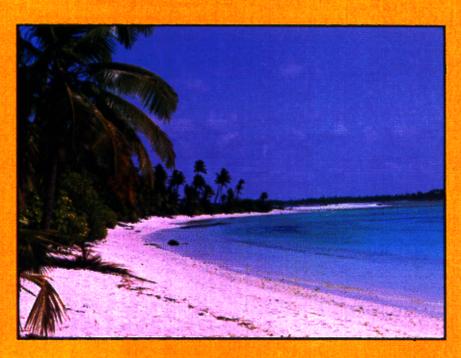# *Cocos (Keeling) Islands*

Geographic Information System Database
Accompanying Documentation

Cocos (Keeling) Islands

Geographic Information System Database
Accompanying Documentation

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BACKGROUND

The National Capital Planning Authority, between November 1991 and March 1992, assisted the Commonwealth Department of Arts, Sport, Environment, Tourism and Territories in preparing a draft plan for the Cocos (Keeling) Islands. As part of the planning study, a geographic information system (GIS) database was established in order to prepare base and thematic maps and to enable the production of high quality figures to illustrate the planning report and to present the plans for public consultation.

The database contains many layers of environmental and planning information and has a range of potential uses beyond the planning exercise. DASETT subsequently briefed the NCPA to carry out some additional work to adapt the database for its ongoing purposes and to make the database available through the Department's ERIN computer network.

The GIS database was created using the software package pc ARC/INFO and can be readily translated for use on other ARC/INFO hardware platforms and under other GIS software systems. The brief required the provision of files in ARC/INFO export format and in 20 metre grid format, both on floppy disk media.

It is currently proposed that data layers will be added to the database when these become available from the Australian Survey and Land Information Group (AUSLIG). In particular, this additional data will include cadastral information which can replace the temporary cadastral covers prepared for the planning study. Other data layers should complement those currently in the database.

This documentation explains the general features of and structure and content of the database, together with some notes to assist in its future use through ERIN.

GENERAL FEATURES OF THE DATABASE

The database consists of 48 covers, 11 of which are simple base covers used for building more complex thematic maps and for defining map extents when using ARCPLOT. A further 6 covers are used mainly as the foundations for adding details such as topography, cadastral boundaries, roads and utilities to thematic maps. The remaining covers comprise 14 covers providing 11 resource map layers and 17 covers providing four land use and planning layers.

So as to provide flexibility in the preparation of map compositions at different scales and showing different features, the land use and planning layers each consist of separate covers for each of the main islands or island groups (ie West Island, Home Island, South Island, the small islands between South and Home Islands, Direction/Horsburgh Islands and North Keeling). Not all islands are represented in each data layer. This was so particularly where there were no features to show on particular islands or an alternative cover from a different layer could be used in a map composition to complete the full atoll coverage. Most of the remaining coverages include all of the southern Cocos atoll.

North Keeling, because of its geographic isolation is always included as a separate cover and represented in map compositions as an inset rather than in its correct location. Only a few of the thematic layers have been compiled for North Keeling. There is little mapped information available for this island and no air photo or field mapping was undertaken during the planning study.

All of the covers are topologically structured and checked for correct polygon closure and labelling. However, in some instances not all polygons have attribute information, where this was found to be unnecessary.

The accuracy of the data are sufficient for planning purposes and are largely governed by the accuracy of existing map sources. Only limited field checking had been undertaken during a one week visit to the islands. Detailed mapping would need to be undertaken for management purposes particularly related to public utilities and services infrastructure, using detailed plans (in non-digital form) held by ACS in Perth.

STRUCTURE AND CONTENT OF THE DATABASE

The information is summarised in two parts in the accompanying attachments. The first is a tabular description of the ARC/INFO coverages which includes details on map extent and coverage features. The second is a description of the map layers by theme, which includes details on covers and feature included, where the information was obtained and its accuracy, attribute classifications and lists of associated lookup tables, key files and macro files for generating the map compositions for the report figures and presentation maps.

USE OF THE DATABASE

Use of the database in its basic form will require a working knowledge of ARC/INFO, particularly for complex queries, preparation of catographic output, updating and further development. Simple automated queries by non-skilled operators using ARC/INFO would require the development of a set of macros designed for user-friendly operation. However, this would require identification of the types of standard queries by users. The use of the new ESRI product ARCVIEW should enable easy use of the database for some queries, without the need for a detailed knowledge of ARC/INFO.

All coverages should function correctly without modification on ARC/INFO platforms once imported. However, there are a number of enhancements which could be made to make better use of the additional features and capabilities of the full ARC/INFO package.

It may be simpler for the user, if some of the covers were combined (by MAPJOIN) to create full atoll coverages for each theme, particularly for use on more powerful hardware platforms where display speed and storage space are less critical than is the case on a pc. This would achieve the same result without having to specify multiple coverages to create a map composition for the whole atoll.

Since the annotation for specific islands was sized to suit the map compositions required, there will be incompatibility in the sizing when covers are joined. This can be fixed easily by using the select and calculate commands in **ARCEDIT.**

Some macros (SML's) are included in the set of files. These have been developed specifically for producing plot files (these were developed to produce the figures in the planning report or the presentation maps). They are included to provide examples of map compositions. Several modification would be required to convert them to workable AML's, including changes to pc SML lines not recognised by ARC/INFO, changes to textfonts, textsets, shadesets, etc and commands for creating plot files. However, most ARCPLOT commands would not need to be changed.

The lookup tables and key files are specifically set up to use the 100 shades in the COLOR shadeset in pc ARC/INFO. They would need to be amended for other shadesets. A few lookup and key files have been included which were developed for use with the CMYK shadeset on the NRIC computer system. They apply only to the land use and planning map covers.

In some instances a parallel set of SML's, key files and coverage annotation levels have been prepared using the Cocos-Malay language. The annotation levels are normally on or two levels higher than the English version and the SML and Key files contain an M at the end of the file name to distinguish them.

Attached are some sample SML's and AML's used for creating map compositions for the planning scheme maps. The full set of SML's is included on the disks provided.

SUMMARY OF COVERS IN DATABASE

COVER NAME	EXTENT	FEATURES	FEATURE CLASS	ATTRIBUTES	ANNOTATION
ISLANDS	Southern atoll	Coastlines	Polygons	None	Island names Level 1 - English Level 2 - Malay
NORTHK	North Keeling	Coastline	Polygon	None	Island name (as above)
WEST	West Island	Coastline	Polygons	None	None
SOUTH	South Island	Coastline	Polygons	None	None
HOME	Home Island	Coastline	Polygons	None	None
NORTH	Horsburgh and Direction Isl.	Coastlines	Polygons	None	None
OTHER	Small islands south of Home Island	Coastlines	Polygons	None	None
REEF	Southern atoll	Reef edge	Polygons	None	Identifying label - level 1 - English - level 2 - Malay
NKREEF	North Keeling	Reef edge	Polygons	None	None
LAGOON	Southern atoll	Reef edge, coastlines and lagoon	Polygons	ZONE	None
NKLAGOON	North Keeling	Reef edge, coastline and lagoon	Polygons	ZONE	None
TOPO	Southern atoll	Coastlines, reef flat, lagoon, beaches, swamps	Polygons	FEAT (feature)	None
WESTCAD	West Island	Coastline, lot boundaries and numbers	Polygons	LOTNO (lot number) TENURE	Level 1 - Lot descriptions Level 2 - Lot numbers
HOMECAD	Home Island	As above	Polygons	LOTNO (lot number)	Level 1 - Lot numbers Level 2 - House/Lot numbers

COVER NAME	EXTENT	FEATURES	FEATURE CLASS	ATTRIBUTES	ANNOTATION
ROADS	Southern atoll	Sealed and unsealed roads, cycle path	Lines	TYPE	None
UTILS	Southern atoll	Public utilities and services infrastructure	Points and lines	TYPE LABEL	None
AIRPORT	West Island	Runway and parking area	Polygons	None	None
WATER	West, Home, South and Horsburgh	Known groundwater lenses	Polygons	None	None
EROSION	West Island	Erosion prone coastline Potential breach areas	Lines	CODE	None
VEG	Southern atoll	Coastlines, Native vegetation communities	Polygons	TYPE	None
VEG2	Southern atoll	Coastlines, Vegetation structure	Polygons	STRUC	None
HABITAT	Southern atoll	Migratory bird habitats	Polygons	TYPE	Species information and notes
MARINE	Southern atoll	Coastlines, Marine habitats	Polygons	TYPE CODE	Polygon codes
MARRES	Southern atoll	Coastlines, important marine areas	Polygons	TYPE	Identifying labels
MARRES2	Southern atoll	Coastlines, marine habitats (similar to MARRES)	Polygons	TYPE CODE	None
RECRES	Southern atoll	Coastlines, recreation facilities and water-based activities	Polygons	TYPE	Identifying labels
SITES	Southern atoll	Heritage sites	Points	TYPE	Identifying labels
NKSITES	North Keeling	Heritage site	Points	TYPE	Identifying label
SITES2	Home Island	Heritage sites	Polygons	TYPE	None
TOURIST	Southern atoll	Proposed tourist development areas	Polygons	None	Identifying labels

COVER NAME	EXTENT	FEATURES	FEATURE CLASS	ATTRIBUTES	ANNOTATION
RUBBISH	Southern atoll	Coastlines, rubbish problem areas	Polygons	DUMP	None
WESTUSE2	West Island	Coastline, cadastral boundaries existing land use	Polygons	USE (land use category)	Identifying labels
HOMEUSE2	Home Island	as above	Polygons	as above	as above
NORTHUSE	Horsburgh and Direction Islands	as above	Polygons	as above	as above
SOUTHUSE	South Island	as above	Polygons	as above	Legend symbols
OTHERUSE	Islands south of Home Island	as above	Polygons	as above	None
NKUSE	North Keeling	as above	Polygons	as above	None
WESTOPT	West Island	Coastline, planning options	Polygons	OPT (options category)	Level 1 - English notes Level 2 - English legend symbols Level 3 - Malay notes Level 4 - Malay legend symbols
HOMEOPT	Home Island	as above	Polygons	as above	Level 1 - English notes Level 2 - Malay notes
NORTHOPT	Horsburgh and Direction Islands	as above	Polygons	as above	Level 1 - English notes Level 2 - English legend symbols Level 3 - Malay notes Level 4 - Malay legend symbols
WESTPREF	West Island	Coastline, preferred planning options	Polygons	OPT (options category)	as above
HOMEPREF	Home Island	as above	Polygons	as above	Level 1 - English notes Level 2 - Malay notes
NORPREF	Horsburgh and Direction Islands	as above	Polygons	as above	Level 1 - English notes Level 2 - English legend symbols Level 3 - Malay notes Level 4 - Malay legend symbols

COVER NAME	EXTENT	FEATURES	FEATURE CLASS	ATTRIBUTES	ANNOTATION
WESTZONE	West Island	Coastline, statutory land use plan	Polygons	ZONE (zone and reserve categories)	as above
HOMEZONE	Home Island	as above	Polygons	as above	Level 1 - English legend symbols Level 2 - Malay legend symbols
NORZONE	Horsburgh and Direction Island	as above	Polygons	as above	as above
OTHZONE	Islands south of Home Island	as above	Polygons	as above	None
SOUZONE	South Island	as above	Polygons	as above	Level 1 - English legend symbols Level 2 - Malay legend symbols

DESCRIPTION OF RESOURCE AND LAND USE MAP LAYERS

TOPOGRAPHY

COVER: **TOPO**

FEATURES: Island coastlines, semi-saline swamps, beaches (sand or coral rubble below high water mark), edge of reef flat and lagoon with attributes to identify features

SOURCES AND ACCURACY: 1:10,000 cadastral maps for coastlines of all islands except South Island and North Keeling other features from 1:25,000 topo maps and air photos. Note - constant coastline changes mean that the current coastline may not be accurately represented in published maps. Some minor changes have been made to reflect the effects of recent lagoon filling on West and Home Island. The 1:10,000 cadastral maps show the coastline above HWM while the 1:25,000 topo maps show the coastline at LWM. Only the South Island coastline was digitized from the 1:25,000 maps.

ATTRIBUTES: FEAT (topographic features)

1	Reef flat and lagoon
2	Islands above HWM
3	Beach
4	Semi-saline swamp
5	Deep hole in lagoon

LOOKUP TABLE: TOPO.LUT (pc ARC/INFO - shadeset COLOR)

CADASTRAL

COVERS: **WESTCAD, HOMECAD**

FEATURES: Lot boundaries and lot numbers with attributes to identify lot numbers and land ownership

SOURCES AND ACCURACY: 1:10,000 cadastral maps of West and Home Islands supplemented by survey plans for individual lots and 1:1000 detail map of Home Island settlement. Note: Cadastral mapping is being undertaken by AUSLIG and will replace these temporary covers when available

ATTRIBUTES: LOTNO – as defined on cadastral plans

                      TENURE

1	Commonwealth Owned
2	Council land licenced to Commonwealth
3	Council Land

LOOKUP TABLE: CAD.LUT (pc ARC/INFO - shadeset COLOR)

KEY FILE: CAD.KEY

SML: WESTTEN.SML (creates plot file used in report)

ROADS

COVER: **ROADS**

FEATURES: Sealed and unsealed roads and cycle path with attributes to identify type

SOURCES AND   Detailed maps of settlement areas on West and Home Islands,
ACCURACY: 1: 10,000 cadastral map for Sydney Highway and 1:25,000 topo maps for other roads and tracks. Cyclepath was field mapped.

ATTRIBUTES: TYPE (road type) - line features

1	Sydney Highway
2	Other sealed roads
3	Other roads and tracks
4	Cycle path

LOOKUP TABLE: ROADS.LUT

UTILITIES AND SERVICES

COVER: **UTILS**

FEATURES: Line features - jettys, boat ramps, seawalls and breakwaters, sewer outfalls and fuel pipeline

Point features - power stations, radio masts, navigation beacons, bores, sand and gravel pits and associated services buildings

Both are identified in attribute tables by type code and text label.

SOURCES AND ACCURACY:	Detailed maps of settlement areas on West and Home Islands and 1:25,000 topo maps for other areas plus some air photo and field mapping

ATTRIBUTES: TYPE - Line features

1	Boat ramps and jettys
2	Breakwaters and seawalls
3	Pipelines

TYPE - Point features

1	Power supply facility
2	Communication facility
3	Navigation facility
4	Navigation buoy
5	Water supply facility
6	Services building
7	Fuel storage tanks
8	Sand or gravel pit

LABEL - text descriptions of both line and point features

LOOKUP TABLES: UTIL.LUT, UTIL2.LUT (pc ARC/INFO)

KEY FILES: UTIL.KEY, UTIL2.KEY

COVER: AIRPORT

FEATURES: Runway and aircraft parking area

SOURCES AND ACCURACY:	1:4000 survey map of West Island settlement area

ATTRIBUTES: None.

WATER RESOURCES

COVER: WATER

FEATURES: Extent of known groundwater lenses

SOURCES AND ACCURACY:	Boundaries as mapped by T. Falkland in reports to DASETT Note - many boundaries are based on predicted extent rather than precise location.

ATTRIBUTES:	None (Note - bores and wells are mapped as point features in the cover UTILS).
KEY FILE:	WATER.KEY
SML:	WATER.SML (creates plot file used in report)

EROSION

COVER:	**EROSION**
FEATURES:	Erosion prone coastline and potential breach areas on West Island (Note - no major erosion problems on other islands have been noted)
SOURCES AND ACCURACY:	Generalised areas based on advice from ANPWS Conservator (P. Stevenson) and field inspection of some locations
ATTRIBUTES:	CODE (Erosion category)

	1	Erosion prone coastline
	2	Potential breach zones

LOOKUP TABLE:	EROSION.LUT (pc ARC/INFO - shadeset COLOR)
KEY FILE:	EROSION.KEY
SML:	WESTDUMP.SML (creates plot file used in report, combined with cover RUBBISH, for West Island only)

VEGETATION

COVER:	**VEG**
FEATURES:	Remnant native vegetation and stands of *Pemphis* on sandbanks in lagoon
SOURCES AND ACCURACY:	1:25,000 maps by D. Williams showing *Pemphis* community on one map and 14 classes of remnant vegetation on another. Both maps were corrected for distortion when digitized by refererence to AUSLIG 1:25,000 topo maps. Note - North Keeling is assumed to have mainly native vegetation but information on types was not available during the planning study.
ATTRIBUTES:	TYPE (vegetation classification) - see D. Williams report for explanation of types A to N

0	Other vegetation
1	Pemphis
2	Remnant veg type A
3	Remnant veg type B
4	Remnant veg type C
5	Remnant veg type D
6	Remmant veg type E
7	Remnant veg type F
8	Remnant veg type G
9	Remnant veg type H
10	Remnant veg type 1
11	Remnant veg type J
12	Remnant veg type K
13	Remnant veg type L
14	Remnant veg type M
15	Remnant veg type N

LOOKUP TABLE: VEG.LUT (pc ARC/INFO - shadeset COLOR)

KEY FILE: VEG.KEY

SML: VEG.SMI (creates plot file used in report, which includes VEG2 cover)

COVER: VEG2

FEATURES:	Simplified vegetation structure including cleared areas which are predominantly grassed or built up, sparsely treed areas (mostly coconut palms), densely treed areas (coconut plantations) and semisaline swamp communities (mostly unvegetated mudflats with dense fringing shrub cover)
SOURCES AND ACCURACY:	Mostly generalised boundaries derived from interpretation of air photographs and field inspection (some areas have been cleared since the 1987 air photos and are not shown on previous maps hence boundaries are only approximate - based on brief field inspection). Note - a more detailed mapping of vegetation structure would be required for detailed planning and management purposes.
ATTRIBUTES:	STRUC (vegetation structure)

1	Cleared land
2	Sparse coconut trees & grass
3	Coconut plantations
4	Shrub cover
5	Settlement area
6	Swamp vegetation
7	Unvegetated beach

LOOKUP TABLE: VEG2.LUT (pc ARC/INFO - shadeset COLOR)

KEY FILE: VEG2.KEY

SML: VEG.SML (creates plot file used in report, which includes VEG cover)

BIRD HABITATS

COVER: **HABITAT**

FEATURES: Habitat areas used by migratory water birds together with some notes on species which are found in certain locations

SOURCES AND   Generalised boundaries based on the advice of ANPWS
ACCURACY: Conservator (P. Stevenson).

ATTRIBUTES: TYPE (habitat type)

               1   Migratory birds

SML: HABITAT.SML (creates a plot file)

MARINE HABITATS

COVER: **MARINE**

FEATURES: Marine habitat classification as mapped and classified by D. Williams with a generalised grouping into reef slope, reef flat and lagoon. Note - no marine habitats classificiation was available for North Keeling, however, the edge of the reef was digitized from the AUSLIG 1:5000 topographic map of North Keeling and is included in the cover NKREEF.

SOURCES AND   1:25,000 map by D. Williams, based on a classified SPOT
ACCURACY: satellite image. The map was corrected for distortion when digitized by refererence to AUSLIG 1:25,000 topo maps.

ATTRIBUTES: TYPE (generalised grouping of habitats)
               1   Islands
               2   Reef slope
               3   Reef flat
               4   Lagoon

               CODE (habitat classification)

               A   Outer reef
               B   Coral and algal flat
               C   Coral flat
               D   Aligned coral flat
               E   Seagrass flat
               F   Prograding sand sheet
               G   Intertidal sand & silt flat
               H   Seagrass sand & silt flat

I	Seagrass flat
J	Coral and algal flat
K	Blue hole mosaic 1
L	Blue hole mosaic 2
M	Blue hole mosaic 3
N	Algal covered staghorn
O	Massive coral outcrops
P	Emergent reef
Q	Sandy lagoon floor
R	Sand shoal
S	Sandy with seagrass
T	Seagrass bed
U	Seagrass bed - Syringodium
V	Mixed seagrass and algal bed
Y	Unidentified (code missing in original map)
Z	Islands

LOOKUP TABLE: MARTYPE.LUT (for TYPE) (pc ARC/INFO - shadeset COLOR)
MARINE.LUT (for CODE) (pc ARC/INFO – shadeset COLOR)

MARINE RESOURCES

COVER: **MARRES**

FEATURES: Important marine features including the navigation channels, 'The Rip', reef flat replenishment zone and fish nursery, which combine with the features in MARRES2 cover to produce the MARINE RESOURCES map used in the planning report

SOURCES AND   Generalised areas based on advice from ANPWS Conservator
ACCURACY: (P. Stevenson)

ATTRIBUTES: TYPE

0	Islands
1	The rip
2	Boat channel
3	Reef flat replenishment zone

LOOKUP TABLE: MARRES.LUT (pc ARC/INFO - shadeset COLOR)

SML: MARRES.SML (creates plot file for map used in report -
                        combined with cover MARRES2)

COVER: **MARRES2**

FEATURES: As for MARINE cover, however, the cover was modified to
                         overcome the polygon size limitation of pc ARC/INFO by
                         subdividing large polygons. This cover is not needed for use in
                         other ARC/INFO systems since the cover MARINE can be
                         used. For the purposes of preparing a simplified map for the
                         MARINE RESORCES map in the planning report, some
                         habitat codes were grouped as indicated in the attributes section
                         below.

SOURCES AND
ACCURACY: As for MARINE cover.

ATTRIBUTES: TYPE AND CODE as for MARINE cover with grouping of
                         codes as follows:

                         Seaward Reef Slope (A)
                         Coral and Algal Reef Flat (B, C, D, E)
                         Prograding Sand Sheet (F)
                         Intertidal Sand and Silt Flat (G)
                         Seagrass Flats (H,I,S,T,U, V)
                         Coral Flat and Patch Reefs (J,N,O,P)
                         Blue Holes (K,L,M)
                         Sandy Lagoon Floor (Q R)

LOOKUP TABLE: MARTYPE.LUT (for TYPE) (pc ARC/INFO - shadeset
                         COLOR)
                         MARRES2.LUT (for CODE) (pc ARC/INFO - shadeset
                         COLOR)

KEY FILE: MARRES2.KEY

SML: MARRES.SML (creates plot file for map used in report -
                         combined with cover MARRES)

RECREATION RESOURCES

COVER: **RECRES**

FEATURES: Major locations of recreation activities including picnic and swimming areas, sailing, surfing, diving, reef walking, sports facilities, and other recreation areas such as the golf course and recreation spaces around West Island settlement. Other open space areas are areas with no specific facilities which are available for informal recreation.

SOURCES AND ACCURACY: Generalised boundaries based on advice from ANPWS Conservator (P. Stevenson) and others and field observations

ATTRIBUTES: TYPE (recreation resource type)

    0   Open space
    1   Picnic and swimming areas
    2   Sports facilities
    3   Other recreation space
    4   Marine recreation

LOOKUP TABLE: RECRES.LUT (pc ARC/INFO - shadeset COLOR)

KEY FILE: RECRES.KEY

SML: RECRES.SML (creates plot file for map used in report)

HERITAGE SITES

COVERS: **SITES, SITES2, NKSITES**

FEATURES: Sites on the Register of the National Estate (polygons in SITES2 coverage) and other sites of heritage interest (points in SITES coverage) including cemeteries, ship wrecks, monuments and war relics. NKSITES cover includes the wreck of the 'EMDEN'.

SOURCES AND ACCURACY: Generalised locations based on advice of ANPWS Conservator (P. Stevenson) and field inspection of some sites.

ATTRIBUTES: TYPE (heritage site type) - point features in SITES and NKSITES covers

    1   Oceania House

2	Cemeterys
3	Memorials
4	Ship wrecks
5	Other sites (guns, cable stn etc)

Note - site names are identified in annotation

TYPE - polygon features in SITES2 cover

1	Sites on the RNE

LOOKUP TABLE: SITES.LUT (pc ARC/INFO)

KEY FILE: SITES2.KEY

SML: SITES.SML (creates plot file for map report, using combination of these covers)

TOURIST RESORT PROPOSALS

COVER: **TOURIST**

FEATURES: Areas in which tourist resorts have been proposed and studies have been carried out

SOURCES AND ACCURACY: Notional boundaries suggested by proponents but not surveyed in detail

ATTRIBUTES: None

SML: TOURIST.SML (creates plot file for map used in report)

RUBBISH PROBLEM AREAS

COVER: **RUBBISH**

FEATURES: Areas in which dumped rubbish is a problem, mostly on beaches and in the lagoon

SOURCES AND ACCURACY: Generalised areas based on advice from ANPWS Conservator (P. Stevenson), mostly field inspected but not accurately mapped

ATTRIBUTES: DUMP

1	Rubbish problem areas

KEY FILE: RUBBISH.KEY

SML'S:	RUBBISH.SMI, WESTDUMP.SW, HOMEDUMP.SML (createplot files for maps used in report)

COVERS: **WESTUSE2, HOMEUSE2, NORTHUSE, SOUTHUSE, OTHERUSE, NKUSE**

FEATURES: Areas classified according to their existing use in the planning study

SOURCES AND ACCURACY: Based on 1:10,000 cadastral map boundaries and detailed maps of settlement areas. Many boundaries were defined during the planning study.

ATTRIBUTES: USE (land use category)

1	Airport
2	Residential
3	Community facilities
4	Commercial
5	Admin. and utility services
6	Industrial and extractive
7	Tourism
8	Recreation facilities
9	Horticulture
10	Open space
11	Roads and carparks
12	Vacant urban land

LOOKUP TABLE: LANDUSE.LUT (pc ARC/INFO - shadeset COLOR)
USE5.LUT (ARC/INFO Rev. 6 - shadeset CMYK)

KEY FILES: LANDUSE.KEY, LANDUSE2.KEY, WESTUSE.KEY, HOMEUSE.KEY (pc ARC/INFO)
USE5.KEY (ARC/INFO Rev. 6)

SML'S: LANDUSE.SML, WESTUSE.SML, HOMEUSE.SML, (create plot files for maps used in report)

AML: LANDUSE5.AML

LAND USE PLANNING OPTIONS

COVERS: **WESTOPT, HOMEOPT, NORTHOPT**

FEATURES: Areas identified in planning study as having potential for particular future uses

SOURCES AND ACCURACY:	Based on existing land use covers - boundaries defined during the planning study
ATTRIBUTES:	OPT (planning options categories - an extension of the existing land use categories)

1	Airport
2	Housing
4	Commercial Development
6	Industrial Area
7	Tourism Development
11	Roads
12	No specific Use
13	Foreshore Protection
14	Rural/Nature Conservation
15	Commonwealth Sites
16	Existing Settlements

LOOKUP TABLE:	OPT.LUT (pc ARC/INFO - shadeset COLOR)
	OPT2.LUT (ARC/INFO Rev. 6 - shadeset CMYK)
KEY FILES:	OPTIONS.KEY, OPTIONS2.KEY, WESTOPT.KEY, HOMEOPT.KEY (pc ARC/INFO)
	OPTIONSM.KEY, OPTIONS2M.KEY, WESTOPTM.KEY, HOMEOPTM.KEY (pc ARC/INFO - Cocos-Malay version)
	OPT5.KEY (ARC/INFO Rev. 6)
	OPT5M.KEY (ARC/INFO Rev. 6 - Cocos-Malay version)
SML'S:	OPTIONS.SML, WESTOPT.SML, HOMEOPT.SML, OPTIONSM.SML, WESTOPM.SML, HOMEOPTMSML (create plot files for maps used in report - last letter 'M' of filename indicates Cocos-Malay version)
AML:	OPTIONS2.AML

DRAFT LAND USE PLAN

COVERS:	**WESTPREF, HOMEPREF, NORPREF**
FEATURES:	Areas identified in planning study as being part of the preferred short to medium term planning strategy and included in the Draft Land Use Plan
SOURCES AND ACCURACY:	Based on planning options covers - boundaries defined during the planning study
ATTRIBUTES:	OPT (planning options categories - an extension of the existing land use categories and the same as used in the planning options covers)

1	Airport
2	Housing
4	Commercial Development
6	Industrial Area
7	Tourism Development
11	Roads
12	No specific Use
13	Foreshore Protection
14	Rural/Nature Conservation
15	Commonwealth Sites
16	Existing Settlements

LOOKUP TABLE: OPT.LUT (pc ARC/INFO - shadeset COLOR)
OPT2.LUT (ARC/INFO Rev. 6 - shadeset CMYK)

KEY FILES: OPTIONS.KEY, OPTIONS2.KEY, WESTOPT.KEY,
HOMEPREF.KEY (pc ARC/INFO)
OPTIONSM.KEY, OPTION2M.KEY, WESTOTTM.KEY,
HOMEPREM.KEY (pc ARC/INFO - Cocos-Malay version)

OPT5.KEY (ARC/INFO Rev. 6)

SML'S: PREF.SML, WESTPREF.SML, HOMEPREF.SML,
PREM.SML, WESTPREM.SML, HOMEPREM.SML (create
plot files for maps used in report - last letter M of filename
indicates Cocos-Malay version)

AML: PREF2.AML

DRAFT PLANNING SCHEME

COVERS: **WESTZONE, HOMEZONE, NORZONE, SOUZONE, OTHZONE**

FEATURES: Areas identified in planning study as the statutory planning
scheme zone and reserved land areas

SOURCES AND
ACCURACY:
Based on planning options covers - boundaries defined during
the planning study

ATTRIBUTES: ZONE (planning scheme classification)

1	Nature Conservation
2	Foreshore Protection
3	Marine Protection
4	Common
5	Administrative Purposes
6	Housing

7	Community
8	Recreation
9	Commercial
10	Tourist
11	Industrial
12	Rural
13	Vacant
14	Roads

LOOKUP TABLE: ZONE.LUT (pc ARC/INFO - shadeset COLOR)
                  ZONE2.LUT (ARC/INFO Rev. 6 - shadeset CMYK)

KEY FILES: ZONE.KEY, RESERVE.KEY, WESTZONE.KEY,
                  WESTRES.KEY, HOMEZONE.KEY, HOMERES.KEY (pc
                  ARC/INFO)
                  ZONEM.KEY, RESERVEM.KEY, WESTZM.KEY,
                  WESTRESM.KEY, HOMEZM.KEY, HOMERESM.KEY (pc
                  ARC/INFO - Cocos-Malay version)
                  ZONE3.KEY, RESERVE3.KEY (ARC/INFO, Rev. 6)
                  ZONE3M.KEY, RES3M.KEY (ARC/INFO, Rev. 6 -
                  Cocos-Malay version)

SML'S: ZONE.SML, WESTZONE.SML, WIINSET.SML,
                  HOMEZONE.SML, ZONEM.SML, WESTZM.SML,
                  WIINSETM.SML, HOMEZM.SMI, (create plot files used for
                  maps in report - last letter M of filename indicates
                  Cocos-Malay version)

AML: ZONE2.AML

SAMPLE SML'S AND AML'S

ZONE.SML - USED TO CREATE A PLOT FILE USING PC ARC/INFO FOR OUTPUT TO EITHER A HP 8 PEN PLOTTER OR A TEKTRONIX COLOUR PRINTER FOR THE PLANNING SCHEME MAP OF COCOS ISLANDS

(Note - the colour printer produces best fit on an A4 page rather than drawing to scale dimensions are set for an A1 page for plotter output)

```
&rem Produces a plot of Cocos islands (all)

&label start
&type
&type "Producing a colour plot of Cocos Islands"
&type
&ask 1 "Type <RETURN> to continue"
&type
&type "Enter cover required:"
&type
&ask 1 "> [ISLANDS] " ISLANDS
&type

&label dudname

&type
&type "Plot file will be named ZONEx.PLT"
&ask 6 "Enter file name [ZONE]: "ZONE
&sv 6 %6.PLT
&goto okname &if &nf %6
dialogclear
&type "%6 already exists..."
&goto dudname

&label okname

dialogclear
&type
&query 5 "Continue " &Y
&goto end &if &eq %5 N
dialogclear

&label makemap
```

```
map %6
mapext %1
mapunits meters
pageunits inches
pagesize 22 32
mapscale 25000
mappos cen cen

textfont 1
textcolor 1
textquality proportional
shadeset color

maplimits 0 0 22 26
polygonshades lagoon zone zone.lut
polygonshades westzone zone zone.lut
polygonshades souzone zone zone.lut
polygonshades homezone zone zone.lut
polygonshades othzone zone zone.lut
polygonshades norzone zone zone.lut

arclines reef 4
arclines westzone
arclines west 4
arclines home 4
arclines roads 2
arclines south 4
arclines north 4

annotext islands
annotext reef
annotext westzone 2
annotext homezone
annotext southuse
annotext norzone

maplimits 126.5 7 31
mapext nkuse
polygonshades nklagoon zone zone.lut
polygonshades nkuse use landuse.lut
arclines northk 4
arclines nkreef 4
annotext northk
annotext nkuse

maplimits page
```

```
textsize .6
move 9 31
text 'DRAFT SCHEME MAP,
textsize .25
move .5 1
text 'See Figures 19 and 20'
move .5 .5
text 'for details of West, Direction and Home Islands'


keybox .5 .5
keyseparation .75 .25

move 9 30
text 'RESERVED LAND'
keyposition 9 29.5
keyshade reserve.key
move 9.75 29.25
text 'NC'
move 9.75 27
text 'C'

move 17 30
text 'ZONES'
keyposition 17 29.5
keyshade zone.key
move 17.75 26.25
text 'T'

linesym 13
box 0 0 22 32
box 126.5 7 31

map end

&label end
```

ZONEM.SML - SIMILAR TO ZONE.SML, BUT USED TO CREATE A PLOT FILE OF THE PLANNING SCHEME IN THE COCOS-MALAY LANGUAGE

```
&rem Produces a plot of Cocos islands (all)

&label start
&type
&type "Producing a colour plot of Cocos Islands

&type
&ask 1 "Type <RETURN> to continue"
&type
&type "Enter cover required:"
&type
&ask 1 "> [ISLANDS] " ISLANDS
&type

&label dudname,

&type
&type "Plot file will be named ZONEx.PLT"
&ask 6 "Enter file name [ZONE]: "ZONE

&sv 6 %6.PLT
&goto okname &if &nf %6
dialogclear
&type "%6 already exists..."
&goto dudname

&label okname

dialogclear
&type
&query 5 "Continue " &Y
&goto end &if &eq %5 N
dialogclear

&label makemap

map %6
mapext %1
mapunits meters
pageunits inches
pagesize 22 32
mapscale 25000
mappos cen cen
```

```
textfont 1
textcolor 1
textquality proportional
shadeset color

maplimits 0 0 22 26
polygonshades lagoon2 zone zone.lut
polygonshades westzone zone zone.lut
polygonshades souzone zone zone.lut
polygonshades homezone zone zone.lut
polygonshades othzone zone zone.lut
polygonshades norzone zone zone.lut

arclines lagoon 4
arclines westzone 1
arclines west 4
arclines home 4
arclines roads 2
arclines south 4
arclines north 4

annotext islands 2
annotext lagoon 2
annotext westzone 4
annotext homezone 2
annotext southuse 2
annotext norzone 3 4

maplimits 126.5 7 31
mapext nkuse
polygonshades nklagoon zone zone.lut
polygonshades nkuse use landuse.lut
arclines northk 4
arclines nkreef 4

annotext northk 2
annotext nkuse 2

maplimits page,

textsize .6
move 9 31
text 'CONTOH KAR SKEMA'
textsize .25
move .5 1
text 'Lihat gambar 19 dan 20'
move .5 .5
text 'di mana ada keterangan pasal Pulu Tikus, Pulu Panjang dan Home Island.'
```

```
keybox .5 .5
keyseparation .75 .25

move 9 30
text 'TANAH LINDUNGAN'
keyposition 9 29.5
keyshade reservem.key
move 9.75 29.25
text 'PA'
move 9.75 27
text TU

move 17 30
text 'VATASAN-WATASAN'
keyposition 17 29.5
keyshade zonem.key
move 17.75 26.25
text 'P'




linesym 13
box 0 0 22 32
box 126.5 7 31

map end

&label end
```

ZONE2.AML - USED TO CREATE A PLOT FILE USING ARC/INFO REV. 6 AND A CALCOMP ELECTROSTATIC PLOTTER TO PRODUCE AN AO PRESENTATION MAP OF THE PLANNING SCHEME

```
ap
disp 1040
zone2.gra

mapext islands
mapunits meters
pageunits inches
pagesize 32 46
mapscale 18000
mappos cen cen

textfont 92534
textcolor 1
textquality proportional
shadeset cmyk
textset /esrimods/symbols/ncarto.txt

maplimits 0 0 32 36

polygonshades lagoon zone zone2.lut
polygonshades westzone zone zone2.lut
polygonshades souzone zone zone2.lut
polygonshades homezone zone zone2.lut
polygonshades othzone zone zone2.lut
polygonshades norzone zone zone2.lut

arclines reef 4
arclines westzone 1
arclines homezone 1
arclines norzone 1
arclines islands 4
arclines roads 2
arclines utils 3
arclines airport 3

annotext islands
annotext reef
annotext westzone 12
annotext homezone 1
annotext souzone 1
annotext norzone 1

maplimits 2 37 10 43
mapext tics nkuse
```