Sydney Weeds Committees

- Sydney Central
- Sydney South West
- Sydney North
- Sydney West – Blue Mountains

Sydney Weeds Committees

High Risk Pathways & Site Management Plan

2010-2015

NEW SOUTH WALES

WEEDS ACTION PROGRAM

Front cover photo: “African Olive road”, Wollondilly Council

© Sydney Weeds Committees (SWC) 2013.

Except as permitted by the *Copyright Act 1968*, no part of the work may in any form or by any electronic, mechanical, photocopying, recording, or any other means be reproduced, stored in a retrieval system or be broadcast or transmitted without the prior written permission of the Sydney Weeds Committees (SWC). The information contained herein is subject to change without notice. The Copyright owner shall not be liable for technical or other errors or omissions contained herein. The reader / user accepts all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly from using this information.

Enquiries about reproduction, including downloading or printing, should be directed to the Lead Agency, Hawkesbury River County Council on wapadmin@hrcc.nsw.gov.au or telephoning 0419 185 368.

TABLE OF CONTENTS

Executive Summary			**3**
1	**Introduction**		**4**
	1.1	Background	4
	1.2	Purpose of the Plan	4
	1.3	The SWC Region	5
	1.4	Objectives	6
	1.5	Scope	6
2	**Weed Spread Mechanisms**		**7**
	2.1	Pathways involving human activity	8
3	**Definitions of High Risk Pathways, Species and Sites**		**9**
	3.1	High Risk Pathways	9
	3.2	High Risk Sites	10
	3.3	Other Priority Sites	10
	3.4	Weed definitions and categories	11
4	**Regional high risk pathways**		**12**
	4.1	High Risk Pathways (entry points) for weed spread in the Sydney and Blue Mountains region	12
	4.2	Transport over land – by roadways	13
	4.3	Transport over land – by other means	19
	4.4	Transport by water - freshwater and marine pathways	19
	4.5	Transport by rail	24
	4.6	Transport by air	25
5	**High risk sites**		**26**
6	**Other priority sites**		**26**
7	**High Risk Pathways & Sites Management Action Plan**		**27**
	7.1	Actions	28
8	**Review of the High Risk Pathways & Sites Management Plan**		**36**

Maps

1	SWC region	5
2	Major road and motorways within the SWC region	14
3	Highest Risk Transport Corridors for Weed Spread	18
4	Sydney Harbour Catchment	20
5	Hawkesbury Nepean Catchment	21
6	Georges River Catchment	22
7	Sydney Water Area	23
8	Railway lines in Sydney	24
9	Sydney Airport Precinct	25

Appendix 1	**UNE Project – Assessing weed spread in Australia using pathway risk analysis – summary**	**37**
Appendix 2	**Minimising Weed Spread – Action Plan**	**38**
Appendix 3	**Threatened Ecological Communities in NSW**	**39**
Appendix 4	**High Risk Pathways and Sites, Other Priority Sites Maps and data for each LCA -**	**40**

ABBREVIATIONS

AWS	Australian Weed Strategy
HRPMP	High Risk Pathways and Sites Management Plan
LCA	Local Control Authority
LLS	Local Land Services
NSW DPI	NSW Dept. of Primary Industries
NSW ISP	NSW Invasive Species Plan 2008 - 2015
NSW WAP	NSW Weed Action Program 2010 - 2015
NWAC	NSW Weed Advisory Committee
NWIP	National Weed Incursion Plan 2008
OEH	NSW Office of Environment and Heritage
RIP	Regional Inspection Program 2010-2015
RRP	Rapid Response Plan 2010 - 2015
RWC	Regional Weed Committee
SWC	Sydney Weeds Committees
WIP	Weed Incursion Plan 2010 - 2015
WIT	Weed Incursion Team
WRA	Weed Risk Assessment

ACKNOWLEDGEMENTS

The SWC High Risk Pathways and Sites Management Plan 2010 – 2015 (the plan) has been modelled on the National Weed Spread Prevention Draft Action Plan 2006 and the Qld Weed Spread Prevention Strategy.

EXECUTIVE SUMMARY

The physical characteristics of weeds allows them to be easily transported by a broad range of mechanisms over road, rail, waterways and airborne transmissions which include contaminated grain, soil and gravel, garden products, stock movement, machinery movement, feral animals, climatic conditions and human activities. The majority of spread is a direct result of human activities. With this considered, coupled with increasing costs of control it is necessary to change community attitudes and practices towards preventing weed spread. For this reason the Plan focuses primarily on pathways and sites attributable to human activity.

The rationale for the Plan is in line with the National Weed Spread Prevention Draft Action Plan July 2006[1] (NWSPDAP) which states that:

1. pathways for weed spread need to be identified and addressed;
2. effective, consistent and complementary measures need to be identified and addressed;
3. government, industry and communities need to be encouraged and empowered to undertake effective preventative actions, and
4. the implementation of strategic actions from the proposed Australian Weed Strategy (AWS) need to be supported.

The SWC High Risk Pathways and Sites Management Plan (SWC HRPSMP) is an integral component of the NSW Invasive Species Plan 2008 – 2015 (NSW ISP) goal to prevent the establishment of new invasive species.

This document is specifically designed to meet the SWC 'Weed Action Program' project 2012-2015' Key Objective 1.1 being *"High risk species and pathways are identified and managed"* and maintains strong links with the NSW ISP and the National Weed Prevention Draft Action Plan 2006.

Issues relating to threat assessment or responses to new weed incursions in the region are covered in the SWC 'Weed Incursion Plan 2010 – 2015' and SWC 'Rapid Response Plan 2010 – 2015' respectively.

Included within the Plan are identified high risk pathways, high risk sites and other priority sites within the SWC region.

The operational program for the implementation of the High Risk Pathways and Sites Management Plan is the SWC 'Regional Inspection Program 2010 – 2015'. This document provides for the inspection of private and public land in the Sydney region of NSW under the New South Wales Invasive Species Plan 2008 – 2015, NSW Weeds Action Program.

[1] National Weed Spread Prevention Draft Action Plan
http://www.weeds.org.au/docs/Draft_National_Weed_Spread_Action_Plan.pdf

INTRODUCTION

1.1 Background

Weeds have a significant adverse impact on primary production, ecosystem biodiversity and the conservation values of the region and more widely across the state. They can also have a detrimental effect on human and animal health.

Although preventing the spread of weeds is difficult, it is the cheapest and most effective method of weed control. Along with airborne and our road, rail and waterway networks/pathways, some of the potential carriers for 'hitch-hiking' weed seeds are machinery, equipment, garden waste, livestock, grain, produce, fodder, landscaping material, plant trading, extractive materials, native animals, wind, water and humans.

Many weeds have physical characteristics that allow them to be easily transported over long distances. Viable seeds and other plant material can be spread accidentally, especially by human activity. Vehicles can readily spread the small seeds for example Parthenium and Giant Parramatta Grass, just a few seeds of which can easily colonise and dominate new areas. Other weeds, such as the waterweed Cabomba, can spread even if just a part of the plant gets caught on a boat or trailer and is moved to another river or dam. The seeds of Tropical Soda Apple can survive for days inside cattle and still germinate once the animal has defecated.

1. 2 Purpose of the Plan

This Plan has been designed to minimise the economic, environmental and social impacts of new widespread and emerging weeds in the SWC region. This can only be achieved through co-ordination, co-operation and commitment from weed managers and the community.

The National Weed Spread Prevention Draft Action Plan 2006[2] has developed six broad goals to reduce the risk of weed spread caused by human activity within Australia. These are:

1. to ensure a consistent and strategic approach to weed spread prevention at local, regional, state and national levels;
2. to develop innovative, practical and cost-effective solutions to minimise weed spread;
3. to provide procedures for effective weed spread prevention;
4. to inform and motivate communities, industries, governments and land managers in order to minimise weed spread;
5. to implement effective measures to minimise weed spread, and
6. to monitor, evaluate and report on the effectiveness of weed spread prevention.

[2] National Weed Spread Prevention Draft Action Plan
http://www.weeds.org.au/docs/Draft_National_Weed_Spread_Action_Plan.pdf

The SWC High Risk Pathways and Sites Management Plan will provide management actions for the six goals listed above at a regional level to address the problem of weed spread, enabling all parties to make the best use of available resources.

1. 3 The SWC Region

The Sydney region is characterised by large tracts of highly urbanised areas intersected with patches of native vegetation. Remnants of original bushland continue to exist as corridors, often in steep terrain, in the north and south; in isolated patches on the alluvial flats of the Cumberland Plain; and in large tracts in National Parks on the coastal and outer boundaries. Many tiny fragments are scattered throughout the built up areas of central Sydney. Much of Sydney's bushland and waterways are threatened by invasive weeds and are under constant pressure from stormwater runoff with high nutrient loads.

MAP 1: The Sydney Weeds Committees region

1.4 Objectives

This Plan will complement the implementation of the weed spread prevention objectives of the Sydney Weeds Action Program Project and the SWC 'Weed Incursion Plan 2010 – 2015'.

The Plan is specifically designed to meet objectives of the NSW ISP and the SWC WAP Key Objective 1.1 - *High risk species and pathways are identified and managed*.

The objectives of the Plan are to manage weed spread in the SWC region by:

- identifying and documenting regional high risk pathways;
- developing effective regional management protocols of high risk pathways, and
- developing a species risk assessment framework.

The Plan focuses on regionally identified pathways and priority sites and the commitment of all stakeholders to work in a strategic, collaborative and co-operative manner to ensure favourable outcomes.

1.5 Scope

The scope of this Plan is limited to the management of high risk pathways and sites within the SWC region.

It does not include management actions for:

- weed risk assessment (refer SWC Weed Incursion Plan 2010-15 and SWC Rapid Response Plan 2010-15);
- detection and incursion response (refer SWC Rapid Response Plan 2010-15), and
- survey and mapping (refer SWC Regional Inspection Plan 2010 -15).

2. WEED SPREAD MECHANISMS

Weed spread can be defined as movement and subsequent establishment of a weed species in new areas[3].

The three main mechanisms of weed spread are:

- natural spread (physical activity) - seeds moved by wind and / or water;
- wild and feral animal activity, and
- human activity.

Natural spread of weeds includes:

- birds – through consumption and excretion of seeds and fruit;
- other animals – through consumption and excretion of seeds and fruit, and external attachment to native and introduced wildlife;
- wind – distribution of wind blown seeds, and
- water – distribution of seeds or plant parts via waterways.

Controlling weed dispersal by natural means is far more difficult, and highlights the importance of managing source populations in order to minimise spread by natural vectors.

Wild and feral animal activity includes wild dogs, feral pigs, rabbits, foxes, feral goats and feral cats. It is estimated that pest animals cost the Australian economy over $1 billion annually[4].

Human activity induced spread includes the movement of weeds by people, and by the use of items such as vehicles, machinery, domestic animals, grain and feed that are contaminated. **Human-induced spread is seen as the most prolific form of weed spread**. This is because seeds are generally moved further and in larger numbers through humans and their activity than by other means.

The spread of weeds along natural and artificial corridors - roadside verges, railways, utilities (transmission lines, gas pipelines), waterways, recreational trails and drainage lines – is a significant avenue for increasing weed distribution throughout the region. A key area of concern is the spread of weeds along road and rail corridors, where they may then provide a source of infestation for neighbouring properties.

Garden plant introductions are the dominant source of new naturalised plants and weeds in Australia.[5] Of the 2,779 introduced plant species now known to be established in the Australian environment, 1,831 (or 66%) are escaped garden plant species.

The University of New England conducted a project on assessing the weed spread in Australia using Pathway Risk Analysis. A comprehensive report has been produced and Appendix 1 provides a summary fact sheet of the results and details of the link to the website containing the full document.

This plan focuses on high risk pathways and sites involving human activity because it being the most prolific form of weed spread and also the one that is the most preventable and cost effective.

[3] National Weed Prevention draft action Plan
[4] NSW Invasive Species Plan 2008 - 2015
[5] Jumping the Garden Fence: Invasive Garden Plants in Australia

2. 1 Pathways involving human activity

This Plan adopts the Queensland Weed Spread Prevention Strategy [6], which identifies ten pathways for potential weed spread involving human activity.

Table 1. Ten pathways for potential weed spread involving human activity (source: Department of Natural Resources and Water 2008).

Pathway	Examples
Transportation over land	Agricultural machinery, stock carriers, cars, trucks, buses, all-terrain vehicles, construction equipment and fire fighting equipment, trains, hikers, horses, and pets, and also via tankers and pipelines when transferring water (containing aquatic weeds) from one storage to another.
Transportation over water	All types of ships (including cruise ships), recreational boats and other large or small craft including industrial, tourist, recreational and law enforcement vessels, military crafts, barges, semi-submersible dry docks, oil derricks (freshwater, marine or both), and stowaways in holds.
Tourism	For recreation, business or relocation purposes. A particular risk in national parks and protected areas.
Movement of plants and plant parts	Fruit, vegetables, nuts, roots, seeds and edible flowers; plants 'in trade' (intentionally released - authorised or unauthorized - or escaped); 'hitchhiker seed' such as weed seeds that have contaminated other seed for sowing or eating, or transported in water, food, growing media, nesting or bedding; and particularly, the dumping of garden waste in parks, reserves and council dumps.
Transportation of live food animals and animal parts	Movement of stock and/or their contaminated waste (containing viable weed seed from a food source such as prickly acacia) and 'hitchhikers' on or in live animals and in their water, food, growing medium, nesting or bedding.
Plant and aquarium trade	Importation and supply of plants, plant parts, seeds and aquatics, and sites of deliberate introduction such as botanical gardens, nurseries, landscaping and garden suppliers, research facilities, public and private plantings, and aquariums/water gardening facilities.
Movement of construction and landscaping material	Extraction and storage of soil, gravel, sand, mulch and rocks.
Gas, power and mineral resources	Mining of resources and development and maintenance of movement corridors.
Waste disposal	Illegal dumping, unsafe disposal and movement of weed waste.
Ecosystem disturbance	Habitat creation, restoration or enhancement; forestry use; road construction; provision of utilities; land clearing; development; stream channels; construction of highways, railroads and utility rights of way; bushfires and fire management; grazing; agriculture; and extreme weather events such as cyclones and drought.

All land managers have a role to prevent the spread of weeds and to work co-operatively to ensure optimal prevention outcomes are achieved. Appendix 2 summarises activities identified to minimise weed spread from each pathway mentioned above.

[6] QLD Weed Spread Prevention Strategy - http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Weed-Spread-Strategy.pdf

3. DEFINITIONS OF HIGH RISK PATHWAYS, SPECIES & SITES

Definitions

Significant Asset	An area (and its values) to be protected from the threat of weed invasion and establishment. Categories: Endangered Ecological Community, Individual Threatened Species, Threatened Population, Waterway, Riparian Zone/Wetland, Wildlife Corridor, High Value Catchment, Agricultural Land.
Hot Spot	Specific high risk sites and properties along high risk pathways or elsewhere, where it is ***already known that weeds are present and spreading*** (because there is little or no weed management occurring there at present). Hots spots can be on public or private land.
New Incursion	Isolated population/s of invasive species recently detected in the region for the first time. This includes: • A weed that has shown up in an area for the first time, where it now exists beyond what was its known extent. Eg Alligator Weed now found further down stream of a waterway. Chilean needle grass now being found further east. • Recent Sydney wide new incursions: Asparagus falcatus, Horsetail, Kudzu, Monkeycomb, Japanese Knotweed, Mysore Thorn, Wild Onion.

Note: Some of these definitions have been developed and adapted from the NSW *Invasive Species Plan*.

3.1 High Risk Pathways

Definition: Pathways that are heavily trafficked, being main road, rail and river corridors that have a high risk of new weed incursions being introduced from external sources.

and

A linear feature in the landscape where weeds are spreading within/towards a significant asset or further along the linear feature.

Categories: Road, Railway line, Waterway (creek/river/drainage canal), Utilities easement, Walking Track, Coastline, Interface with urban areas.

Note: All of these above can be 'pathways' for weeds. We want to map and concentrate on the ones that are of highest risk (depending on what weed is spreading there, how invasive it is, the significant asset/s being impacted etc)

High Risk Pathways directly relate to the Goals 1 and 2 of the NSW Invasive Species Plan 2008 – 2015'

Goal One
Excude: *Prevent the establishment of new invasive species*

Goal Two
Eradicate or Contain: *Eliminate or prevent the spread of new invasive species.*

3.2 High Risk Sites

Sites where weeds ***will always have the potential to show up and the potential to spread***. These sites need to be checked regularly (as part of surveying and formal inspections).

Categories: Dam, Waste disposal site, Depot for transporting weed/plant material, Garden/mulch & landscape materials supplier, Livestock holding area, Horse event, Boat launch area, Nursery, Florist, Aquarium, Retail homemaker outlet, Development site, Fresh produce market, local markets, distribution depot for goods coming in and out of Sydney.

3.3 Other Priority Sites

Other Priority Sites include high value conservation, agricultural, tourism and recreational areas, the periphery around identified high risk sites, plus other private property inspections, over the 42 LCA's. The rate of inspection of identified sites varies across the region depending on priorities and resources.

3.4 Weed Definitions and Categories:

Naturalised Species: species from outside the SWC region that can maintain populations in the wild without cultivation.

Invasive Species: naturalized species that are spreading.

Environmental Weed: Those naturalized plant species that have invaded areas of native vegetation. The species are presumed to impact negatively on native species diversity or ecosystem function. Environmental weeds are usually non-native species, although native plant species that are invasive beyond their indigenous range are also included.

Noxious Plant: A formally declared weed under the *Noxious Weeds Act 1993*. The declaration of "noxious" always implies the need for active management to reduce the negative impact of the particular plant species on agricultural and human activities.

Weeds of National Significance (WONS): A list of weed species, nominated under the National Weeds Strategy of 1997 as amended, which require a national (trans-boundary) effort to tackle their management. These weeds affect extensive land use systems such as conservation areas and grazing systems, rather than cropping systems.

High Risk Species:
Species currently not known in the LCA but have the ability to establish rapidly in new areas.
Example: Tropical Soda Apple, Alligator Weed, Class 1 & 2 Weeds, new weed incursions.
and/or
Species currently not widespread in the region but have the potential to expand rapidly into new areas.
A regional list of High Risk Species is identified in the SWC 'Weed Incursion Plan 2010 – 2015'.

High Value Agriculture Areas
Areas of land that are engaged in high return agricultural practices such as dairy farming, horticulture and cattle grazing properties.

High Value Conservation Areas
Areas of land that have been deemed protected in order to ensure that natural features, cultural heritage or biota are safe-guarded. A conservation area may be a nature reserve, a park, a land reclamation project, or other area (refer Appendix 3 – Threatened Ecological Communities in NSW).

4. REGIONAL HIGH RISK PATHWAYS

To implement the Management Plan and the Regional Inspection Program it is crucial to have an understanding of the pathways that enable weeds to spread and is paramount to preventing new incursions of invasive species within the region.

4.1 High Risk Pathways (entry points) for weed spread in the Sydney and Blue Mountains region

In 2011, the Sydney Weeds Committees, comprising of representatives from most local and state government land managers, commenced the process of identifying and documenting the main “pathways” for the potential spread of high risk invasive species across Sydney. These pathways (which can include a specific site or a linear feature in the landscape such as a transport corridor, waterway etc) are among the highest priorities to focus weeds inspection, education and control programs.

This is an ongoing process of capturing knowledge and determining the best management actions to prevent the introduction and further spread of these invasive species that pose threats to areas of high conservation. The list below includes the pathways known to date.

The Sydney Weeds Committees continue to work together and further pathways may be added list as more information becomes available.

1. **Entry points into Sydney (from other parts of NSW, Australia and overseas)**

SWC map reference	Name	Location (LGA)	Concerns regarding spread of invasive species
Entry Point	Sydney Markets, Flemington	Strathfield	Potential for new invasive species coming into Sydney via shipping of fresh produce, freight vehicles coming in and out of Sydney. Weeds being sold through florists – eg Madeira inflorescence, Privet berries.
Entry Point	Port of Botany Bay	Randwick, Botany Bay	Potential for new invasive species coming into Sydney via shipping
Entry Point	Intermodal Logistics Centre at Enfield	Strathfield	Potential for new invasive species coming into Sydney via shipping. Linked to "Metropolitan Goods Railway"

4.2 Transport over land – by roadways

The SWC regional high risk road pathways that enable the transport of weeds into the region include the Pacific Highway, Great Western Highway, Hume Highway, Princes Highway, and the associated motorways.

Map 2 identifies the major high risk pathways relating to roads and motorways in the SWC region.

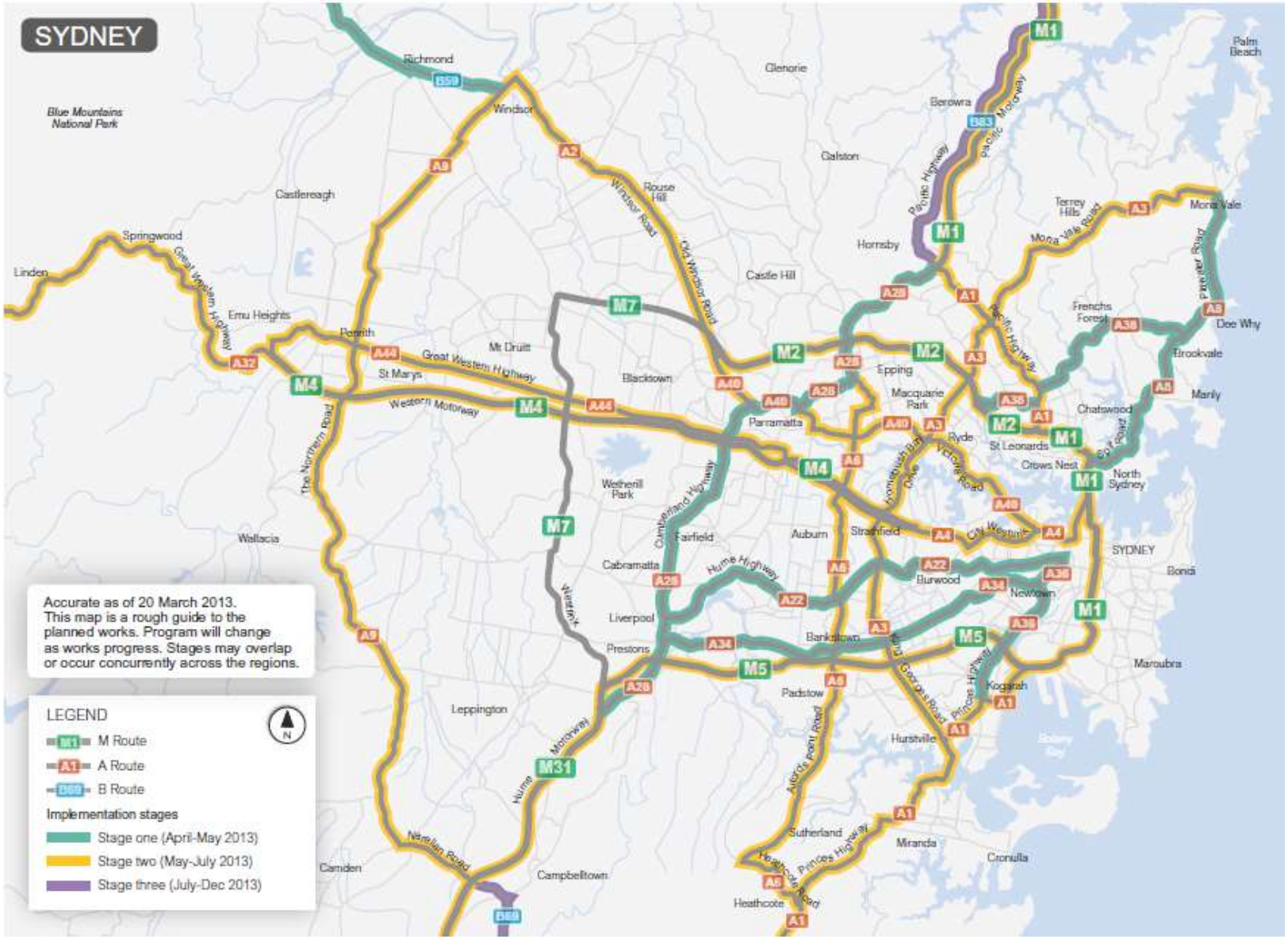
All pathways allow vehicles to move into and within the regions and require priority actions to ensure weed spread is prevented.

The mechanisms along which high risk species may be introduced through road pathways include:

- supply and movement of machinery and equipment;
- tourism and recreational activities and includes general travel;
- roadside vegetation maintenance activities;
- foot traffic;
- on-ground activities such as road and rail maintenance and construction activities;
- construction and development projects such as mining, seismic testing and pipeline construction;
- energy and telecommunications infrastructure construction activities;
- property development which involves the disturbance and removal of soil materials;
- quarry activities which involves the supply and sale of quarry type materials such as soil, sand, gravel and rocks;
- fencing construction and maintenance;
- audit, survey and research activities and includes mapping;
- resource recovery and removal and planting activities associated with forestry;
- weed prevention activities such as chemical applications, slashing and mowing and manual removal and
- waste disposal – both discriminate and indiscriminate.

Weed spread is not limited to vehicle movement along pathways.

MAP 2: Major Roads and Motorways in the SWC region (Roads & Maritime Services, 2013)



Transport corridors

The “Top 10” corridors, developed through the Roadside Environment Committee project (grant given to Sydney Weeds Committees in 2011).

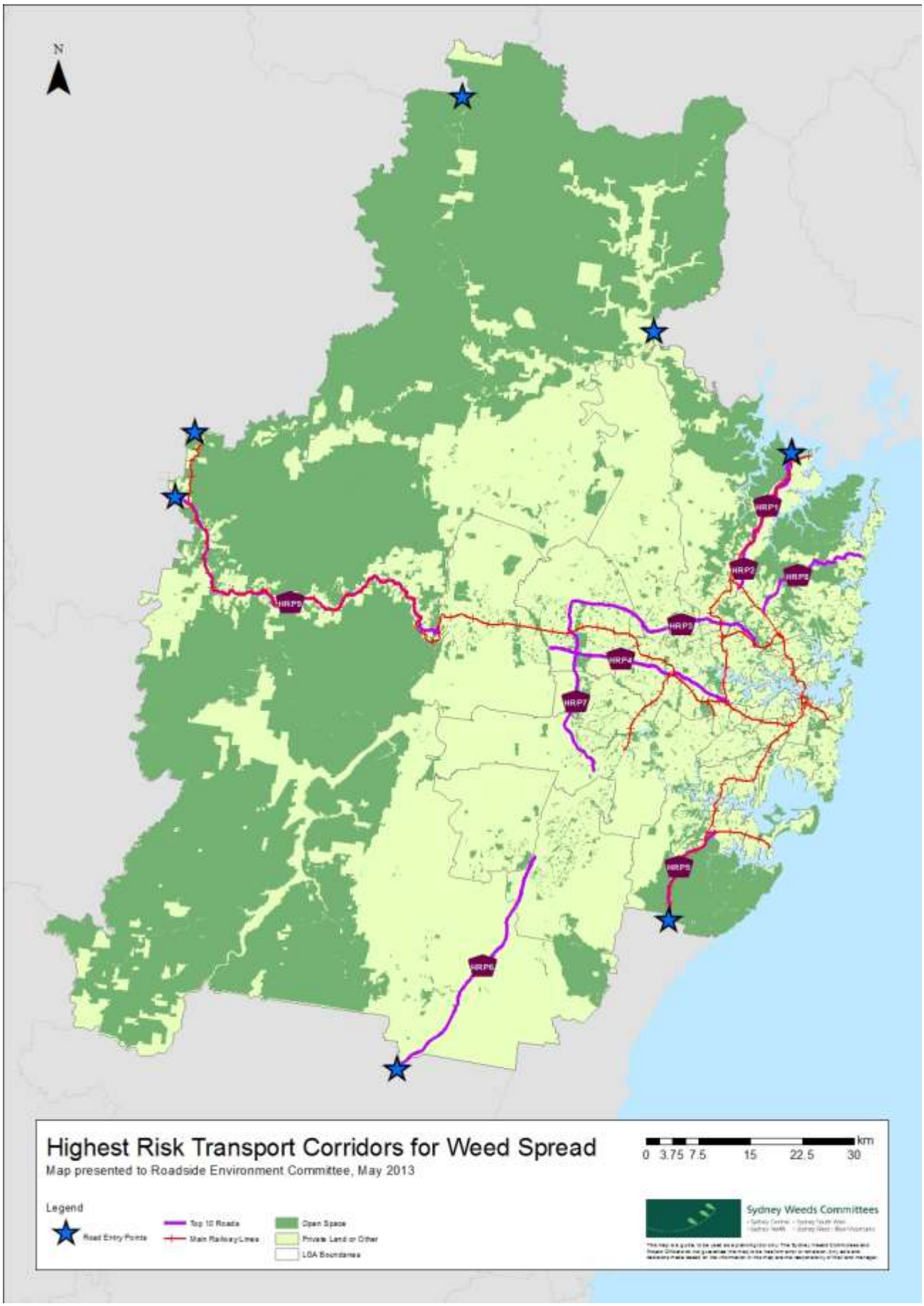
SWC Map reference **“**High Risk Pathway”	**Transport corridor**	**Significant Assets** What is there that we want to protect?	**High risk weeds present** What is there that we want to remove?	**Transport corridor manager**
HRP1	F3 Freeway	Ku-ring-gai Chase National Park, Berowra Valley Regional Park, Muogamarra Nature Reserve	Boneseed, Coolatai Grass	Roads and Maritime Services
HRP2	Pacific Highway along length of F3	Ku-ring-gai Chase National Park, Berowra Valley Regional Park, Muogamarra Nature Reserve.	Boneseed, Coolatai Grass	Roads and Maritime Services
HRP3	M2 Motorway	Lane Cove National Park, Bidjigal Reserve, NPWS critical threatened species conservation site and *biodiversity sites. *LGA: Hornsby, Ryde, Ku-ring-gai, The Hills.*	Boneseed, Tussock Paspalum, Pampas Grass, Ludwigia	Hills M2 (private)
HRP4	M4 Motorway	Prospect Nature Reserve. Sydney Olympic Parklands. Eradication target for Sydney: Asparagus falcatus in road corridor at Bill Boyce Reserve *LGAs: Canada Bay, Strathfield, Auburn, Parramatta*	Asparagus falcatus, Boneseed, Bitou Bush, Coolatai Grass	Roads and Maritime Services
HRP5	Princes Highway	Royal National Park, Heathcote National Park *LGA: Sutherland*	Boneseed, Pampas Grass	Roads and Maritime Services
HRP6	M5 South/Hume Highway	Agricultural land, Council reserves with Endangered Ecological Communities, *biodiversity site *LGAs: Strathfield, Bankstown, Liverpool, Campbelltown, Wollondilly*	African Olive Serrated Tussock Ludwigia sp Alligator Weed	M5 South West Motorway (private)

SWC Map reference **"**High Risk Pathway"	**Transport corridor**	**Significant Assets** What is there that we want to protect?	**High risk weeds present** What is there that we want to remove?	**Transport corridor manager**
HRP7	M7 Motorway	Western Sydney Regional Park, *biodiversity sites *LGAs: The Hills, Blacktown, Liverpool, Fairfield*	Boneseed Coolatai Grass Ludwigia sp.	Westlink M7 (private) Contact: Daniel Lovett Community Stakeholders & Environmental Manager Phone: 9834 9212 Mobile: 0419 978 091 Email: dlovett@westlinkm7.com.au
HRP8	Mona Vale Rd	Garigal National Park, Ku-ring-gai Chase National Park and Dalrymple-Hay Nature Reserve, NPWS critical threatened species conservation site and *biodiversity sites LGAs: Ku-ring-gai, Warringah, Pittwater	Tussock Paspalum, Pampas Grass	Roads and Maritime Services
HRP9	Great Western Highway	Blue Mountains World Heritage Area *LGAs: Blue Mountains, Penrith*	Broom	Roads and Maritime Services
HRP10a	Various sections of rail corridor throughout Sydney and Blue Mountains. Most are detected and reported by Sydney Weeds Committees members.	Various points where rail corridor intersects bushland and significant areas.	Boneseed, Bitou Bush, Broome, Acacia saligna	Railcorp Contact: Peter Semple Peter Semple Biodiversity Specialist - Environment Division Tel: 8922 4072 Mobile: 0411 0214 40 Peter.Semple@railcorp.nsw.gov.au
HRP10b	Metropolitan Goods Rail Line	*LGAs: Randwick, Botany Bay, Marrickville, Canterbury, Bankstown, Strathfield*	Freight rail line that links Port Botany to Sydney Markets (Flemington). Potential for spread of new/existing invasive species.	

* Sites identified in *Biodiversity Priorities for Widespread Weeds*. NSW Office of Environment and Heritage & NSW Department of Primary Industries. 2011.
★ Road entry/exit points for Sydney: link with weed management in other regions, inspection zones to check for weeds travelling into Sydney.

Other roads – medium priority at sub-regional/local level:

Road	LGA	Description
Centenary Drive	Strathfield	Existing weeds: Celtis, Lantana, Privet, Boneseed, Onion Weed. Potential for new invasive species coming into Sydney - vehicles coming in and out of Sydney Markets (Flemington)
Homebush Bay Drive	Strathfield, Canada Bay	Potential for new invasive species coming into Sydney - vehicles coming in and out of Sydney Markets (Flemington)
Delhi Road	Ryde, Ku-ring-gai, Willoughby	Spread of existing high risk weeds: Tussock Paspalum, Pampas Grass. Road traverses high conservation areas.
Lady Game Drive	Ku-ring-gai, Ryde	Spread of existing high risk weeds: Coolatai, Ludwigia Peruviana
Comenarra Parkway	Ku-ring-gai	Spread of existing high risk weeds: Tussock Paspalum, Pampas Grass
Wakehurst Parkway	Warringah, Manly	Spread of existing high risk weed: Tussock Paspalum Road traverses high conservation areas.
Heathcote Road	Sutherland, Liverpool	Boneseed containment line
Picton Road	Wollondilly	High conservation area, Sydney water catchment area, transport corridor between inland & coast
Bulli / Appin Road	Wollondilly	High conservation area, Sydney water catchment area, transport corridor between inland & coast
Silverdale Road / Montpellier Drive	Wollondilly	Western containment of African Olive and Lantana



MAP 3: Highest Risk Transport Corridors for Weed Spread

4.3 Transport over land – by other means

Mechanisms along other overland pathways include:

- fencing construction and maintenance activities;
- domestic stock between paddocks;
- native and non-native animal movements including migratory bird pathways;
- drinking water infrastructure,
- property development and
- indiscriminant dumping (such as green waste).

4.4 Transport by Water – Freshwater and Marine pathways

Many kinds of weed seeds, even those without special modifications, are readily dispersed by water. Weed seeds differ in their ability to float on water, and there are also various adaptations of fruit and seed that aid water dissemination. Water Hyacinth (eichhornia crassipesis) an excellent example of a weed species equipped for water dispersal. The seed is buoyant, being flattened at the apex and containing an air chamber.

All water pathways allow weed material to move along the watercourses within the SWC area and require priority actions to ensure weed spread is prevented. In addition, waterways carry a large amount of recreational and commercial traffic along and between them allowing the further potential for spread of propagules.

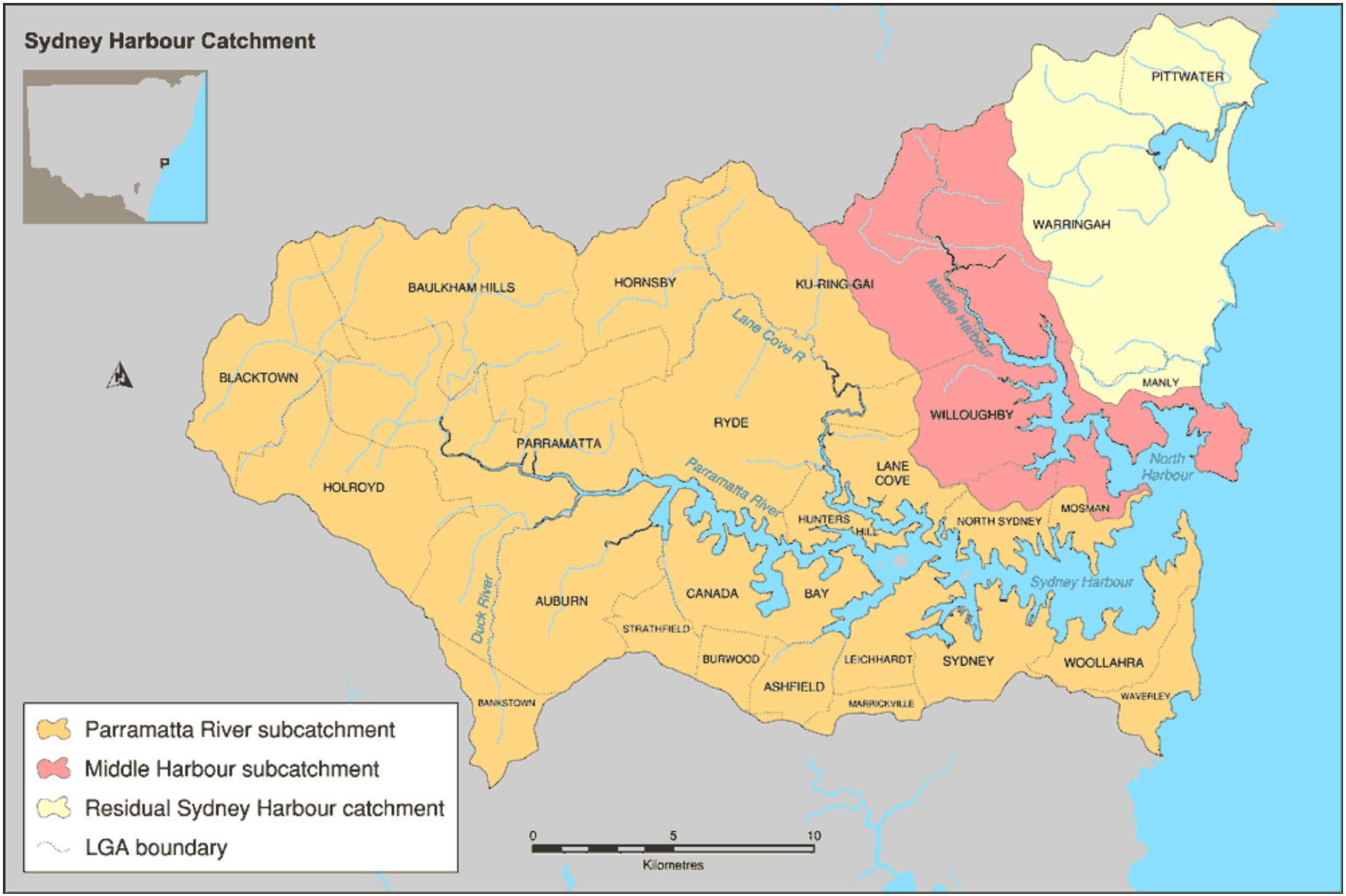
The SWC region has a number of major river systems traversing the region, being the
Hawkesbury-Nepean Catchment
Parramatta River / Sydney Harbour Catchment
Georges River, Port Hacking River and Cooks River

Waterways – list incomplete, more to sort and add.

Waterway	LGA	Description
Devlins Creek	Hornsby, Ryde	Spread of existing high risk weeds: Ludwigia species (*L.longifolia, peruviana, repens)*
Lane Cove River	Hornsby, Ku-ring-gai, Ryde, Lane Cove	Spread of existing high risk weed: Alligator Weed
Stringybark Creek	Lane Cove	Spread of existing high risk weed: Alligator Weed
Kemps Creek	Liverpool	Spread of existing high risk weed: Alligator Weed Flows to high conservation area
Woranora River	Sutherland	Alligator weed, ludwigia, boneseed
South Creek	Multiple LGAs	Widespread weeds
Wollondilly River	Wollondilly	Alligator weed

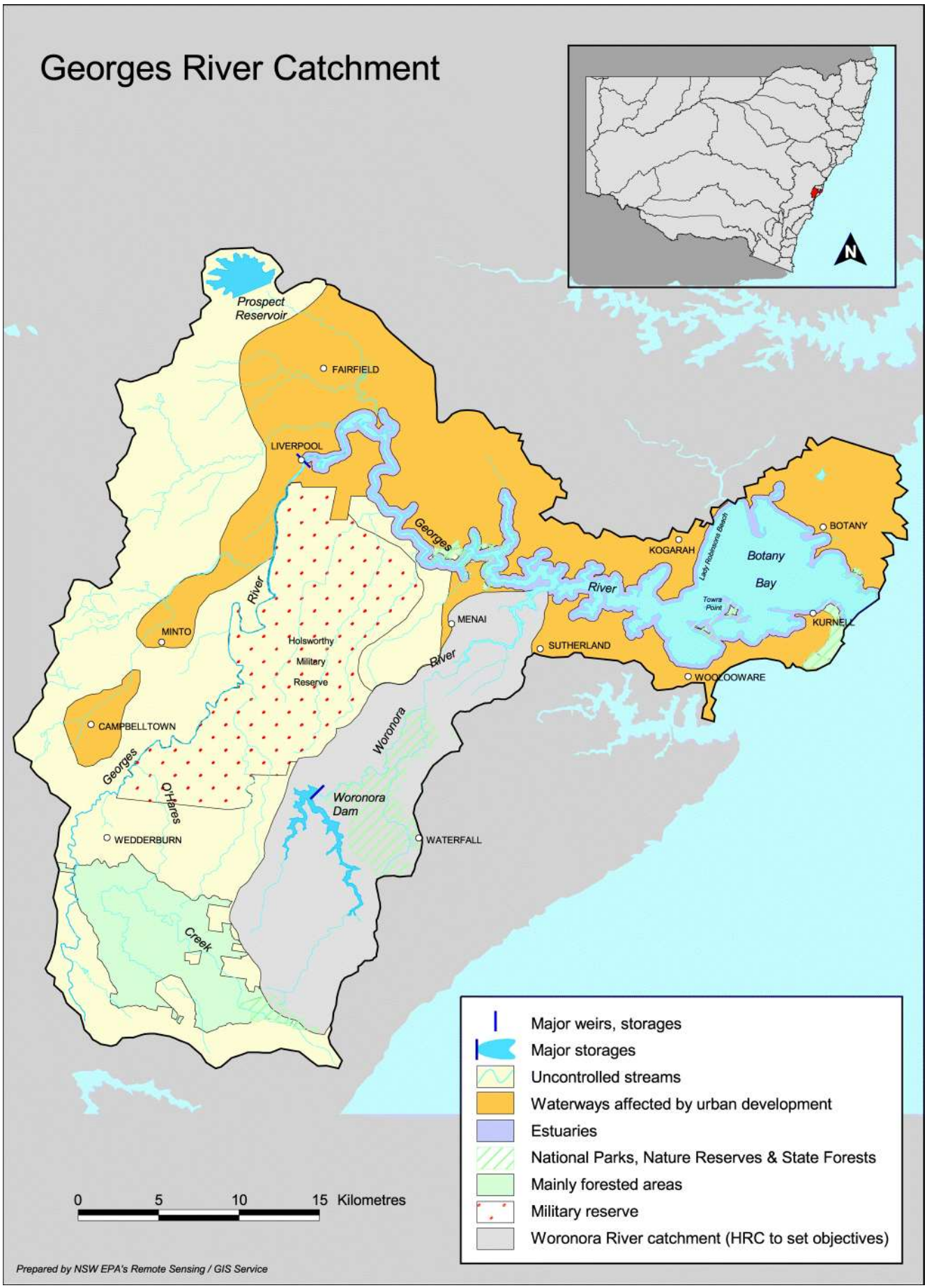
The mechanisms along which high risk species may be introduced through water pathways include:

- All types of recreational and commercial craft;
- Recreational activities such as fishing, camping, mountain bikes and horses
- Recreational boating activities and includes fishing, skiing and swimming and
- Commercial fishing activities.

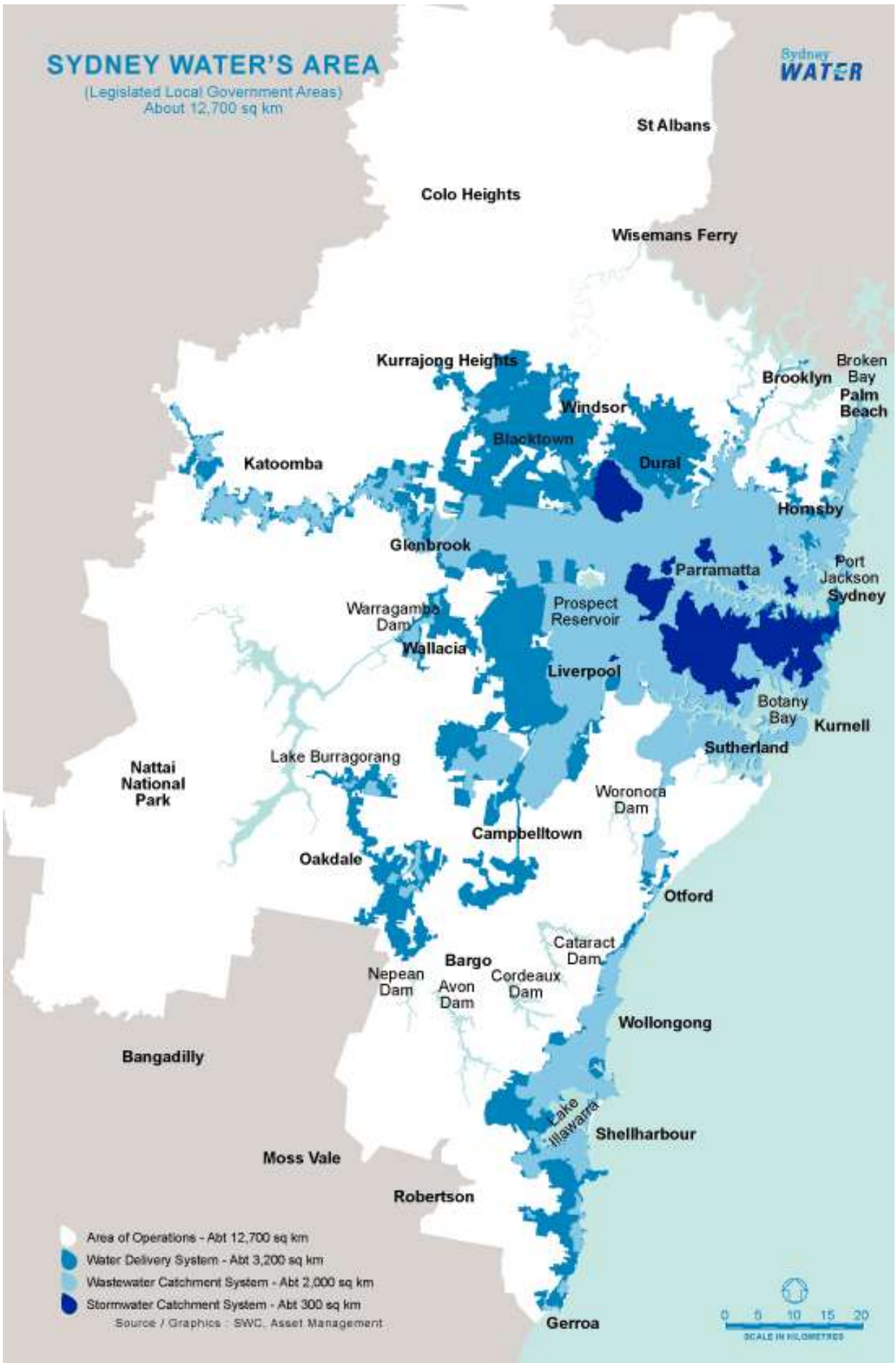


MAP 4: Sydney Harbour Catchment, OEH

MAP 5: Hawkesbury Nepean catchment, OEH



MAP 6: Georges River Catchment, OEH



MAP 7: Sydney Water's Area

4.5 Transport by rail

Sydney has an extensive rail network servicing suburban and regional commuters as well as the movement of goods. The network comprises over 2,060 kilometres of track, extending north to the upper Hunter Region, south to the Shoalhaven and Southern Highlands and west to Bathurst[7].

Mechanisms for weed spread along rail corridors include:

- Vehicle and commodity movement within the corridor;
- Disturbance associated with maintenance activities;
- Use of machinery from other areas which may be contaminated and
- Waste dumping within the corridor.

Accessing the rail corridors is inhibited by remoteness and safety issues, often enabling weeds to establish undetected.

MAP 8 – Railway line access to the SWC region

[7] Railcorp Annual Report 2012-13

4.6 Transport by air pathway

Sydney Airport has more routes, more destinations, more airlines and more frequencies than any other airport in Oceania.

Statistics at a glance –

- 41% of all international arrivals and 48% of freight
- 37 million passengers in 2012
- Close proximity to CBD and major tourist attractions
- 6% of the NSW economy and 2% of the Australian economy
- Directly creates 28,000 jobs and $9 billion in economic contribution
- 39 Airlines serving 95 destinations

Other airports in the region include Bankstown, Holsworthy Barracks (Army), Richmond (RAAF) and Camden.

Mechanisms along air pathways

- Private light aircraft
- Commercial charter
- Supply and movement of machinery, equipment and produce by air
- Tourism and recreational activities including general air travel and aerial sporting activities
- Military activities

MAP 9: Sydney airport precinct

5. HIGH RISK SITES

High risk sites are comprised of nurseries, saleyards, community markets, jetties, boat ramps, car parks, gravel quarries, aquaria / pet shops, stock and produce outlets and dealers, maritime borders, machinery dealers and roadside truck stops within the SWC region. Sites close to class 1 and 2 noxious weeds, Fire Access Zones (FAZ) sites and waste disposal and recycle centres.

These are summarised in the compilation map, Map 6 below and more specific details are contained within Appendix 4.

The SWC Regional Inspection Program 2010 - 2015 document provides more detailed information on specific high risk sites.

6. OTHER PRIORITY SITES

Other Priority Sites include high value conservation, agricultural, tourism and recreational areas, the periphery around identified high risk sites, plus other private properties over the 42 LCA's. The rate of inspection of identified sites varies across the region depending on priorities and resources.

More information regarding other priority sites can be found in Appendix 4.

The SWC Regional Inspection Program 2010 - 2015 document also provides more detailed information on other priority sites.

7. HIGH RISK PATHWAYS AND SITES MANAGEMENT ACTION PLAN

The High Risk Pathways and Sites Action Plan details the measurable outcomes and actions identified in the SWC WAP project application 2010 - 2015 as necessary to deal with high risk pathways and sites.

The Plan is structured under four categories:

- co-ordination, planning, procedures and documentation;
- execution;
- education / extension and
- evaluation and reporting.

Each category relates to a specific goal within the SWC Weed Action Program. These are:

1. **EXCLUDE:** Prevent the establishment of new invasive species;
2. **ERADICATE OR CONTAIN:** Eliminate or precent the spread of new invasive species;
3. **EFFECTIVELY MANAGE:** Reduce the impact of widespread invasive species and
4. **CAPACITY:** Ensure all land managers in Sydney and the Blue Mountains have the ability and commitment to manage invasive species.

Activities and measurable outcomes are listed beneath each goal. These have been developed so that SWC can assess how effectively the Weed Action Plan has been implemented.

7. 1 ACTIONS

Goal 1: EXCLUDE – Prevent the establishment of new invasive species							
ISP Key Objective 1.1 High Risk species and pathways identified and managed							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEAR (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
Regional High risk pathways identified and documented	Regional high risk pathways are identified and documented	SWC/ WOT	1	2			
A commitment to measuring weeds along the high risk pathways is reflected in at least two more local council operational plans each year	Develop links (5) with industries/stakeholders / land managers of infestation pathways e.g. transport comp.nurseries, rec.clubs	SWC	5	1			

Goal 1: EXCLUDE – Prevent the establishment of new invasive species (Cont'd)							
ISP Key Objective 1.2 Develop and implement early detection capabilities							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEAR (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
List of High Risk weeds developed	List of high risk weeds developed	RWCs / WOT	3	1			
Incursion plans for high risk weeds developed in line with the NSW Incursion plan for Invasive species	New Weed Incursion Plan developed and progress reviewed annually	RWCs / WOT	1	2			
Regional inspection program developed	Regional Inspection program developed	RWCs / WOT	1	1			

Goal 2: ERADICATE OR CONTAIN – Eliminate, or prevent the spread of new invasive species							
ISP Key Objective 2.1 Timely detection of new weed incursions							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEAR (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
Regional Inspection program implemented	Regional Inspection program implemented and reviewed annually	SWC & LCA's	5	1-5			
	Priority sites / high risk sites are inspected (no sites)	SWC & LCA's	3300	3-5			
	Strategic property inspections under the Noxious Weeds Act (no properties)	SWC & LCA's	13680	3-5			
	High risk pathways are inspected for high risk weeds (no. kms)	SWC & LCA's	2580	3-5			

Goal 2: ERADICATE OR CONTAIN – Eliminate, or prevent the spread of new invasive species cont'd							
ISP Key Objective 2.2 Provide a rapid response to eradicate or contain new weeds							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEAR (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
Rapid Response Plan is developed	Rapid Response Plan developed	SWC & LCA's	1	3			
	Implementation of the Rapid Response Plan is reviewed annually through the four regional weeds committee meetings	RWCs & LCA's	4	3-5			
	Annual contingency fund for outbreak of high risk weeds or new incursions	SWC	1	3-5			
	High risk pathways are inspected for high risk weeds (no. kms)	SWC & LCA's	2580	3-5			

Goal 3: EFFECTIVELY MANAGE – Reduce the impacts of widespread invasive species							
ISP Key Objective 3.2 Provide effective and targets on-ground control							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEAR (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
High risk aquatic weeds are controlled to protect significant assets (no. kms)	High risk aquatic weeds controlled (= 45ha)	LCAs	535	3-5			
Alligator Weed Plan	Review the implementation of the 2010 Sydney Region Alligator Weed Priorities Plan	SWC	1	3			
EEC/ High conservation area management to prevent impact from invasive grasses, tree, shrub or vine weeds (no of ha)	Manage EEC / High conservation areas	LCAs	465	3-5			
High Risk terrestrial weeds controlled	High Risk terrestrial weeds controlled to protect significan assets (no of ha)	LCAs	1208	3-5			

Goal 4: EDUCATION AND EXTENSION

ISP Key Objective 4 .2 Private landholders motivated to manage invasive species proactively

Measurable Outcomes	Activities	Responsibility	Overall Target	YEARS (1 to 5)	STATUS		
					Pending	Commenced	Completed
Progress of the Regional Inspection Program reviewed annually with the four Weeds Committees	Regional Inspection Program reviewed annually	RWCs, SWC	5	1-5			
Private landholders are mentored about controlling high risk weeds. **(no. of landholders)**	Engagement with private landholders	LCAs	2995	3-5			

ISP Key Objective 4 .3 Increase community acceptance of and involvement in effective weed management							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEARS (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
Regional Communication Strategy Developed	Regional Communication Strategy completed	RWCs, SWC	1	2			
Weed awareness community events and displays are held across the region (no. of events and displays)	Events and displays held across the region	LCAs	140	3-5			

ISP Key Objective 4 .5 Increase the skill of the workforce implementing weed management							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEARS (1 to 5)**	**STATUS**		
					Pending	**Commenced**	**Completed**
An annual skills and training survey is conducted across the four committees	Skills and Training survey completed	RWCs, SWC	5	1-5			
Weed Management Officers attend relevant profession training courses **(No. of Officer)**	Weed Officers attend training	LCAs	340	3-5			

ISP Key Objective 4 .5 Increase the skill of the workforce implementing weed management cont'd							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEARS (1 to 5)**	**STATUS**		
Other people trained to identify and control high risk weeds	Other people attend training to identify and control high risk weeds – eg other staff members in an organisation, Bushcare and Landcare volunteers etc (no of participants).	LCAs, SWC	325	3-5			

ISP Key Objective 4 .6 Ability to measure the effectiveness of invasive species management							
Measurable Outcomes	**Activities**	**Responsibility**	**Overall Target**	**YEARS (1 to 5)**	**STATUS**		
Weed control work and Weed Officer capacity are checked regularly	Weed control work and Weed Officer capacity are checked regularly, and gaps are identified for ongoing improvement.	LCAs, SWC	3	3-5			
Grant Funding administered, Mandatory Documents completed **Annual Reports submitted to NSW DPI**	Administer allocation and reporting of grant funds. Tasks include: finalise mandatory documents, supervise data collection, mapping and reporting, assessment of regional priorities. Annual progress reports submitted to NSW DPI.	HRCC, Project Officer, SWC	1	3-5			
Revised MOU signed by new Lead Agency and WAP Project partners	Revised MOUs signed between the new Lead Agency and the WAP project partners.	HRCC, Project Officer, SWC	1	3			
Annual progress report submitted to DPI	Annual progress report submitted to DPI	Project Officer, HRCC	1	3-5			

8. REVIEW OF THE SWC HIGH RISK PATHWAYS & SITES MANAGEMENT PLAN

The SWC High Risk Pathways and Sites Management Plan will be reviewed regularly as part of the SWC Weed Action Program.

It will also continue to be updated in conjunction with the SWC Weed Incursion Plan 2010 – 2015, Rapid Response Plan 2010 – 2015 and Regional Inspection Program 2010 -2015 and amended as part of the evaluation process of the response to new weed incursions.

Appendix 1 - UNE Project – Assessing weed spread in Australia using pathway risk analysis – summary

(full report - http://lwa.gov.au/files/products/defeating-weed-menace/pn22274/pn22274.pdf)

Assessing weed spread in Australia using pathway risk analysis

Michael J. Coleman[1], Brian M. Sindel[2], Annemieke W. Schneider[2] and Ian J. Reeve[1]

[1] Institute for Rural Futures, University of New England, Armidale NSW 2351, Australia

[2] School of Environmental and Rural Science, University of New England, Armidale NSW 2351, Australia

Email: michael.coleman@une.edu.au Phone: +61 2 6773 3616

1. Goals

- Assess the relative risks of the different sources and pathways of weed ingress within Australia.
- Identify ways to reduce these risks.

2. Methods

- Identify relevant or potentially relevant pathways.
- Assess the risks associated with each pathway.
- Evaluate ease of pathway management.

The project progressed in two stages:

- a literature review; and
- a survey of Australian experts working in weed science, government and extension.

3. Results

The literature review identified:

- 24 sources of weeds (sites or areas of land from which new weed invasions may emerge); and
- 17 deliberate, accidental and natural pathways of weed spread (means of plant/propagule dispersal).

All weed sources and pathways were included in the survey. Over 100 survey responses were received.

3.1 Important weed sources

- Transport sites.
- Land in transition (degraded, abandoned or unused).
- Pastures/rangelands (grazing land).
- Ornamental horticulture (flowers, plants, bulbs, seeds).
- Private gardens.
- Arable/cropping land (dryland and irrigated).

Pastures and rangelands are considered amongst the most important weed sources in Australia (Senecio madagascariensis, Gloucester NSW)

3.2 Important weed spread pathways

- Ornamental plant trade.
- Machinery and vehicles.
- Fodder trade.
- Agricultural produce.
- Livestock movement.
- Wind.
- Birds.

3.3 High-risk pathways

Risk was evaluated according to eight pathway capabilities. The higher the score, the higher the risk (Figure 1).

- Speed: transport propagules quickly > live.
- Diversity: transport a high diversity of species.
- Quantity: transport large numbers of propagules in a single event.
- Frequency: a regular/ongoing rather than occasional event.
- Hospitability: deliver viable plants/propagules.
- Environment: introduce into suitable environments.
- Tolerance: overcome or avoid preventative strategies.
- Impact: transport weeds into sensitive areas.

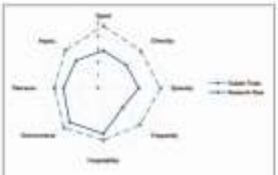


Figure 1: contrasting mean pathway capabilities – fodder trade (high capability) and research sites (low capability) (where 1 = 'low/non-existent capability' and 5 = 'high capability')

Unweighted mean capability scores were also produced to illustrate overall risk (Figure 2).

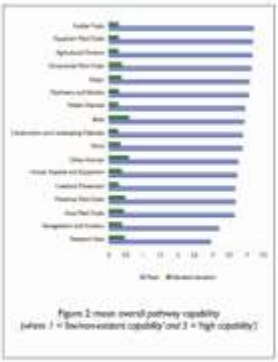


Figure 2: mean overall pathway capability (where 1 = 'low/non-existent capability' and 5 = 'high capability')

Ornamental plant trade and **machinery and vehicles** stood out as the most significant weed spread pathways.

- Prevalence: the highest proportion of respondents were aware of these pathways being a factor in weed spread.
- These were considered amongst the highest risk pathways.
- Related weed sources were amongst the most important – ornamental horticulture, private gardens, transport sites, pastures/rangelands, arable/cropping land.

The ornamental plant trade and machinery and vehicles pathways (ornamental plants (photo: J. Moss); vehicle (photo: L.Torres))

3.4 Increasing future pathway risk

- Fodder trade: more frequent/severe droughts.
- Water: variable climate, reduced herbicide availability.
- Machinery and vehicles: greater traffic movement.
- Ornamental plant trade: semi-rural population growth, popularity of gardening, drought-tolerant species.

The water (Egeria densa, Fernwood VIC) and fodder/fodder plant trade pathways may pose a greater risk in the future due to climate variation

3.5 Improving pathway management

Insufficient management may be due to gaps in regulation, insufficient knowledge, or inadequate implementation.

A specific management/regulation approach is required for each pathway. However, a general strategy includes a mixture of:

- 'negative' regulation: enforcement and fines;
- 'positive' management: education, labelling, codes of practice; and
- more research to assess pathway management options.

4. Outcome

Pathway risk assessment makes it possible to target scarce weed control resources by identifying those pathways (e.g. ornamental plant trade, machinery and vehicles) that have the greatest potential to spread weeds.

Acknowledgements

Thanks to Land & Water Australia for funding the research, and to all contributing organisations and individuals.

Further information is available at www.ruralfutures.une.edu.au

Appendix 2

MINIMISING WEED SPREAD – ACTION PLAN

The activities of all individuals may contribute to the introduction of new weed species, or the spread of existing weeds.

All land managers have a role to prevent the spread of weeds to neighbouring properties and to work co-operatively to ensure optimal outcomes are achieved. The following table summarises activities identified to minimise weed spread from each pathway.

	Management Action*										
Pathway for potential Weed spread Involving human Activity	**CoP**	**EMS**	**Comm**	**WRA**	**Educ & Aware**	**R &D**	**Resources Made Available**	**Clean Down Facilities**	**Compliance, Evaluation/ Audit/ Surveillance monitoring**	**Third Party Inspections**	**Incentives Levies**
Transport (land)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Transport (water)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tourism			✓		✓			✓			✓
Plants & plant parts	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Transport of live food, animals & parts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Plant trade	✓	✓	✓	✓	✓		✓		✓		✓
Aquarium trade	✓	✓	✓	✓	✓		✓		✓		✓
Construction & Landscape material	✓	✓	✓		✓	✓		✓	✓	✓	✓
Gas, power & mineral resources	✓				✓				✓		
Waste disposal				✓	✓			✓			✓
Ecosystem disturbance	✓	✓	✓		✓			✓			

Abbreviations:
CoP - codes of practice
EMS - environmental management systems
Comm - communication
WRA - weed risk assessments
Edu & aware - education and awareness
R & D - research and development

There requires an understanding among communities and industries that weed spread prevention activities must be imbedded as part of a working culture to ensure further impacts are not experienced. Weed Spread prevention must be included as an integral component in the development of future local government, agency and industry weed management plans.

Appendix 3 - Threatened Ecological Communities in Sydney

Extracted from Map of threatened ecological communities in NSW, Department of the Environment (Australian Government)

Appendix 4 - HIGH RISK PATHWAYS, HIGH RISK SITES and OTHER PRIORITY SITES Per LCA

Information contained in this section has been provided by each LCA

Campbelltown City Council HIGH RISK SITES			**GPS Co-ordinates X, Y - Projection MGA Zone 56 (GDA94)**	
	Name	**Location**	**X**	**Y**
Nurseries	Tims Garden Centre	2 Queen St, Campbelltown	299,123.87	6,229,315.81
	Campbelltown Wholesale Nursery	Wedderburn Rd, Wedderburn	298,485.72	6,221,230.79
	Bunnings Warehouse Campbelltown	Cnr Gilchrist And Kellicar Rd, Campbelltown	297,104.48	6,227,574.89
	Glenfield Wholesale Nursery	Glenfield Wholesale Nursery, Wills Rd, Long Point	305,931.34	6,235,369.74
	Private Undeclared Nursery	Sixth Ave, Macquarie Fields	306,359.21	6,235,676.61
Aquariams	Strictly Aquariams	18 Blaxland Rd, Campbelltown	298,776.81	6,229,499.25
	Campbelltown Pet and Aquariam Centre	Rear of Macquarie Shops, 647/266 Queen St, Campbelltown	298,169.49	6,228,042.19
Community Markets	Boot Hill Markets (Every Thursday and Saturday)	10 Swettenham Rd, Minto	299,860.44	6,232,477.53
Previuosly Identifyed Areas	Boneseed Treated Area	St Andrews Rd West, St Andrews	299,139.21	6,234,773.38
	Boneseed Treated Area	St Andrews Rd East, St Andrews	299,702.51	6,233,859.93
	Boneseed Treated Area	Sixth Ave, Macquarie Fields	306,387.13	6,235,785.43
	Boneseed Treated Area	Burrendah Reserve, St Andrews (on dam bank)	299,028.37	6,234,372.73
	Boneseed Treated Area	Peter Meadows Reserve	301,776.51	6,229,285.48
	Boneseed Treated Area	Rear of Cottonwood Cres, Macquarie Fields	306,424.69	6,236,916.23
	Boneseed Treated Area	Redfern Creek (Treelands Walk), Ingleburn	303,123.26	6,235,289.65
	Salvinia Treated Area	45 Junction Rd, Lumeah	301,544.97	6,229,633.10
	Salvinia Treated Area	Saam Thai Resturant, Dumaresq St, Campbelltown	298,185.68	6,228,116.51
	Salvinia Treated Area	Cambridge Ave, Glenfield Causeway, Glenfield	307,111.50	6,239,173.71
	Water Hyacinth 2009	Simmos Beach (Bottom Picnic Area) Lagoon, Macquarie Fields	306,702.48	6,235,691.15
	Water Hyacinth 2009	Glenfield Wholesale Nursery, Wills Rd, Long Point	305,931.34	6,235,369.74
	Water Hyacinth 2009	Mandurama Reserve Dam, Glen Alpine	295,689.74	6,224,857.01
	Water Hyacinth 2009	Bunburry-Curran Ck, Kennet Pk Glenfield	305,073.82	6,238,138.02

Campbelltown City Council HIGH RISK SITES			**GPS Co-ordinates X, Y - Projection MGA Zone 56 (GDA94)**	
	Name	**Location**	**X**	**Y**
	Water Hyacinth 2009	52 Raby Rd, Varroville	297,775.19	6,234,701.45
High Value Conservation Areas	Dharwal National Park	Victoria Rd, Wedderburn	299,735.29	6,218,327.88
	Holsworthy Army Barracks	Heathcote Rd, Holsworthy	312,170.16	6,232,883.26
	Georges River Corridor	Georges River Rd, Kentlyn-Minto Heights	303,311.43	6,228,800.12
	Fishers Ghost Reserve	The Parkway, Bradbury	298,105.77	6,226,439.90
	Peter Meadows Reserve	Peter Meadows Rd, Kentlyn	301,999.90	6,229,597.53
	Milton Park	Henderson Rd, Macquarie Fields	303,701.24	6,236,586.37
	Smiths Creek Reserve	Lumeah/Ruse	300,493.57	6,228,309.13
	Cooks Reserve	Ruse	301,247.84	6,228,373.17
	Kennet Park	Newtown Rd, Glenfield	305,123.03	6,238,257.62
	Simmos Beach Reserve	Helica Rd, Macquarie Fields	306,482.86	6,235,936.03
	Ingleburn Reserve	Picnic Grove, Ingleburn	304,767.51	6,235,184.28
	Macquarie Rd Reserve	Macquarie Rd, Macquarie Fields	304,151.32	6,236,182.54
	Noorumba Reserve	Appin Rd, Gilead	296,152.92	6,222,801.50
	Beulah biobank	Appin Rd, Mt Gilead	295,989.26	6,220,033.44
	Spring Creek	St Helens Park	298,124.00	6,224,601.79
	Mansfield Creek	St Helens Park	297,561.86	6,223,235.56
	Eagle Farm Reserve	Aquamarine Dr, Eaglevale	298,430.16	6,231,436.22
Aquatic Areas				
Rivers/Creeks	Georges River (Start)	Cambridge Ave, Glenfield-Dharawal National Park	306,718.53	6,233,929.71
	Georges River (Finish)		307,207.39	6,239,766.36
	Nepean River (Start)	Wollondilly-Camden	292,793.53	6,217,456.73
	Nepean River (Finish)		291,638.05	6,226,641.30
	Smiths Creek (Start)	College Rd, Airds-Bowbowing Ck, Lumeah	299,504.66	6,226,842.68

Campbelltown City Council HIGH RISK SITES			**GPS Co-ordinates X, Y - Projection MGA Zone 56 (GDA94)**	
	Name	**Location**	**X**	**Y**
	Smiths Creek (Finish)		299,775.01	6,230,279.49
	Fishers Ghost Creek (Start)	The Parkway, Bradbury-Bowbowing Ck, Campbelltown	298,075.12	6,226,120.50
	Fishers Ghost Creek (Finish)		297,667.74	6,228,309.25
	Birriwiri Creek (Start)	Bagdally Rd, Blairmount- Blaxland Rd, Campbelltown	297,730.70	6,229,331.40
	Birriwiri Creek (Finish)		298,330.66	6,228,935.13
	Thomson Creek (Start)	Aberfeldy Cres, St Andrews-Bowbowing Ck, St Andrews	299,645.39	6,233,027.46
	Thomson Creek (Finish)		300,556.44	6,233,408.91
	Box Hill Creek (Start)	Burrendah Reserve, St Andrews-Bunbury Curran Ck-St Andrews	298,447.32	6,234,586.61
	Box Hill Creek (Finish)		299,260.23	6,234,321.81
	Redfern Creek (Start)	Sackville St, Ingleburn-Bunbury Curran Ck, Ingleburn	302,841.48	6,233,916.29
	Redfern Creek (Finish)		304,509.88	6,238,410.43
	Macquarie Creek (Start)	James Meehan Pk, Macquarie Fields-Bunbury-Curran/Canterbury Rd, Macquarie Fields	305,081.61	6,237,140.61
	Macquarie Creek (Finish)		305,603.79	6,237,644.28
	Mcbarron Creek (Start)	Westmoreland Rd, Minto - Bow-Bowing Ck, Airds Rd, Minto	301,819.32	6,230,857.23
	Mcbarron Creek (Finish)		299,845.38	6,231,542.37
	Birunji Creek (Start)	Nurra Reserve, Dickens Rd, Ambarvale - Bow-Bowing Ck, Narrellan Rd, Campbelltown	297,045.56	6,225,316.86
	Birunji Creek (Finish)		297,367.76	6,227,861.13
	Lumeah Creek (Start)	Valley Reserve, Valley Rd, Leumeah - Bow-Bowing Ck, Rear of Hollyea Dr, Campbelltown	299,589.84	6,227,946.31
	Lumeah Creek (Finish)		299,508.36	6,229,901.73
	Cooks Reserve (Start)	Old Kent Rd, Ruse - Smiths Creek, Leumeah	301,361.48	6,228,066.21
	Cooks Reserve (Finish)		300,748.56	6,229,373.53
	Spring Creek (Start)	St Helens Pk Drive, St Helens Pk- Georges River, Wedderburn	297,464.06	6,225,005.76
	Spring Creek (Finish)		298,767.67	6,223,642.89
Boats Ramps	Menangle Park (Nepean River)(Non Public Access)	Menangle Rd, Nepean River, Menangle	291,959.62	6,222,541.00

Campbelltown City Council HIGH RISK SITES			**GPS Co-ordinates X, Y - Projection MGA Zone 56 (GDA94)**	
	Name	**Location**	**X**	**Y**
Dams	Nourumba Reserve Dam	Nourumba Reserve, Appin Rd. Rosemeadow	296,283.90	6,222,769.25
	Mandurama Dam	Mandurama Reserve, Glen Alpine	295,858.27	6,224,791.09
	Burrendah Dam	Burrendah Reserve, Cnr Thunderbolt Rd & Spitfire Rd, St Andrews	298,876.87	6,234,380.84
	Eaglevale Pond	Emerald Drive, Eaglevale	298,456.06	6,231,771.95
	Campbelltown Golf Course Main Dam	Heritage Way, Glen Alpine Dr, Glen Alpine	295,618.02	6,226,554.85
	Campbelltown Golf Golf Course Top Dam	Heritage Way, Glen Alpine	295,218.27	6,225,647.07
	Kanbyugal Reserve Dam	Behind Mill Rd, Lumeah	298,894.49	6,230,014.65
	Macquarie Links Golf Course	Macquarie Links	303,501.88	6,237,822.56
	University Western Sydney Dams	UWS, Narellan Rd, Campbelltown	296,236.79	6,228,145.58
	Marsfield Retreat Dam	Narellan Rd, Campbelltown	296,515.51	6,228,505.11
	Airds Pond	Riverside Dr, Airds	299,514.39	6,226,214.50
	Menangle Paceway	Racecourse Ave, Menangle Park	291,638.24	6,223,497.78
	Mt Gilead Dam	Appin Rd, Gilead	296,139.81	6,222,473.05
Wetlands	Marsden Park	Park Central, Parkside Cres, Centennial Dr, Campbelltown	297,270.57	6,227,046.37
	Tree Gully Drainage Reserve	Behind Mt Erin Rd, Blair Athol	297,267.66	6,229,304.77
	Simmos Beach	Helica Rd, Macquarie Fields	306,702.48	6,235,691.15
Lakes	Lake Mandurama	Mandurama Reserve, Glen Alpine	295,858.27	6,224,791.09
Stormwater Drains	Bow Bowing Canal (Start)	Campbelltown-Minto	294,680.44	6,225,606.19
	Bow Bowing Canal (Finish)		301,598.50	6,235,546.26
	Bunbury Curran Creek (Start)	Ingleburn-Macquarie Fields	299,260.23	6,234,321.81
	Bunbury Curran Creek (Finish)		306,961.11	6,238,153.50

Campbelltown City Council HIGH RISK PATHWAYS			**GPS Co-ordinates X, Y - Projection MGA Zone 56 (GDA94)**	
	Name	**Location**	**X**	**Y**
Terrestrial				
Roads				
Freeways	Hume Hwy (M5) (Start)	Length of Campbelltown LGA (Wollondilly-Liverpool)	293,102.32	6,222,314.54
	Hume Hwy (M5) (Finish)		303,670.97	6,239,486.20
Regional	Appin Rd (Start)	Campblltown-Appin	296,234.29	6,216,903.50
	Appin Rd (Finish)		297,765.32	6,227,403.99
	Campbelltown Rd (Start)	Lumeah-St Andrews	299,168.76	6,229,377.21
	Campbelltown Rd (Finish)		300,878.07	6,237,462.30
	Menangle Rd (Start)	Campbelltown-Menangle	291,557.30	6,222,510.29
	Menangle Rd (Finish)		297,373.82	6,227,816.47
Local	Moore-Oxley Bypass (Start)	Campbelltown	297,765.32	6,227,403.99
	Moore-Oxley Bypass (Finish)		299,168.76	6,229,377.21
	Narellan Rd (Start)	Campbelltown-Mt Annan	295,241.56	6,228,976.97
	Narellan Rd (Finish)		297,765.32	6,227,403.99
Railway Corridors	Main South Line (Start)	Glenfield-Menangle	291,896.34	6,222,493.29
	Main South Line (Finish)		305,985.64	6,239,642.38
	Glenfield East Hills Line (Start)	Glenfield	306,165.19	6,239,772.35
	Glenfield East Hills Line (Finish)		307,152.63	6,239,742.01
Waste Locations				
Waste Recovery Centres	Sita Depot	59 Junction Rd, Lumeah	301,442.57	6,229,294.26
Sewage Treatment Plants	Glenfield Sewer Treatment Plant (Sydney Water)	100 Victoria Rd, Glenfield	306,694.59	6,237,713.98

Campbelltown City Council HIGH RISK PATHWAYS			**GPS Co-ordinates X, Y - Projection MGA Zone 56 (GDA94)**	
	Name	**Location**	**X**	**Y**
Soil Related				
Lanscape and Soil Suppllies	Ambarvale Landscape and Building Supplies	67 Woodhouse Rd, Ambarvale	296,985.03	6,225,972.03
Machinery Depots	Campbelltown City Council Depot	Pembroke Rd, Minto	301,074.79	6,231,414.28

Hawkesbury River County Council HIGH RISK SITES		**Location**	**GPS Co-ordinates -**	
			Easting	**Northing**
Lakes	Glenmore loch	Glenmore park		
	Woodcroft lake	Woodcroft		
	Plumpton wetland	Plumpton		
High Value Conservation Sites	Peppermint reserve	Kingswood		
	Nurragingy reserve	Doonside		
	Newman road	Glenorie		
	Ellerman reserve	Round corner		
Nurseries	Milestone nursery	Dunheved		
	Flower power	Prospect		
	Sydney's plant market	Annangrove		
	Bunnings warehouse	McGraths hill		
	Bosch nursery	Londonderry		
Aquariums	Westside aquarium	St. Marys		
Saleyards	McGraths hill auctions	McGraths hill		
Community	Penrith markets	Penrith		

Hawkesbury River County Council HIGH RISK SITES		**Location**	**GPS Co-ordinates -**	
			Easting	**Northing**
Markets				
	Parklea markets	Parklea		
Jetties	Tench reserve	Penrith		
	Governor Philip park	Windsor		
	Windsor wharf	Windsor		
	River road reserve	Penrith		
Boat ramps	Tench reserve	Penrith		
	Governor Philip park	Penrith		
	Skeleton rocks reserve	Lower portland		
	Windsor wharf (canoe and kayaks)	Windsor		
	Little manly	Freemans reach		
	Fowlers reserve	Wallacia		
	Pacific park	Maroota		
	Cliftonville lodge	Leetsvale		
Land fill sites	East kurrajong tip	East kurrajong		
	South Windsor waste facility	South Windsor		
	SITA Eastern creek	Eastern creek		
	Mulgoa waste facility	Mulgoa		
	Blacktown waste services	Marsden park		
Quarries	Sydney sandstone quarries	East kurrajong		
	Dixon sand	Maroota		
Mines	Boral	Emu plains		
Showgrounds	Luddenham showground	Luddenham		
	Hawkesbury showground	Clarendon		

Hawkesbury River County Council HIGH RISK SITES		Location	GPS Co-ordinates -	
			Easting	Northing
	Blacktown showground	Blacktown		
Dams				
Wetlands	Blue hills wetlands	Glenmore park		
	Nurragingy reserve	Doonside		
	Yarramundi reserve	Yarramundi		
	Norwest business park (constructed wetland)	Bella vista		
	Surveyors creek	Glenmore park		
Stormwater drains	Breakfast creek	Marayong		

Hawkesbury River County Council HIGH RISK PATHWAYS		Location	GPS Co-ordinates - Projection Unit used (e.g. WGS 84)			
AQUATICS			**Start - Easting**	**Start - Northing**	**End - Easting**	**End - Northing**
Rivers / Creeks	Nepean river	Wallacia-Yarramundi	150˚38´21.28"E	33˚52´16.60”S	150˚42’00.38 ”S	33˚
	Hawkesbury river	Yarramundi- Ebenezer				
	Cattai creek	Glenorie-Ebenezer				
	South creek	Badgerys creek-Windsor				
	Eastern creek	Doonside-Riverstone				
	O’haras creek	Dural-Glenorie				

Hornsby Council HIGH RISK SITES		**Location**	**GPS Coordinates**	
HIGH RISK SITES			**Easting**	**Northing**
High Value Conservation Sites				
Chilworth Reserve	Hornsby Shire Council	Beecroft	320,527.682	6,263,469.111
Nurseries				
Arcadia Lily Ponds	Private	Arcadia	320,654.603	6,278,904.820
Austral Water Gardens	Private	Cowan	331,626.680	6,283,247.159
Ledora Water Gardens	Private	Mount Kuring-gai	327,671.492	6,276,195.573
Boat ramps	Hornsby Shire Council	Parsley Bay Brooklyn	335712.797	628648.442
Land fill sites				
Hornsby Shire Council Green Fill site	Hornsby Shire Council	Mount Kuring-gai	327,068.226	6,275,686.659
Hornsby Shire Council Hardfill Depot	Hornsby Shire Council	Mount Kuring-gai	327,489.261	6,275,816.525

Hornsby Council HIGH RISK PATHWAYS		**Location**	**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
AQUATICS			**Start - Easting**	**Start - Northing**	**End - Easting**	**End - Northing**
Rivers / Creeks						
Cockle Creek	Sydney Water and Hornsby Shire Council	Hornsby	325,560.150	6,269,314.254	325,878.594	6,270,360.572
TERRESTRIAL						
ROADS						
Pacific Highway	Roads and Maritime Service	Asquith to Cowan	323,858.323	6,269,787.859	330,319.811	6,281,403.602
Yatala Road	Hornsby Shire Council	Mount Kuring-gai	326,629.908	6,275,818.138	326,986.031	6,275,652.435
Old Northern Road	Hornsby Shire Council	Dural to Glenorie	317,036.296	6,268,595.032	315,580.849	6,281,967.633
Other						
Drainage line and Fire trail	Metropolitan Aboriginal Land Council	Lot 1129 Pacific Hwy, Berowra	327,617.353	6,276,080.288	327,313.657	6,276,409.330
Epping Rail Corridor	Railcorp	Epping Station to Cheltenham Station	322,489.703	6,261,209.022	322,079.085	6,263,244.913
Wahroonga Rail Corridor	Railcorp	Wahroonga Station to Waitara Station	325,132.645	6,267,892.930	324,409.685	6,268,334.257

Hunters Hill Council HIGH RISK SITES			**GPS Co-ordinates**	
	Name	**Location**	**Easting**	**Northing**
High Value Conservation Sites	Boronia Park	Park Rd Hunters Hill	328046	6255770
	Buffalo Creek Reserve	Pains Rd Hunters Hill	328097	6256423
	Riverglade Reserve and Tarban Creek Reserve	Manning Rd Hunters Hill	327495	6254515
	Gladesville Reserve and Betts Park	Huntleys Point Rd Huntleys Point	327720	6253878
	Kellys Bush	Nelson Parade Hunters Hill	330403	6253827
	Ferdinand St Reserve	Ferdinand St Hunters Hill	329082	6255010
Nurseries	Cornucopia Native Nursery	Victoria Rd Gladesville	326975	6254275
Community Markets	Riverside Girls High Organic Markets	Huntleys Point Rd, Huntleys Point	328006	6254071
Jetties	Alexandra Street	Woolwich	329806	6254534
	Valencia Street	Woolwich	331234	6254227
	Huntleys Point Road	Huntleys Point	328096	6253825
	Numerous private jetties			
Boat ramps	Margaret Street	Woolwich	330604	6253761
	Horse Paddock, Sydney Harbour Federation Trust Land (to Cockatoo Island)	Clarke Rd, Woolwich	330813	6253771
	UNSW Leased Land near Tarban Creek Bridge	End of Waruda Place, Huntleys Cove	328249	6254284
Wetlands	Patches of coastal saltmarsh and mangroves along Lane Cove and Parramatta Rivers			
	Constructed wetlands at Riverglade Reserve		327948	6254254
Stormwater drains	Numerous			

Hunters Hill Council HIGH RISK PATHWAYS			**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
	Name	**Location**				
AQUATICS			**Start - Easting**	**Start - Northing**	**End - Easting**	**End - Northing**
Rivers / Creeks	Lane Cove River		328205	6256489	331078	6253749
	Parramatta River		326824	6253818	331078	6253749
	Buffalo Creek		327502	6256810	328158	6256458
	Tarban Creek		327582	6254361	328756	6254346
TERRESTRIAL						
ROADS	Victoria Road		326815	6254407	328485	6253924
	Pittwater Road		326654	6255094	327489	6256831
	Gladesville Road		327344	6254888	328357	6254718
	Ryde Road		327202	6255771	328215	6254744
	Burns Bay Road		328359	6254325	328446	6255099
	Woolwich Road		329350	6254367	330820	6254026

Liverpool City Council HIGH RISK PATHWAYS			GPS Co-ordinates - Projection Unit used (e.g. WGS 84)			
	Name	Location	Start - Easting	Start - Northing	End - Easting	End - Northing
AQUATICS						
Rivers / Creeks	Georges River	Liverpool				
	Nepean River	Greendale				
TERRESTRIAL						
	Hume Hwy	Liverpool				
	M7	Cecil Hills				

Parramatta City Council HIGH RISK PATHWAYS			GPS Co-ordinates - Projection Unit used (e.g. WGS 84)			
	Name	Location	Start - Easting	Start - Northing	End - Easting	End - Northing
AQUATICS						
Rivers / Creeks	Toongabbie Creek	Toongabbie - Westmead	125	650	145	583
	Vineyard Creek	Telopea - Rydalmere	179	594	174	567
	Ponds Subiaco Creek	Dundas - Rydalmere	195	597	177	564
	Duck River	Granville	249	495	195	557

Pittwater Council HIGH RISK SITES			GPS Co-ordinates	
	Name	**Location**	**Easting**	**Northing**
High Value Conservation Sites				
	Loquat Valley Reserve - Cats Claw Creeper	22A & 25 Loquat Valley Rd, Bayview 2104	341,774.36	6,274,275.44
	Cabbage Tree Road - Asparagus falcatus	Road Reserve adj 52/54 Cabbage Tree Road, Bayview 2104	341,572.91	6,273,176.44
	Dendrobium Crescent-Horsetail	24 Dendrobium Crescent, Elanora Heights 2101	336,905.81	6,269,316.02
Nurseries				
	FlowerPower	20-22 Macpherson St, Warriewood 2101	341,680.8382	6,271,420.204
	Foley's	16 Macpherson St, Warriewood 2101	341,884.0663	6,271,287.251
Wetlands	Nareen Wetland - Ludwigia	45A Nareen Parade, North Narrabeen 2101	341,581.7060	6,269,293.848
	Warriewood Wetland - Ludwigia	14 Jacksons Road, Warriewood 2101	341,769.6324	6,270,495.860

Pittwater Council HIGH RISK PATHWAYS			GPS Co-ordinates - Projection Unit used (e.g. WGS 84)			
	Name	**Location**	**Start - Easting**	**Start - Northing**	**End - Easting**	**End - Northing**
AQUATICS						
Rivers / Creeks	Narrabeen Creek - Ludwigia/Alligator Weed		342,590.6	6,270,375.6		
	Fern Creek - Ludwigia	193A Garden Street, Warriewood 2011	341,623.0581	6,271,081.449		
	41/45 Warriewood	Rear of properties/ Narrabeen Creek	342,161.93	6,271,109.34		

Pittwater Council HIGH RISK PATHWAYS			**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
	Road – Senegal Tea Plant					
TERRESTRIAL						
ROADS	Mona Vale Road – Tussock paspalum/Coolatai Grass	Ingleside East, 2101	337,966.53	6,271,370.20		

Sutherland Shire Council HIGH RISK SITES			**GPS Coordinates**	
	Name	**Location**	**Easting**	**Northing**
High Value Conservation Sites	Lucas Heights Conservation Area	Lucas Heights		
	Kurnell Peninsular	Kurnell		
	Loftus Valley	Loftus, Yarrawarra, Engadine		
	Woronora Valley	Woronora, Bangor, Barden Ridge, Lucas Heights, Engadine, Woronora Heights		
	Bundeena	Bundeena		
	Waterfall	Waterfall		
	Mill/ Barden Creek	Lucas Heights, Menai, Alfords Point		
	Savilles Creek	Kirrawee		
Nurseries	Ausplants Nursery	Gymea		
	Accent Hydroponics P/L	Caringbah		
	Bamboo Grove	Jannali		
	Blakehurst Nursery P/L	Miranda		

Sutherland Shire Council HIGH RISK SITES			**GPS Coordinates**	
	Bonsai South Nursery	Caringbah		
	Bryants Orchids	Kurnell		
	Bunnings	Kirrawee		
	Bunnings	Taren Point		
	Catts Nurseries	Sylvania		
	Department of Lands	Cronulla		
	Engadine Plantation	Engadine		
	Evergreen Interiors	Lilli Pilli		
	Flower Power Nurseries	Taren Point		
	Illawong Garden Centre	Illawong		
	Lorac Australia P/L	Bonnet Bay		
	Mr Hydroponics	Gymea Bay		
	Pines Garden Studio	Gymea Bay		
	Pines Nursery P/L	Gymea		
	Plants Plus	Sylvania		
	Southern Mower Centre	Engadine		
	Sutherland Shire Council Nursery	Gymea		
	Swanes Nurseries	Sylvania		
	Sydney Wildflower Nusery	Heathcote		
	The Orchid Place	Heathcote		
	Trenchex	Kareela		
Aquariums	AG & K Aquariums and Discount Pet Supplies	Dolans Bay		
	Koi Keeper's Supplies	Engadine		
	Magestic Aquariums	Taren Point		
	Strictly Aquariums	Engadine		

Sutherland Shire Council **HIGH RISK SITES**			**GPS Coordinates**	
	Wings 'n' Fins	Sutherland		
	Xtreme Aquariums	Taren Point		
Saleyards	N/A			
Community Markets	Caringbah Rotary Market Como Markets Menai Community Markets Engadine Lions Market Cronulla Markets Gymea Village Fair Bundeena Markets	Caringbah Como Menai Engadine Gymea Bundeena		
Boat ramps	**(All boat ramps go into salt water)**			
	Swallow Rock Rd	Grays Point		
	Wonga Rd	Yowie Bay		
	Port Hacking Rd	Port Hacking		
	Water St	Caringbah South		
	Royal Motor Yacht Club	Caringbah South		
	Tonkin St	Cronulla		
	NSW Fisheries Research Institute	Cronulla – Hungry Point		
	Bonna Point	Kurnell		
	Old Taren Point Rd	Taren Point		
	Hawkesbury Esplanade	Sylvania Waters		
	Holts Point Place	Sylvania Waters		
	Princes Hwy (Tom Uglys Bridge)	Sylvania		

Sutherland Shire Council **HIGH RISK SITES**			**GPS Coordinates**	
	Connell Rd	Oyster Bay		
	Como Marina - Cremona Rd	Como		
	Scylla Bay - Verona Range	Como		
	Washington Drive	Bonnet Bay		
	Burnum Burnum Sanctuary	Woronora		
	Woronora Caravan Park	Woronora		
	Prince Edward Park Rd	Woronora		
	Old Ferry Rd	Illawong		
	St George Crescent	Sandy Point		
Land fill sites	Lucas Heights SITA	Lucas Heights		
	Kurnell Land fill (Breen)	Kurnell		
	Holt	Kurnell		
	NPWS	Audley		
Quarries	Heathcote Road – White Rock Lucas Heights SITA Kurnell Land Fill (Breen) Holt	Sandy Point Lucas Heights Kurnell Kurnell		
Mines	Woronora Dam Area	Woronora Dam		
Showgrounds	N/A			
Dams	Woronora Dam	Woronora Dam		
	Barden Dam	Barden Ridge		
	Ansto - 1 dam	Lucas Heights		
	Lucas Heights Conservation Area - 1 dam	Lucas Heights		
	Lucas Heights SITA - 4 dams	Lucas Heights		

Sutherland Shire Council HIGH RISK SITES			**GPS Coordinates**	
	Marconi Clay Shooting Club - 1 dam	Lucas Heights		
	The Ridge Golf Course - 2 dams	Barden Ridge		
	Audley Weir	Audley		
	Cronulla Golf Course - 5 dams	Cronulla		
	Woolaware Golf Course - 1 dam	Woolaware		
	Desalination Plant - 2 dams	Kurnell		
	Kareela Golf Course	Kareela		
Wetlands	Mianga Wetland	Engadine		
	Engadine Wetland	Engadine		
	Mina Rd Wetland	Menai		
	Sutherland Shire Council Nursery Wetland	Gymea		
	Camellia Gardens - 2 wetlands	Miranda		
	Australand - 3 wetlands	Kurnell		
	Serenity Cove - 2 wetalnds	Kurnell		
	Elourea Rd Wetland	Cronulla		
	Captain Cook Drive wetland	Woolaware		
	Caltex wetland	Kurnell		
	Hino Taren Point	Taren Point		
	Silverleaf Row wetland	Bangor		
	Dilkara Circuit wetland	Bangor		
	Gandangara Land wetland	Barden Ridge		
	RTA Alfords Point Rd – 2 wetlands	Menai		
	Waterfall Cam Couttes Wetland	Waterfall		
	Bundeena Creek	Bundeena		
Stormwater drains	Sir Joseph Banks Drive	Kurnell		

Sutherland Shire Council HIGH RISK PATHWAYS			**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
	Name	**Location**	**Start - Easting**	**Start - Northing**	**End - Easting**	**End - Northing**
AQUATICS						
Rivers / Creeks	Georges River					
	Woronora River					
	Port Hacking River					
	Mill Creek Barden Creek Loftus Creek Skinner Creek Carina Creek Dents Creek Still Creek Oyster Creek Ewey Creek Fahy Creek Forbes Creek Bottle Forest Creek	Lucas Heights Barden Ridge Engadine, Yarrawarra, Loftus Bonnet Bay Jannali/ Como Grays Point Menai, Bangor Sutherland, Kareela, Jannali Miranda Yarrawarra Engadine Heathcote				
TERRESTRIAL						
ROADS	Princes Highway	Waterfall, Heathcote, Engadine, Yarrawarra, Loftus, Sutherland, Kirrawee, Gymea, Kareela, Sylvania.				
	Heathcote Road	Heathcote, Engadine, Lucas Heights, Sandy Point				
	Alfords Point Road	Menai, Illawong, Alfords Point				
	Captain Cook Drive	Kurnell				
	Bangor Bypass	Bangor				

Sutherland Shire Council HIGH RISK PATHWAYS			**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
	Taren Point Rd	Taren Point, Caringbah				
Other						
National Park roads	Sir Bertram Stevens Drive Farnell Ave McKell Ave	Royal National Park				
State forest roads	N/A					
Railway corridors	Illawarra Train Line	Waterfall to Como				
	Cronulla Train Line	Sutherland to Cronulla				

Warringah Council **HIGH RISK SITES**				
	Name	**Location**	**GPS Co-ordinates – GDA 94**	
HIGH RISK SITES			**Easting**	**Northing**
High Value Conservation Sites				
	Middle Creek Catchment	Warringah Council-		
	Manly Warringah War Memorial Park	Warringah Council- 475ha		
	Deep Creek Reserve	Warringah Council-		
	JJ Melbourne Hills Reserve	Warringah Counci-l		
Nurseries	Mr Bamboo	Warringah Council	334529.009	6269977.791
	Palm Land	Warringah Council	334660.313	6269904.523
	Four Seasons Nursery	Warringah Council	334735.344	6267932.395
	Bonds Nursery	Warringah Council	335568.968	6271167.015
	Bunnings Brookvale	Warringah Council	339619.387	6262367.104
	Bunnings Belrose	Warringah Council	334220.709	6269405.118
	Valley Ranch Nursery	Warringah Council	336523.888	6267277.973
	Forest Way Nursery	Warringah Council	334737.268	6267703.623
	North Manly Garden Centre	Warringah Council	339879.992	6261466.952
	Green St Nursery	Warringah Council	339590.567	6262675.638
Aquariums	Hi Tek Aquarium	Warringah Council	340107.460	6262958.550
	Fish Works	Warringah Council	334589.149	6270026.875
Land fill sites	Kimbriki Recycle Centre	Warringah Council	336241.535	6270838.934
Lagoons	Dee Why Lagoon	Warringah Council		
	Narrabeen Lagoon	Warringah Council		
	Manly Lagoon	Warringah Council		
	Curl Curl Lagoon	Warringah Council		

Warringah Council **HIGH RISK SITES**				
Wetlands	Dee Why Wetland	Warringah Council		
	Deep Creek Freshwater wetland	Warringah Council		

Waverley Council **HIGH RISK SITES**				
	Name	**Location**	**GPS Co-ordinates – GDA 94**	
HIGH RISK SITES			**Easting**	**Northing**
High Value Conservation Sites	York Road ESBS	York Rd Bondi Junction		
	Queens Park ESBS	Queens Park Road Bondi Junction		
Nurseries	Honeysuckle Gardens Nursery	Oxford St Bondi Junction		
	Eco Gardens Bondi	Blair St Bondi		
Aquariums	AquaPets Aquarium	Ebley St Bondi Juction		
Community Markets	Bondi Beach Markets	Bondi Beach Public School Warners Avenue Bondi Beach		

Wollondilly Shire Council HIGH RISK SITES		**Location**	**GPS Coordinates Easting**	**Northing**
Lakes	Thirlmere Lakes (NPWS)	Slades Road, off West Parade, Couridjah		
High Value Conservation Sites	Thirlmere Lakes national Park			
	Warragamba Dam Special Area			
	Nepean/Avon/Cataract/Cordeaux Dam Special Area			
	Bargo State Conservation Area			
Nurseries	Tahmoor Garden Centre	Remembrance Drive, Bargo		
	Downes Wholesale Nursery	Stanhope Rd, Theresa Park		
	Botanica Wholesale Nursery	Silverdale Rd, Silverdale		
Aquariums	Derks Pets and Rural	Argyle St, Picton		
Community Markets	Wollondilly Creative Traders Markets			
Boat ramps	Douglas Park Causeway – Nepean River			
	Cobbity Reserve			
	400 Mckee road – Private access			
Land fill sites	Bargo Waste Management Centre			
	Warragamba Waste Management Centre (closed)			
	Remondis (Domestic Waste Contractor) Depot	Wonga Road, Picton		
	Wonga Road landfill (closed)			
Quarries	Mulhollands Road Shale Quarry (closed)			
	Buxton Sandstone Quarry	West parade, Buxton		
	Wilton Sandstone Quarry	Wilton road, Wilton		
Mines	Tahmoor colliery			

Wollondilly Shire Council HIGH RISK SITES		**Location**	**GPS Coordinates Easting**	**Northing**
	Westcliff Colliery	Bulli-Appin Road, Appin		
	Cordeaux Colliery	Picton Road, Wilton		
	Oakdale Colliery			
Showgrounds	Picton Showground	Menangle Street, Picton		
Dams	Private Dams, Glenfiddich Rise Estate	Garlics Range Road, Orangeville		
	Private Dam, Warredale Road			
	Private Dams, Silverdale Road	Corner Silverdale Road and Sylvan Rd, Werombi		
Wetlands	Turner St, Wetlands	Corner Turner St and Rita St, Thirlmere		
	Bridgewater Stormwater Detention Basins	Park Way and Macarthur Circuit, Camden Park		

Wollondilly Shire Council HIGH RISK PATHWAYS		**Location**	**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
AQUATICS			**Start - Easting**	**Start - Northing**	**End - Easting**	**End - Northing**
Rivers / Creeks	Nepean River	Nepean Dam to Wallacia				
	Bargo River	Yanderra to Pheasants Nest				
	Stonequarry Creek	Lakesland to Maldon				
	Redbank Creek	Thirlmere to Picton				
	Hornes Creek	Bargo to Couridjah				
	Dogtrap Creek	Bargo to Pheasants nest				
	Scotchies Creek	Silverdale to Warragamba				
	Allens Creek	Wilton to Douglas Park				
	Werri Berri Creek	Mobray Park to Warragamba				

Wollondilly Shire Council HIGH RISK PATHWAYS		**Location**	**GPS Co-ordinates - Projection Unit used (e.g. WGS 84)**			
		Dam				
	Mount Hunter Rivulet	Mount Hunter to Cobbitty				
	Kennedy Creek	Appin				
	Georges River	Appin				
	Cataract river	Cataract Dam to Douglas park				
	Cordeaux River	Cordeaux Dam to Pheasants Nest				
	Avon River	Avon Dam to Pheasants nest				
TERRESTRIAL						
ROADS	South western Freeway (31)	Yanderra to Menangle				
	Picton Road	Picton Township to Wollongong				
	Appin-Bulli Road	Appin township to Bulli				
Other						
Railway corridors	Main Southern Railway	Yanderra to Menangle				
	Picton Loop Line (tourist use)	Picton to Buxton				
	Maldon-Dombarton Rail Link (construction abandones, may be resumed in future)					