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Stockton Bight environmental study

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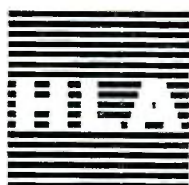
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STOCKTON BIGHT ENVIRONMENTAL STUDY AND MANAGEMENT PLAN



Part A

INTRODUCTION AND EXECUTIVE SUMMARY



AUGUST 1995

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Prepared for:

**NEWCASTLE BIGHT CO-ORDINATION AND LIAISON COMMITTEE ON BEHALF
OF PORT STEPHENS COUNCIL AND NEWCASTLE CITY COUNCIL**

**STOCKTON BIGHT
ENVIRONMENTAL STUDY
PART A
INTRODUCTION AND
EXECUTIVE SUMMARY**

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EXECUTIVE SUMMARY

The Environmental Study and Management Plan for Stockton Bight aims to optimise land uses within the area which reflect the fragile environment, the competing resource allocation demands on the area and the limited urban potential.

The objectives of the Study are:

- to assess the study area in respect of site characteristics, existing land degradation and existing/potential land uses;
- to identify issues/constraints and strategies for dealing with these; and
- to overview and justify a favoured approach for the implementation of preferred land use strategies over the study area.

1.0 FOREWORD

The Newcastle Bight Co-ordination and Liaison Committee commissioned HLA-Envirosciences Pty Limited as the principal consultant to carry out a Local Environmental Study and Management Strategy for Stockton Bight.

2.0 ACKNOWLEDGMENTS

This study has been prepared by the following Study Team, project managed by HLA-Envirosciences Pty Limited, each of whom made significant contributions to the report:

- Mr Jeff Wilson, Australian Water and Coastal Studies Pty Ltd.
- Ms Jennifer Roberts, Facilitation Services.
- Mr Richard Bennett, Hill Top Planners Pty Ltd.
- Mr Geoffrey Winning, SWC Wetlands and Ecological Consultancy.
- Dr John Turner, Historian.
- NSW Department Mineral Resources.

- NSW National Parks and Wildlife Service.
- NSW Department of Land and Water Resources.

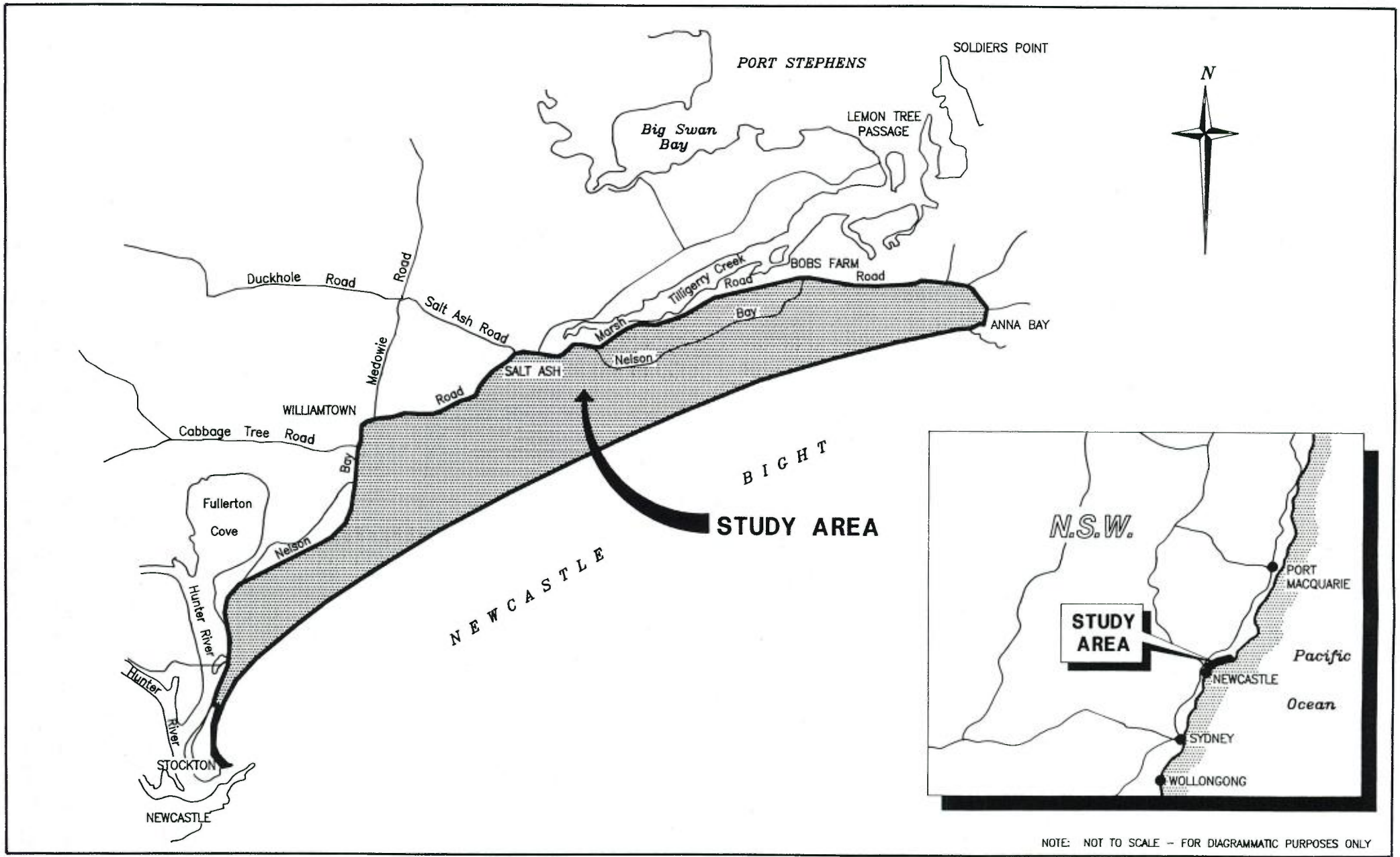
In addition, the Study Team wishes to acknowledge the assistance provided by all local and state authorities and in particular Mr Jeff Hunt and Ian Williams of the Department of Land and Water Conservation (LaWC) and members of the Newcastle Bight Co-ordination and Liaison Committee. Furthermore information from concurrent studies undertaken by Department of Water Resources, Department of Mineral Resources and National Parks and Wildlife Service is incorporated into this study and the assistance offered by officers of these authorities is appreciated.

3.0 BACKGROUND

Throughout this report reference is made to Stockton Bight which is the legally correct geographical name for the study area and is synonymous with Newcastle Bight.

Stockton Bight is the area of land bounded by Corroba Oval Reserve and Stockton Beach to the south, Anna Bay to the north and areas between Stockton Bight to the east and Fullerton Street/Nelson Bay Road/Marsh Road to the west. It includes the whole of the Bight sand dune system, the townships of Fern Bay, the rural areas of Williamtown, Salt Ash and Bobs Farm as illustrated in **Figure 1**.

In 1990, the Newcastle Bight Co-ordination and Liaison Committee (formerly known as the Newcastle Bight Sand Drift Committee) was established to work in a collaborative effort to prepare an overall management strategy for Stockton Bight. The committee recognised the necessity to develop an overall management strategy for the area which reflects the fragile and complex environment, as well as the competing uses and activities in the area. Furthermore there was an identified need to ensure that an overall strategy was consistent with the current planning framework for the area set out in the Hunter Regional Environmental Plan 1989, Port Stephens Local Environmental Plan 1987 and the NSW Coastal Policy.



ENVIROSCIENCES PTY LIMITED

PROJECT No. 1 US3

LOCATION PLAN

FIG. 1

Consequently the Committee instigated the preparation of an Environmental Study and Management Plan for the Bight to assess the area in respect of site characteristics; existing land degradation; existing and potential land uses; identification of issues and constraints; land management strategies for dealing with these and establishment of a planning framework from which Newcastle City Council and Port Stephens Council can prepare draft Local Environmental Plans for the area, and if necessary instigate more extensive studies for particular localised issues.

The Study has been prepared in accordance with the provisions of the Environmental Planning and Assessment Act, 1979, in respect of a Local Environmental Study. While the Department of Urban Affairs and Planning has not issued specific requirements in respect of the form, content and preparation of the Study, the Director advised that the Study should have due regard to relevant state and regional planning documents, as well as providing advice in relation to maritime archaeology.

Additionally, the Part B: Resource Inventory of this Study forms the basis for an assessment of Crown Land under Part 3 of the Crown Lands Act, 1989. This assessment has been prepared separately and will be placed on public exhibition at a latter date.

4.0 STUDY METHODOLOGY

The overall study methodology involves integration of a resource inventory, and identification of current and potential land uses culminating in the formation and justification of management options and strategies for the area as a whole and within specific precincts. A comprehensive community consultation process provides the study's foundation.

4.1 COMMUNITY CONSULTATION

Consultation with local community, regional users and government stakeholder at all levels

was seen as critical to the success of the study and ultimately its implementation. The NBCLC provided the key access into state and local government agencies ensuring continuity and freedom of information, participation, ownership and a breath of local/technical expertise.

Accessing community input in terms of attitudes and priorities as well as local knowlege, history and experience was considered fundamentally important. The aim, therefore, was to establish a credible consultative mechanism and a process which enabled a two way flow of information and ideas. A consultation strategy was adopted which was progressively modified to reflect community input and the evolution of the study process. It involved the following:

- First public meeting to report back to the community and to get their input into the necessary content and issues which the study should address.
- Second public meeting to report back to the community on the study findings and achieve a common understanding of the issues and influences which affect the Bight Area.
- Third and fourth public meetings to work through the proposed management strategies for the Bight and to get community input during public exhibition.

This public meeting process was complemented and enhanced through the establishment of a smaller community working group known as the Bight Consultative Committee. The BCC's constitution of members reflected the issues areas identified at the first meeting. Members of this committee helped the study team better understand the communities priorities and concerns covering such areas as recreation, business, environment, development, drainage, agriculture, transport and tourism. This group met formally five times during the study process, their participation in the community and business life of the area enabled them to gather and disseminate information on the project on almost a daily basis.

The public and consultative committee meetings and the communication process as a whole was supported by:

- The production and distribution of a Bight Newsletter which went to approximately 2,200 homes in the area three times during the study.
- Regular advertisements in the regional and local newspapers.
- Television and radio coverage prior to and after all public meetings.
- Establishment of a community HOTLINE serviced five days a week to receive and give out study information.

The study process concluded with a major public exhibition and a newsletter report back to the community.

The Newcastle Bight Environmental Study and Management Plan was founded on and built by a genuine attempt by the community and the study team to get it right, have it accepted and make it happen.

A Draft report was prepared in consultation with the consultative committee. The Management Strategy has been viewed and discussed with the committee, and where appropriate their comments have been incorporated. While some members are not in agreeance with aspects of the strategy there is general agreement with its direction.

The Draft report was exhibited for a two month period.

In response to the exhibition, 31 written submissions were received from individual landowners and community groups. Additionally, submissions were received from government authorities.

The following is a summary of the main issues arising from the consultation process:

- The proposed 400 m land use restriction along Nelson Bay Road does not reflect existing topography and land use, and will adversely affect private property rights and land values.
- The community consultation process has not been extensive.
- The proposed 9(a) coastal zone will restrict existing and future land uses and devalue property values.
- The National Park Model is not adequately discussed and considered in the Study.
- The Study does not adequately address the issue of acid sulphate soil.
- Lack of direct consultation with tourism activity operators in the Study Area.

These issues have been considered by the Study Team and Newcastle Bight Co-ordination and Liaison Committee and are discussed in **Part C - Section 2.0**. As a result the final study report has been altered having regard to these submissions.

4.2 RESOURCE INVENTORY - IDENTIFICATION OF CURRENT LAND USES, CONSTRAINTS AND OPPORTUNITIES

A resource inventory has been compiled over the whole study area overlain on base maps. The inventory is based upon literature reviews supplemented by field investigations, and analysis of aerial photography and cadastral information to verify and clarify particular physical and land use issues which influence the formulation of management strategies.

The resource inventory is presented in a separate document entitled Part B : Resource Inventory.

4.3 MANAGEMENT OPTIONS AND STRATEGIES

Using the information derived from the consultation process and resource inventory, management options have been prepared for strategic issues. These have been transposed into action plans for land precincts and are presented in **Part C - Section 5.0**.

5.0 IMPLEMENTATION OF RECOMMENDATIONS AND STRATEGIES

5.1 BACKGROUND

Part C comprises management options, strategies and recommendations relating to the Stockton Bight generally, and in particular to identifiable precincts within the area.

5.2 MAJOR STRATEGIC ISSUES

In order to consider overall management strategies for the Stockton Bight as well as establish a strategic direction for the subsequent Plan of Management which is presented in Part C, major strategic issue areas were identified. These have been borne out from discussions with the Bight Consultative Committee; stakeholder organisations and the resource inventory.

The major area wide issue categories are:

- Sand Drift/Sandmining;
- Underground Water/Surface Water;
- Environmental Protection;
- Development;
- Recreation/Tourism;
- Management Co-Ordination and Statutory Framework.

Within each of these general issue areas major strategic issues are identified.

5.2.1 Sand Drift/Sand Mining

- Stockton Bight contains the largest unvegetated coastal dune system in NSW. This mobile dune is transgressing inland up to 10 m/yr and at an average rate of 4.1 m/yr. Its inland movement is generally uncontrolled.
- In the absence of controlling measures, the mobile dunes will continue to move inland towards Nelson Bay Road and within the next 100 years could inundate and destroy 1,650 ha of vegetated land.
- The ecological significance of the vegetated land at threat from the mobile dune has not been quantified.
- There is increasing sand extraction from the Bight.
- Approximately 1.2 million tonnes of sand is currently being extracted from Stockton Bight annually.
- There are 12 existing significant sand extraction operations in Stockton Bight, mostly on freehold land in woodland areas.
- Sand extraction within the Bight could be rationalised and used as a means of ameliorating sandrift.

5.2.2 Underground Water/Surface Water

- Stockton Sand Member contains good quality water and is a valuable community resource.

- The sub optimal network of drains and tidal gates when releasing surface water to Fullerton Cove and Tilligerry Creek, do not perform effectively at times of coincident local catchment flooding and Hunter River floods.
- Lack of a single public authority for primary drainage network linking Fullerton Cove and Port Stephens.

5.2.3 Environmental Protection

- The Stockton Bight is considered to have unique conservation value primarily due to the mixture of sand dune and dunal vegetation communities. The significance of existing vegetation is its relationship to the large transgressive dunal system and its relatively undisturbed nature.
- The relatively undisturbed vegetation could provide a valuable habitat for a number of threatened fauna species.
- Vegetation is unique within the Region and supports many diverse forms of wildlife, including likely rare and endangered species.
- Land forms of the Bight represent a geological record of coastal evolution and are of scientific interest.
- Bushfire hazard within the vegetated dunal system is high.
- Noise levels in the vicinity of Williamtown limit urban development potential.
- The Bight has significant archaeological resources, both Aboriginal and Maritime.
- Beach pollution arises from a number of sources including flotsam and jetsam and personal litter associated with recreational beach uses.

- Sand extraction is occurring within the woodland area of the hind dune.
- The low lying estuarine areas of Fullerton Cove, Williamtown and Tilligerry Creek have potential acid sulphate soils

5.2.4 Development

- Fort Wallace, Stockton Hospital, Rifle Range comprise properties likely to be under pressure for alternate urban development.
- The Fern Bay proposal area is identifiable as having urban development potential. Environmental studies support urban development of this land.
- The Boral land is identified as having urban development potential but requires comprehensive environmental assessment.
- Nelson Bay Road is the main thoroughfare to Port Stephens and can be regarded as a "tourist gateway". This corridor is visually unattractive due to ad hoc ribbon development. Proposals by PSC/RTA to upgrade the road on or near its current alignment will satisfy long term transport needs and thus eliminate the need to "reserve" a future road corridor east of Nelson Bay Road.
- Better quality agricultural land occupies the low lying terrain generally between Nelson Bay Road and the hind dunal system.
- Any proposal for infrastructure should establish that a route through the Bight is preferred on environmental grounds. Further destruction of vegetation should be avoided.
- Opportunities exist immediately south of Anna Bay urban area for appropriate sensitive development on the Crown Land as a means of ameliorating sand drift in the area.

- The unauthorised huts while not a major issue, require resolution in the short term.

5.2.5 Recreation/Tourism

- The Recreational Plan for Birubi Point, Newcastle Bight (AWACS 1993) provides a sound foundation for a strategy for recreational planning and management of the area.
- Stockton Bight is utilised by an extensive range of recreation pursuits.
- The existing Lavis Lane 4WD access requires upgrading and implementation of an ongoing maintenance programme.
- Provision of a southern 4WD access requires further investigation.
- There appears to be an identifiable need for a mid 4WD access point. However, the transgressive dunal system makes 4WD access difficult to maintain at this location.
- Stockton Bight is identifiable as an area of unique coastal wilderness with ecotourism attributes.
- Opportunities exist to promote the Bight as a tourist destination, and complement the established tourism destination of Port Stephens.
- Uncontrolled activities which lessen the geomorphological and ecological value of the Bight will reduce tourism opportunities.
- Marine and Aboriginal archaeology of the Bight should be managed in such a manner so as to contribute to the tourism experience.

5.2.6 Management Co-Ordination and Statutory Framework

- Sand extraction activities could be rationalised and used to ameliorate sand drift threatening private property, however this requires co-operation between government, citizens and the sand mining industry.
- The multiplicity of recreational activities within the Bight continue to co-exist without apparent environmental impact or adequate management.
- Port Stephens Local Environmental Plan requires amending to prevent ad hoc ribbon development along Nelson Bay Road and give effect to the preferred management strategy for the Study Area.
- Any overall management strategy for the Bight, and the dunal system in particular, should acknowledge the existing stakeholders and their activities.
- Increased pressure to utilise the area for a mixture of mining, rural, development, recreation and tourism activities in future years will lead to land use conflict and the current management structure is ill equipped to handle these challenges.

5.3 PREFERRED MANAGEMENT STRATEGIES

For the major strategic issues preferred management strategies have been prepared for each.

5.3.1 Sand Drift/Sand Extraction

DISCUSSION OF ISSUES

The western movement of sand will, over time, result in the significant loss of native vegetation, wildlife corridor and habitat, and is impacting upon private property, most noticeable at Anna Bay. The area inundated is estimated to increase from the current 2,420 ha

to 4,100 ha in 100 years. Over this time some 1,650 ha of vegetated relic dune ridges will be inundated by the transgressive dunal system, while the dunal area of the existing water reserve will increase from 640 ha to 1,440 ha. Privately owned lands will be inundated from the present 520 ha to 1,310 ha.

Managing sand drift at Stockton should be considered in relative degrees of intervention. From the research carried out to date, there is clearly insufficient information known as to the extent of sand "generation" on Stockton Bight. While it appears the range is between 1.2 and 2.6 million m³ annually, further detailed photogrammetric analysis is required.

The management strategies range from doing nothing and "let nature take its course" or intervening in a significant manner so as to limit the impact upon property (Anna Bay) and vegetation communities.

The mechanism available to achieve the latter is through allowing sand extraction to occur along the face of the prograding hind dune at a rate consistent with the level of sand generation in that locality.

Currently, most of the sand extraction operations occur on freehold land and involve the removal and subsequent rehabilitation of vegetation. If these operations were gradually relocated to the hind dune areas, then the resultant environmental impact would be lessened. However, to date, insufficient research has been carried out to ensure that this approach would not result in consequential environmental impact over the larger term. It is unlikely that all the existing sand extraction operations can be relocated to the hind dune due to the varying quality of the sand. Further investigation is needed.

The dune stabilisation works being undertaken at Anna Bay and proposed at Fern Bay are positive examples of how sand extraction operations can complement rehabilitation works and result in considerable lower rehabilitation costs. These works are appropriate to protect urban development from sand drift and the same approach should be investigated to "halt" the sand drift in the rest of the Bight.

PREFERRED MANAGEMENT STRATEGY

Due to the consequential loss of vegetation, and impact on private property, the preferred option is to undertake a pro-active approach to sand drift at Stockton Bight. The process to achieve this would include:

- Establishing a working committee of sand miners, land owners, conservationists, Hunter Water Corporation (HWC), LaWC, Councils, Department of Mineral Resources, Department of Planning and Department of Water Resources.
- Undertake research to establish "sand generation" levels, potential consequential impacts, the quality of sand available, the ecological value of the vegetated dunal system, etc.
- Preparation of sand resource suitable maps;
- Prepare a sand extraction Management Plan for Stockton Bight incorporating both private and public lands. This plan should seek to provide for a sustainable sand extraction industry in Stockton Bight over the long term with the resultant benefits returning to the Bight through improved resource allocation and on-site environmental management. Removal of sand from unvegetated areas is preferred.
- Implementation of the sand extraction management plan would be through co-ordination with Council and LaWC. Royalties from the sand should be utilised in the provision of recreation and tourism facilities in the Bight.
- Implementation of the sand extraction/rehabilitation plans on all affected lands, and particularly at Anna Bay and Fern Bay, as well as the frontal dunes.

AFFECTED LANDS

The transgressive dunes and vegetated relic dunes.

5.3.2 Hydrology

DISCUSSION OF ISSUES

Major drainage problems occur in the Tilligerry Creek catchment. Prime areas of concern are at Williamtown and Bobs Farm (Marsh Road). The existing network of drains and tidal gates do not appear to perform to a satisfactory level and further development (RAAF, Nelson Bay Road) is expected to exacerbate the existing situation.

Fragmented management practises of the past have led to an unco-ordinated and inadequate drainage system ill equipped to handle even low level flooding.

There is currently no single public authority with responsibility for the primary drainage network linking Fullerton Cove and Port Stephens. While several flooding/drainage studies have been undertaken to address isolated drainage issues, a comprehensive study has not been undertaken.

An appropriate management strategy should address four principal concerns:

- existing lack of knowledge of the hydrology of the Fullerton Cove/Tilligerry drainage system;
- development of a drainage management plan;
- need for single management body;
- sources of funding/funding mechanisms to implement drainage management plan.

These issues were highlighted in Longbight - Williamstown Area Report (March 1992). This report made a series of recommendations which dealt with:

- Institutional issues (i.e. management).
- Regulatory issues.
- Design/construction issues - two levels of priority for civil works.

To date, few of these recommendations have been implemented due to the drains not being the responsibility of one authority.

PREFERRED MANAGEMENT STRATEGY

The recommendations of the Longbight/Williamstown Report (March 1992) be implemented.

AFFECTED LANDS

All lands in the Study Area draining into Tilligerry Creek and Fullerton Cove.

5.3.3 Groundwater

DISCUSSION OF ISSUES

The Study Area probably contains good quality groundwater which should be appropriately managed to avoid contamination. The Stockton Sand Member underlies most of the Study Area and is estimated to contain about 230 GL of groundwater. In February 1995 the Department of Land and Water Conservation (Water Resources) released a technical review of the Tomago/Tomaree/Stockton groundwater, as part of the process of developing a groundwater management plan. The plan should be completed by the end of 1995.

Currently there is insufficient evidence to suggest that any existing land use has resulted in a negative impact on the quality of groundwater. The quality of groundwater probably varies

throughout the Study Area but is likely to be high in most parts. The existing water reserve lands and Crown Land to the north incorporate the majority of the high quality aquifer.

The DWR Aquifer Study, identified a number of land uses which may impact upon the quality of groundwater. These include:

- sand extraction;
- sewage disposal;
- housing;
- heavy mineral mining.

Until such time as the potential impact of these uses is known, it is recommended that a precautionary approach is taken to prospective land use change within the area identified as containing high quality water. Development proposals should be assessed against potential impact on the aquifer.

PREFERRED MANAGEMENT STRATEGY

- Completion and implementation of the management plan for the Stockton aquifer by Department of Water Resources.
- Development proposals which may impact upon the quality of groundwater be required to carry out an aquifer impact assessment. This provision to be incorporated into the Port Stephens LEP.

AFFECTED LANDS

Lands lying above the Stockton Sand Member as identified by DWR.

5.3.4 Environmental Protection / Conservation

DISCUSSION OF ISSUES

Unfortunately, insufficient investigation has been undertaken to date to determine both the quality and quantity of fauna in the vegetated dunal communities. The extent of habitat for endangered species which may exist is also not known. Therefore, appropriate research and investigation is required in order to determine the impact various activities may have on flora and fauna communities. Until such studies are undertaken, a precautionary approach is considered appropriate.

Geological, Aboriginal and Maritime archaeology are of significance within the Bight. Detailed studies of Aboriginal archaeology, in particular by Sullivan (1994), reveal areas of high archaeological sensitivity and there is a need to precisely identify site locations. A precautionary approach to activities likely to impact on these areas in the meantime is appropriate.

There are potential acid sulphate soils in the estuarine environment around Fullerton Cove and Tilligerry Creek. If these soils are drained and exposed to air, acidic conditions can arise and adversely impact on general land degradation, water quality and the biotic environment.

Any proposed land uses require site assessment and implementation of appropriate management measures.

PREFERRED MANAGEMENT STRATEGIES

- Undertake a comprehensive study of flora and fauna to determine particular areas of vegetation which provide habitat for endangered or rare fauna.
- Prepare a Flora and Fauna Management Plan. This is most likely to include the development of a network of vegetation/wildlife corridors throughout the Study Area.

- Further destruction of vegetation should not occur until detailed flora/fauna studies are completed, and wildlife corridors determined.
- Preparation of an archaeological zoning plan incorporating Marine, Aboriginal and Historic archaeology.
- Establish an environmental research fund to assist in ongoing ecological research including:
 - establishing a geological record of coastal evolution;
 - study of coastal habitat;
 - bushfire management;
 - rehabilitation measures - old dunes;
 - impact of recreation/tourism on wildlife;
 - identify areas of high archaeological sensitivity for conservation and protection.

Funding sources could be explored through the NSW Governments' Dune Care, Environmental Trusts, Heritage Assistance Scheme and National Estates Grant through the Australian Heritage Commission. Federal Government Coast Care and Land Care programmes are administered by the NSW Government and could also be sources of funding.

- An acid sulphate soil management plan be prepared for all proposals likely to disturb acid sulphate soils.

AFFECTED LANDS

All naturally vegetated lands, the exposed dunal system, Marine and Aboriginal archaeology sites, and the estuarine environment.

5.3.5 Development

DISCUSSION OF ISSUES

Urban Development

The capability of the Study Area to accommodate urban development was examined following the completion of the resource inventory. The area is significantly constrained by:

- Sand Drift - 100 year progradation zone (up to 620 m).
- Flooding - Tilligerry Creek system, high water table.
- RAAF ANEF zones.
- Agricultural land - maintain viability of large rural properties in the Williamtown area.
- Geotechnical constraints - transgressive dunes.
- Stockton aquifer - high protection zone (lands north of Coxs Lane).
- Nelson Bay Road - visual corridor - tourist gateway to Port Stephens.
- Coastal Zone - including the beach front, frontal and hind dunal system.
- Areas of flora and fauna habitat potential.
- Provision of infrastructure.

The abovementioned constraints reduce the area for potential urban development to land lying south of Coxs Lane. Development of these lands however would be subject to thorough environmental assessment and in particular impact on the aquifer.

In respect to specific lands, the following conclusions are made:

Fern Bay Development Proposal Area

An extensive local environmental study has been undertaken in respect to a proposed residential development at Fern Bay. The Fern Bay Residential Development Local Environmental Plan was gazetted on 17 March 1995 and rezones a significant portion of land to part Residential 2(a), part Environment Protection (Wetlands) 7(a) and part Environment Protection (Flora and Fauna Conservation) 7(k). Approximately one third of the eastern area has been deferred by the Minister and remains partly zoned Rural 1(a) and part Environment Protection (Water Catchment) 7(c) and 6(a) Open Space.

Boral's Land

This land adjoins the area of the Fern Bay development proposal and exhibits similar environmental characteristics. To date no comprehensive land capability study has been undertaken to assess the impact urban development may have upon the land system.

Consequently it has not been possible to determine the lands suitability for any high order land use activity. Further detailed environmental studies including potential aquifer impact will be required if alternate land use is to be considered.

Anna Bay

Additional urban development potential south of Anna Bay has been discounted for the following reasons:

- Transgressive dunal system.
- Urban development will result in visually obtrusive ribbon development.
- Will result in a proliferation of access points onto a busy main road.
- Likely to detract from the existing urban settlement at Anna Bay.

Hind Dune Area

No urban development is favoured for this area as it would adversely impact on the water aquifer.

Bobs Farm

Urban development potential is constrained because of:

- Low lying flood prone land.
- Poor soil quality.
- Infrastructure cost likely to be prohibitive.

Williamtown/Salt Ash (including low lying area to east of the Nelson Bay Road)

There may be limited opportunities adjacent to existing urban areas. An area of land has been identified off Richardson Road which appears suitable for residential development provided services are available.

However, generally the high water table in these areas, together with likely flood inundation and the need to protect viable agricultural activities do not provide obvious urban development potential.

The larger rural holdings, surrounding Williamtown, occupy the better agricultural land and should not be considered for urban development.

Land in the vicinity of RAAF zone necessarily restricts development potential.

Stockton Precinct

If the Fern Bay development proceeds, alternate uses for the Rifle Range, Stockton Hospital

and Fort Wallace could be investigated. For a large extent, the future of this area will remain unresolved due to Government ownership. However, these lands are capable of supporting forms of urban development and further detailed environmental studies are needed to identify preferred land use alternatives.

In particular, the environmental issues affecting this precinct are predominantly related to the coastal zone. These include coastal erosion, particularly at the southern end of Stockton Beach, and dune stabilisation. Any redevelopment of the Rifle Range land should critically assess stabilisation of the dunal system.

Unauthorised Huts on Crown Land

These huts are illegal and efforts should be made for their removal. There is no justifiable reason why they are needed. The owners should be given three years to remove them after which the Council should proceed with their demolition and removal. A temporary licence can be granted for the three year period, and a fee charged from which LaWC could recoup the cost of removal.

The need/demand for overnight occupancy on the beach could be met through the establishment of an environmentally "friendly" wilderness resort (i.e. solar power, waste recycling), budget accommodation, ecotourism and fishing centre; a possible location for this facility could be Fort Wallace.

INFRASTRUCTURE

Nelson Bay Road Corridor

The Council/RTA alignment is considered appropriate. The future road alignment as provided on PSC LEP 1987, traverses vegetated dunal areas. It should be abandoned and replaced with the Council/RTA route.

In order to ensure Nelson Bay Road retains a high level of service and provides a pleasant visual experience for motorists travelling to Port Stephens, restrictions on land use should be investigated.

Along most of the current alignment there has been an undesirable proliferation and ad hoc development.

A rezoning review is required to investigate removal of the provisions which allow unsightly ribbon development and to identify service orientated land uses only within, or adjacent to, existing urban settlement.

The road should be promoted as a tourist corridor to Port Stephens.

Opportunities may exist for specific tourist related activities, however these must not be located on Nelson Bay Road. They would preferably be located on the western side of the road.

Stockton Sewage Treatment Works

The upgrading of sewerage treatment facilities for Stockton and Fern Bay are required following a determination of development at Fern Bay. Irrespective of this decision, it is likely that the existing system will require upgrading and any EIS should examine a range of disposal methods.

Port Facilities

In 1990 the MSB advised that the Bight is no longer considered an alternative to the Port of Newcastle and is not required to be reserved for future port facilities.

Electricity Corridor

A proposed transmission line easement from Williamstown to Anna Bay should not result in significant loss of vegetation and undesirable visual impact.

PREFERRED MANAGEMENT STRATEGY

Urban Development

- The northern limit of urban development potential is Coxs Lane.
- The area proposed for urban development at Fern Bay (which has been subject to significant environmental investigation in conjunction with the preparation of a Local Environmental Plan by Port Stephens Council gazetted on 17 March 1995), has urban development capability.
- Any additional proposals for urban development south of Coxs Lane must meet recognised environmental guidelines including investigation into the impact on the aquifer and should not proceed until an assessment has been carried out on the Bights ecotourism potential.
- A study be undertaken to establish the area of the Nelson Bay Road corridor and those land uses which lessen the motorists' visual experience when travelling along the road.
- The Port Stephens LEP be amended so as to recognise the Nelson Bay Road Corridor as a tourist gateway and significantly restrict/limit future development within the corridor.
- Studies be undertaken of the Rifle Range, Stockton Hospital and Fort Wallace to identify long term land use options. Improved linkages between Stockton and the proposed Fern Bay development should be thoroughly examined.

- Investigation be carried out to ameliorate erosion of Stockton Beach and determine source of the erosion.
- The owners of the illegal huts be advised that they have three years to vacate after which time demolition will take place and that a temporary licence be issued over each of the huts for this period.
- An augmentation of the Stockton Sewage Treatment Works is required. Any proposed method of waste disposal should examine the potential impact upon the aquifer and /or the Bight.
- The Port Stephens LEP 1987 be amended to support the land use strategy proposed in the Management Plan.
- Amendment to the Newcastle LEP 1987 is not recommended in the short term due to public ownership issues and lack of investigation into alternate landuses.

AFFECTED LANDS

- Specific sites as detailed in the report.
- LEP amendment would cover all the Study Area.

5.3.6 Tourism

DISCUSSION OF ISSUES

The limited amount of eco-tourism activity which occurs at present supports the suggestion that there is a growing interest in the Bight. This interest would expand if the attributes of the Bight were promoted and tourist access provided onto the beach at Stockton.

While the area cannot be compared with better known areas of Uluru or Daintree, its close

proximity to one of the largest domestic markets in Australia (i.e. Sydney), provides sufficient support for some research to be undertaken leading towards the preparation of an ecotourism plan for the Bight.

This plan would identify opportunities which should be capitalised upon, and should address such issues as:

- on-site accommodation;
- educational tours;
- access - tour routes;
- archaeological sites - interpretive signage;
- cost benefits;
- environmental impact; and
- management.

The area covered by the ecotourism plan should encompass the Nelson Bay Road corridor as this road represents the access spine upon which any ecotourism activity is likely to depend.

As the demand for ecotourism and recreation activity in the Bight grows, there will be increased pressure to provide onsite accommodation. Although the transgressive dunal system lacks mainstream tourist accommodation appeal, the siting of an ecologically "friendly" sand wilderness resort just behind the fore dune has potential to stimulate significant ecotourism interest. This facility would replace the unauthorised huts, and provide a venue for both recreational fisherman and tourists.

A data base of marine and Aboriginal archaeology, geomorphology, sand drift, flora and fauna should be prepared and form the basis of an educational package. Information markers could be placed along the beach and relate to shipwrecks, natural features and form part of an ecotourism trail.

A cycleway corridor has merit but would require detailed investigation, particularly in regards to sand drift and impact on flora/fauna. Consideration should be given to utilising existing informal routes and developing a cycle network from the Nelson Bay Road corridor.

Preferred tourism strategies would be those which facilitate the flow of money back into the Bight.

PREFERRED MANAGEMENT STRATEGIES

- Investigation and preparation of an ecotourism plan for Stockton Bight. This plan would provide direction to prospective tourism operators, promotional activities, and medium to long term options for on site accommodation.

AFFECTED LANDS

All lands in Study Area and Nelson Bay Road Corridor.

5.3.7 Recreation

DISCUSSION OF ISSUES

The range of recreation activities occurring in the Study Area is extensive. While 4WD activity (fishing and driving) is the predominant recreational use, the Bight accommodates a wide variety of recreational pursuits from dog walking, surfing, hang gliding, RVs and horse riding.

The Bight is large enough to accommodate the existing recreational users with little conflict. Increased recreational activity is likely to occur over time and dependant upon appropriate management, increased usage could easily be accommodated.

The most pressing issue is the provision of a southern access for 4WD vehicles. The existing

Lavis Lane access is of poor standard and although it could be improved, maintenance costs would be high.

An opportunity exists to investigate the provision of a southern 4WD beach access. Other issues associated with 4WD access include:

- Demand for access to southern portion of the Bight is considered to be high due to the place of origin of most 4WD vehicles (i.e. Newcastle, Lake Macquarie, Sydney).
- Access for other uses appears adequate.
- Anticipated growth of other recreational uses indicates no need for additional access points.
- Whilst there is an identified need for mid access points, the transgressive dunal system makes access difficult to maintain. Future long term planning should however not discount this, if sufficient resources are available to maintain an access (particularly in respect of costs).
- Demand for future ecotourism may hasten consideration of additional access points.
- Distance markers along beach (associated with shipwrecks) would improve safety and assist in education, promotion and ecotourism.

The Recreation Plan for Birubi Point, Newcastle Bight and Shelley Beach (AWACS November 1993) was examined and its findings are endorsed. Port Stephens Council, LaWC and PWD should proceed to implement the Plan's action strategies. Further to the findings of that study the following additional findings are made:

Dogs

- Existing opportunity for walking dogs unleashed on Stockton Bight (in Port Stephens Council area) should remain.
- In Newcastle City Council area consideration should be given to a restricted unleashed dog walking area.

RV Uses

- Generally unmuffled Recreational Vehicles are considered satisfactory for designated areas.

Buildings for Recreational Uses

- Recreation facilities should be located within existing urban areas. There is no justification for additional commercial services, particularly along Nelson Bay Road.
- Any proposed recreation/tourist facility within Stockton Bight should be visually unobtrusive, not viewed from Nelson Bay Road or the beach front.

Other Issues

- 4WD's should be prohibited from vegetated dunal areas and be generally confined to the beach area and designated access routes.
- No great evidence of physical environmental impact from existing users. The 4WD clubs tend to be self regulatory, while increasing numbers of other users are becoming more environmentally aware. Additional education and promotion in relation to conservation values of the Bight would further assist this trend.

- Management of waste from recreational users. Provision of waste disposal bins at access points should be investigated.

The principal area for recreational activities is the beach/frontal dune area. In order to ensure the Bight can successfully accommodate growth in recreational activities in this area, a Recreational Management Plan for these lands extending the length of the Bight should be prepared. This plan should indicate clear definition of uses between beach (active area) and dunal system (passive) - recognise existing user groups and not preclude activities which are environmentally "friendly". This plan could be extended to include the vegetated dunal lands when recreational activity in these areas demanded better site management. Council's LEP should be amended to give effect to the management plan, namely to ensure the zoning of the beach zone is consistent along the total length of the Bight

PREFERRED MANAGEMENT STRATEGIES

- Implementation of the Birubi Point Newcastle Bight Recreational Plan.
- Preparation of a Recreation Management Plan covering the total beachfront area (i.e. 32 km).
- Examine opportunities for the provision of a southern beach access for 4WDs.
- Promote the Bight as the Hunter's "coastal recreational park".

AFFECTED LANDS

Beachfront and all Crown Land north of Coxs Lane.

5.3.8 Management Co-Ordination and Statutory Framework

DISCUSSION OF ISSUES

The Port Stephens LEP 1987 does not provide sufficient direction or land use control over activities in the Study Area.

Both the provisions of the LEP and the map will require extensive amendment in order to give effect to the directions proposed by the Management Plan. Of particular concern is the current 1(a) zoning along the Nelson Bay Road Corridor which does not give effect to protecting the existing visual corridor or "tourist gateway".

Much of the dunal area suggested for sand extraction activities is zoned 7(c) or 7(f1). Within these zones sand extraction is a prohibited development.

In order to give effect to the Management Plan, it is suggested that a new zone be investigated, covering all public owned lands lying north of Coxs Lane. This zone could provide for a range of land uses with site specific management co-ordination via the Management Plan and subordinate plans. This legal structure would allow for the changing nature of the transgressive dune system and the various conservation and resource management plans to flow from subsequent investigations.

Decisions relating to long term land use management of the Bight have been ad hoc for many decades. Port Stephens Council, LaWC and HWC have all played passive roles in land use management of the Study Area. This loose arrangement will not be sufficient if the Management Plan is to be effectively implemented. Thus an improved management structure will be required. Various management models are discussed in Part 5.

PREFERRED MANAGEMENT STRATEGIES

- Port Stephens LEP 1987 be amended to give effect to the provisions of the Management Plan. A review of the LEP be carried out to investigate flexible provisions to enable resource extraction (sand, water), recreation and tourism uses, primarily applying to public land. This would support several resource management plans and subprecinct land management plans.
- A management framework be set up which can effectively implement the Management Plan and provide for continuing impact from government, citizens and stakeholder groups.

AFFECTED LANDS

All lands in The Study Area plus those lands lying within the visual corridor of Nelson Bay Road.

5.4 INDICATIVE AREA ACTION PLANS

An Action Plan has been developed for each of the precincts with strategies for each identified sub-precinct. For each of these strategies, recommendations are made regarding the appropriate body for implementation, the priority for the work and an estimate of initial and re-current costs, where appropriate. These are presented in the following tables.

Ultimately, implementation of these strategies is dependent upon the level of ongoing Government commitment to funding.

If an alternate implementation option to that recommended in **Section 5.5** proceeds, then Area Action Plans will require modification. Prior to proceeding to implementation of Area Action Plans, and together with resolution of the preferred Implementation Option, all existing redundant reserves will require revocation.

STOCKTON						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
1.1	Investigate provision of southern 4WD access.	NCC/PSC		1996		
	Investigate a "free leash" area for dogs.	NCC	Medium			
	Implementation of a Beach Pollution Reduction Programme in respect of: (i) Sewerage Outfall; (ii) Bilge Waste; and (iii) Beach Waste.	HWC MSB NCC/PSC	High			
	Carry out further detailed assessment of maritime archaeology and preparation of a Conservation Plan	NCC/PSC	Low	1997	\$20,000	
	Development of a long term beach stabilisation strategy	NCC/PWD	Medium to High	1995/96		
	Extend the beach patrols within NCC area	NCC	High	1997		
1.2	Investigate alternate uses for Fort Wallace e.g. tourist / museum / residential	NCC/Landowner	Low/Medium	1996/7		
	Undertake a Land Capability / Suitability Study for the Rifle Range	PSC/Landowner/ NCC	Medium	1996/7		
	Consider alternate uses for Stockton Hospital	PSC/NCC	Medium	2000		
	Undertake planning strategy for precinct to determine long term potential landuses (preferred strategy and timing dependent upon Fern Bay proceeding).	PSC/NCC/Major Landowners	Medium to High (depending on Fern Bay proceeding)	1997		
	Augmentation works/alternate site for sewage treatment works depending upon future development proceeding.	HWC	Medium	1996		
	The existing beach outfall from Stockton Treatment Plant be repositioned to prevent visual and environmental pollution.	HWC	High	1996		

STOCKTON						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
1.3	A DCP be prepared for this area having regard to adjoining landuses and linkages to Stockton.	PSC	High (depending on Fern Bay)	1996		
1.4	Further detailed environmental studies be carried out over area to determined future use.	Landowner/PSC	Low	1996		
	Further extension of sandmining activities should be deferred pending detailed environmental impact assessment.	Landowner/PSC	Medium/High	1996		
	Provision of beach access to Signa be investigated.	PSC	Medium	1996		
1.5	A further southern 4WD access point be investigated in the Fern Bay proposal proceeds.	PSC/NCC/ Landowner	Medium	1995/6		
	Installation of beach marker poles	Manager of PSC	High	1995		

WILLIAMTOWN / SALT ASH						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
2.1 Beachfront	Implementation of a Beach Pollution Reduction Programme in respect of: (i) Sewerage Outfall; (ii) Bilge Waste; and (iii) Beach Waste.	PSC/MSB	High	1996		
	Carry out further detailed assessment of maritime archaeology and preparation of a conservation plan.	PSC/LaWC	Low/Medium	1997		
	Upgrade and maintain Lavis Lane 4WD access in accordance with Birubi Point Study.	PSC	Medium/High	1996/7	\$30,000	\$5,000 (Maintenance)
	Installation of beach marker poles.	PSC	High	1996	\$30,000	\$5,000
	Implementation of user environmental awareness education programme to contain 4WD activity to frontal beach zone to protect the Little Tern, as part of existing permit system.	PSC/Trust/NCC	Medium	1997		
	Removal of unauthorised huts.	PSC/LaWC	Medium	1997/8	\$10,000	
	Development and implementation of user environmental awareness education programme.	Councils/ Landowners	Medium	1997		
2.2 Dunal System	Detailed investigation of sandrift and long term impact on conservation value and resource allocation.	Council/LAWC	High	1996		
	Identify areas for rationalising sand mining activities within the transgressive dunal system having regard to nature of sand drift and conservation value of the area.	Mineral Resources/Councils /NPWS	High	1996		
	Market demand investigation for sand.	Mineral Resources	High	1996		

WILLIAMTOWN / SALT ASH						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
2.2	Ensure access to underground water reserve is available to HWC or its successor and that land use management does not adversely affect water quality.	LAWC	High	1996		
	Rehabilitation of degraded areas to promote a flora/fauna corridor.	NPWS LAWC	Medium	1997		
2.3	Rehabilitation plans be prepared for each existing sand mining / extraction operation.	Landowners	Medium	1997		
	Investigate in appropriate north-south tourist trail with pedestrian/cycle access to beach and Nelson Bay Road	LAWC/PSC	Low	1997		
	A bushfire management plan be prepared	LAWC/PSC	Low	1997		
	Deletion of 5(c) Arterial road zoning from PSC LEP	PSC	Low	1997		
	Investigate provision of waste recepticals at key tourist roads i.e. Lavis Lane.	LAWC/PSC	Medium/High	1996/7		
	Amend LEP to ensure non-proliferation of ribbon development Nelson Bay Road	PSC	High	1996		
	A single authority / organisation be allocated task of co-ordinating drainage improvement and maintenance works for the network of main drains.	PSC/PWS	High	1996		
	Consider and adopt the recommendations of the Steering Committee's Report Future Requirements of Drainage Facilities in the General Long Bight-Williamtown Area, dated March 1992.	PSC/PWS	High	1996		

WILLIAMTOWN / SALT ASH						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
2.4	Amend LEP to ensure non-proliferation of ribbon development along Nelson Bay Road	PSC	High	1996		
	Implement an area improvement programme to improve visual corridor associated with road re-alignment.	PSC/RTA	Medium	1996/97		
	LEP be amended to provide for ecotourism activities / facilities excluding the Nelson Bay Road corridor.	PSC	High	1996		
	Consider and adopt recommendations of the Steering Committee's Report dated March 1992 in respect of drainage and establishment of a singular co-ordinating authority.	LAWC/PSC	High	1996		
	Promote Nelson Bay Road as a tourist gateway to Port Stephens.	PSC	Medium	1997		
	Continuance of maintenance works to existing drainage network.	PSC	High	1996		
	The existing noxious weeds removal programme continue on an ongoing basis.	PSC	High	1996 ongoing		
	ANEF zones be included on LEP maps and appropriate reference be made in the planning instrument.	PSC	Low	1997		
	Examine opportunities to retain exposed sand dune at southern end.	PSC/LAWC	Low	1997		

BOBS FARM						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
3.1	Completion of Council initiated flood mitigation works.	PSC/Landowners	High	1996		
3.2	Amend LEP to ensure non-proliferation of ribbon development along Nelson Bay Road.	PSC	High			
	Promote Nelson Bay Road as a tourist gateway to Port Stephens.	PSC/RTA	Medium			
	Forested road corridor to be maintained with Nelson Bay Road re-alignment proposal.	RTA/PSC	Medium			

ANNA BAY						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
4.1	Implementation of a Beach Pollution Reduction Programme in respect of: (i) Sewerage Outfall; (ii) Bilge Waste; and (iii) Beach Waste.	HWC MSB NCC PSC	High	1996		
	Carry out further detailed assessment of maritime archaeology and preparation of a conservation plan.	NCC/PSC	Low	1997		
	Installation of beach markers.	PSC	High	1996		
	Development and implementation of user environmental awareness education programme.	PSC/NCC /HUFMT	Medium	1997		
	Birubi Point plan of management in respect of facility improvements be implemented.	PSC	High	1996		
	Seek expressions of interest regarding development of "Robinson's" Lease area of James Patterson Street.	LaWC	High	1996		
4.2	Detailed investigation of sand drift and long term impact on conservation value and resource allocation.	See 2.2	High	1996		
	Identify areas for rationalising sand mining activities within the transgressive dunal system having regard to nature of sand drift and conservation value of the area.	See 2.2	High	1996		
	Ensure that access to underground water reserves is available to HWC or its successor and that landuse management does not adversely affect water quality.	See 2.2	High	1996		
	Extension of the Water Reserve be resolved.	HWC/LAWC	High	1996		

ANNA BAY						
Sub-Precinct No.	Action	Responsibility	Priority	Timing	Cost	Recurring Cost
4.2	Rehabilitation of degraded areas to promote a flora/fauna corridor.	LaWC	Medium	1997		
4.3	Promote Nelson Bay Road as a tourist gateway to Port Stephens.	PSC/RTA	Medium	1997		
	Forested road corridor to be maintained with Nelson Bay Road realignment proposal.	RTA/PSC	Medium	1997		

5.5 IMPLEMENTATION OPTIONS

It is most important that the approved management strategies for Stockton Bight can be effectively implemented either through the existing legislative framework or an alternative mechanism. It is evident from a reading of the Action Plan that several Government agencies will be responsible for implementation of a range of measures. While Port Stephens Council will play the most significant role, other agencies, in particular LaWC, Water Resources, HWC and Mineral Resources will play major roles in overseeing the implementation of the Management Plan.

Five organisational models were examined and the strengths and weaknesses of each discussed with the Consultative Committee and Government Agencies. All five models assume that a new LEP is gazetted which gives effect to the Management Plan. The LEP would include all lands in the Study Area and include the Nelson Bay Road corridor.

MODEL NO.1 STATE RECREATION AREA AND COUNCIL COMMITTEE

This model proposes that the land held in public ownership lying north of Cox's Lane be proclaimed a State Recreation Area pursuant to Division 1A of National Parks and Wildlife Act 1974.

These provisions provide for:

- mining of the land;
- retention of existing leases, reservations etc;
- management of the land in accordance with an approved management plan.

The SRA would be administered by National Parks and Wildlife Service.

The private lands would be managed by Port Stephens and Newcastle Councils via a joint Council committee established under the Local Government Act, 1993. This committee would comprise Councillors and staff, citizens, landowners, interest groups and one trustee of the SRA. The role of this committee would be to advise Council on the implementation of the Management Plan and provide advise on various development applications within the area covered by the Management Plan.

Strengths

- Coastal land administered through existing legal framework.
- Responsibilities defined on land ownership.
- Recreational activities could be administered by LaWC or Port Stephens Council.
- State Government responsible for administration and management i.e. not at cost of local residents.
- Body of management expertise available through NPWS and Councils.
- Resource bodies could liaise directly with LaWC re: resource utilisation.
- Royalties from sand could off-set management costs.

Weaknesses

- Implementation of management strategies split in two.
- Existing unco-ordinated approach to land management would continue.
- Council still the determining authority for resource utilisation in State Recreation Area, unless specifically excluded by legislation.
- Resolution of sand extraction management would be more complex ie. public v's private land management systems.
- Proponents of activities which traverse both land systems would require approvals from two separate bodies.
- No appointment of trustees to provide ongoing input from stakeholder groups and local community.

MODEL NO.2 CROWN RESERVE AND COUNCIL COMMITTEE

This model proposes that the land held in public ownership lying north of Cox's Lane be dedicated as a Crown Reserve pursuant to Part 5 of *Crown Lands Act 1989*.

These provisions provide for the establishment of a dedicated reserve trust. A reserve trust is charged with the care, control and management of the reserve of which it is appointed trustee. The reserve may be administered by either:

- a trust board with between 3 and 7 members appointed by the Minister;
- a corporation or a council appointed by the Minister; or,
- an administrator appointed by the Minister.

Preference is for the establishment of a trust board with trustees representing recreational, conservation, tourism and sand mining interests.

The private lands would be managed by Port Stephens and Newcastle Councils via a joint Council committee established under the Local Government Act, 1993. This committee would comprise Councillors, citizens, landowners, interest groups and one reserve trust member. The role of this committee would be to advise Council on the implementation of the Management Plan and provide advice on various development applications within the area covered by the Management Plan.

Strengths

- Coastal land administered through existing legal framework.
- Responsibilities defined on land ownership.
- Recreational activities would be administered by the reserve trust and Port Stephens Council.
- State Government responsible for administration and management i.e. not at cost of local residents.

- Body of management expertise available through LaWC, NPWS and Councils.
- Resource bodies could liaise directly with the trust re: resource utilisation.
- Royalties from sand could off-set management costs.
- Appointment of trustees to provide ongoing input from stakeholder groups and local community.

Weaknesses

- Implementation of management strategies split in two.
- Existing unco-ordinated approach to land management may continue.
- Council still the determining authority for resource utilisation in the dedicated reserve, unless specifically excluded by legislation.
- Resolution of sand extraction management would be more complex ie. public v's private land management systems.

Proponents of activities which traverse both land systems would require approvals from two separate bodies.

MODEL NO.3 STOCKTON BIGHT MANAGEMENT TRUST

This model involves the establishment of the Stockton Bight Management Trust. This body would be set up under its own legislation and comprise representatives of major interest groups similar to the *Hunter Catchment Management Trust*. The Trust would be responsible for land management of the Study Area and the Nelson Bay road corridor. The Trust would not override Council's planning powers, however, certain development proposals would require the concurrence of the Trust. The Trust would be financed through a local land rate collected by the Councils. Alternatively, funds could be raised through a special levy on sand extraction. The role of the Trust would be to co-ordinate the implementation of the Management Plan, direct research, assist in the resolution of landuse conflict and provide for the Bight's long term sustainability.

Strengths

- Only one body responsible for the implementation of the Management Plan.
- LaWC's role not compromised by not having to wear two hats i.e. land owner and resource allocator.
- Provides an independent and solely focused organisation.
- Financially self sufficient.
- Can co-ordinate various competing user groups.
- Marketing and promotional benefits.
- Acknowledges management issues extend beyond public/private landuse.

Weaknesses

- New legislation required.
- Establishment of an additional bureaucracy.
- Removal of management role away from LaWC and Council.
- Possible lack of accountability in decision making.

MODEL NO.4 STOCKTON BIGHT CATCHMENT MANAGEMENT AND SAND DRIFT COMMITTEE

This Model retains the existing management team and organisation structure.

Planning and landuse management of Stockton Bight is co-ordinated through an inter-governmental committee administered by LaWC (the Stockton Bight Catchment Management and Sand Drift Committee). This committee comprises representatives from:

- Department of Water Resources;
- Newcastle and Port Stephens Councils;
- LaWC;

- Department Public Works;
- Department of Planning;
- Hunter Water Corporation;
- Department of Mineral Resources;
- Department of Defence;
- NPWS; and
- Hunter Valley Catchment Management Trust.

The committee's mandate would be expanded to include the implementation of the Management Plan.

Strengths

- Committee already established.

Weaknesses

- Lack of resources to implement plan.
- LaWC as major land owner would continue to play major management role.
- Inability for Committee to take proactive stance on land management issues i.e. existence not recognised by legislation, role not defined.
- Influence over Council's development control process may not be significant.
- Possibly not able to administer funds in its own right.
- Ability to promote the area or defend it against various pressures is questioned.

MODEL NO. 5 NATIONAL PARK AND COUNCIL COMMITTEE

This model proposes that the land held in public ownership be dedicated as a National Park Pursuant to the NSW National Parks and Wildlife Act, 1974 (as amended).

The Park would be under the care, control and management of the NSW National Parks and Wildlife Service.

The private lands would be managed by Port Stephens and Newcastle Councils via a joint Council committee established under the Local Government Act, 1993. This committee would comprise Councillors, citizens, landowners and interest groups. The role of this committee would be to advise Council on the implementation of the Management Plan and provide advice on various development applications within the area covered by the Management Plan.

Strengths

- Coastal land administered through existing legal framework.
- Responsibilities defined on land ownership.
- All activities would be administered by the NPWS.
- State Government responsible for administration and management i.e. not at cost of local residents.
- Body of management expertise available through NPWS.
- Provides a high profile for tourism marketing.
- Maintenance of access to Water Reserves.

Weaknesses

- Implementation of management strategies split in two.
- Perceived incompatibility of National Park with recreational vehicles and sand extraction activities.
- Perceived legislative difficulties regarding compatibility and ongoing flexibility of resource utilisation within a National Park.
- No appointment of trustees to provide ongoing input from stakeholder groups and local community.
- In the context of an existing multi-use area a National Park model is not likely to provide flexibility to enable ongoing rationalisation of sand extraction as a means of ameliorating sandrift on public land.

- Potential for payment of compensation to existing sand extraction operations on public land.
- The existing range of recreational uses occurring through the entire Bight are likely to be rationalised and reduced.
- Availability of long term funding for rehabilitation of dunal system and implementation of management strategy.

5.6 DISCUSSION OF PREFERRED OPTION

All of the five options have merit and would be effective in implementing the Management Plan. Each of the options needs to be assessed against several criteria these being:

- A. Compatibility with existing legislation.
- B. Effectiveness and flexibility in resolving land use management.
- C. Marketing impact.
- D. Cost/benefit.
- E. Local autonomy in land management.

Values from 1 (lowest) to 5 (highest) have be placed against each criteria for each option.

Option	Criteria					Total
	A	B	C	D	E	
1	4	4	3	2	4	17
2	5	4	4	2	4	19
3	2	5	3	2	5	17
4	3	2	1	4	3	13
5	5	2	5	3	1	16

While the above approach is fairly crude, it does highlight that there is little difference between each of the options. Option 2 scores highest, however, Options 1, 3 and 5 cannot be discounted.

All models examined have relative strengths. The most identifiable weakness is the legislative framework required to enact the recommended management strategy. While not a prerequisite it is necessary to more closely examine models which pose the least number of barriers to implementation.

On the basis of this somewhat crude assessment of alternate models, Model No. 2 is revealed as having the least barriers to implementation and is therefore the favoured option. A dedicated Crown Reserve offers a similar level of future security for the Bight as a National Park while enabling ongoing stakeholder and local community involvement in its management.