonwealth and NPWS 1997).

TABLE 2: BIOPHYSICAL NATURALNESS RATING SCHEME AS APPLIED TO THE EDEN REGION

Indicator Value	NWI Descriptor for Eden Regional Update
5 High	No evident disturbance from grazing or logging; natural water bodies.
4	Record of pre-1960 selective logging; windthrow; evidence of logging from API and senescence dominant with no associated logging records; disturbance not obvious from satellite imagery.
3	Grazing (Brogo only); evidence of logging from API and senescence 10-30% and evident regrowth with no associated logging records.
2	Clear-fell or integrated logging records with evidence of regrowth and/or some senescence.
1 Low	Clear-fell logging and pre-1982 'integrated logging' with minimum seed trees left; recent logging, still evident on satellite images.
0	Agricultural, urban and developed land, pine and other exotic plantations, reservoirs.

Identification and Delineation

Three measures were used to identify areas of potential natural landscape value:

- naturalness (or level of disturbance);
- size; and
- integrity in the landscape.

Areas of BN equal to 5 (high) and with an area of 1,000 ha or greater were identified. To rationalise boundaries, identified areas could contain a small amounts of fragmentation. That is, delineated areas may contain no more than 5% of their area having a biophysical naturalness rating of less than 5.

2.3 UNDISTURBED CATCHMENTS

The identification of undisturbed catchments was based on an analysis of river flow impediments and the naturalness of the area within the catchment. The assessment is derived from the River Disturbance Index Database (Stein 1995) held by the Wilderness and Wild Rivers Group, Environment Australia.

River Disturbance Index Database

The River Disturbance Index Database is a GIS database using modelling procedures to identify potential wild rivers. The database delineates a separate modelled sub-catchment for each stream segment, as defined on the AUSLIG 1:250,000 scale hydrography theme database. Specifically, the River Disturbance Index (RDI) is a measure of river/stream quality across sub-catchment areas based on two indicators: Naturalness of Flow Regime Index (NFRI); and Sub-Catchment Naturalness Index (SCNI).

The River Disturbance Index Database was constructed by establishing a grid across a primary database and calculating scores for sub-catchment condition (SCNI) and flow regime indicators (NFRI). The scores for SCNI are combined and adjusted for sub-catchment area to produce a Catchment Naturalness Index (CNI). The final RDI values are combined NFRI and CNI.

The primary database is made up of geographical data derived from topographical map series and the NWI primary database. The NWI sources provide settlement and infrastructure features, the extent of non-natural land cover and an index of biophysical naturalness (Lesslie and Maslen 1995). Topographical map series provides watercourse data, built-up areas, infrastructure, reservoirs and canals.

The RDI was created using guidelines established by an expert panel of government and non-government officials and stakeholders. Panel participants helped develop decision rules on quantifying disturbance and measuring catchment and river naturalness. From these discussions the RDI rates sub-catchment areas on a scale from undisturbed (0) to disturbed (1).

Identification and Delineation

Selection of a threshold to capture intact and undisturbed catchments was made on the basis that highly undisturbed catchments occur in the RDI range less than or equal to 0.01.

Using GIS, the data was filtered to capture all sub-catchments less than or equal to 0.01. Those places falling within these parameters were deemed to

have national estate value for undisturbed catchments.

3. RESULTS

3.1 NATURAL LANDSCAPES

Fifteen natural landscapes areas of national estate significance were identified. These areas cover a total of 219,549 ha and ranged in size from 1,162 ha (South-east Nimmitabel) to 86,159 ha (Wadbilliga). Delineated areas of natural landscapes are listed in Table 3 and shown on the accompanying Map 1.

TABLE 3: NATURAL LANDSCAPE AREAS ASSESSED AS MEETING THE THRESHOLD FOR NATIONAL ESTATE SIGNIFICANCE

Place	Area (ha)
Wadbilliga	86,159
Ben Boyd-Nadgee	32,796
Coolangubra	18,546
Tantawangalo	12,563
Bournda	11,596
Yowaka	10,126
Nalbaugh	10,085
Nungatta	9,390
Mount Imlay	8,437
Biamanga-Murrah	7,028
Numeralla	6,694
Delegate	1,813
Coolambooka	1,632
North-east Nimmitabel	1,521
South-east Nimmitabel	1,162
Total	219,549

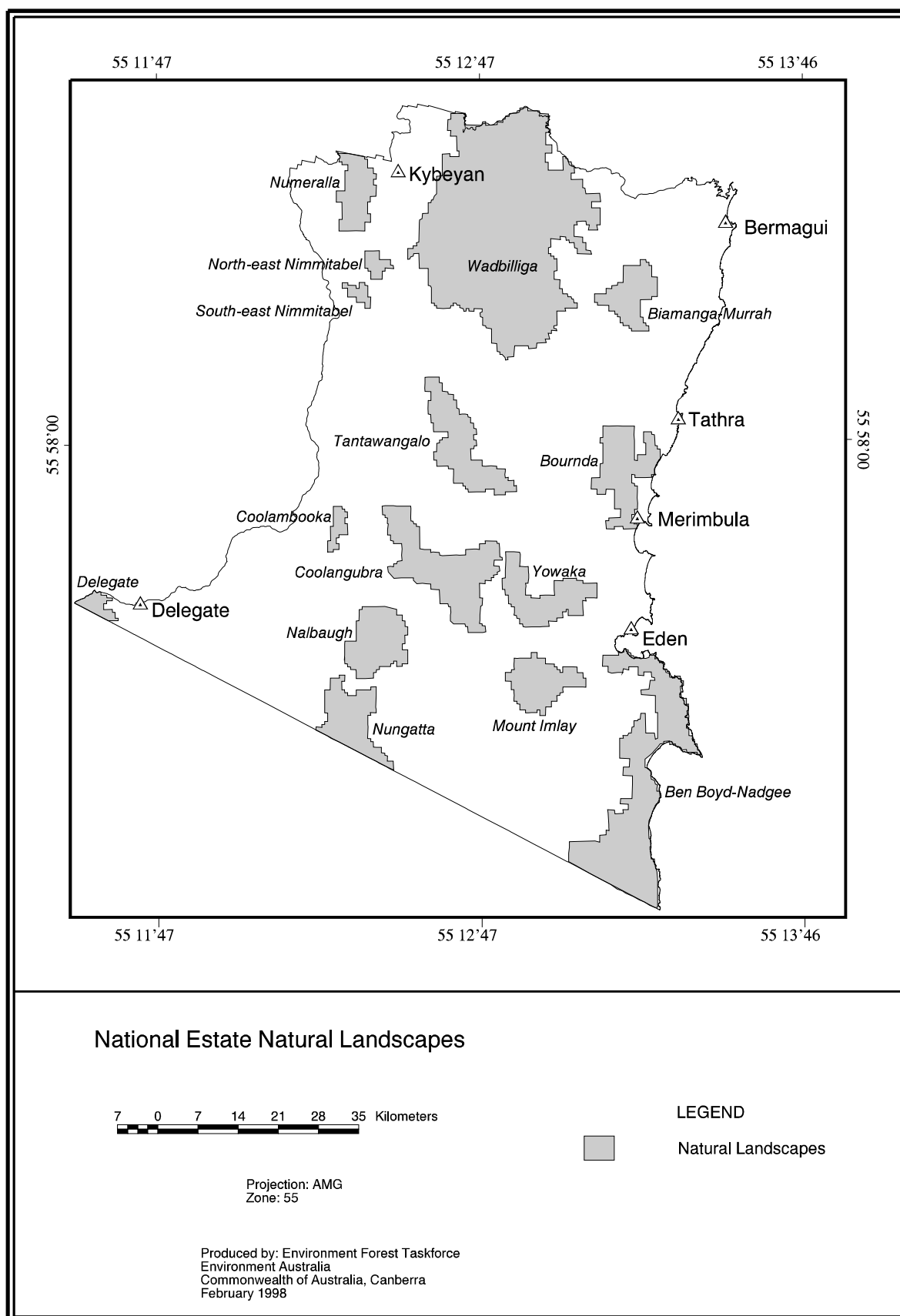
Just over 70% of the total natural landscape area occurs in national park or nature reserve while 11% of the total area is in state forest (Table 4). Also, approximately 60% of total area currently occurs in places already listed in the Register of the National Estate.

The metadata for this dataset is at Appendix 2.

TABLE 4: LAND TENURE OF THE AREA OF NATURAL LANDSCAPES ASSESSED AS MEETING THE THRESHOLD FOR NATIONAL ESTATE SIGNIFICANCE

Tenure	Approximate Area (ha)	Proportion of Total (%)
National Park or Nature Reserve	153,235	70
Private Land	31,460	14
State Forest	23,627	11
Reserved Crown Land	2,929	1
Leasehold Crown Land	2,792	1
Other Crown Land	2,764	1
PMP 1.3*	931	<1

*PMP 1.3 is the State Forests of NSW Preferred Management Priority Classification for areas reserved as Flora Reserves and Forest Preserves (Forestry Commission of NSW 1993)

Map1: Delineated Natural Landscapes that Meet the Threshold for National Estate Significance

3.2 UNDISTURBED CATCHMENTS

Fifty seven areas were identified as undisturbed catchments, covering a total of 110,965 ha and ranging in size from 7 ha to 59,209 ha. These 57 areas were made up of 320 sub-catchments which range in size from just over 1 ha to 5,590 ha.

Approximately 87% of the total area of undisturbed catchments occurs in national park or nature reserve and 9% of the total area is in state forest (Table 5) and shown on Map 2.

TABLE 5: LAND TENURE OF THE AREA OF UNDISTURBED CATCHMENTS

Tenure	Approximate Area (ha)	Proportion of Total (%)
National Park or Nature Reserve	96,364	87
State Forest	9,740	9
Private Land	3,468	3
Reserved Crown Land	439	<1
Leasehold Crown Land	405	<1
PMP 1.3*	285	<1
Other Crown Land	149	<1
State Forest Plantation	47	<1
Coastal Inlet	7	<1

*PMP 1.3 is the State Forests of NSW Preferred Management Priority Classification for areas reserved as Flora Reserves and Forest Preserves (Forestry Commission of NSW 1993)

After applying the size threshold of 1,000 ha, thirteen areas of national estate significance were identified (Table 6).

Approximately 89% of the identified undisturbed catchment areas occurs in national park or nature reserve, 7% of the total area is in state forest (Table 7). Nearly 84% of the total area occurs in places currently listed in the Register of the National Estate.

The metadata for this dataset is at Appendix 3.

TABLE 6: UNDISTURBED CATCHMENT AREAS ASSESSED AS MEETING THE THRESHOLD FOR NATIONAL ESTATE SIGNIFICANCE

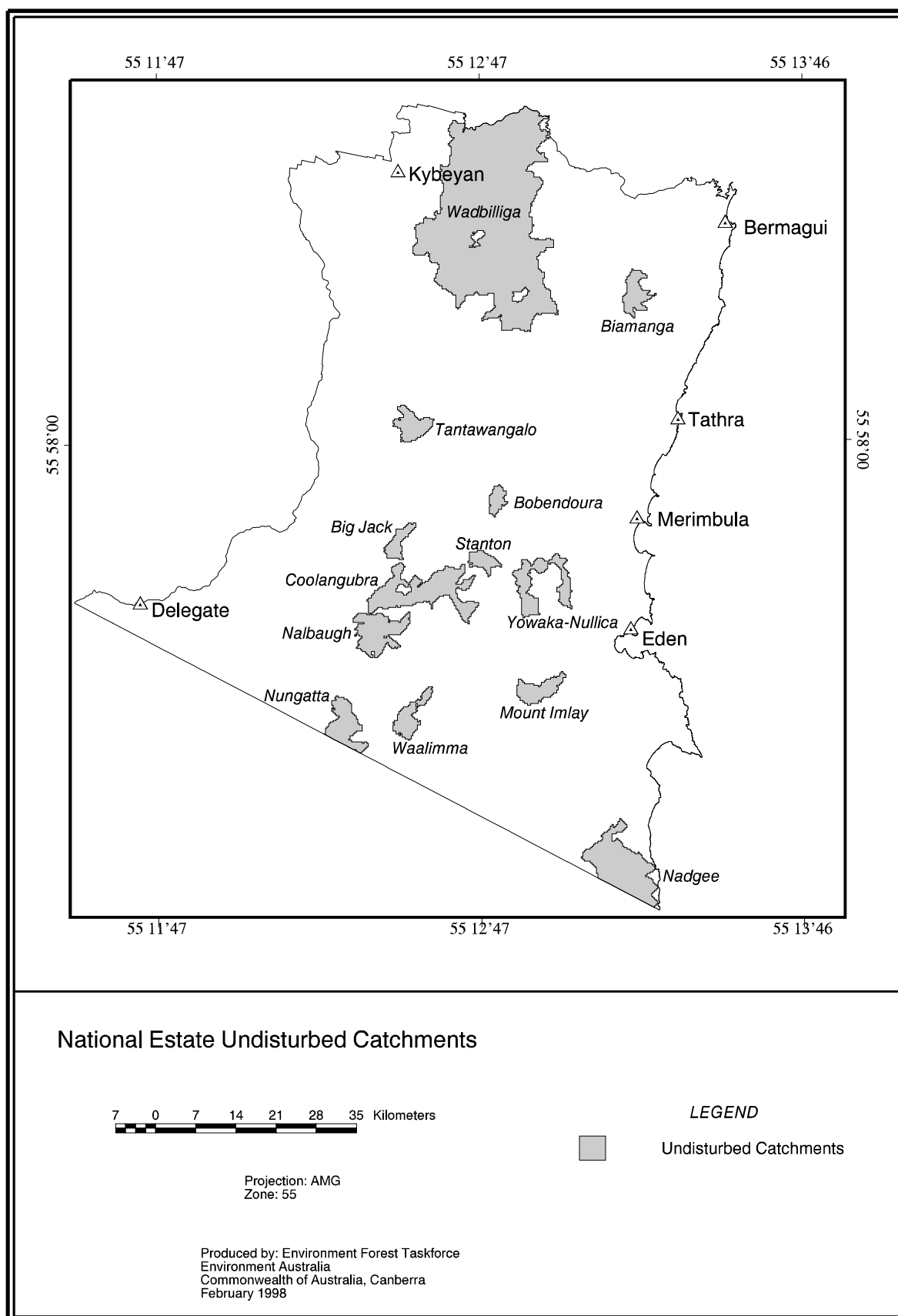
Place	Area (ha)
Wadbilliga	59,209
Nadgee	8,875
Coolangubra	8,453
Nalbaugh	4,658
Yowaka-Nullica	4,337
Nungatta	3,540
Tantawangalo	2,428
Mount Imlay	2,421
Biamanga	2,371
Waalimma	2,329
Big Jack	1,467
Stanton	1,303
Bobendoura	1,090
Total	102,483

TABLE 7: LAND TENURE OF THE AREA OF UNDISTURBED CATCHMENTS ASSESSED AS MEETING THE THRESHOLD FOR NATIONAL ESTATE SIGNIFICANCE

Tenure	Approximate Area (ha)	Proportion of Total (%)
National Park or Nature Reserve	91,387	89
State Forest	7,336	7
Private Land	2,753	3
Leasehold Crown Land	405	<1
PMP 1.3*	274	<1
Other Crown Land	139	<1
Reserved Crown Land	77	<1
State Forest Plantation	47	<1

*PMP 1.3 is the State Forests of NSW Preferred Management Priority Classification for areas reserved as Flora Reserves and Forest Preserves (Forestry Commission of NSW 1993)

Map2: Delineated Undisturbed Catchments that Meet the Threshold for National Estate Significance



4. CONCLUSION

This report presents the outcomes of the national estate assessment of natural landscapes and undisturbed catchments in the Eden CRA. These assessments contribute to meeting the Scoping Agreement requirements in relation to the National Estate and contribute to the development of options for a CAR reserve system and RFA for Eden.

The result of these assessments show that the majority of the expressions of these values are already protected in existing national parks and nature reserves and are also currently listed in the Register of the National Estate.

All the areas identified are considered to have national estate value. However, natural landscapes and undisturbed catchments constitute only two of the values that will be used to identify national estate places for listing in the Register of the National Estate.

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APPENDIX 1

AUSTRALIAN HERITAGE COMMISSION CRITERIA FOR THE REGISTER OF THE NATIONAL ESTATE

Without limiting the generality of sub-section (1) of the *Australian Heritage Commission Act 1975*, a place that is a component of the natural or cultural environment of Australia is to be taken to be a place included in the national estate if it has significance or other special value for future generations as well as for the present community because of:

Criterion A: Its importance in the course, or pattern, of Australia's natural or cultural history.

A.1 Importance in the evolution of Australian flora, fauna, landscapes or climate.

A.2 Importance in maintaining existing processes or natural systems at the regional or national scale.

A.3 Importance in exhibiting unusual richness or diversity of flora, fauna, landscapes or cultural features.

A.4 Importance for association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, State, region or community.

Criterion B: Its possession of uncommon, rare or endangered aspects of Australia's natural or cultural history.

B.1 Importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness.

B.2 Importance in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practiced, in danger of being lost, or of exceptional interest.

Criterion C: Its potential to yield information that will contribute to an understanding of Australia's natural or cultural history.

C.1 Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.

C.2 Importance for information contributing to a wider understanding of the history of human occupation of Australia.

Criterion D: Its importance in demonstrating the principal characteristics of:

(i) a class of Australia's natural or cultural places; or
(ii) a class of Australia's natural or cultural environments.

D.1 Importance in demonstrating the principal characteristics of the range of landscapes, environments or ecosystems, the attributes of which identify them as being characteristic of their class.

D.2 Importance in demonstrating the principal characteristics of the range of human activities in the Australian environment (including way of life, custom, process, land-use, function, design or technique).

Criterion E: Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

E.1 Importance for a community for aesthetic characteristics held in high esteem or otherwise valued by the community.

Criterion F: Its importance in demonstrating a high degree of creative or technical achievement at a particular period.

F.1 Importance for its technical, creative, design or artistic excellence, innovation or achievement.

Criterion G: Its strong or special associations with a particular community or cultural group for social, cultural or spiritual reasons.

G.1 Importance as a place highly valued by a community for reasons of religious, spiritual, symbolic, cultural, educational, or social associations.

Criterion H: Its special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.

H.1 Importance for close associations with individuals whose activities have been significant within the history of the nation, State or region.

APPENDIX 2:

NATURAL LANDSCAPES METADATA

CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title:	Eden RFA - National Estate - Delineated Natural Landscapes
	Custodian:	Environment Australia
	Jurisdiction:	Australia
CONTACT ADDRESS	Contact organisation:	Environment Australia
	Contact position:	NSW Officer - ERIN Regional Information Section (ERIS)
	Mail address:	ERIS - Environment Australia GPO Box 787
	Suburb/place/locality:	Canberra
	State:	ACT
	Country:	Australia
	Postcode:	2603
	Telephone:	02 - 6274 1111
	Facsimile:	02 - 6274 1977
	Electronic mail address:	(name.name@ea.gov.au)
DESCRIPTION	Abstract:	<p>This product was developed to satisfy national estate assessment of 'extensive natural values' under the Eden CRA. Delineated Natural Landscapes assessment is derived from the National Wilderness Inventory - Biophysical Naturalness (BN) indicator. The BN Indicator and NWI is developed by the Wilderness and Wild Rivers Unit - Environment Australia. The NWI is a GIS database using modelling procedures to identify remote and natural lands. The NWI is a measure of disturbance variation across the landscape based on two attributes; remoteness and naturalness. The quality of the landscape is measured against four indicators; Remoteness from Settlement, Remoteness from Access, Apparent Naturalness and Biophysical Naturalness. The NWI database is constructed by establishing a lattice of sampling points across all areas selected for inclusion in the survey.</p>

		A range of measurements are calculated for each sampling point which are then processed to produce values for each of the four wilderness quality indicators. The Natural Landscape database consists of only the BN indicator to derive areas showing 'naturalness or no disturbance'. The BN indicator has values in the range of 0 (highly disturbed) to 5 (undisturbed). This dataset has been derived by selecting only BN = 5. Delineation of natural landscapes for national estate purposes, selected areas greater than 1000 ha. For sensible boundaries, areas were allowed to contain no more than 5% of BN values less than 5. Areas were delineated using Arcview (digitising).
	Keywords:	Natural Landscapes, Biophysical Naturalness, Land Cover, Forest, Disturbance, GIS, BN, NWI.
	Geographic extent:	Eden RFA Region
	Bounding coordinates:	Geographic Extent: Coordinates (approx.) 36°00'S 148°30'N; 38°00'S 150°30'N or xmin: 148.5, ymin: -36, xmax: 150, ymax: -37.5
	Type of feature:	Polygon
	Attribute/Field List:	Biophysical Naturalness - Value Number
	Attribute/Field Description:	Attributes are classified on a scale: 0 - 5 (from disturbed to undisturbed).
	Scale/Resolution:	1: 25,000
DATASET CURRENCY	Beginning date:	Unknown
DATASET STATUS	Ending date:	Current at September, 1997
	Progress:	Complete
	Maintenance and update frequency:	None
DATASET ENVIRONMENT	Name of System:	Unix (ArcView)
	Minimum Software Requirements:	
	Input Format/Type:	ArcInfo grid
	Output Format/Type:	ArcView shapefile
	Dataset size:	22 kb
ACCESS	Stored Format:	Arcview shapefile
	Available Format Type:	ArcInfo / ArcView / ascii / hardcopy map.
	Access constraints:	Unrestricted. Permission, Acknowledgment and Data Agreements are required.

DATA QUALITY	Lineage:	<p>Eden region baseline data was collected from 1:250,000 scale National Topographic Map Series (digitised by the NWI team). Updated roads (NSW LIC) at 1:100,000; Operational roads (NSW State Forests) at 1:25,000; API floristics and Growth Stage layers (NSW NPWS) from Landsat at 100m; Eastern bushlands (NSW NPWS) from Landsat at 100m; Coups layer to 1996 (NSW State Forests) at 1:15,000; Coups Layer to 1997 (Environment Australia) from Landsat TM at 30m; and Brogo logging history (NSW NPWS) at 1:15,000.</p> <p>Data was the best available at 19 September 1997 but some datasets may have been sourced prior to this date.</p> <p>Refer to the National Wilderness Inventory Handbook, Second Edition, 1995. Australian Heritage Commission for a complete detailed account of the basic methodology used for the national database.</p> <p>The Eden CRA Report gives an account of the ratings for Biophysical Naturalness specific to the Eden update.</p>
	Positional accuracy:	Unknown
	Attribute accuracy:	Attributes are classified according to feature codes as described in the NWI handbook (see reference below). Verification of feature codes done at summary level (i.e. grades of impact) using expert knowledge.
	Logical consistency:	Topological checks undertaken in ArcInfo. All source data checked prior to analysis.
	Completeness:	This dataset covers the Eden CRA region.
NOTES	Notes:	Separate metadata is available for National Wilderness Inventory database.
	References:	NWI Handbook, Second Edition, Australian Heritage Commission; NSW Wilderness Act 1987.
	Metadata date:	15 - 10 - 1997
	Metadata sheet compiled by:	K Bossard and P Hodgson (NSW Section, EFT, EA)
	Further information:	National Wilderness Inventory - Environment Australia

APPENDIX 3:

UNDISTURBED CATCHMENTS METADATA

CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title:	Eden RFA - National Estate - Undisturbed Catchments
	Custodian:	Environment Australia
	Jurisdiction:	Australia
CONTACT ADDRESS	Contact organisation:	Environment Australia
	Contact position:	NSW Officer - ERIN Regional Information Section (ERIS)
	Mail address:	ERIS - Environment Australia GPO Box 787
	Suburb/place/locality:	Canberra
	State:	ACT
	Country:	Australia
	Postcode:	2603
	Telephone:	02 - 6274 1111
	Facsimile:	02 - 6274 1977
	Electronic mail address:	(name.name@ea.gov.au)
DESCRIPTION	Abstract:	This product was developed to satisfy national estate assessment of 'extensive natural values' under the Eden CRA. The assessment is derived from the River Disturbance Index (RDI) database developed by the Wilderness and Wild Rivers Unit - Environment Australia. The RDI is a GIS database using modelling procedures to identify potential wild rivers. The RDI is a measure of river/stream quality across sub-catchment areas based on two indicators; Naturalness of Flow Regime Index (NFRI) and Sub-Catchment Naturalness Index (SCNI). The RDI database is constructed by establishing a grid across the primary database and calculating scores for sub-catchment condition (SCNI) and flow regime indicators (NFRI). The scores for SCNI are combined and adjusted for sub-catchment area to produce a Catchment Naturalness Index (CNI). The final RDI values are combined NFRI and CNI.

		<p>The primary database is made up of geographical data derived from a topographical map series and the National Wilderness Inventory primary database. The NWI sources provide settlement and infrastructure features, the extent of non-natural land cover and an index of biophysical naturalness. Topographical map series provides watercourse data, built-up areas, infrastructure, reservoirs and canals.</p> <p>The RDI rates sub-catchment areas on a scale from undisturbed (0) to disturbed (1). This scale was developed from expert advice contributed by a stakeholder working group. This dataset has been derived by selecting sub-catchment areas that are below 0.01. This figure was selected as it captures all highly undisturbed sub-catchments.</p>
	Keywords:	Wild Rivers, RDI, NWI, Disturbance, Catchment, Land Use, GIS
	Geographic extent:	Eden RFA Region
	Bounding coordinates:	Geographic Extent: Coordinates (approx.) 36°00"S 148°30"N; 38°00"S 150°30"N
	Bounding coordinates:	AMG (UTM55) xmin: 653874.75 ymin: 5836420.00 xmax: 776631.31 ymax: 5989865.50
	Type of feature:	Polygon
	Attribute/Field List:	RDI (Values) Scale: 0 - 1 (from undisturbed to disturbed).
	Attribute/Field Description:	Attributes classify sub-catchments from undisturbed (0.0) to disturbed (1). Verification of feature codes done at summary level (i.e. grades of impact) using expert knowledge.
	Scale/Resolution:	<p>All natural watercourses - 1:250,000</p> <p>Topographic map series - 1: 250,000</p> <p>NWI primary data:</p> <ul style="list-style-type: none"> Remoteness from settlement - 1:250,000 Remoteness from Access - 1:100,000 Apparent Naturalness - 1: 250,000 Biophysical Naturalness - 1: 25,000 <p>(Mapping in AMG55 projection (units meters))</p>
DATASET CURRENCY	Beginning date:	Unknown
	Ending date:	Current at September, 1997
DATASET STATUS	Progress:	Complete
	Maintenance and update frequency:	<p>None.</p> <p>The RDI (river disturbance index) is updated separately by the Wilderness and Wild Rivers Unit, Environment Australia.</p>
DATASET ENVIRONMENT	Name of System:	<p>Unix ArcInfo (Sparc, Sun workstation)</p> <p>Unix ArcView</p>
	Minimum Software Requirements:	

	Input Format/Type:	ArcInfo grid
	Output Format/Type:	ArcView shapefile
	Dataset Size:	ArcInfo size 462 kb ArcView size 399 kb
ACCESS	Stored Data Format:	ArcInfo grid and polygon cover ArcView shapefile.
	Available Format Type:	ArcInfo / ArcView / ascii / hardcopy map.
	Access constraints:	Unrestricted. Permission, Acknowledgment and Data Agreements are required.
DATA QUALITY	Lineage:	Eden region baseline data was collected from 1:250,000 scale National Topographic Map Series (digitised by the NWI team). Updated roads (NSW LIC) at 1:100,000; Operational roads (NSW State Forests) at 1:25,000; Eastern bushlands (NSW NPWS) from Landsat at 100m; Coups layer to 1996 (NSW State Forests) at 1:15,000. Data was the best available at 4 September 1997 but some datasets may have been sourced prior to this date.
	Positional accuracy:	1:250,000 (Mapping in AMG55 projection (units meters))
	Logical consistency:	Topological checks undertaken in ArcInfo. All source data checked prior to analysis.
	Completeness:	Complete for the Eden RFA region.
NOTES	Notes:	Separate metadata is available for National Wilderness Inventory database.
	References:	Wilderness and Wild Rivers Unit - Australian Heritage Commission.
	Metadata date:	15 - 10 - 1997
	Metadata sheet compiled by:	K Bossard and P Hodgson (NSW Section, EFT, EA)
	Further information:	Wilderness and Wild Rivers Group- Environment Australia