ngh environmental

PITTWATER COUNCIL

Review of Environmental Factors

Document Verification

ngh environmental
planning • assessment • ems • auditing

Job title: Proposed trial of an unleashed dog swimminig area at Station Beach, Palm Beach

Document Title	REF
File Name	\\SYDSERVER\SydActive\Projects-Sydney\2008\Pittwater Council\Unleashed dog area Palm Beach REF\REF\REF v1.doc

Revision	Date	Prepared by		Checked by		Approved by	
Draft v1	5.12.2008	name	Raphael Morgan	name	Natascha Arens	name	Natascha Arens
		name		name		name	

ngh environmental
planning • assessment • ems • auditing

206/410 elizabeth st ***surry hills*** *nsw 2010* ***australia*** ***t*** *61 2 8202 8333* ***f*** *61 2 9211 1374*

web*: www.nghenvironmental.com.au* ***email****: ngh@nghenvironmental.com.au*

1/216 carp street (po box 470) ***bega*** *nsw 2550* ***australia*** ***t*** *61 2 6492 8333* ***f*** *61 2 6494 7773*

102/63-65 johnston st ***wagga wagga*** *nsw 2650* ***australia*** ***t*** *61 2 6971 9696* ***f*** *61 2 6971 9693*

suite 4/4, 234 naturaliste terrace ***dunsborough*** ***wa*** *6281* ***australia*** ***t*** *61 8 9759 1985* ***f*** *61 2 6494 7773*

Table of Contents

1 INTRODUCTION

1.1 PROJECT IDENTIFICATION

Pittwater Council is proposing to trial an unleashed dog swimming area at Station Beach, Palm Beach. The proposed site for the trial is approximately 600m long and within the southern end starting at Beach Road and ending at Carmels Boat Shed in the north (Figure 1-1; Appendix A for site photos). The beach is approximately 20m wide at low tide and is bordered by the Palm Beach Golf Course to the east and Pittwater to the west. The Proposal site is located in proximity of Barrenjoey Aquatic Reserve which lies to the north. Extensive seagrass beds are located along the Proposal site and the surrounding area is potential habitat for resident and migratory shorebirds. Residential properties are located at the southern end of Station Beach.

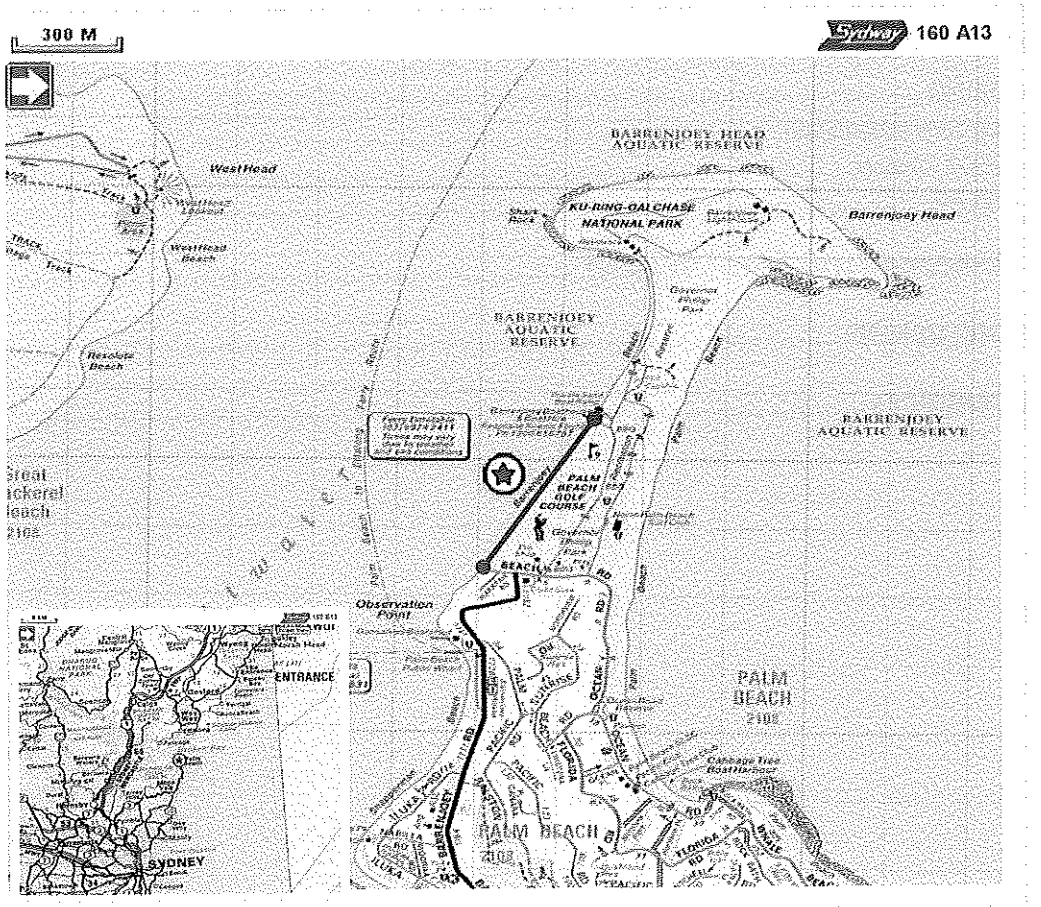

Figure 1-1. Location of Station Beach and proposed trial of an unleashed dog swimming area (indicated in red) (Source: www.street-directory.com.au)

1.2 BACKGROUND INFORMATION

Pittwater Council has a number of dog exercise areas where dogs may be left off the leash. These include Hitchcock Park at Careel Bay, Dearin Reserve in Newport, Rowland Reserve in Bayview, Deep Creek Reserve in north Narrabeen, South Mona Vale Headland in Warriewood

and Progress Park in North Narrabeen. Rowland Reserve is the only area where dogs are allowed access to the water.

A number of potential sites for a second unleashed dog swimming area within the LGA were investigated as detailed in Section 3. Following this investigation, Pittwater Council selected Station Beach to trial the Proposal. Council subsequently wrote to the Department of Primary Industries (Fisheries) (DPI Fisheries), the Department of Infrastructure, Planning and Natural Resources (DIPNR) and the Department of Crown Lands (DCL) in order to seek their comments on the proposal.

DPI and DIPNR approved the trial under certain monitoring and reporting conditions. DCL requested that a Review of Environmental Factors be prepared to assess the potential impacts of the Proposal before making any comments. Should DCL approve the trial the REF would be placed on public exhibition for comments. Council would then decide whether to proceed with the trial based on the findings of the REF and the comments received during the exhibition period.

2 STATUTORY AND PLANNING FRAMEWORK

2.1 LOCAL ENVIRONMENTAL PLANS

2.1.1 Pittwater Local Environmental Plan 1993

The proposal site is located in the Pittwater Council Local Government Area (LGA). Development in the Pittwater LGA is controlled by the *Pittwater Local Environmental Plan 1993* (Pittwater LEP). The proposed works would be undertaken on land categorised as the following:

- Below the Mean High Water Mark : 7(a1) Environment Protection Waterways
- Above the Mean High Water Mark : 6(a) Existing Recreation "A"

Under the Pittwater LEP development consent is not required for recreational activities within zone 7(a1).

For land zoned 6(a), development controls from a relevant Management Plan should be followed. The Proposal is located within the Governor Phillip Park and as such would be controlled by the relevant Plan of Management (Pittwater Council 2002). Table 3.8 of the Plan of Management indicates that unleashed dog exercise/training areas are permissible without development consent. The Proposal would also need to comply with the various strategies outlined in the Plan of Management to protect specific areas. These have been taken into account in the preparation of this REF.

2.2 REGIONAL ENVIRONMENTAL PLANS

2.2.1 Sydney Regional Environmental Plan (Hawkesbury-Nepean River) (SREP) 20

The aim of this SREP is to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context. This plan applies to the relevant areas of LGA including the Proposal site. It sets out development controls for certain types of developments additional to those from other planning instruments.

According to clause 4:

(1) The general planning considerations set out in clause 5, and the specific planning policies and related recommended strategies set out in clause 6 which are applicable to the proposed development, must be taken into consideration:

(a) by a ***consent authority*** *determining an application for consent to the carrying out of development on land to which this plan applies, and*

(b) by a person, company, public authority or a company State owned corporation proposing to carry out development which does not require development consent.

This REF has been undertaken with consideration of the General Planning Considerations, Specific Planning Policies and Recommended Strategies under Part 2 of the plan.

2.3 STATE ENVIRONMENTAL PLANNING POLICIES

No State Environmental Planning Policies apply to the Proposal.

2.4 OTHER RELEVANT LEGISLATION

2.4.1 Threatened Species Conservation Act 1995 *(TSC Act)*

An assessment of the potential impacts of the Proposal on threatened species, populations, ecological communities and critical habitat listed on the TSC Act must be undertaken in accordance with section 5A of the EP&A Act (7 part test). An assessment of potential impacts on biodiversity has been undertaken for the Proposal (Appendix B)).

2.4.2 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*

Approval by the environment minister is required if an action is likely to have a significant impact on a matter of national environmental significance or if it is listed as a matter of national significance.

Of particular concern for the Proposal, the EPBC Act protects all syngnathids (eg. pipefish, seahorses) found in Commonwealth waters, making it is an offence to kill, injure, take, trade, move or export any members of the family without a Commonwealth approval permit.

An assessment of potential impacts on biodiversity has been undertaken for the Proposal (Appendix B).

2.4.3 Fisheries Management Act 1994 *(FM Act)*

To assist in the protection of key fish habitats, the Act enables the Minister for Fisheries to make Habitat Protection Plans (HPPs) for the protection of any fish habitat, "whether the habitat is critical for the survival of the species or required to maintain harvestable populations of fish".

Habitat Protection Plan 1 – General is relevant to the Proposal. This plan includes management measures to protect various aquatic habitats such as seagrasses from damage. It outlines the process for individuals or agencies to follow when consent, notification or consultation is required.

Habitat Protection Plan 2 – Seagrass. The primary objective of this Plan is to ensure there is no net loss of seagrasses within the coastal and estuarine waters of NSW by providing guidance for certain activities.

Habitat Protection Plan 3 – Hawkesbury-Nepean River System is relevant to the Proposal. This plan includes management strategies for pollution, erosion and sedimentation, clearing of riparian or floodplain vegetation, water regulation and impeding fish passage.

Under Section 205 of the Act, the Minister's consent is required for any cutting, removal, damage or destruction of mangroves, seagrasses or any other prescribed marine vegetation (a) on Crown land, or (b) on land vested in a public authority (or trustees for public recreation or for any other public purpose), or (c) on an aquaculture lease, or (d) on the foreshore of any such land or lease.

An assessment of the potential impacts of the Proposal on threatened species, populations, ecological communities and critical habitat listed on the FM Act must be undertaken in accordance with section 5A of the EP&A Act (7 part test).

An assessment of potential impacts on biodiversity has been undertaken for the Proposal (Appendix B).

2.4.4 Companion Animals Act 1998 (CA Act)

The principal object of this Act is to provide for the effective and responsible care and management of companion animals. It includes principles for the establishment of unleashed dog areas within LGAs, responsibilities while dogs are in public spaces and management measures for dangerous dogs or special breeds.

2.5 CONFIRMATION OF STATUTORY POSITION

Pittwater council is the proponent and determining authority for this proposal. This REF fulfils the Council's obligation as the proponent under Section 111 of the *Environmental Planning and Assessment Act 1979.* By adopting the Pittwater LEP requirements the Proposal would be undertaken under Part 5 of the *Environmental Panning and Assessment Act 1979.*

3 OPTIONS CONSIDERED

Five beach/foreshore sites within the Pittwater LGA and north of the Bilgola Bends were reviewed for their suitability as an off-leash dog swimming area. Table 3-1 lists the various sites and the advantages and disadvantages of each.

Table 3-1. Options considered

Snapperman Beach	
Advantages	**Disadvantages**
Located on Pittwater west of Iluka Road. DIPNR owns the area and Council manages it. Easy access for elderly Has no environmental protection classification	Houses present along the beach without any fencing Little parking available Beach has high utlisation by small catamaran sailors, families and other recreational users

Sandy Beach	
Advantages	**Disadvantages**
Located on Pittwater west, southern end of Iluka Road. Dept. Of Lands owns the area and Council manages it. Easy access for elderly Has no environmental protection classification	Houses present along the beach without any fencing Little parking available High utilisation by other recreational users and has low jetty running from the grass reserve to the waters edge making it difficult to walk along the beach

North Palm Beach – the far northern end	
Advantages	**Disadvantages**
The beach and water up to the mean high water mark is vacant crown land available for sale or lease Adequate parking available	The beach is exposed to the open sea resulting in considerable surf Access to beach difficult for the elderly High utilisation by kite surfers, swimmers, surfboards riders, fishermen

Station Beach – northern end	
Advantages	**Disadvantages**
Located on Pittwater side of Governor Phillip Park. Dept. Of Lands owns the area and Council manages it. Adequate parking	Large seagrass beds are present offshore The area is zone 7(a1) Environment Protection Waterways High utilisation by wind surfers, swimmers, sunbathers, walkers,

	sailors and jet-skis especially on weekends and in summer. Located adjacent to National Park

Station Beach - southern end (Preferred Option)	
Advantages	**Disadvantages**
Located south of Carmels boat shed to Beach Road on the Pittwater side of Governor Phillip Park and the Palm Beach Golf Club. Department of Lands owns the area and Council manages it. Adequate parking available Easy access for the elderly	Large seagrass beds located offshore some of which are uncovered during low tides The area is zone 7(a1) Waterways Located adjacent to the golf course with no fencing Houses present at the southern end of the beach but these include high seawalls Potential risk of golf balls hitting beach users

4 CONSULTATION

4.1 GOVERNMENT AGENCIES

A number of government agencies were consulted regarding the Proposal in order to receive their approval. The agencies and their response are provided in Table 4-1.

Table 4-1. Government Agency consultation results

Government Agency	Response
DEPARTMENT OF PRIMARY INDUSTRIES (FISHERIES)	Agrees to the Proposal under the following conditions: ' A marker is placed in the water adjacent to the seagrass beds to indicate depth above the seagrass that allows dogs to swim and the depth that prohibits swimming ' Interpretive signage is placed on the beach and at the entrance to the beach outlining the rules of use and the requirements to protect seagrass and the reason that seagrass, specifically *Posidonia australis* requires protection ' Before and after surveys are conducted on the distribution and density of Posidonia australis seagrass to determine any impacts from the use as a dog swimming beach
DEPARTMENT OF LANDS	Agrees to the Proposal under the same conditions as DPI (Fisheries)
(THEN) DEPARTMENT OF INFRASTRUCTURE, PLANNING AND NATURAL RESOURCES	Agree to the Proposal under the following conditions: ' Environmental Impact Assessment (ie. REF) is required and needs to be reported back to DIPNR prior to its approval ' Public should be consulted and REF exhibited for community feedback prior to trial ' DPI (Fisheries) should be consulted ' Monitoring during the trial should be undertaken
NSW NATIONAL PARKS AND WILDLIFE SERVICES	No objection to the Proposal

4.2 COMMUNITY

A number of community groups have been in contact with Council regarding the Proposal. A summary of the results of petitions and letters received for and against the Proposal are provided in Table 4-2.

Table 4-2. Community response to the Proposal

Community group	Response
THE PALM BEACH AND WHALE BEACH ASSOCIATION INC.	Against the Proposal for the following reasons: ' Concerned about safety for public ' Concerned about impact to local residential properties ' Increase in dog faeces ' Decrease in parking availability
THE PALM BEACH GOLF CLUB LIMITED	Against the Proposal for the following reasons: ' Dogs would invade the golf course and impact its users ' Concerned about the safety to golfers and the general public ' Decrease in parking availability ' Increase in faeces
STATION BEACH PROTECTION COMMITTEE	Against the Proposal for the following reasons: ' Increased risk to the health of users of the beach due to dog faeces ' Increase risk to the safety of users due to potentially aggressive dogs ' Decrease in parking availability ' Early morning noise ' Impact to seagrass beds, water quality, shorebirds ' Against a fence along the golf course Petition singed by over 400 people. Approximately 33% of the signatures were from people living outside the Pittwater LGA including from overseas.
RESIDENTS	3 letters have been received from residents against the Proposal. The following reasons were given for their opposition: ' Increased risk to the health of users of the beach due to faeces ' Impact to seagrass beds ' Potential for spread of *Caulerpa taxifolia* ' Inconsistent with the land management principles of the Crown Lands Act 1989 ' Inconsistent with the Governor Phillip Park Plan of Management ' Difficulty of compliance
DOG OWNERS COMMITTEE	Petition for the creation of an unleashed dog area at Station Beach signed by over 300 people. The majority of the signatures are from people living in the

Community group	Response
	Pittwater LGA either at Palm Beach or Avalon.

The REF would be exhibited to the public following approval from Department of Lands.. Additional issues raised during public exhibition would be incorporated in the REF prior to final determination.

5 ENVIRONMENTAL ASSESSMENT

A preliminary environmental risk assessment has been undertaken to determine which environmental issues are relevant to the Proposal. Only those with a risk ranking of Medium or greater are further discussed in this document. Descriptions of the risk definitions and classifications are provided below.

Issue	Aspect of Proposal	Probability	Consequence	Risk Ranking	Comments
Non-indigenous Heritage	Impacts on items listed as being of heritage significance	1	1	1	Some heritage items are located in the vicinity of the site. However, the Proposal would not have any impact on these.
Aboriginal Heritage	Impacts on scarred trees, aboriginal objects or places.	1	1	1	No aboriginal items/places would be impacted by the Proposal.
Land Use	Alter the existing use of lands affected by the Proposal.	1	1	1	The site is used for recreation and as such the Proposal would not alter the existing use of the land.
Water Quality	Affect the quality of water	3	3	**9**	Potential localized impacts may arise through increase in nutrients due to dog faeces and increase in turbidity due to disturbance of sandy mud.
Geology and Soils	Cause short or long-term erosion.	3	3	**9**	Potential impacts though dogs disturbing soils along the golf course.
Air Quality and Microclimate	Affect air quality or microclimates in the locality.	2	2	4	Proposal has the potential to have a minor impact on air quality due to dog faeces.

Flora and fauna	Impact flora/fauna or their habitats.	4	3	**12**	Limited flora and fauna habitat occurs along the golf course. Large seagrass beds present along the beach. Potential for impact to shorebirds.
Waste	Generate hazardous or large quantities of waste	3	3	**9**	Potential for creation of waste through dog faces along a beach used by the public.
Noise	Cause environmental noise impacts on receivers	3	3	**9**	Barking dogs could potentially cause disturbance for residents at the southern end of Station Beach.
Visual	Impact on the visual amenity of the site	2	2	4	Proposal would not have any impact on the visual amenity of the site except for dog faeces (discussed in waste above).
Human interactions	Aggressive dogs, conflict between dog owners and other users	3	4	**12**	Potential for conflicts between dog owners and other users of the beach
Traffic and/or Parking	Impact traffic and/or parking during operation	3	3	**9**	Potential for limited parking spaces available during busy days.

Probability		**Consequence**	
Descriptor	**Description**	**Descriptor**	**Description**
Rare	An impact may occur only in extreme circumstances	**Negligible**	No adverse social or environmental impact. No noticeable impact on the community, low financial loss.

Probability		Consequence	
Descriptor	**Description**	**Descriptor**	**Description**
Unlikely	An impact could, but is unlikely to occur during the project	**Minor**	Some reversible impacts but readily managed with minimum financial cost.
Possible	An impact might occur during the project	**Moderate**	Reversible impact on environment. Impacts managed with moderate financial cost, possibly with outside assistance. Measurable adverse environmental or social impact. Will result in annoyance or nuisance to community.
Likely	An impact will probably happen during the project	**Major**	Major impact on environment, possibly irreversible. Impacts either unmanageable or managed at a high cost with outside assistance. Potential for major off site release with detrimental effects.
Almost certain	An impact is expected to occur during the project	**Catastrophic**	Significant, widespread irreversible impact on environment

Risk Matrix

		SEVERITY				
		1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic
PROBABILITY	1 Rare	1	2	3	4	5
	2 Unlikely	2	4	6	8	10
	3 Possible	3	6	9	12	15
	4 Likely	4	8	12	16	20
	5 Almost certain	5	10	15	20	25

Low Risk

Moderate Risk

High Risk

The Preliminary Environmental Risk Assessment requires the following issues to be considered in more detail:

- Water quality

- Soils
- Flora and Fauna
- Waste
- Noise
- Human interactions
- Parking

The other issues were considered to have a low risk of impact and can be managed through best management practices.

5.1 HUMAN INTERACTIONS AND SAFETY

5.1.1 Background information

Daily users of Station Beach may include residents located at the southern end, patrons of Carmels Boat Shed and users of Palm Beach Golf Course. Furthermore, the beach is likely to be regularly frequented by visitors during the holiday season and/or during the weekends. No seasonal data could be found on the number of people using Station Beach. However, a single site visit undertaken on a weekday in November 2008 by **ngh**environmental recorded 2 people walking along the beach between 10am and 3pm. It is accepted that this is not indicative of usage. Visitor numbers would be expected to be considerably higher on weekends and before and after business hours. Visitation would also be influenced by season and weather conditions.

5.1.2 Potential Impacts

Palm Beach Golf Course

The golf course and the beach are not separated by a fence and the golf course would be easily accessible to unleashed dogs.. Dogs roaming the golf course could disturb golfers..

Station Beach

Human interactions are most likely to arise along the beach. This is more likely to occur during weekends and summer holiday periods when the beach would be more frequented. The highest concern is the potential for dogs acting aggressively towards other beach users.

Van de Kuyt (2001) discusses dog behaviour and aggression in public places. He noted that in Victoria, 81% of dog attacks causing hospitalisation occur in private homes, and 43% of these incidents involved children under five years old. In comparison, only around 19% of dog attacks in public places resulted in hospitalisation of human victims (Ashby 1996 in Van de Kuyt 2001).While most dog aggression incidents in public places result in minor or no physical injuries to people, their frequency has been enough to cause public concern.

Over a two year period, six Melbourne Municipalities collected detailed information on 700 dog attack and menace incidents. An analysis of the data by the Bureau of Animal Welfare helped identify the factors involved in dog attacks in public places.

61% of dog aggression incidents involved an attack or bite and 39% involved a rush or chase.

Prior to the incident, most dogs in the survey were either inadequately confined on or near their property (51%), or wandering at large (31%). Therefore, over 80% of dog attack or menace incidents in public places occurred due to dogs not being adequately confined to the property. Only 9% of dog aggression incidents in public places occurred in parks or reserves, despite off-leash areas traditionally being a topic of community concern.

In light of these statistics it is unlikely that dogs would pose a risk at Station Beach as very few residences occur at the Proposal site and dog owners using the beach are likely to come from areas outside these residences and therefore territorial behaviour would not be an issue. While it is not possible to completely remove the risks, safeguards would be put in place to limit the usage of the beach by dog owners to strict hours and periods of the year when numbers of beach users would be low.

Shark attacks

No scientific evidence currently exists proving or refuting that dogs attract sharks at beaches.

5.1.3 *Safeguards*

- A fence would be erected between the beach and the golf course. The fence would be designed in consultation with dog owners, residents and the golf course management. The fence should be kept to a height that deters dogs without creating a barrier to other users.
- The beach would be closed to unleashed dogs during the summer holiday period and weekends after 9am.
- Records of any complaints relating to aggressive dogs during the trial period would be kept and would include the nature and circumstance of the incident (eg. chase, bite, etc).

5.2 FLORA AND FAUNA

nghenvironmental (2008) undertook an assessment of the biodiversity value of the Proposal site and the potential impact of the Proposal on biodiversity (Appendix B). The main findings of the report are presented below.

5.2.1 *Background information*

Terrestrial flora and fauna

Terrestrial vegetation is limited to the section bordering the Palm Beach golf course. Vegetation is sparse and mostly composed of mown grass, landscaped gardens and isolated trees. This vegetation provides very minimal fauna habitat. No hollow-bearing trees were observed and the ground layer is devoid of any microhabitat complexity such as fallen timber or leaf litter. At most the golf course provides roosting and nesting habitat for common native birds.

Terrestrial bird species recorded were common native species capable of using a range of disturbed urban environments (Common Koel, Noisy Miner, Australian Magpie, Galah and the introduced Common Mynah).

A Koala population is known to occur on Barrenjoey Head to the north.

Shorebirds

Station Beach is a narrow sandy beach which at low tide does not have extensive exposed mudflats. Seagrass beds exposed at low tide do provide foraging habitat for shorebirds but available foraging habitat is far more extensive at nearby Careel Bay.

Bird species observed using the beach and intertidal areas are listed below with numbers observed in parentheses.

- Masked Lapwing (2)
- Pied Cormorant (11)
- Little Pied Cormorant (3)
- Black Cormorant (1)
- Crested Tern (1)
- Silver Gull (6)

None of the species observed at the site are listed as threatened or migratory on the EPBC Act or threatened on the TSC Act.

Seagrass and Aquatic fauna

An extensive seagrass bed is located along Station Beach (Figure 3-1). Two species of seagrass were observed within 10-20m of the shoreline seagrass edge. *Posidonia australis* was not observed although it is known to occur at the site further offshore and at deeper depths.

Seagrass beds were exposed at low tide for approximately 10-15m above the low water mark. However, water depth was relatively low (<0.5m) for approximately 30m below the low water mark and it is possible that more of the seagrass would be exposed during lower tides.

Some disturbance along the seagrass edge closest to the shore line was observed as a result of trampling..

The pest macroalgal species *Caulerpa taxifolia* was not observed during the survey but it is known to occur in the area.

Aquatic fauna observed during the seagrass survey were recorded and included toadfish, hermit crabs, amphipods and jelly fish. No threatened fauna species or the protected syngnathiformes (ie. Pipefish, sea horses, sea dragons) were observed during the field survey. However, it is likely that due to the extensive and dense seagrass beds present that syngnathiformes use the area. A more comprehensive list would be obtained through the use of a variety of collecting techniques such as sediment core sampling and dip netting and by undertaking surveys at high tide as well as low tide.

5.2.2 Potential Impacts

Terrestrial flora and fauna

It is unlikely that the terrestrial component of the site provides substantial habitat for any threatened fauna species with the possible exception of marginal foraging habitat for the Bush Stone-curlew and Grey-headed flying- fox.

Grey-headed Flying-foxes are likely to rely more heavily on the vegetated peninsula and Barrenjoey Head to the north. If Grey headed Flying-foxes were present on the site they would not be impacted by the proposal as they are arboreal.

Bush Stone-curlews are known to breed at Careel Bay 3 km to the south of the site. If Bush Stone-curlews were present on the site they would be impacted by the presence of dogs as they forage and nest on the ground. A test of significance undertaken for the species revealed that the Proposal would not have a significant impact.

Shorebirds

The presence of dogs in areas inhabited by ground dwelling birds has the potential to impact in a number of ways including:

- Disturbance of roosting birds by dogs and people
- Disturbance of foraging birds by dogs and people
- Disruption to breeding/nesting birds by dogs and people
- Destruction of nests, eggs and young by trampling or dog predation
- Stress on birds through chasing by dogs
- Direct mortality
- Degradation of habitat quality

Based on the data available at the time of writing this report, Station Beach is not utilised by migratory shorebirds protected by the EPBC Act. Careel Bay, approximately 3 km to the south of the site provides extensive mudflat and mangrove habitat and is known to support migratory shorebirds. The absence of mangrove and saltmarsh vegetation and extensive mudflats means that Station Beach is sub optimal foraging habitat for waders, relative to a site like Careel Bay. For this reason it is unlikely that the Proposal would have any impact on populations of threatened or migratory shorebirds.

Bird surveys undertaken before and after a trial of an unleashed dog swimming area at Careel Bay showed that the trial had little impact on species using the site (Smith and Smith 2001). However, fewer birds were generally observed using the site after the trial. It was noted that the majority of dogs visiting the site were allowed to roam the mudflats outside the designated swimming area which could be the main reason for the declining bird numbers. This stresses the importance of restraining dogs to within designated swimming areas.

For this reason, mitigation and monitoring measures have been recommended to ensure that guidelines for use of the proposed off leash swimming area are followed to minimise impacts to birds. Rocky areas at the southern boundary of the proposal provide roosting habitat for a range bird species such as terns and cormorants and appear to support higher numbers of marine bird species than the beach itself. This area (south of Beach road) should be clearly delineated as off limits to dogs.

Seagrass and Aquatic fauna

Australian seagrasses are under threat from both natural and anthropogenic events. Loss of seagrass results in loss of critical habitat for many species, declines in coastal productivity and increased sediment instability. Potential impacts to seagrass meadows can occur through the following activities:

- An increase in nutrients through stormwater runoff and sewerage discharges. This promotes the growth of epiphytic algae and phytoplankton which reduces the amount of available light necessary for seagrass growth (Lee et al. 2007).
- A decrease in water quality from increased particles in the water column. As above this can lead to the reduction of available light reaching the seagrass (Longstaff and Dennison, 1999). Furthermore, it can lead to the smothering of the plant due to increased sedimentation (Erftemeijer and Lewis, 2006).
- Physical disturbances such as dredging, reclamation, moorings, trampling can lead to direct damage to seagrass meadows (Giulia et al. 2007, Fyfe and Davis 2007, Erftemeijer and Lewis 2006).
- The introduction of exotic species such as the introduced macroalgae *Caulerpa taxifolia* which can outcompete native species and have an impact on fish assemblages (York et al. 2006).

In NSW, seagrass is protected under the *Fisheries Management Act 1994* and it is forbidden to harm marine vegetation.

The Proposal has the potential to impact the seagrass bed along Station Beach through trampling. Physical disturbance through trampling was observed during the field survey. This disturbance, however, did not extend beyond 10 metres from the edge of the seagrass bed. The likely species to be disturbed would be *Zostera capricornii* and *Halophila sp. Posidonia australis* is known to occur further offshore and is unlikely to become fully exposed even during king tides.

The Proposal site is located close to the ocean entrance and would therefore have important tidal flushing. Impact to seagrass due to increased nutrient loading as a result of dog faeces is unlikely to occur.

Seagrass beds are known to be nursery grounds for a high number of species (Kirkman 1997, NSW DPI 2007). These include the syngnathiformes.

The Proposal is unlikely to have a direct impact on syngnathyformes or other aquatic fauna. However, it could have an indirect impact through disturbance of habitat.

5.2.3 Safeguards

- Dogs should not be allowed to walk on the seagrass beds. Dogs would be restricted to using the beach when there is a minimum of 0.5 m of water above the seagrass bed. Appropriate markers would be placed showing at what tidal height the beach would be open/closed to unleashed dogs.
- Appropriate signage would be placed at both ends of the beach indicating the importance of seagrass beds to estuarine health and the importance of mudflats as shorebird habitat. Signage should also show the potential impacts dogs may have on biodiversity.
- Dogs must be controlled by their owners and be discouraged from chasing birds.
- Appropriate bins with bag dispensers should be placed at both ends of the beach to pick up dog faeces.

- Smith and Smith (2001) stressed the potential impact unleashed dogs have on birds when left to roam outside designated swimming areas. Signage should clearly define the limits of the unleashed dog swimming area at Station Beach (from Beach Road to the south to Carmels Boat Shed to the north).
- Regular monitoring (monthly) should be undertaken at Station Beach during the trial period as well as at a nearby control site in order to determine the potential impact the trial has on seagrass and shorebirds. Specifically, monitoring should include data on the presence of shorebirds in the area, any interactions of birds with dogs and behavioural responses of birds to dogs and data on condition and extent of seagrasses.
- If threatened or migratory birds are detected at the site the trial period should be halted until further safeguards are put in place, or for the duration of the migratory species presence.
- Regular inspections by Council Rangers of the dog swimming area should be undertaken to make sure usage guidelines are being complied with.

5.3 WASTE

5.3.1 Background information

A site survey was undertaken on 13th October 2008 as part of the Biodiversity Assessment. No litter was observed at the Proposal site. Bins are provided at the northern end of the Proposal site in the vicinity of the parking area.

5.3.2 Potential Impacts

The Proposal has the potential to impact the site as a result of dog faeces. These would most likely be located either along the beach or along the golf course.

Dog faeces have the potential to have a visual impact on the proposal site as well as increase health risks of beach users, especially young children.

Hayward (2008) reviews the potential health risks posed by dog faeces. Dog faeces are potential vectors for the following parasites:

- Helminths
    - Dog roundworm. The prevalence of dog roundworms in dog faeces is low due to worming procedures.
    - Hookworms. The prevalence of hookworms in Sydney dogs in 1975 was 10%.
    - Hydatid tapeworm. Usually confined to rural areas with prevalence in urban areas low.
- Protozoans
    - Giardia. It is a most unlikely risk for man from dog faeces.
    - *Cryptosporidium parvum*. It is regarded as an extremely low risk for man from dog faeces.
- Bacteria

- *Campylobacter*. Commonly found in dog faeces overseas but rare in Canberra. Potential to cause gastro-enteritis.
- *Salmonella*. Potentially found in dog faeces but most human cases usually associated with poor food hygiene rather than contact with dog faeces.
- *Escherichia coli*. Found in all faeces and potential for contamination of waterways after heavy rains.
- *Leptospira*. It can be found in the urine of dogs but the incidence of Leptospirosis in dogs in NSW is low.

Hayward (2008) shows that while there is a health risk associated with dog faeces the probability of contamination is low for the following reasons:

- It requires direct contact with/ingestion of dog faeces. Small children would therefore be more at risk of exposure.
- The prevalence of the various parasites in dog faeces is relatively low.

It is to be noted that it is an offence, under the Companion Animals Act, for dog owners not to pick up after their dog. Despite this, dog owners do not necessarily comply with the legislation. This could be due to a number of reasons as proposed by Jackson (2000):

- Incovenience if no bag dispensers and/or bins are in proximity of the site
- Distaste at picking up faeces
- Don't care
- Threat of getting caught is low
- Not aware of potential impacts to health and/or the environment

Safeguards are proposed to remove some of these causes.

5.3.3 Safeguards

- Appropriate bin with bag dispensers should be placed at both ends of the beach to pick up dog faeces.
- Appropriate signage should be placed at both ends of the beach stressing the importance of picking dog faeces and the potential impacts faeces have to health and the environment.
- Regular inspections by Council Rangers of the Proposal site should be undertaken in order to check if guidelines are complied with.

5.4 WATER QUALITY

5.4.1 Background information

Potential pollution sources at the Proposal site include a small stormwater drain discharging to the beach just north of the Proposal site, residential properties to the south and irrigation of the Palm Beach golf course.

The Beachwatch and Harbourwatch State of the Beaches report (DECC 2006) includes data on water quality at various locations including Station Beach. Faecal coliforms and enteroeooci levels complied with swimming guidelines 100% of the time during 2005-2006 and the 5 years before. Faecal coliform levels tended to be low across all rainfall levels with only slight elevations in response to 20mm or above rain in the previous 24 hours. Enterococci levels increased with rainfall and occasionally exceeded the median guideline limit in response to 20mm or above rain in the previous 24 hours.

nghenvironmental (2008) indicated that the seagrass beds at Station Beach showed little epiphytic growth, an indication that nutrient overloading may not be an issue at the site.

The location of Station Beach close to the ocean entrance allows for important tidal exchanges that assist in maintaining high water quality. Low residential development and adjacent vegetated areas would also contribute to the relatively high quality of the water found at the Proposal site.

5.4.2 Potential Impacts

The Proposal could impact water quality through the accumulation of faeces along the beach. This could have an impact by increasing nutrients at the Proposal site. This is however, unlikely to occur as Station Beach is located close to the ocean entrance and has regular tidal exchange and subsequent flushing.

Nonetheless, the accumulation of waste could be an issue and would therefore need to be managed (refer to Section 5.3). Management of the waste would also mitigate any minor impact faeces may have on water quality.

Water quality could also be affected due to sediment disturbances. The fine sediments located below the mean low water mark could easily be disturbed as a result of trampling leading to increased turbidity. While this impact would likely be to be minor, appropriate measures would be put in place to reduce increased turbidity where seagrass occurs.

5.4.3 Safeguards

- Dogs should not be allowed to walk on the seagrass beds. Dogs would be restricted to using the beach when there is a minimum of 0.5 m of water above the seagrass bed. Appropriate markers would be placed showing at what tidal height the beach would be open/closed to unleashed dogs.

5.5 SOILS

5.5.1 Background information

Station Beach is composed of sand. Grassed soils occur on the Palm Beach Gold Course while a muddy substrate occurs in the seagrass beds located along the beach.

5.5.2 Potential Impacts

Dogs are unlikely to have any impact on the beach itself. Trampling in the muddy substrate offshore could have a potential impact on the seagrass beds. Furthermore, dogs could potentially dig up sections of the golf course.

5.5.3 Safeguards

- Dogs should not be allowed to walk on the seagrass beds. Dogs would be restricted to using the beach when there is a minimum of 0.5 m of water above the seagrass bed. Appropriate markers would be placed showing at what tidal height the beach would be open/closed to unleashed dogs.
- Dogs should be kept off the golf course through the installation of an appropriate fence between the beach and the golf course.

5.6 NOISE

5.6.1 Background information

The Proposal site was inspected as part of the biodiversity assessment which was undertaken on a weekday in November 2008. Five hours were spent at the site between 10am and 3pm. Noise emitters recorded during the inspection included boating (including personal watercrafts) and seaplanes landing and taking off.

Potential noise receivers include users of the Palm Beach Golf Course, Carmels Boat Shed and users of Station Beach. A small number of residential properties also occur at the southern end of Station Beach.

5.6.2 Potential Impacts

The Proposal could potentially impact noise receivers through the barking of dogs.

McGreevy (2004) indicates that dogs will bark for a variety of reasons including innate reasons which may subsequently be subject to learning. He also states that behavioural needs that may be poorly served in dogs that bark include exercise, company, stimulation and oral needs.

Furthermore, while some dogs bark when they are taken for a walk, most dogs will only bark when in the confinement of their home (Righetti 2004). This is likely due to the reasons stated above. Therefore, dogs will be less likely to bark at Station Beach as they will be exercised and stimulated. Furthermore, any barking would likely only have a minor impact on noise receivers due to the presence of other noise emitters at the Proposal site.

5.6.3 Safeguards

- Any complaints regarding barking dogs at Station Beach should be recorded.

5.7 PARKING

5.7.1 Background information

Parking is available at the southern and northern end of the Proposal site. Parking at the southern end includes a 25 car parking space with additional on street parking while the northern end includes over 100 parking spaces. The Parking at the southern end would most likely be used by users of Station Beach and the Palm Beach Golf course. Parking at the northern end would likely be used by users of Station Beach both north and south of Carmels Boat Shed and patrons of Carmels Boat Shed.

5.7.2 Potential Impacts

Due to the number of car spaces in the vicinity of the Proposal site it is unlikely that these would be put at stress as a result of the Proposal. However, as it is not known how many dog owners would use the site at any one time monitoring of the utilisation of parking space would be undertaken during the trial.

5.7.3 Safeguards

- Monitor parking usage by the community during the trial period.

6 ENVIRONMENTAL MANAGEMENT

The following table summarises the safeguards for each identified issue from Section 6.

Human Interactions and Safety

- A fence would be erected between the beach and the golf course. The fence would be designed in consultation with dog owners, residents and the golf course management. The fence should be kept to a height that deters dogs without creating a barrier to other users.
- The beach would be closed to unleashed dogs during the summer holiday period and weekends after 9am.
- Records of any complaints relating to aggressive dogs during the trial period would be kept and would include the nature and circumstance of the incident (eg. chase, bite, etc).

Flora and Fauna

- Dogs should not be allowed to walk on the seagrass beds. Dogs would be restricted to using the beach when there is a minimum of 0.5 m of water above the seagrass bed. Appropriate markers would be placed showing at what tidal height the beach would be open/closed to unleashed dogs.
- Appropriate signage would be placed at both ends of the beach indicating the importance of seagrass beds to estuarine health and the importance of mudflats as shorebird habitat. Signage should also show the potential impacts dogs may have on biodiversity.
- Dogs must be controlled by their owners and be discouraged from chasing birds.
- Appropriate bins with bag dispensers should be placed at both ends of the beach to pick up dog faeces.
- Smith and Smith (2001) stressed the potential impact unleashed dogs have on birds when left to roam outside designated swimming areas. Signage should clearly define the limits of the unleashed dog swimming area at Station Beach (from Beach Road to the south to Carmels Boat Shed to the north).
- Regular monitoring (monthly) should be undertaken at Station Beach during the trial period as well

Human Interactions and Safety

as at a nearby control site in order to determine the potential impact the trial has on seagrass and shorebirds. Specifically, monitoring should include data on the presence of shorebirds in the area, any interactions of birds with dogs and behavioural responses of birds to dogs and data on condition and extent of seagrasses.

- If threatened or migratory birds are detected at the site the trial period should be halted until further safeguards are put in place, or for the duration of the migratory species presence.
- Regular inspections by Council Rangers of the dog swimming area should be undertaken to make sure usage guidelines are being complied with.

Waste

- Appropriate bin with bag dispensers should be placed at both ends of the beach to pick up dog faeces.
- Appropriate signage should be placed at both ends of the beach stressing the importance of picking dog faeces and the potential impacts faeces have to health and the environment.
- Regular inspections by Council Rangers of the Proposal site should be undertaken in order to check if guidelines are complied with.

Water Quality

- Dogs should not be allowed to walk on the seagrass beds. Dogs would be restricted to using the beach when there is a minimum of 0.5 m of water above the seagrass bed. Appropriate markers would be placed showing at what tidal height the beach would be open/closed to unleashed dogs.

Soils

- Dogs should not be allowed to walk on the seagrass beds. Dogs would be restricted to using the beach when there is a minimum of 0.5 m of water above the seagrass bed. Appropriate markers would be placed showing at what tidal height the beach would be open/closed to unleashed dogs.
- Dogs should be kept off the golf course through the installation of an appropriate fence between the beach and the golf course.

Noise

- Any complaints regarding barking dogs at Station Beach should be recorded.

Parking

- Monitor parking usage by the community during the trial period.

7 CONCLUSIONS

While unleashed dog area proposals in urban areas attract attention and conflict between those for and against, this Proposal is unlikely to cause a significant impact on the environment or the community if all safeguards outlined in Section 6 are complied with. However, as most of the safeguards require that dog owners comply with the guidelines it is important that the trial be monitored and all complaints and non compliance/compliance with guidelines be recorded.

8 REFERENCES

DECC (2006). Beachwatch and Harbourwatch State of the Beaches report.

Hayward, M. (2008). Risks of Zoonoses from dogs on sporting fields.

Jackson, V. (2000). Faecal litter management - a local government priority for reasons of community health and environmental amenity. Urban Animal Management Conference Proceedings Hobart 2000

nghenvironmental (2008). Proposed trial of an unleashed dog swimming area at Station Beach, Palm Beach. Biodiversity Impact Assessment.

NSW legislation website (www.legislation.nsw.gov.au)

Pittwater Council website (www.pittwater.nsw.gov.au)

Righetti J. (2004). Barking Up the Wrong Tree: The Importance of understanding and correct diagnosis of barking in dogs. Urban Animal Management Conference Proceedings Adelaide 2004

nghenvironmental

PITTWATER COUNCIL

Biodiversity Assessment

PROPOSED TRIAL OF AN UNLEASHED DOG SWIMMING

Document Verification

Job title: Proposed trial of an unleashed dog swimminig area at Station Beach, Palm Beach

Document Title	Biodiversity Assessment
File Name	\\SYDSERVER\SydActive\Projects-Sydney\2008\Pittwater Council\Unleashed dog area Palm Beach REF\Biodiversity Assessment Report\Biodiversity Assessment draft v1.doc

Revision	Date	Prepared by		Checked by		Approved by	
Draft v1		name	Raphael Morgan and Jacqueline Coughlan	name	Jacqueline Coughlan	name	Natascha Arens
		name		name		name	

ngh environmental
planning • assessment • ems • auditing

ngh environmental
planning • assessment • ems • auditing

206/410 elizabeth st ***surry hills*** *nsw 2010* ***australia*** ***t*** *61 2 8202 8333* ***f*** *61 2 9211 1374*
web*: www.nghenvironmental.com.au* ***email****: ngh@nghenvironmental.com.au*

1/216 carp street (po box 470) ***bega*** *nsw 2550* ***australia*** ***t*** *61 2 6492 8333* ***f*** *61 2 6494 7773*

102/63-65 johnston st ***wagga wagga*** *nsw 2650* ***australia*** *t 61 2 6971 9696* ***f*** *61 2 6971 9693*

suite 4/4, 234 naturaliste terrace ***dunsborough*** ***wa*** *6281* ***australia*** *t 61 8 9759 1985* ***f*** *61 2 6494 7773*

Table of Contents

1 INTRODUCTION

Pittwater Council has a number of dog exercise areas where dogs may be left off the leash. These include Hitchcock Park at Careel Bay, Dearin Reserve in Newport, Rowland Reserve in Bayview, Deep Creek Reserve in north Narrabeen, South Mona Vale Headland in Warriewood and Progress Park in North Narrabeen. Rowland Reserve is the only area where dogs are allowed access to the water.

Pittwater Council is proposing to trial a second unleashed dog swimming area at Station Beach, Palm Beach. The proposed site for the trial is approximately 600 m long and starts at Beach Road to the south and ends at Carmels Boat Shed to the north (Figure 1-1). The beach is approximately 20 m wide at low tide and is bordered by the Palm Beach Golf Course to the east and Pittwater to the west. The Proposal site is located in proximity of Barrenjoey Aquatic Reserve which lies to the north. Extensive seagrass beds are located along the Proposal site and the surrounding area is potential habitat for resident and migratory shorebirds.

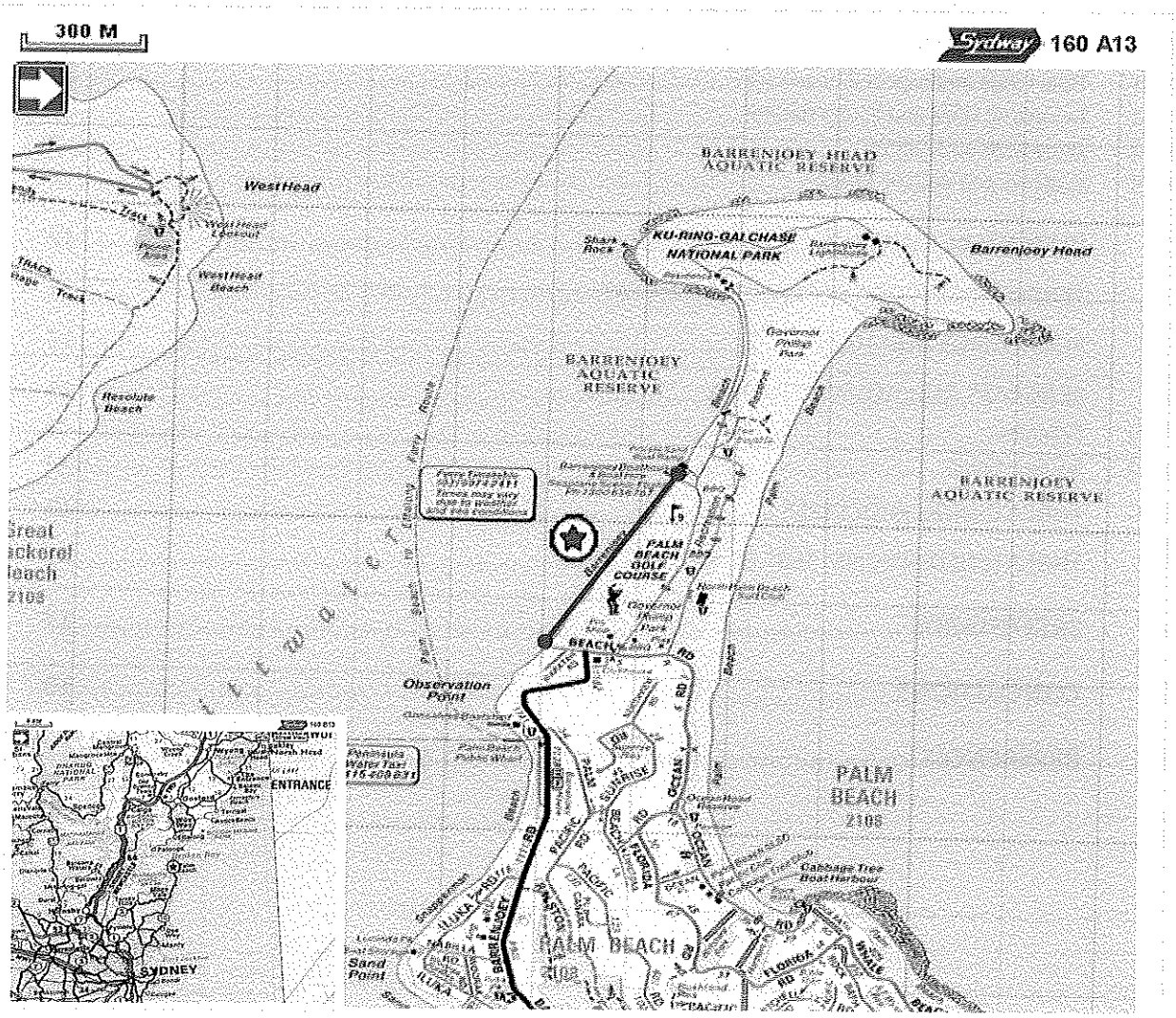

Figure 1-1. Location of Station Beach and proposed trial of an unleashed dog swimming area (indicated in red) (Source: www.street-directory.com.au)

A study has been requested by Pittwater Council in order to assess the potential impacts of the proposed trial on biodiversity at the proposed site.

This report contains the following:

- The methodology used to assess the biodiversity value of the Proposal site;
- A description of the biodiversity value of the Proposal site;
- An assessment of the potential impacts likely to arise as a result of the Proposal;
- Proposed safeguards to mitigate those impacts; and
- A conclusion as to whether or not the Proposal would have a significant impact on biodiversity.

2 METHODOLOGY

In order to describe the biodiversity value of the Proposal site and to assess the potential impacts of the Proposal on biodiversity the following was undertaken.

- **Background searches** of existing databases to identify potential threatened species using the Proposal site. The databases consulted included:
    - NSW Bionet (lists threatened and protected species under the NSW *Threatened Species Conservation Act 1995* (NSW TSC Act) and NSW Fisheries Management Act (NSW FM Act);
    - NSW Wildlife Atlas (lists threatened and protected species under the NSW TSC Act);
    - *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC) Protected Matters (lists threatened species, migratory species and endangered ecological communities on the EPBC Act).

  Background research also included a review of any potential or known sensitive ecological sites within the Proposal locality such as national parks and aquatic reserves.

  A review of relevant reports and maps covering the Proposal site and/or surrounding area was also undertaken.

- A **site survey** was undertaken to assess the biodiversity value of the site. Figure 2 shows the areas that were surveyed. The survey area was approximately 800 m long and encompassed the Proposal site (600 m) as well as a 100 m section north and south of this site.

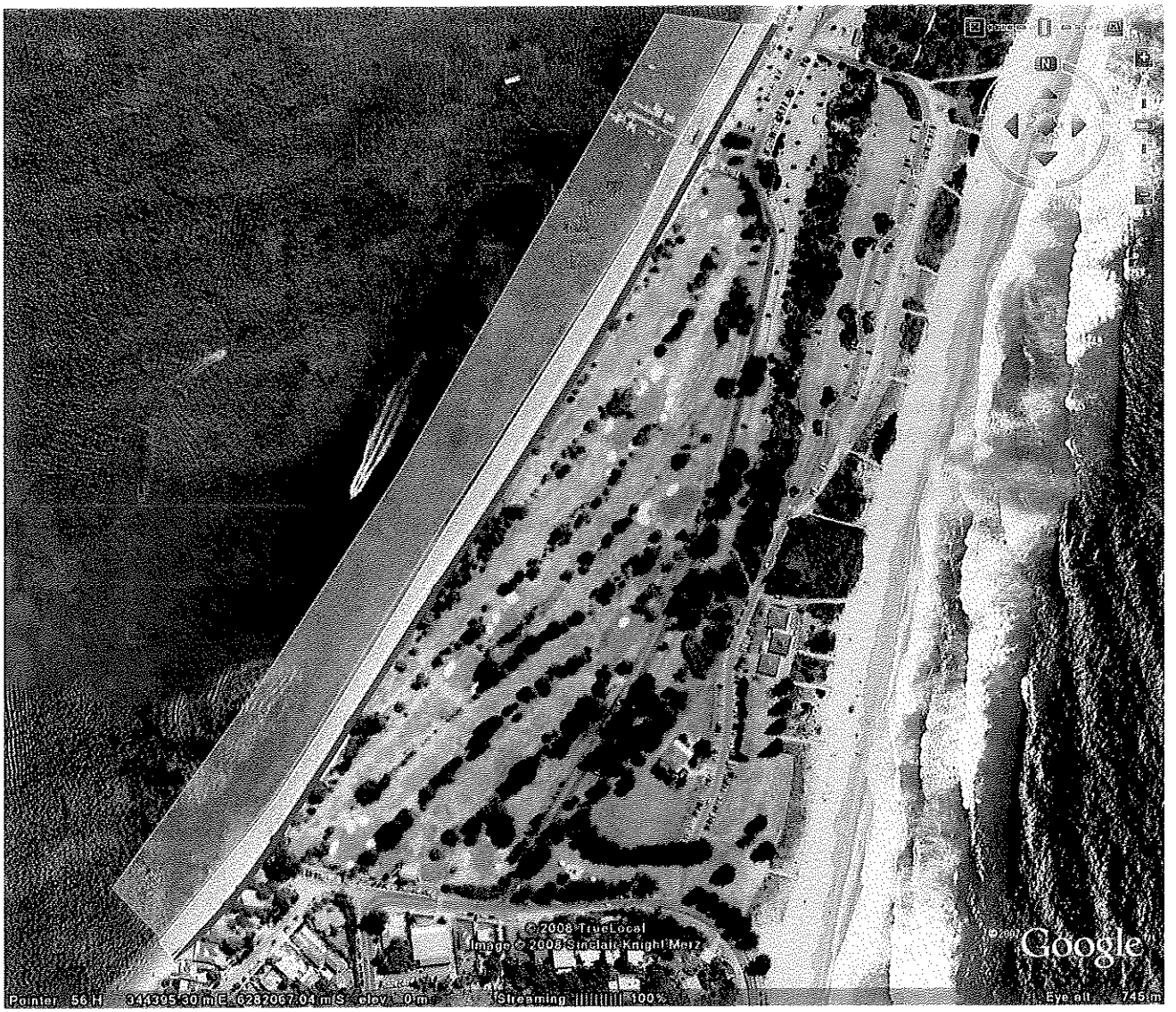

Figure 2. Site survey. Blue – seagrass survey area; Yellow – shorebird survey area; Red – Flora and fauna habitat survey area (Source: Google Earth)

The terrestrial flora and fauna habitat survey area (Figure 1 – red area) was traversed on foot by an ecologist on 13 October 2008. Notes were taken on the vegetation present and its potential as fauna habitat. Particular attention was paid to ground level which would most likely to be disturbed as a result of the Proposal.

The Shorebird survey area (Figure 1 – yellow area) was surveyed to assess the value of the site as shorebird habitat. A one-off traverse of the beach (north to south and return) was conducted in good weather conditions on 13 October 2008. The survey was conducted by an experienced ornithologist using high powered binoculars. Bird species and numbers of individuals observed during the survey were recorded. Since this one-off survey could only provide a snapshot of bird usage of the beach, site survey data was used in conjunction with survey results from nearby Careel Bay and a consideration of available habitat on the site in order to assess potential impacts of the proposal.

The seagrass area (Figure 1 – Blue area) was surveyed on foot at low tide up to 10 m out from the seagrass edge closest to the shoreline (the location of the edge of the seagrass bed was recorded every 100 m using a GPS). Every 100 m a 10 m x 10 m quadrat was surveyed and the following was recorded:

- Species of seagrass encountered;
- Seagrass coverage (%) (this was be undertaken by placing 3 random $1m^2$ quadrats within each survey area);
- Estimates of epiphyte coverage (%) (this was undertaken by placing 3 random $1m^2$ quadrats within each survey area);
- Presence of any macroalgae including *Caulerpa taxifolia* ;
- Any signs of disturbance such as trampling; and
- Fish species and other fauna encountered with target searches for syngnathiformes (seahorses, pipefish), protected under the FM Act and EPBC Act.

- Based on the results of the background searches and field surveys **an assessment of the potential impacts of the Proposal on biodiversity** was made. This included, where necessary:
  - A test of significance (in accordance with DECC Threatened Species Assessment Guidelines August 2007) for each flora and fauna species, ecological community and population listed on the TSC Act or the FM Act likely to be affected by the proposed activity.
- **Safeguards** were proposed in order to remove and/or, where that is not possible, reduce the impacts to biodiversity.

3 RESULTS

3.1 BACKGROUND SEARCHES

3.1.1 Database searches

Background searches of the NSW Bionet database, NSW Wildlife Atlas and the EPBC Act Protected Matters were undertaken on 16th October 2008. Detailed results are included in Appendix B and are summarised in Table 3-1.

Table 3-1. Results of database searches

Database	Search area	Results
NSW Bionet	Pittwater LGA	Database searches revealed 39 threatened fauna species and 17 threatened flora species
NSW Wildlife Atlas	Pittwater LGA	Database searches revealed 35 threatened fauna species and 15 threatened flora species
EPBC Act Protected Matters	5 km search radius	Database searches revealed 1 National Heritage Place, 1 Threatened Ecological Community, 36 threatened Fauna Species, 10 threatened flora species and 46 Migratory Species.

3.1.2 Report review

A number of reports contain information on biodiversity within the Pittwater LGA and the area surrounding the Proposal site in particular. The major reports are listed below according to whether they provide information on Terrestrial Flora and Fauna, Shorebirds or Seagrass and the data they provide briefly summarised.

Terrestrial Flora and Fauna

- Pittwater vegetation community mapping (Pittwater Council website). The area along Station Beach is mapped as Coastal Plains.
- Pittwater wildlife corridor map (Pittwater council website). The area along Station beach is mapped as 'mostly cleared non-residential area with good potential for improvement of habitat'.
- The Koala population in the Pittwater LGA – profile (DECC website). The endangered population occurs within the Pittwater LGA, with most recent records occurring on the Barrenjoey Peninsula.

Shorebirds

- Smith and Smith (2001) Waterbird Survey of Careel Bay. Provides information of a 2001 survey conducted in Careel Bay to the south of the site. The purpose of the survey was to compare results with those of a 1997 survey and to assess the impacts of an off-leash dog swimming area that was in operation. The report concluded that the unleashed dogs were having no adverse impacts on birds in the area. There had been no obvious loss of species from the site between the two survey periods. Important species such as the Bush Stone-curlew, Eastern Curlew and Whimbrel were all still present.

- Bush Stone-curlew Recovery Plan DECC 2006. Predation by dogs, cats and foxes are cited as causes of decline of this ground nesting species. Its preferred foraging habitat is mudflats, saltmarsh and mangroves.
- Smith and Smith (1997). Annotated bird list from 2007 Careel Bay surveys. Notes records of Bush Stone-curlews foraging on Avalon Golf Course. Also records presence of Little Penguins in the bay and breeding colony on Lion Island.

Seagrass

- NSW Comprehensive Coastal Assessment (Department of Planning 2006). Seagrass was mapped within the Pittwater Estuary by NSW Department of Primary Industries (Fisheries) as part of the Comprehensive Coastal Assessment. A large seagrass bed is located in front of Station Beach with *Zostera capricorni* being the common species along the foreshore. The introduced pest species *Caulerpa taxifolia* is also known to occur in the area.
- Seagrass Monitoring program for the Penrhyn Estuary Habitat Enhancement Plan: Selection of reference seagrass meadows (Bioanalysis 2007). The report includes some information on seagrass beds at Barrenjoey Beach (i.e. Station Beach). Seagrass along the beach include *Zostera capricorni* with *Posidonia australis* present further offshore. *Halophila sp.* was also present as well as the noxious algae *Caulerpa taxifolia*.

3.2 FIELD SURVEYS

3.2.1 Tidal range and exposed beach area

At high tide, Station Beach is reduced to a width of approximately 5m between Palm Beach Road and Carmels Boat Shed. At low tide, the exposed beach is approximately 15m-20m wide (Figure 3-2).

3.2.2 Terrestrial Flora and Fauna Habitat

Terrestrial vegetation is limited to the section bordering the Palm Beach golf course. Vegetation is sparse and mostly composed of mown grass, landscaped gardens and isolated trees. One large *Ficus* sp was recorded that when fruiting would provide foraging habitat for birds and Grey-headed Flying-foxes. However, due to its isolation this is unlikely to represent a substantial foraging resource for any species. Other tree species recorded on the site include:

- Coastal Hibiscus (Cottonwood) *Hibiscus tiliaceus*
- Sydney Golden Wattle *Acacia longifolia*
- Bottlebrush *Callistemon viminalis*
- Willow Myrtle *Agonis flexuosa*

Only the Sydney Golden Wattle is native to the region.

This vegetation provides very minimal fauna habitat. No hollow-bearing trees were observed and the ground layer is devoid of any microhabitat complexity such as fallen timber or leaf litter. As the golf course is regularly mowed and probably treated with fertilisers and pesticides it is unlikely to provide important foraging habitat for birds or other fauna. At most the golf course provides roosting and nesting habitat for common native birds. If Bush Stone-curlews were present in the area, the golf course would provide potential foraging habitat (although limited depending on insect populations). Bush Stone-curlews have been recorded further south at Careel Bay (Smith and Smith 1997 &2001). This species is known to utilise park like environments in urban areas to forage. However the

terrestrial environment of the golf course provides very little cover and is not complemented by nearby salt marsh or mangrove environments.

Terrestrial bird species recorded were common native species capable of using a range of disturbed urban environments (Common Koel, Noisy Miner, Australian Magpie, Galah and the introduced Common Mynah).

A Koala population is known to occur on Barrenjoey headlands to the north. The Proposal site does not offer habitat for this threatened species.

It is unlikely that the terrestrial component of the site provides habitat for any threatened fauna species (with the possible exception of marginal foraging habitat for the Bush Stone-curlew and Grey-headed flying- fox as noted above).

3.2.3 Shorebirds and habitat

Station Beach is a narrow sandy beach which at low tide does not have extensive exposed mudflats. Seagrass beds exposed at low tide do provide foraging habitat for shorebirds but available foraging habitat is far more extensive at nearby Careel Bay. Bird species observed using the beach and intertidal areas are listed below with numbers observed in parentheses. A pair of Masked Lapwings was observed foraging in the seagrass exposed by the receding tide. The other species were all observed roosting on large rocks in the southern extreme of the study area, south of Beach Road.

- Masked Lapwing (2)
- Pied Cormorant (11)
- Little Pied Cormorant (3)
- Black Cormorant (1)
- Crested Tern (1)
- Silver Gull (6)

None of the species observed at the site are listed as threatened or migratory on the EPBC Act or threatened on the TSC Act. A population of Little Penguin – a listed marine species on the EPBC Act, is known from Lion Island to the north of Station Beach and birds from this breeding colony have been recorded at Careel Bay. There are currently no records of the species in the vicinity of Station Beach and the beach does not provide any suitable breeding habitat. A breeding pair of Bush Stone-curlews is known form Careel bay (Smith and Smith 2001) but none have been recorded from Station Beach.

3.2.4 Seagrass and aquatic fauna

A survey of the seagrass bed occurring along Station Beach was undertaken during low tide on 13th October 2008. Low tide was at 13h48 (0.34 m). Figure 3-2 illustrates the study area, the location of the quadrats, the low water mark and high water mark.

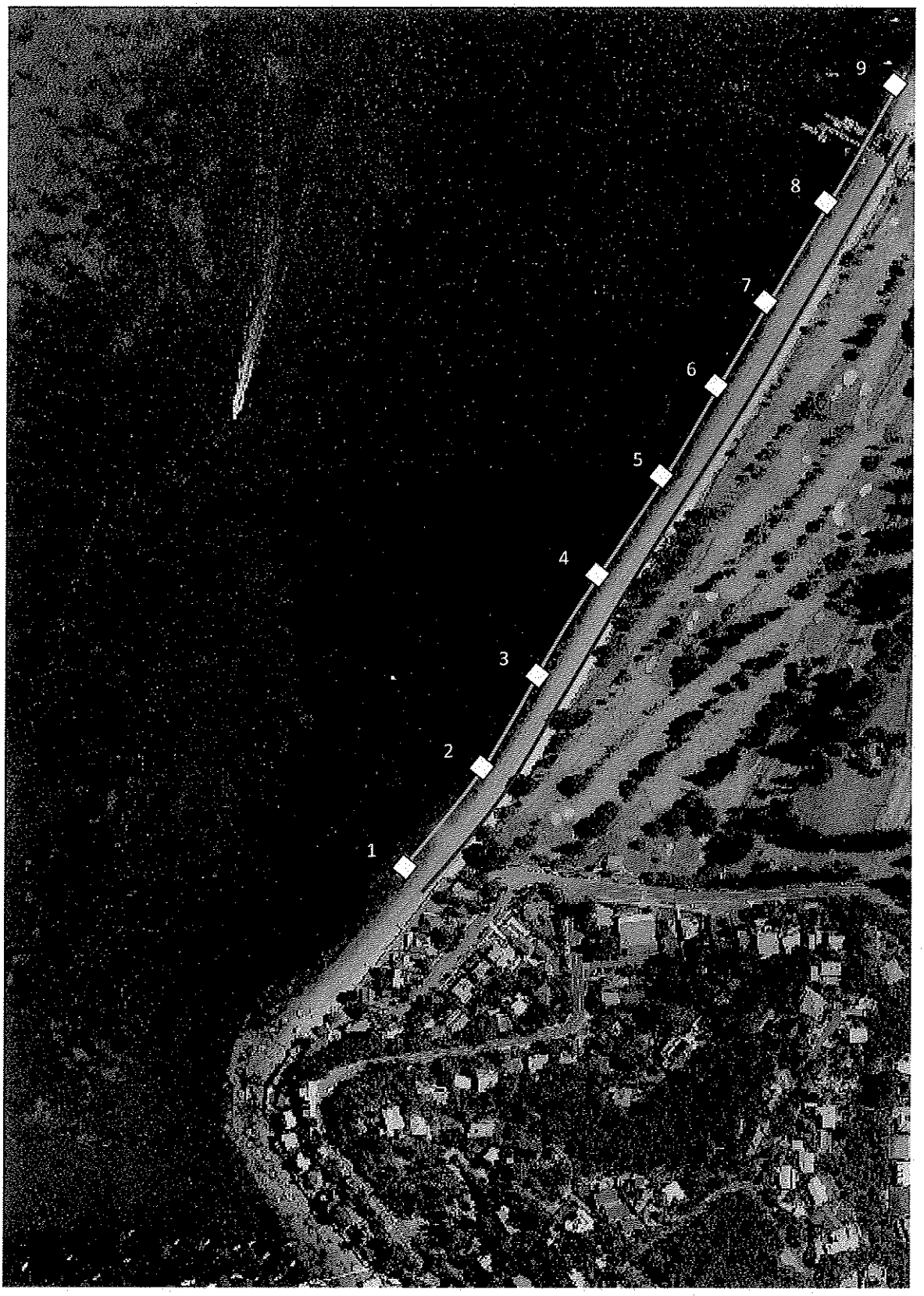

Figure 3-2. Aerial photograph of the Proposal site in 2005 showing low water mark (blue line), high water mark (red line) and location of 10mx10m survey quadrats. (Source: Pittwater Council).

Seagrass

An extensive seagrass bed is located along Station Beach (Figure 3-1). Two species of seagrass were observed within 10-20 m of the shoreline seagrass edge (*Zostera capricorni* and *Halophila sp). Z. capricorni* was the most common species observed with *Halophila* only encountered at two occasions (Table 3-1). *Posidonia australis* was not observed although it is known to occur at the site further offshore and at deeper depths (Bioanalysis 2007). *Posidonia* wrack was observed along the shore.

Seagrass beds were exposed at low tide for approximately 10-15m above the low water mark. However, water depth was relatively low (<0.5m) for approximately 30 m below the low water mark and it is possible that more of the seagrass would be exposed during lower tides. Table 3-1 summarises the results of the seagrass survey within each quadrat undertaken along Station Beach.

Table 3-1. Results of seagrass quadrat surveys (Z: Zostera; H: Halophila; SD: Standard Deviation)

Quadrat (from south to north)	Seagrass Species	Zostera Coverage (average based on three 1m^2 quadrats)	Epiphyte Coverage	Other observations
1	Z, H	82%	5%	
2	Z	62%	5%	Drift macroalgae
3	Z	52%	5%	Drift macroalgae
4	Z	38%	5%	
5	Z	25%	4%	Drift macroalgae
6	Z	28%	4%	Drift macroalgae
7	Z	45%	5%	Trampling observed; Drift macroalgae
8	Z, H	38%	4%	Trampling observed
9	Z	50%	1%	Drift macroalgae

The seagrass bed along the foreshore of Station Beach is continuous and dense and in good condition with low epiphytic growth observed. Some drift macroalgae were observed along the shoreline and consisted of *Ecklonia radiata* fronds and *Sargassum* sp. *Caulerpa taxifolia* was not observed during the survey but it is known to occur in the area (Bioanalysis 2007). Some disturbance was observed as a result of trampling along the seagrass edge close to the shore line.

Aquatic Fauna

Aquatic fauna observed during the seagrass survey included:

- Amphipods
- Jelly Fish
- Hermit Crab *Pagurus sinuatus*

- Shrimp
- Toadfish *Tetractenos hamiltonii*

No threatened species or the protected syngnathiformes were observed during the field survey. However, it is likely that syngnathiformes use the area due to the extensive and dense seagrass beds present.

A more comprehensive list would be obtained through the use of a variety of collecting techniques such as sediment core sampling and dip netting and by undertaking surveys at high tide as well as low tide.

4 POTENTIAL IMPACTS

4.1 TERRESTRIAL FLORA AND FAUNA HABITAT

Terrestrial environments at the site currently comprise a highly altered environment of golf course with vegetation dominated by landscape plantings of exotic trees and mown lawns. Therefore the site provides minimal fauna habitat. It may potentially be used from time to time by the threatened species Grey-headed Flying-fox and Bush Stone-curlew however there are no known records of these species from the site. Grey-headed Flying-foxes are likely to rely more heavily on the vegetated peninsula and Barrenjoey Head to the north. If Grey headed Flying-foxes were present on the site they would not be impacted by the proposal as they are arboreal. Bush Stone-curlews are known to breed at Careel Bay 3 km to the south of the site. If Bush Stone-curlews were present on the site they would be impacted by the presence of dogs as they forage and nest on the ground. For this reason mitigation and monitoring measures have been recommended in Section 5 in the event that Bush Stone-curlews are ever recorded at the site and an assessment of significance (7 part test) is provided in Appendix D.

The site does not support suitable habitat for koalas. Koalas are known from Barrenjoey Head to the north but are unlikely to use the site.

4.2 SHOREBIRDS AND HABITAT

Wetlands are the preferred foraging habitat of hundreds of bird species known as waders (or shorebirds). In particular, waders rely on intertidal wetlands where they forage on shrimps, crabs, shellfish and worms (Barter 2003). Many of these bird species migrate on a regular annual basis between their Northern hemisphere summer breeding grounds in arctic tundra habitats of Siberia and Alaska to their overwintering sites in the southern hemisphere. On this journey they pass through many stopover points, known as staging posts, where they rest and feed before resuming their journey. The migratory pathway that is routinely followed in every annual migration is known as a flyway. Australia is part of the East Asian-Australasian Flyway. Important wetland sites occur in coastal and inland areas around Australia and support both resident and migratory bird populations. The highest numbers of wetland birds occur in eight inland and two coastal sites in Australia (Nebel *et al* 2008).

Based on the data available at the time of writing this report, Station Beach is not utilised by migratory shorebirds protected by the EPBC Act. Careel Bay, approximately 3 km to the south of the site provides extensive mudflat and mangrove habitat and is known to support migratory shorebirds. The absence of mangrove and saltmarsh vegetation and extensive mudflats means that Station Beach is sub optimal foraging habitat for waders, relative to a site like Careel Bay. For this reason it is unlikely that the Proposal will have any impact on populations of threatened or migratory shorebirds.

The presence of dogs in areas inhabited by ground dwelling birds has the potential to impact in a number of ways including:

- Disturbance of roosting birds by dogs and people;
- Disturbance of foraging birds by dogs and people;
- Disruption to breeding/nesting birds by dogs and people;
- Destruction of nests, eggs and young by trampling or dog predation;
- Stress on birds through chasing by dogs;
- Direct mortality; and

- Degradation of habitat quality

Bird surveys undertaken before and after a trial of an unleashed dog swimming area at Careel Bay showed that the trial had little impact on bird species using the site (Smith and Smith 2001). However, fewer birds were generally observed using the site after the trial. It was noted that the majority of dogs visiting the site were allowed to roam the mudflats outside the designated swimming area which could be the main reason for observed decline in bird numbers. This stresses the importance of restraining dogs to within designated swimming areas and discouraging dogs from chasing birds.

For this reason, mitigation and monitoring measures have been recommended to ensure that guidelines for use of the proposed off leash swimming area are followed to minimise impacts to birds. Rocky areas at the southern boundary of the proposal provide roosting habitat for a range bird species such as terns and cormorants and appear to support higher numbers of marine bird species than the beach itself. This area (south of Beach road) should be clearly delineated as off-limits to dogs.

4.3 SEAGRASS AND AQUATIC FAUNA

4.3.1 Seagrass

Seagrasses are marine flowering plants which reproduce by producing flowers fertilised from pollen, producing seeds or seedlings.

Seagrasses play a number of key functions (Kirkman 1997, NSW DPI 2007):

- Seagrass meadows are the nursery grounds for many of Australia's commercial fish and crustacean species. The juveniles come into the seagrass meadows for protection against predators, to feed on the epiphytes growing on seagrass plants and to feed on the organic detrital rain that falls into the meadow from the water above.
- Seagrass leaves act as a filter; the strap-like leaves of seagrass plants slow the overlying water thus allowing any sediment that is suspended in the water to fall out into the seagrass meadow.
- The extensive rhizome systems of most seagrass meadows stabilise the underlying sediment and prevent sediment movement. Many beaches, channels and sandy bottoms are stabilised by seagrass rhizomes.
- Seagrass meadows play an important part in the cycling of nutrients and in the food web of inshore coastal areas.

Generally, seagrass meadows fringe the shorelines of many coastal areas. The meadows cannot withstand great energy from swell or waves so they are usually found in sheltered bays, estuaries or within the lee side of reefs or other barriers. The shallower edge of seagrass meadows is limited by water depth and the ability of plants to withstand breaking waves. The deeper edge is limited by light (Kirkman 1997).

Seagrass meadows located along beaches reduce sand erosion or accretion and maintain high water quality. While the seagrass meadows are sometimes considered a nuisance because of the accumulation of wrack on nearby beaches this is the source of nutrients for offshore communities and supports part of the food web of this marine environment (Kirkman 1997).

Australian seagrasses are under threat from both natural and anthropogenic events. Loss of seagrass results in loss of critical habitat for many species, declines in coastal productivity and increased sediment instability. Potential impacts to seagrass meadows can occur through the following activities:

- An increase in nutrients through stormwater runoff and sewerage discharges. This promotes the growth of epiphytic algae and phytoplankton which reduces the amount of available light necessary for seagrass growth (Lee *et al.* 2007).
- A decrease in water quality from increased particles in the water column. As above this can lead to the reduction of available light reaching the seagrass (Longstaff and Dennison, 1999). Furthermore, it can lead to the smothering of the plant due to increased sedimentation (Erftemeijer and Lewis, 2006).
- Physical disturbances such as dredging, reclamation, moorings, trampling can lead to direct damage to seagrass meadows (Giulia et al. 2007, Fyfe and Davis 2007, Erftemeijer and Lewis 2006).
- The introduction of exotic species such as the macroalgae *Caulerpa taxifolia* which can outcompete native species and have an impact on fish assemblages (York et al. 2006).

In NSW, seagrass is protected under the *Fisheries Management Act 1994* and it is forbidden to harm marine vegetation. To assist in the protection of key fish habitats, the Act enables the Minister for Fisheries to make Habitat Protection Plans (HPPs) for the protection of any fish habitat, "whether the habitat is critical for the survival of the species or required to maintain harvestable populations of fish":

- Habitat Protection Plan 1 – General. This plan includes management measures to protect various aquatic habitats such as seagrasses from damage. It outlines the process for individuals or agencies to follow when consent, notification or consultation is required.
- Habitat Protection Plan 2 – Seagrass. The primary objective of this Plan is to ensure there is no net loss of seagrasses within the coastal and estuarine waters of NSW by providing guidance for certain activities.

The Proposal has the potential to impact the seagrass bed along Station Beach through trampling. Physical disturbance through trampling was observed during the field survey. This disturbance, however, did not extend beyond 10 metres from the edge of the seagrass bed. The likely species to be disturbed would be *Zostera capricornii* and *Halophila* sp. *Posidonia australis* is known to occur further offshore and is unlikely to become fully exposed even during king tides.

The Proposal site is located close to the ocean entrance and would therefore have important tidal flushing. Impact to seagrass due to increased nutrient loading as a result of dog faeces is unlikely to occur.

4.3.2 Aquatic fauna

Seagrass beds are known to be nursery grounds for a high number of species (Kirkman 1997, NSW DPI 2007). There are currently up to 31 syngnathids (seahorse, pipefish, pipehorse and seadragon), four solenostomids (ghostpipefish) and two species of pegasids (seamoths) that are known to exist in NSW waters. Three of these species, the White's seahorse *Hippocampus whitei*, Coleman's Seahorse *Hippocampus colemani* and the pygmy pipehorse *Idiotropiscis sp*, are endemic to NSW.

Syngnathiformes have become vulnerable to human impacts due to continued degradation of their habitats and increasing overseas demand for their use in traditional Chinese medicines and as tourist souvenirs. The ornamental live fish trade has similarly contributed to localised overfishing in some traditionally fished parts of Southeast Asia, especially the Philippines. A decline in seahorse populations in many Asian countries has led to increased pressure on local populations in Australia for trade purposes and hence the need for protection against commercial harvesting.

Syngnathiformes are listed as "protected" under the NSW FM Act. It is an offence to have in your possession, collect or harvest any species of seahorse, seadragon, pipefish, pipehorse, ghostpipefish or seamoths in NSW without a permit. Furthermore, the EPBC Act protects all syngnathids found in Commonwealth waters, making it

an offence to kill, injure, take, trade, move or export any members of the family without a Commonwealth approval permit.

The Proposal is unlikely to have a direct impact on syngnathyformes or other aquatic fauna. However, it could have an indirect impact through disturbance of their habitat (refer to Section 4.3.1).

4.4 THREATENING PROCESSES

The schedules of the *Threatened Species Conservation Act 1995* (TSC Act), *Fisheries Management Act 1994* (FM Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) contain a listing of key threatening processes.

Of the key threatening processes only one listed under the FM Act is relevant to the Proposal:

- Introduction of non-indigenous fish and marine vegetation to the coastal waters of New South Wales

This process has the potential to be triggered should non-indigenous marine vegetation, such as *Caulerpa taxifolia*, be present at the Proposal site. The Proposal could introduce non-indigenous marine vegetation in non infested areas in the following ways:

- Dogs could disturb infested areas, detaching vegetation from the substrate which could drift to non infested areas; or
- Dogs could disturb infested areas and act as carriers moving vegetation from infested areas to non infested areas

The field survey did not identify any non-indigenous marine vegetation at the Proposal site and as such it is unlikely, at this point in time, that the key threatening process would be triggered as a result of the Proposal. Infestations, however, could occur in the future and as such need to be considered in terms of monitoring and management.

4.5 THREATENED SPECIES: TEST OF SIGNIFICANCE

Appendix C provides an assessment of the likelihood that threatened and migratory species revealed through background searches occur at the site. The assessment revealed that five species have the potential to occur at the Proposal site and of these one has the potential to be impacted by the Proposal. Table 4-1 summarises the results.

Table 4-1. Threatened species

Common name	Scientific name	Listing	Likelihood of occurrence	Potential for impact
Fauna				
Bush Stone-curlew	*Burhinus grallarius*	E-TSC	Possible	Yes
Australian Grayling	*Prototroctes maraena*	V-EPBC	Possible	No
Grey headed Flying-fox	*Pteropus poliocephalus*	V-TSC, V-EPBC	Vagrant	No
Green Turtle	*Chelonia mydas*	V-TSC, V-EPBC, Migratory	Vagrant	No

Common name	Scientific name	Listing		Likelihood of occurrence	Potential for impact
Leathery Turtle	*Dermochelys coriacea*	V-TSC, Migratory	V-EPBC,	Vagrant	No

A test of significance has been undertaken for Bush Stone-curlew in accordance with the TSC Act (Refer to Appendix D for results). The test concluded that the Proposal is unlikely to have a significant impact on the Bush Stone-Curlew.

5 SAFEGUARDS

In order to mitigate against potential impact to biodiversity the following safeguards are proposed for the operation of the trail of-leas dog swimming area at Station Beach:

- Dogs should not be allowed to walk on the seagrass beds. A minimum of 0.5 m of water would need to be kept above the seagrass bed when dogs have access to the beach. Appropriate markers would need to be placed showing at what tidal height the beach would be open/closed to unleashed dogs.
- Appropriate signage would need to be placed at both ends of the beach indicating the importance of seagrass beds to estuarine health and the importance of mudflats as shorebird habitat. Signage should also show the potential impacts dogs may have on biodiversity, and in particular dogs should be discouraged from chasing birds.
- Appropriate bins and bag dispensers should be placed at both ends of the beach to pick up dog faeces.
- Regular monitoring (monthly) should be undertaken at Station Beach during the trial period as well as at a nearby control site in order to determine the potential impact the trial has on seagrass and shorebirds. Specifically, monitoring should include data on the presence of shorebirds in the area, any interactions of birds with dogs and behavioural responses of birds to dogs and data on condition and extent of seagrasses.
- Smith and Smith (2001) stressed the potential impact unleashed dogs have on birds when left to roam outside designated swimming areas. Signage should clearly define the limits of the unleashed dog swimming area at Station Beach.
- Regular inspections of the dog swimming area should be undertaken to make sure usage guidelines are being complied with.
- If threatened or migratory birds are detected at the site the trial period should be halted until further safeguards are put in place, or for the duration of the migratory species presence.

6 CONCLUSIONS

The Proposal is unlikely to have a significant impact on biodiversity if the safeguards outlined in Section 5 are put in place. Furthermore, the monitoring of Station Beach to be undertaken during the trial period will indicate whether or not the trial has had any impact on biodiversity.

7 REFERENCES

Barter, M. (2003). The Yellow Sea Connection. Wingspan. Vol 8.

Bioanalysis (2007). Seagrass Monitoring program for the Penrhyn Estuary Habitat Enhancement Plan: Selection of reference seagrass meadows

Department of Environment and Conservation NSW (2006). Recovery plan for the Bush Stone-curlew *Burhinus grallarius*.

ERFTEMEIJER, P. L. A. & LEWIS, R. R. R. (2006) Environmental impacts of dredging on seagrasses: A review. *Marine Pollution Bulletin,* 52, 1553-1572.

FYFE, S. K. & DAVIS, A. R. (2007) Spatial scale and the detection of impacts on the seagrass Posidonia australis following pier construction in an embayment in southeastern Australia. *Estuarine Coastal and Shelf Science,* 74, 297-305.

GIULIA, C., DAVIDE, C. & MARCO, M. (2007) Short-term response of the slow growing seagrass Posidonia oceanica to simulated anchor impact. *Marine Environmental Research,* 63, 341-349.

Kirkman, H. (1997). *Seagrasses of Australia*, Australia: State of the Environment Technical Paper Series (Estuaries and the Sea), Department of the Environment, Canberra.

LEE, K. S., PARK, S. R. & KIM, Y. K. (2007) Effects of irradiance, temperature, and nutrients on growth dynamics of seagrasses: A review. *Journal of Experimental Marine Biology and Ecology,* 350, 144-175.

LONGSTAFF, B. J. & DENNISON, W. C. (1999) Seagrass survival during pulsed turbidity events: the effects of light deprivation on the seagrasses *Halodule pinifolia* and *Halophila ovalis*. *Aquatic Botany,* 65, 105-121.

Nebel S., Porter J. & Kingsford R. (2008). Long term trends of shorebird populations in eastern Australia and impact of freshwater extraction. *Biological Conservation* 141.

Smith P and Smith J (2001). Waterbird Survey of Careel Bay. Report to Pittwater Council.

YORK, P. H., BOOTH, D. J., GLASBY, T. M. & PEASE, B. C. (2006) Fish assemblages in habitats dominated by *Caulerpa taxifolia* and native seagrasses in south-eastern Australia. *Marine Ecology-Progress Series,* 312, 223-234.