

KEMPSEY SHIRE COUNCIL



CONSULTANT BRIEF

KOROGORO CREEK

DATA COMPILATION & ESTUARY PROCESS STUDY

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KOROGORO CREEK MANAGEMENT PLAN

CONSULTANT BRIEF

1.0 INTRODUCTION

1.1 General

This brief is to seek consultant services to undertake initial assessments that will provide the basis for development of a management plan for Korogoro Creek. These assessments will include;

- Data Compilation, Mapping & Evaluation
- Community Consultation & Issue Scoping and refinement
- Processes Study

1.2 Location

The entrance to Korogoro Creek is located at the coastal village of Hat Head within the Kempsey LGA on the mid-north coast of NSW (Figure 1).

Hat Head has a permanent population of 354 (Population Profile 2005) and is about 32km north-east of Kempsey located on the coast midway between Crescent Head and South West Rocks.

Hat Head residents have a strong community spirit and actively seek action to maintain the health of their environment.

Hat Head and its environs is a popular tourist and surfing location that experiences a major influx of visitors during school holiday periods. This influx often doubles or triples its population which exerts huge pressure on local resources.

Tourism is a major industry within the Kempsey LGA with 415,000 visitors spending an estimated \$90 million per year (Kempsey Tourist Information Centre)

The main attractions in this area include the picturesque coastal setting of Hat Head village and Hat Head National Park.

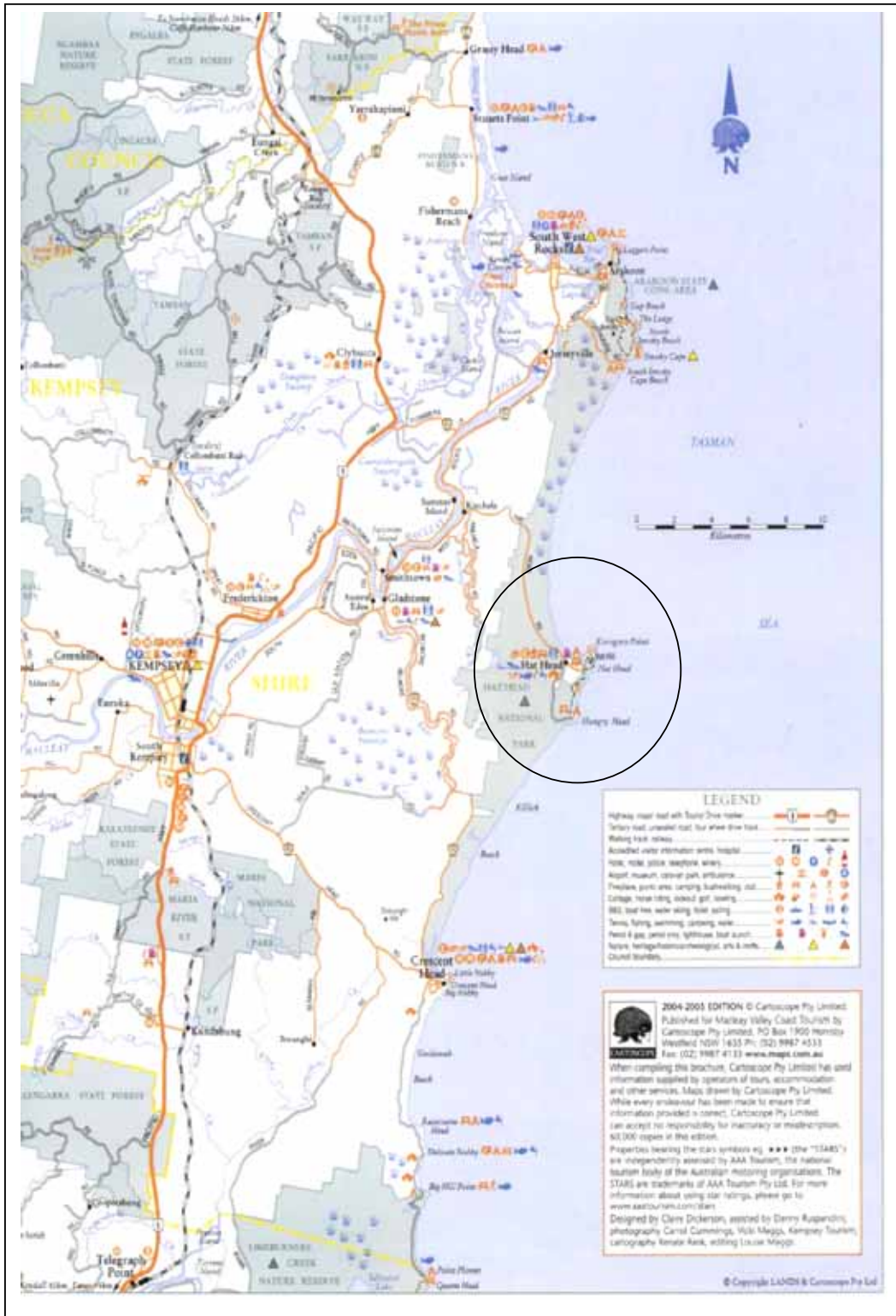


Figure 1. Korogoro Creek location map. (Source MVC)

1.3 Background

Prior to the arrival of Europeans the area had been inhabited by the Ngamba-ngagu Aborigines. Their peaceful existence was briefly disturbed in 1817 when John Oxley passed through the area but he found the river swampy and inaccessible and did nothing to encourage settlement.

Sandmining was a significant activity in Hat Head National Park for the extraction of rutile, zircon, monazite and ilmenite for up to fifty years. All mining operations had ceased in Hat Head by the late 1970's. (NPWS 1997).

Korogoro Creek is a small coastal estuary that has been physically modified by the construction of flood mitigation infrastructure and levees. A paper produced for the Flood Mitigation Seminar held in Kempsey December 1976 indicated by 1969 \$324,500.00 was spent on the Korogoro Creek Scheme.

The area has been at the vanguard of coastal protection. As early as 1987 Hat Head was chosen for a pilot dune care scheme. The following year the Hat Head Community Dune Care Group – the first of its kind in Australia – was formed.

Fish kills, red weed problems, water quality, siltation and potential dune erosion are just some of the recurring issues reported for Killick Creek.

The small coastal village of Hat Head has a relatively high proportion of older persons, 40% over 55 years old. Significantly 48.4% of private dwelling are unoccupied, indicating seasonal population fluctuations.

Hat Head National Park adjoins Korogoro Creek and covers an area of 6445 hectares with camping facilities at Smokey Cape and Hungary Head.

The Hat Head Tourism Park is located on the eastern bank of Korogoro Creek. A Draft Management Plan for the Tourism Park is currently being developed.

1.4 Description of Korogoro Creek

1.4.1 Catchment

- a) The natural catchment area of Korogoro Creek is approx 16 km². With a waterway area ~0.2 km² (see Fig 2).
- b) Korogoro Creek is small sized estuary with no significant tributaries.
- c) The entrance is untrained but always open due to good protection from the south (MHL 2005)
- d) Hydrologically the Swanpool Wetlands and a series of coastal aquifers connects to Korogoro Creek via a constructed flood mitigation drain and natural drainage patterns
- e) There are a number of SEPP 14 Coastal Wetlands mapped in the Korogoro Creek catchment (see Land Use & Tenure)

- f) Major flood mitigation infrastructure is located 4.3 and 5.3 kms up stream from the entrance.

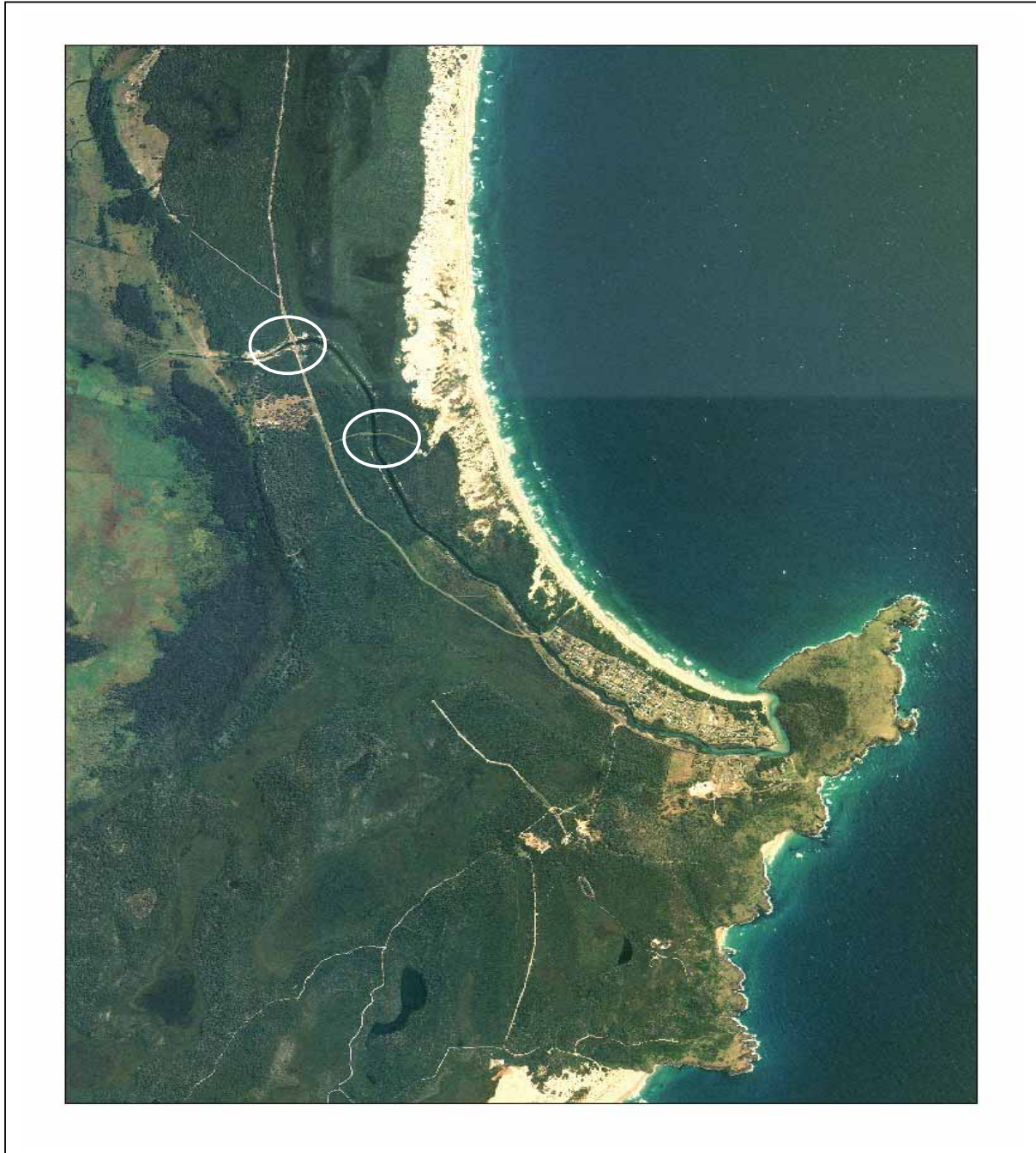


Figure 2. Korogoro Creek catchment area and location of flood mitigation infrastructure.

1.4.2 Entrance

The entrance is untrained but always open, although sand shoaling is evident due to good protection from the south.

1956 aerial photograph show Korogoro Creek with a narrow channel opened to the sea.



Figure 3. 1956 aerial photograph of Korogoro Creek and Hat Head village.

Korogoro Creek was chosen to provide a natural outlet to the sea. The Macleay River Flood Mitigation – Korogoro Creek Model Investigation (S.J.G Day Feb 1967) Report No. 119 details the objectives of using Korogoro Creek as a component of flood mitigation.

1.4.3 Land uses & Tenure

- a) The town of Hat Head is located at the entrance with its urban residential areas largely in the eastern and western sides of Korogoro Creek.
- b) Hat Head National Park encompasses the coastal catchment to the south and west.
- c) Swanpool Wetland in the north-west and large tracks of land surrounding Korogoro Creek is largely National Park estate. Cattle grazing is the dominant land use in the upper sections of the catchment.
- d) All land in the vicinity of the entrance to Korogoro Creek below mean high water is Crown Land. The adjacent foreshore is Crown Reserved Land for Public Recreation & Resting Place. Trusteeship of Reserve No R52803 is vested in Kempsey Shire Council.
- e) SEPP 14 Coastal Wetlands (see Fig 4)



Figure 4. SEPP 14 locations in Korogoro Creek catchment.

- f) LEP Land use zoning:

- 8 (a) National Park – large areas to the south-east, south and west of Korogoro Creek
- 6 (a) Open Space – located along the creek banks below the traffic bridge
- 7(f1) Coastal land protection – beach and dune areas
- 1(d) Rural Investigation (D) – to the south
- 29 (v) Village – located on both sides of the creek down stream of the traffic bridge

1.4.4 Water Quality

The urban areas are sewered via the Treatment plant located near the south of the creek. Effluent disposal is via dune sand exfiltration on the eastern side of the creek, north-west of the village. Water Resource Laboratory has undertaken groundwater monitoring of the area.

Stormwater discharge from urban areas of Hat Head largely discharge into the Korogoro Creek system.

Acidic and blackwater discharge from the Swanpool and coastal aquifers areas.

2.0 ESTUARY PLANNING PROCESS

2.1 Coastal & Estuary Management Committee

Kempsey Shire Council has an active Coastal & Estuary Management Committee with membership recently reviewed to ensure all key stakeholders are included. Their role is to facilitate the development of management plans for the estuaries and coastal resources of the Kempsey Local Government Area, largely through funding derived from the State Estuary and Coastal Programs and Council.

2.2 Korogoro Creek Working Group

A small working group of stakeholders from Hat Head area assists in identifying local issues and providing local knowledge. This working group reports back to the main Coastal & Estuary Management Committee.

2.3 Estuary Management Policy

To encourage the integrated, balanced responsible and ecologically sustainable use of the States estuaries. (NSW Government 1992)

2.4 Planning Process

The estuary management planning process traditionally involves an eight stage process as follows:

1. Form an Estuary Committee
2. Assemble existing information
3. Carry out an estuary processes study
4. Carry out estuary management study

5. Draft estuary management plan
6. Review estuary management plan
7. Adopt and implement estuary management plan
8. Monitor and Review management process

This brief is for steps 2 to 3 of the process.

3.0 STUDY AREA (See Fig2).

3.1 Data compilation / Process Study Study Area

The study area comprises the catchment of Korogoro Creek, which includes the upper Swanpool wetland area to the north as well as the coastal dune system.

3.2 Community Consultation

The study comprises the communities of hat Head and the various landholder groups from the Swanpool area as well as all relevant stakeholder groups that have a vested interest in the management of Korogoro Creek.

4.0 PROJECT OVERVIEW

- a) Establish what **information** is available, its quality and identify any **data gaps** given the issues of concern
- b) Develop **conceptual models** of how this coastal creek/lagoon functions from literature / studies available on comparable systems
- c) Define the **critical processes** associated with **issues** raised through committee meetings, working group meetings, community consultation and the data compilation study
- d) Develop an understanding of the **dynamics** of the creek ecosystem and its response to urban development, rural landuse practice, flood mitigation and drainage management practices, and entrance manipulation
- e) Assess the **health** of Korogoro Creek
- f) Develop a **communication strategy** to increase communities awareness and understanding of these small coastal systems values and natural processes
- g) Develop list of **management objectives and options** to be considered in the next phase

5.0 ISSUES

See Appendices 1 for community comments of issues discussed at the March 7 2006 community meeting held at the Hat Head Surf Club.

5.1 Water Quality

5.1.1 Salinity

- a) Water quality from Swanpool and dune aquifers and its impact on Korogoro Ck
- b) Saltwater issues resulting from ingress of saline water into freshwater wetlands
- c) Killing off vegetation in freshwater swamp

5.1.2 Stormwater

- a) Stormwater pollution and its impacts on the health and recreational use of Korogoro Creek as well as the local tourism industry at Hat Head and environs
- b) Faecal coliform and contaminants (pesticides, insecticide and chemical residues)
- c) Bowling green runoff and stormwater outlets

5.1.3 Recreational Use

Ensure water quality is fit for swimming and recreational use by future generations

5.1.4 Acid Sulfate Soils

- a) Acid sulfate soils have been mapped in the upper catchment – Swanpool area

5.2 Entrance Management

- a) Entrance shoaling
- b) Creek entrance management
- c) Boating access

5.3 Ecology

- a) Korogoro Creek natural functioning
- b) What's the extent of change to flora and fauna?
- c) Maintenance of natural creek functions how possible with flood & drain mitigation
- d) Wetland management - How to keep freshwater wetlands wetter
- e) Fish stock depletion
- f) Red weed access into Korogoro Creek during NE winds in summer time and king tides

5.4 Sediments

- a) Concern over black ooze in bottom sediments & its effects on flora and fauna, seeming lack of fish stock

- b) Siltation of upper & lower reaches of Korogoro Creek, no longer a lagoon, now heavily shoaled
- c) Composition of siltation within drainage channel (black ooze)

5.5 Flood Mitigation

5.5.1 Floodgate management

- a) Has flood mitigation become swamp drainage
- b) Explore ways of mimicking natural system functions
- c) Flood function versus drainage function
- d) Clarification of hydrologic effects
- e) Manage to maximise benefit for landholders and environment
- f) Prevent scalding of pasture from saline incursion
- g) Retain freshwater on wetland areas

5.5.2 Drain Management

- a) Has does the management of the drain effect Korogoro Creek

5.5.3 Choke/throttle Management

- a) Has does the management of the Choke/throttle effect Korogoro Creek

5.5.4 Korogoro Creek foreshore

- a) See comments (Appendices 1)

6.0 SCOPE OF WORKS

6.1 DATA COMPILATION STUDY

The consultant is to undertake an extensive literature review of published journals and reports on coastal estuaries with the view of developing **conceptual models** that describe how this system functions. The consultant is to identify and assemble all data and reports on Korogoro Creek and its catchment.

The consultant is to undertake those tasks necessary to;

- Provide a list of documents to be added to Councils **electronic register** of projects, reports and information pertinent to the estuary and its floodplain,
- Review and analyse existing reports and plans in order to describe the **historical context** and to **identify problem areas**
- Define data gaps and data quality
- Prepare a Report on the Data Compilation Process
- Create a **comprehensive base map** of essential biological, physical and geomorphological features of the estuary and its floodplain.

Assess and evaluate the adequacy and reliability of the reports and their data given the issues of concern, and critical processes that drive these issues.

Interpret existing information to provide an understanding of the ecological

processes that operate within Korogoro Creek given the added interactions with the Swanpool and coastal dune aquifers.

Specific attention given to;

- a) Storm loadings and the main trophic inputs & pathways in the creek system
- b) Flood mitigation scheme management implications
- c) Identification of any rare or endangered species or communities, or areas of conservation &/or cultural significance that may require special management attention
- d) Identify the role of groundwater to Korogoro Creek function
- e) Identify sensitivity of the dunal & fringing vegetation and benthic flora communities to changed water levels and quality
- f) Locations within the study area that have specific, important ecological functions should be identified and described
- g) Data and information gaps be highlighted and ranked in terms of importance for lagoon management. A suitable data collection program to fill gaps be designed and costed.
- h) Influence on water quality by the coastal dune aquifers.
- i) Historical context (geographic and cultural)
- j) The interconnection between Korogoro Creek and broader floodplain (ie Belmore/Kinchela/Swanpool)

6.1.1 Mapping Database

The consultant shall;

- Refer to existing **ortho rectified airphoto base map** with cadastre for the Korogoro Creek catchment mapping unit. (digital mapped unit of stressed rivers) using latest air photography 1: 25,000 (available mid January 2004).
- This base map to be scanned at a resolution that enables use down to individual property areas of not less than 1 ha. Base map to be useful for all levels of planning, development, management and assessments.
- All pertinent mapped physical attributes, infrastructure, services and planning layers be collated for incorporation into Council's GIS system. (It is envisaged at a later stage, this will be repackaged to permit ready access for Council, State agencies and community.)

Mapping of important physical attributes

- Mapping must be sufficiently detailed to allow all features to be readily identified eg individual areas of features such as intertidal mud and sand flats, seagrass, saltmarsh, bank protection works, boat ramp access will be included.
- Desktop assessment, collation and review of existing datasets held by various State & Federal Agencies, Council and Academic Institutions.
- Field verification of mapped attributes by boat and on foot
- Physical attributes will include;

- **Flora** – identify, map and describe the extent of habitat types, namely Mangrove, Saltmarsh, Macrophytes, Seagrass, Wetlands, riparian vegetation, remnant floodplain forest with statement of current condition
- **Fauna** - identify map and describe the various habitat types of the major estuarine and riparian faunal communities including migratory birds
- **Geology** - soil landscapes as well as rocky reefs, rock bar, sand shoals, sediment bars, intertidal sand and mudflats, flood channels, near-shore bathymetry of continental shelf at river entrance
- **Structures** - floodgates, levees, drains, flood mitigation structures, culverts, stormwater inflows, sewer overflows, boat ramps, jetties, moorings, pontoons, training walls, bank protection works
- **Dredging** - map areas that have been historically dredged including date of dredging, quantity removed and spoil dump sites
- **Geomorphic Assessment & Mapping** of river channel, bank, bed characteristics - Provide statistical analysis for each mapped unit of the relative extent, representation (% of total locally and regionally), type, condition and significance of key attributes eg backswamp wetlands,

6.1.2 Suggested Reference Sources would include at least:

- a) Kempsey Shire Council **Ron Kemsley**
 - b) Aboriginal Land Council **Andrew Hoholt**
 - c) Department of Natural Resources(Kempsey, Grafton GIS Ray Whitty, Newcastle Coast & Flood Specialist Branch, CNR Coastal Ecology Group – **Estuaries Branch, Sydney Martin Fitzhenry.**
 - d) Environment Protection Authority **Alex Purvis** Grafton
 - e) Waterways Authority **Rod McDonagh** SWR
 - f) NSW Fisheries Ballina **Marcus Riches**
 - g) NSW Agriculture **Rick Whitehead** Alstonville
 - h) National Parks and Wildlife Service **Colin Campbell** Port Macquarie
 - i) Roads and Traffic Authority – **Peter King**
 - j) State Emergency Service – **May Gill**
 - k) Community Interest Groups (MASSLAG) **Ivan Sillitoe**
 - l) Southern Cross University Lismore **Dr Brad Eyre**
 - m) University of New England Armidale **Andrew Boulton, Bob Pressey**
 - n) Macquarie University
 - o) Commonwealth Environment Protection Authority – **Brett Nudd**
 - p) Coastal CRC Brisbane
 - q) Local historical services
 - r) Local newspapers
 - s) North Coast Environment Council
- t) References

Note: The consultant will be liable for all search and copying fees.

6.1.3 Data Compilation Report

The report outputs will include the following;

- a) Information to be included on Councils Electronic Macleay Information Register
- b) Description of the historical context and overview of problems that require assessment and management
- c) Comprehensive Base Map of Physical Attributes
- d) A report on specific information/data accuracy/gaps with direct relevance to the described issues
- e) Description of Conceptual Models that detail how the system works
- f) Summary Conclusion and Recommendation
- g) Summary of selected references

6.2 COMMUNITY CONSULTATION

6.2.1 Inspection

Inspect the study area in the company of the working group & /or Coastal & Estuary Management Committee to gain an appreciation of the scope of the estuary and the issues of relevance to the community, Council and State Government agencies.

6.2.2 Public Meeting

6.2.2.1 Working Group

Facilitate a meeting with the Korogoro Creek working Group to establish and confirm all relevant issues associated with the management and function of Korogoro Creek.

6.2.2.1

General Community

Facilitation of a public meeting about Korogoro Creek at a central venue, consisting of invited guests and open invitation to community to:

- a) Raise **awareness** about the natural functions of small coastal lagoons, the estuary planning process and role of community input
- b) **Clarify** issues identified by the working group and data compilation
- c) Identify the **significance** of Korogoro Creek to community
- d) Identify the **essential features** and what makes these important
- e) Establish the **value** of the Korogoro Creek
- f) Document community views about what the management plan should aim to achieve
- g) Record any anecdotal information and request data.

6.3 PROCESS STUDY

On the basis of the priority issues derived from the data compilation study, community consultation, Coastal & Estuary Management Committee and Working Group undertake those studies necessary to understand the critical processes of the Korogoro Creek ecology to enable development of management options.

The consultant is to report on the following processes:

6.3.1 Catchment Processes

- a) Estimate storm loadings to Korogoro Creek from the diffuse and point source sources (urban area stormwater outlets).

6.3.2 Hydrodynamic

- a) Qualitatively describe the relationship between the Korogoro Creek Estuary and its floodplain wetlands and how this relationship has changed since European settlement. In particular, describe the water balance for the estuary and interactions between the floodplain wetlands and freshwater inflows.
- b) Describe alterations to the ecology and physical processes that any man-made structures have initiated.
- c) Discuss how the marine processes interact with the entrance and lower estuary.
- d) Describe the water balance for this estuary and interactions between the floodplain wetlands and freshwater inflows
- e) Describe the salinity regime during wet and dry periods.
- f) Identify and assess the mixing processes operating throughout the various zones within the estuary highlighting those areas of greatest sensitivity to poor water quality.
- g) Describe the tidal influence on the estuary and its prominent floodplain wetlands

6.3.3 Water Quality

- a) Estimate the contribution of poor quality water to Korogoro Ck from the Swanpool and coastal aquifer systems
- b) Discuss poor water quality implications to biota of Korogoro Ck
- c) Describe pathways and processes for pathogenic organisms
- d) Assess water quality of Korogoro Creek with ANZECC guidelines and the interim water quality and river flow environmental objectives (NSW Gov 1999)
- e) Construct nutrient budgets for the estuary.

6.3.3 Ecological Processes

- a) Map current extent and composition of aquatic and fringing terrestrial communities (benthic flora, sedgeland, mangroves, wetlands and foreshore riparian vegetation)
- b) Measure sediment biogeochemical processes including benthic production and respiration, nutrient fluxes and denitrification in key benthic habitats.

- c) Establish an understanding of the key biogeochemical processes that control and maintain the ecological health of the Korogoro Creek Estuary. In particular the factors controlling algal blooms and the growth of aquatic weeds, and the impact of elevated concentrations of any contaminants.
- d) Describe the fauna of the creek /lagoon (fish, invertebrates, birds)
- e) Assess the ecological health of Korogoro Ck
- f) Identification of any rare or endangered species or communities, and areas of conservation significance that may require special management attention
- g) Identify critical times of year for different biota life cycle functions (nesting, breeding etc)
- h) Provide information on how entrance management procedures may affect fish recruitment to the estuary

6.3.5 Entrance Behaviour

- a) Provide an historical overview of entrance characteristics
- b) Describe factors determining the location, shape and longevity of openings and the hydrologic and wave climate factors controlling closure. Discuss how the dynamics have changed since the flood mitigation.
- c) Describe processes causing shoaling of entrance to improving understanding of natural processes and determine whether intervention is warranted.

6.3.6 Sediments

- a) Estimate the denitrifying efficiency of bed sediments to allow an estimate of the trophic condition of this system
- b) Discuss the role of black ooze within the drains and Korogoro Ck

6.3.7 Process Study Report

The Process Study Report will cover those elements in the brief including detailed assessments and descriptions of;

- a) the ecological health of the Korogoro Creek Estuary and its floodplain
- b) interactions between the processes and the extent to which human activities have modified or disrupted the processes
- c) how this estuary, its coastal floodplain and marine processes function
- d) the critical processes and scenarios to be considered for the issues raised

with specific focus on;

- **Hydrology and Hydrodynamics**
- **Sedimentation**
- **Biogeochemistry and Ecology**

7.0 REPORTING

Prepare 3 reports that address those matters listed above via;

- 1) **Data Compilation report**
- 2) **Community Consultation**
- 3) **Process Study & Mapping Report**

8.0 SUBMISSION OF PROPOSAL

The Consultant's proposal for the Korogoro Creek Data Compilation and Processes Study is to detail activities proposed to undertake the work. The proposal is to be presented in the three stages shown in Table 1

Table 1 Stages of Work required

Stage	Work required	Time (wk's)
1	Data Compilation Study	Approx 8 -12
2	Community Consultation Study	X
3	Process Study	Approx 12 -36

Note: Consultants Submissions to forwarded to Kempsey Shire Council no later than 4:00pm Friday May 5 2006.

9.0 DATA AND REFERENCE DOCUMENTS

The Consultant will be responsible for collecting adequate information for review to fulfil the requirements of the brief. There will be no charge to the Consultant for access to reports and files held by DNR offices or Kempsey Shire Council.

10.0 REPORTING AND TIMETABLE

Progress Reporting

The Consultant is to provide regular and comprehensive progress reports. The Consultant must notify Council of any significant issues or outcomes arising during the process study development.

Final report

Following consideration of community comments and review by the Committee of proposed amendments, and written Council approval, the Consultant shall

- print forty (40) copies (with colour exhibits) of the final Korogoro Creek Processes Study to allow for distribution to Council, libraries, key stakeholder groups and State Agencies

- 10 CD Rom copies of the final reports in pdf format

In addition the Consultant shall supply to Council and DNR an unbound printing quality master copy (including artwork) of the Estuary Management Plan plus a copy in the following electronic form:

- textual data (report) - Word 6.0 for Windows or later version
- format suitable for web listing eg pdf file format
- graphical data - Mapinfo.TAB format or Autocad.DXF format, Mapinfo version 4.6 Autocad Version 14
- Tabular data - Excel 6.0 format or later version

The final report including figures must be published in format for distribution on CD ROM and by a web site.

The Consultant shall supply a realistic timeframe and program timetable for completion to draft study report and time required from receipt of community comments to final study report stage.

11.0 DATA AND REFERENCE DOCUMENTS

The Consultant will be responsible for collecting adequate information for review to fulfil the requirements of the brief. There will be no charge to the Consultant for access to reports held by DNR offices or Kempsey Shire Council.

All spatial data and relevant metadata must be forwarded to Kempsey Council and DNR Kempsey office upon completion of the project on CD-ROM.

Data must comply with the requirements as set out in “DNR North Coast Region Spatial Information Management Manual Nov 2003” All data obtained or developed through project funding are regarded as Department deliverables, including relevant license documents.

12.0 PERSONNEL

The Consultant's proposal is to include the qualifications and relevant experience of each team member proposed to be employed on the study/plan including any sub consultants. Any similar studies/plans recently undertaken by the Consultant are to be detailed.

Note: the consultant's personnel or sub consultant is to include a suitably qualified and recognised coastal process practitioner/engineer.

13.0 BUDGET

A fee proposal is to be submitted on lump sum basis with the exception of hourly rates for additional work or meetings requested by Kempsey Council.

A maximum budget of \$40,000.00 has been set for the work as outlined.

Should the consultant consider the budget inadequate for the scope of the work required, an alternative fee proposal can be submitted.

14.0 LIAISON

Personnel responsible for briefing and liaison are:

- ◆ Mr. Ron Kemsley Kempsey Shire Council (tel no. 6566 3248)
- ◆ Mr. John Schmidt, DNR Kempsey Office (tel no. 65 620707)

15.0 CONDITIONS OF ENGAGEMENT

15.1 General Conditions of Engagement

The tasks as identified in the brief are based on Council's assessment of the study. The consultant may suggest any amendments required to achieve the study objectives during the course of the study.

Any proposed departure from the agreed study tasks must first be ratified by Council before proceeding.

The conditions under which the consultant will be engaged shall be generally in accordance with the Association of Consulting Engineers Australia Guide to Consulting Engineering Services and this Brief.

15.2 Termination

The consultant's commission to carry out the study may be subject to termination due to non-performance or inability to meet set deadlines. The consultants will be informed by letter of such termination. This letter will be final and not subject to further correspondence.

15.3 Confidentiality

Investigations and reports will remain confidential unless, or until, released by the Council.

15.4 Sub-Consultants

The primary consultant may engage a sub-consultant for a specified part of the study subject to the written approval of Council. The primary consultant is responsible for the sub-consultant's work and compliance with the terms of the study. The sub-consultant has no claim on Council for fees or expenses.

15.5 Insurance

15.5.1 Professional Indemnity

The consultant shall maintain a current Professional Indemnity policy of insurance at a sum not less than \$300,000 or not less than that sum specially nominated in the Letter of Engagement. The consultant shall maintain a policy of insurance for an amount that is sufficient to indemnify the consultant after completion of the commission.

15.5.2 On Site Public Liability

The consultant is responsible for taking out at least \$10 million public liability insurance giving cover to himself/herself, his/her employees and any agent engaged by consultant for the duration of the work.

The consultant should also be aware of the obligations and liabilities under the "Occupational Health and Safety Act, 1983" and National Code of Practice pertaining to the Act.

15.5.3 Employees or Agents

Before commencing work under the commission, the consultant shall ensure that a suitable insurance policy is taken out giving cover to the consultant, the consultants employees and agents against any liability, loss, damage, costs and expenses arising at common law or under any statute as a result of personal injury to or death of any person employed by the consultant or the consultants agents in or about the work.

15.5.4 Inspection of Insurance Policies and Receipts for Premiums

The consultant shall make available for inspection the policies of insurances effected, for the purpose of complying with this section and the receipt for payment for the current premiums or other such evidence of insurance as may be requested by Council.

15.6 Copyright

Results of the study and the models developed in the course of the study are the ownership of Council. All data files are to be provided to Council on completion of the study.

15.7 Conflict of Interest

The consultant shall inform Council immediately of any matter connected with this study which could give rise to an actual or potential conflict of interest. This information will be treated as confidential.

15.8 Certification

All final documents prepared by the Consultant must be signed by the Project Director nominated in the consulting proposal to certify that they have been prepared by competent professional staff, checked for accuracy and comply with relevant regulations and the requirements of the brief.

15.9 Corrections

Any error, ambiguity or deficiency, which becomes apparent during the course of the study, shall be referred to the consultant for correction or clarification. The consultant shall not be entitled to an additional fee where the correction or clarification arises from a fault of the consultant.

15.10 Acceptance of Commission

Written confirmation of acceptance of the commission for the study, in accordance with the conditions of engagement, is required before work commences.

15.11 Payment and Costs

Monthly progress payments will be made after project progress reports. Progress payments are not acknowledgment of the satisfactory performance of work and Council reserves the right to recover any overpayment.

Council will retain 10% of project costs on completion of the draft documentation. All monies will be paid on acceptance of the final documentation.

Clause SC2 - Goods and Services Tax

"Goods and Sales Tax (GST)" means any tax on goods and/or services, including any value added tax, broad based consumption tax introduced in Australia.

"GST Law" includes and Act, order or regulation which imposes or otherwise deals with the administration or imposition of a GST in Australia.

Notwithstanding any other provision of this Agreement:

- (a) If a GST applies to any supply made by any party or in conjunction with this Agreement, the consideration provided or to be provided for that supply will be increased by an amount equal to the GST liability properly incurred by the party making the supply.
- (b) If the imposition of a GST or any subsequent change in the GST law is accompanied by or undertaken in connection with the abolition of a reduction in any existing taxes, duties or statutory charges (in this clause *"taxes"*), the consideration payable by the recipient of the supply made under this Agreement will be reduced directly or indirectly as a consequence of the abolition of or reduction in taxes.

Each party warrants that at the time any supply is made under this agreement on which GST is imposed, that party is registered under the GST law. If the other

party requests written evidence of registration, the party claiming to be registered will promptly produce evidence satisfactory to the party seeking such evidence.

Any invoice rendered by a party to this agreement which seek to recover an amount of GST payable by that party must conform to the requirements for a tax invoice (as that term as defined in the GST law). If requested to do so by the recipient of the supply, the supplier must provide a tax invoice within 14 days.

Council shall not be obliged to make any payment unless it is satisfied that the work satisfies the requirement of the brief.

The consultant shall be responsible for all his/her own costs for travel, accommodation and other expenses.

15.12 Selection Criteria

Proposals shall be assessed by a sub-committee of the Macleay Coast & Estuary Management Committee. The sub-committee is likely to be comprised of representatives from Council, DNR and the community.

Proposals will be assessed on an objective basis in general accord with the following selection guidelines. Factors to be considered in the assessment process will be:

- a) methodology;
- b) demonstrated level of understanding of what is required to produce a quality outcome;
- c) the quality of the Consultant's team in terms of demonstrated experience in the field. Proven track record. Of particular importance is the presence of sufficient depth of experience to cover the broad range of skills needed to address the issues and formulate objectives and strategies;
- d) community consultation proposal and skills;
- e) overall fee;
- f) project timetable; and
- g) understanding of the Estuary Management Process.

15.13 Acceptance

Written acceptance and agreement from the Consultant that the work will be undertaken in accordance with the Brief is required before the Commission can begin.

16.0 RESPONSIBILITY OF CONSULTANT

- 16.1** The responsibility for the preparation of the entrance management strategy and the supervision of sub consultants and their integrity, effectiveness and suitability for the purpose rests with the consultant. Council is relying upon the consultants knowledge, skill and judgement to produce a finished product which is fit for its intended purpose.

- 16.2** The consultant shall accept full responsibility for all work undertaken as a requirement of this brief.
- 16.3** The consultant is responsible for ensuring that adequate data and information to meet the requirements of this brief have been supplied are obtained from the appropriate sources.
- 16.4** Draft documents submitted for review by Council shall be signed by the consultants principal nominated in the proposal to certify that the documents represent adequate professional presentation for the particular of the work. All final documents prepared by the consultant must be signed by the consultants principal nominated in the proposal to certify that the documents have been prepared by competent professional staff and have been checked for accuracy, compliance with relevant regulations, the requirements of the brief and fully co-ordinated with all related documents.
- 16.5** Any errors, ambiguities or deficiency, which becomes apparent during the commission, shall be referred to the consultant for correction or clarification in suitable form. The consultant shall not be entitled to an additional fee where the correction or clarification arises from the fault of the consultant.
- 16.6** The consultant should ensure that the documents produced under the commission comply with relevant Acts, Codes, Ordinances and Regulations. The consultant shall immediately advise Council and obtain direction if the work requirements conflict with any such statutory requirement.
- 16.7** The consultant is to advise Council of any conflict of interest that may arise in the undertaking of this study from other work undertaken by the consultant in the study area.
- 17.0 FEES**
- 17.1** The fees to be paid for the work described in the Brief shall be a lump sum nominated by the consultant in the proposal for the work. The lump sum is to include all fees for sub-consultants. The fees for sub-consultants shall be stated separately.
- 17.2** The lump sum fee may only be exceeded if work additional to the extent of this Brief is requested by Council.
- 17.3** Items not specifically mentioned in the Brief but which are necessary for the satisfactory completion and performance of the work shall be executed by the consultant without adjustment to the nominated fees.
- 17.4** No payment for additional work will be made in excess of the nominated fee unless the additional work is first authorised in writing by Council. The fees shall be deemed to include all works and costs necessary to carry out the work set out in the brief.

- 17.5** The lump sum fee submitted by the consultant shall be a true reflection of the cost of professional services to be provided. The lowest fees submitted will not necessarily be accepted by Council.

KILLICK CREEK DATA COMPILATION AND PROCESS STUDY

FEE SCHEDULE

ITEM	AMOUNT \$
Stage 1 Consultation	
Attend public meetings	
Develop Communication strategy	
Implement Communication strategy	
Undertake public exhibition of draft Study	
Undertake exhibition to Council of Final Study	
Sub total	
Stage 2 Process Study	
Undertake Study as per Section 9.	
a) Data Compilation & Mapping	
Issue Analysis	
b) Processes	
Hydrology & Hydrodynamic	
Sedimentation	
Ecological Processes	
Sub total	
Stage 3 Prepare DRAFT Process Study report.	
Finalise and print Reports (5 copies).	
Cost per additional copy if required	
Sub total	
Stage 4 Prepare FINAL Process Study report.	
Finalise and print Reports (40 copies).	
Cost per additional copy if required	
Sub total	
OTHER	
Disbursements (all Stages).	
Additional data requirements – (detail if required).	
Work in the brief not covered by the above items.	
Sub Total	
TOTAL FEE	
Additional Meetings	
Attend any additional meetings as directed (per meeting).	

Appendices 1

Community members were asked to list issues that they felt related to estuary management and were important enough to be dealt with by a management plan.

It is acknowledged that community participants had little time to give considered opinions on issues but nevertheless were able to provide a broad list that provides a useful basis for both the reference group and consultants for follow up discussions

Issues Listed Include

Korogoro Creek Foreshore

1. Caravan Park Foreshore Management
2. Levee bank condition
3. Bank vegetation
4. Bank Erosion
5. Riparian land weeds
6. Public access
7. Fire management

Water quality

8. Water quality
9. Acid Sulfate Soils
10. Stormwater

Public Facilities

11. Boating Facilities
12. Boat Ramp
13. Footbridge

Fisheries

14. Fishing
15. Hand netting
16. Bait collection

Flood mitigation

17. Flood mitigation
18. Drain management
19. Drainage

Development

20. Future urbanisation
21. Caravan Park Management

Entrance

22. Sedimentation
23. Creek entrance

Waterway Usage

24. Educational Access
25. Creek usage impacts on waterway and banks

26. Compliance waterway users

27. Indigenous use and values

28. Rescue SES Access

Caravan Park Management

Comment

1. Consultation processes used do not allow meaningful participation by community
2. Caravan park business important to local economy
3. People pressure during holidays on
 - bait collection
 - bank access impacts
 - general foreshore impacts
 - jumping tree off Myrtle St bank impacts
4. change character of town through park management seeking extra cabins and more upmarket accommodation which moves the nature of the park from strong family base towards more upmarket
5. changed building types change character of town, visual amenity impacts

Fisheries

Comment

1. Bits of tackle and rubbish left around waterways
2. Excessive collection and smashing of oysters - need for education
3. Excessive?? collection of subtropical fishes for aquariums
4. 2001 flood waters killed everything in the creek
5. illegal spearfishing upstream of town entrance minor problem, overall good compliance within the town limits
6. rumours of creek closure to commercial fishing

Water Quality

Comment

1. Stormwater inputs from town where are they and what quality
2. Council monitors water quality random samples (check Council website)
3. Stormwater outlets ineffective in preventing saltwater entering village drains
4. What impacts does sewage system have on the creek?
5. Events greater than 1 in 2 yr return lead to poor water quality

Bank Erosion

Comment

1. Important to protect foreshore asset
2. Protection of habitat is important to health of creek
3. Recreation impacts primarily through uncontrolled public access
4. Some boat wash impacts during peak holiday periods
5. Uncontrolled vehicle access tracks on southern side of creek impacting on saltmarsh and general bank condition
6. Levee bank damage from vehicle access
7. Need for restoration of disturbed and impacted areas from vehicle track damage
8. Flood mitigation works have caused bank erosion and sedimentation through original earthworks and reshaping to create levees

Foreshore Lands

Comment

1. Obvious high level usage impact from both people and vehicles
2. Uncontrolled 4WD vehicle track access inundated by king tides and after rain become boggy

3. Parking and access needs to be managed
4. Gap Rd too narrow vegetation encroachment
5. Plants being planted on creek side land inappropriate species eg silky oaks
6. management of fuel loads within riparian lands fire hazard risk to town

Creek Entrance

Comment

1. Recognition required by residents of importance of dune health to control coastal process
2. Sand moving passed old stone wall work on west side –beach sand material moving into creek entrance and generally constricting entrance
3. Excess sand buildup at boat ramp periodically moved by Council only provides short term benefit

Boat Waterway Usage

Comment

1. Upsteam of boat ramp few complaints
2. Some safety issues at creek entrance with offshore fishing boats and surfers/swimmers during busy periods
3. Minor conflict between passive and power vessels
4. Issue of where surf club positions safe swimming flags on beach

Boat Ramp

Comment

1. Works well
2. Facilities adequate
3. Increased frequency of larger vessels using this relatively small creek entrance may require education program clearly stating typical size vessel that is appropriate. (Small creeks small craft/ large river larger craft/ deep water ports vessels ??metres etc)
4. Edge treatment with rockwork not people friendly

Flood Mitigation

Comment

1. General education on role of Korogoro Creek to Macleay River flood mitigation scheme
2. Nature of creek character and width radically changed by flood mitigation works involving channelisation, levee construction and construction of a choke to control the rate of flood waters discharge through Korogoro Creek
3. Passive gates
4. Weed management within the swanpool sometimes causing blockages during floods
5. Floodwaters of 2001 resulted in fish kill