ABBREVIATIONS AND ACRONYMS

AAQ NEPM	National Environment Protection Measure for	CBD	Commercial Building Disclosure
	Ambient Air Quality	CCA	copper chrome arsenate
ABARES	Australian Bureau of	CCF	Climate Change Fund
	Agricultural and Resource Economics and Sciences	CDS	container deposit scheme
ABS	Australian Bureau of Statistics	CFI	Carbon Farming Initiative
AEEA	Australian Environmental-	CINSW	Coal Innovation NSW (Fund)
	Economic Accounts	CLM Act	Contaminated Land Management Act 1997
AEMC	Australian Energy Market Commission	CMA	catchment management authority
AEMO	Australian Energy Market Operator	CO	carbon monoxide
ANSTO	Australian Nuclear Science	CO ₂	carbon dioxide
ANSTO	and Technology Organisation	COAG	Council of Australian
ANZECC	Australian and New	OOAO	Governments
ANZEOO	Zealand Environment and	CSG	coal seam gas
	Conservation Council	CSIRO	Commonwealth Scientific
ARMCANZ	Agriculture and Resource Management Council of		and Industrial Research Organisation
	Australia and New Zealand	CWP	cold water pollution
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999	DCCEE	Department of Climate Change and Energy Efficiency (Australian Government)
AWD	available water determination	DEC	Department of Environment and Conservation NSW
BAM	biodiversity assessment method	DECC	Department of Environment and Climate Change NSW
BASIX	Building Sustainability Index		(formerly DEC)
BFCC	NSW Bush Fire Coordinating Committee	DECCW	Department of Environment, Climate Change and Water
BioBanking	Biodiversity Banking and		(formerly DECC)
	Offsets Scheme	DEWHA	Department of the
BTRE	Bureau of Transport and Regional Economics		Environment, Water, Heritage and the Arts (Commonwealth)
BoM	Bureau of Meteorology	DFS	Department of Finance and
BREE	Bureau of Resources and	DI WO	Services (NSW)
C&D	Energy Economics construction and demolition	DLWC	Department of Land and Water Conservation (NSW)
C&I	(waste) commercial and industrial	DP&E	Department of Planning and Environment (NSW)
	(waste)	DPI	Department of Primary Industries (NSW)
CAHC	Clean Air, Healthy Communities program	DUAP	Department of Urban Affairs and Planning (NSW)

DWE	Department of Water and Energy (NSW)	IPCC	Intergovernmental Panel on Climate Change
EDO	Environmental Defenders Office (NSW)	IUCN	International Union for the Conservation of Nature
EEGP	Energy Efficient Government Program (NSW)	KTP	key threatening process (see Glossary)
EEAP	NSW Energy Efficiency Action Plan	Landsat	Land and Earth Observation Satellite
ENSO	El Niño – Southern Oscillation	LGA	local government area
	(Index)	LLS	local land services
EOAM	Environmental Outcomes Assessment Methodology	LMwC	land management within capability
EPA	Environment Protection	LSC	land and soil capability
	Authority (NSW)	LTAAEL	long-term average annual
EPHC	Environment Protection and Heritage Council		extraction limits (see Glossary)
ERF	Emissions Reduction Fund	LULUCF	land use, land use change and
ESCo	energy service company		forestry
ESD	ecologically sustainable	LWU	local water utility
ESS	development Energy Savings Scheme	MAC	microbial assessment category
EWMP	environmental water	MDB	Murray–Darling Basin
FM Act	management program	MDBA	Murray-Darling Basin
FIVI ACI	Fisheries Management Act 1994	MEHW	Authority mouse-ear hawkweed
FMS	fire management strategy	MEMA	
GCCSA	(Sydney) Greater Capital City		Marine Estate Management Authority (NSW)
GDE	Statistical Area groundwater-dependant	MER	monitoring, evaluation and reporting
	ecosystem	MIL	monitoring investigation level
GEMS	Greenhouse and Energy	MLA	Metropolitan Levy Area
GMR	Minimum Standards Greater Metropolitan Region	NABERS	National Australian Built Environment Rating System
	(see Glossary)	NEM	National Electricity Market
GREP	Government Resource Efficiency Policy (NSW)	NEPC	National Environment Protection Council
GSP	gross state product	NEPM	National Environment
GVA	gross value added		Protection Measure
GWP	global warming potential	NGPSG	National GreenPower Steering
IBRA	Interim Biogeographic Regionalisation for Australia	NHMRC	Group National Health and Medical
IEA	International Energy Agency	MINING	Research Council
IOD	Indian Ocean dipole	NLI	National Litter Index
IPART	Independent Pricing and Regulatory Tribunal	NLWRA	National Land and Water Resources Audit
	garatery arta	N	nitrogen
		-	··-9-··

NO_2	nitrogen dioxide	REAP	Renewable Energy Action
NO _x	oxides of nitrogen	DET	Plan
NOW	NSW Office of Water	RET	Renewable Energy Target
NPW Act	National Parks and Wildlife Act 1974	RFMS	reserve fire management strategy
NPWS	National Parks and Wildlife	RIFA	red imported fire ant
	Service (NSW)	RIS	regulatory impact statement
NRC	Natural Resources	SCA	state conservation area
	Commission	SDL	Sustainable Diversion Limit
NRM	natural resource management		(Murray-Darling Basin Plan)
NRMMC	Natural Resource Management Ministerial	SEEA	System of Environmental- Economic Accounts
NDO	Council	SEPP	state environmental planning
NRS	national reserve system		policy
NV Act	Native Vegetation Act 2003	SHEBA	Soil Health Evidence Based Assessment
NWI	National Water Initiative	CL ATC	
NWQMS	National Water Quality Management Strategy	SLATS	statewide landcover and tree survey
O ₃	ozone	SMI	statement of management intent
OA	Office for Ageing (NSW)	SMU	soil monitoring unit
OECD	Organisation for Economic Cooperation and Development	SNA	System of National Accounts
OEH	Office of Environment and	SO ₂	sulfur dioxide
OLIT	Heritage (formerly DECCW)	SRA	Sustainable Rivers Audit
OHW	orange hawkweed	T&I	Department of Trade and
Р	phosphorus	TAD	Investment (NSW)
PAS	priorities action statement	TAP	threat abatement plan
PCP	pentachlorophenol	TfNSW	Transport for NSW
PM	particulate matter	TN	total nitrogen
PM ₁₀	particulate matter less than	TP	total phosphorous
PM _{2.5}	10 micrometres (10 ⁻⁶ metres) particulate matter less than	TSC Act	Threatened Species Conservation Act 1995
	2.5 micrometres (10 ⁻⁶ metres)	TSR	travelling stock route
POEO Act	Protection of the Environment	TSS	total suspended solids
	Operations Act 1997	UNFCCC	United Nations Framework
PoM	plan of management		Convention on Climate
PV	photovoltaic (solar energy)		Change
PVP	property vegetation plan	UPSS Regulation	Protection of the Environment
RAMA	routine agricultural management activity (by local government)		Operations (Underground Petroleum Storage Systems) Regulation 2008
RCEP	Regional Clean Energy Program	UV-B	ultraviolet radiation in the 280–320 nm wavelength band
RD&E	research, development and	VKT	vehicle kilometres travelled
NDGE	extension	VOC	volatile organic compound

VR1 Stage 1 vapour recovery

(motor vehicle emissions)

VR2 Stage 2 vapour recovery

(motor vehicle emissions)

WARR Waste Avoidance and

Resource Recovery

WELS Water Efficiency Labelling and

Standards

WHO World Health Organization

WoNS Weed of National Significance

UNITS

 μ micro (10⁻⁶)

μg microgram (10⁻⁶ grams)

 $\mu g/m^3$ micrograms per cubic metre

μm micrometre (10⁻⁶ metres)

μS/cm microSiemens per centimetre

cm centimetre

CO₂-e carbon dioxide equivalent units (see Glossary)

GL gigalitres (10⁹ litres)
GL/y gigalitres per year

Gt gigatonne GWh gigawatt-hour

ha hectare kg kilogram

kL kilolitre (10³ litres)

km kilometre

km² square kilometres

kWh kilowatt-hour

L litre m metre

m³ cubic metre

ML megalitre (10⁶ litres)

mm millimetre

Mt megatonne (10⁶ tonnes)
MW megawatt (10⁶ watts)

pH measure of acidity or alkalinity

PJ petajoule (10¹⁵ joules)

ppm parts per million

t tonne y year

GLOSSARY

acid sulfate soils: low-lying coastal clays and sands that contain sulfur-bearing compounds at concentrations above 0.05% in clays and 0.01% in sands

adaptive environmental water: water that is committed to the environment through water access licences; equivalent to 'held water' under Australian Government legislation

air toxics: gaseous, aerosol or particulate contaminants present in ambient air in trace amounts with characteristics (toxicity, persistence) which make them a hazard to human health, and plant and animal life

algal bloom: extensive growth of algae in a body of water, which occurs due to climatic conditions or as a result of excess nutrients in the water

alluvium: clay, silt, sand, gravel or similar material deposited by running water, especially during recent geological time

anthropogenic: produced or caused by human activity

aquaculture: cultivation for commercial purposes of aquatic organisms including fish, molluscs and plants in fresh or salt water

aquifer: rocks and porous sediments which hold and yield groundwater

ballast water: water carried in tanks to maintain stability when a ship is lightly loaded and normally discharged to the sea when the ship is loaded with cargo

benthic: bottom-dwelling; usually refers to organisms living on the substrate at the bottom of a water body

bioaccumulation: the accumulation in an organism of substances such as pesticides or other chemicals, which occurs when the organism absorbs a toxic substance at a faster rate than the substance is lost

biodiversity: the variety of all life forms; the different plants, animals and microorganisms, the genes they contain and the ecosystems they form

biological control: use of organisms (predators, herbivores, parasites and disease-producing organisms) to control pests and weeds

biomass: the total mass of living material occupying a specific part, or the whole of, an ecosystem at a given time

bioregion: relatively large areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of ecosystems – these landscape patterns are linked to fauna and flora assemblages and processes at the ecosystem scale, providing a useful means for simplifying and reporting on more complex patterns of biodiversity

biota: collectively, the plants, microorganisms and animals of a region

black water: occurs naturally due to the breakdown of leaf litter, inundated crops and other vegetation which results in the release of tannins and lignin causing water discolouration and is associated with low dissolved oxygen levels.

bloom: dense and visible growth of organisms (algae or other phytoplankton) in water, resulting from proliferation caused by increased nutrients (such as phosphorus), possibly toxic and generally resulting in reduced oxygen in the water

blue-green algae: members of the cyanobacteria (or Cyanophyta), characterised by blue-green pigmentation and a lack of cellular organisation

brownfield site: a site which needs to be cleared of existing industrial and commercial facilities with the accompanying risk of contamination

bycatch: species taken incidentally in a fishery along with the target species; often discarded

calcitic: in marine organisms, skeletons, shells, etc. can be based on calcium carbonate (calcite)

chain volume measures: volumes of economic activity or production that are weighted annually to remove the effect of changing prices and linked (or chained), to describe changes in levels of production or activity, particularly relevant where the prices of resources (like oil) or commodities (like computers) are subject to rapid change

climate variation/climate variability: long-term changes in the patterns of average weather of a region or the Earth as a whole

 CO_2 -equivalent (CO_2 -e): a metric measure used to compare the global warming potential (GWP) of various greenhouse gases relative to the concentration of CO_2 (which is defined as having a GWP of 1). For example, methane is 21 times more effective than CO_2 at heating the atmosphere and therefore has a GWP of 21; thus five tonnes of methane is equivalent to 5 × 21 = 105 tonnes of CO_2

connectivity: the degree to which the landscape facilitates animal or plant movement or spread, and ecological flows

Country: (Aboriginal) the term used to describe both the land and waters, including the sea, to which Aboriginal people have a cultural connection

critically endangered species: species (or population or ecological community) facing an extremely high risk of extinction in NSW in the immediate future

cyanobacteria: see blue-green algae

disturbance: (ecology) any process or event which disrupts ecosystem structure and processes

diversion: volume of water taken from a stream or aquifer on a sustained basis to supply water for rural, urban and industrial use; includes diversions undertaken by a water authority, private company or a group of individuals authorised to act as a water supply authority

domestic household use: when referring to water use, this is residential water use, excluding use for stock in rural areas

ecological community: an aggregation of organisms characterised by a distinctive combination of two or more species

ecosystem processes: the numerous interactions between different components (living and non-living) of an ecosystem that support the biological elements of the system including the storage and cycling of energy, nutrients and minerals, predation and competition, disturbance, weathering, and succession

ecosystem services: any functions provided by an ecosystem, such as the provision of clean air and water, the maintenance of soil fertility and the removal of wastes, that benefit humankind

El Niño – Southern Oscillation (ENSO): a natural oscillation in the state of the ocean—atmosphere system that leads to substantial changes in atmospheric circulation throughout the Asia—Pacific region and generally drier conditions in eastern Australia

electrical conductivity: a measure of charged particles in water used to estimate salinity, measured in microSiemens per centimetre (µS/cm)

emissions trading: a scheme to provide for market-based allocation of discharge opportunities; the environmental regulator first determines total acceptable emissions and then divides this total into tradeable units (often called credits or permits); these units are then allocated to scheme participants

endangered species: a species (or population or ecological community) facing a very high risk of extinction in NSW in the near future, but not considered to be critically endangered

environmental flows: flows of water (by volume and season) necessary to maintain aquatic biota and ecosystem processes

ephemeral plants: plants with a short life cycle – either perennial plants that produce new growth in a short seasonal cycle or plants that emerge and grow in response to short wet periods in arid climates

estuary: the part of the mouth or lower course of a river in which its current meets the sea's tides, and is subject to their effects

euthanisation: the deliberate killing of a pest animal using humane means

eutrophication: the over-enrichment of a body of water with nutrients, primarily nitrogen and phosphorus, resulting in excessive growth of some plants and algae and the subsequent depletion of dissolved oxygen e-waste: used ('end-of-life') electrical and electronic equipment, commonly composed of many component materials that are difficult and expensive to separate before they can be reused. Many of these materials, such as copper and gold, are valuable non-renewable resources; others, such as heavy metals, carbon black and brominated-flame retardants, are hazardous

extinct species: species that has not been recorded in its known or expected habitat in NSW over a time-frame appropriate to its life cycle and form

extraction: taking water from a waterbody or aquifer for use (also called abstraction)

faecal coliforms: a group of bacteria found in animal (including human) intestines and used as an indicator of the sanitary quality of water

faecal enterococci: a group of bacteria found in animal (including human) intestines and used as an indicator of the sanitary quality of water

fish kill: any sudden and unexpected mass mortality of wild or cultured fish

fishing effort: the amount of fishing gear used in a fishery over a unit of time, essentially fishing capacity times fishing activity

fishway: a structure placed on or around a constructed barrier (such as a dam or weir) to give fish the opportunity to migrate, also known as a fish ladder or fish pass

food web: a network describing the feeding interactions of the species in an area

fragmentation: the division of continuous habitat by vegetation clearance for human land-use activities, which isolates the remnant patches of vegetation and the species within them, and limits genetic flow between populations

fugitive emissions: releases of gases or vapours from mines or industrial equipment due to unintended or irregular occurrences (e.g. leaks)

full fuel cycle: emissions resulting from end use plus those resulting from feed stock extraction and refining, power generation and energy distribution Greater Metropolitan Area (GMA): the area of greater Sydney defined under the Protection of the Environment (Clean Air) Regulation 2010 (Part 1 s.3) and comprising the:

- (a) Central Coast Metropolitan Area
- (b) Newcastle Metropolitan Area
- (c) Sydney Metropolitan Area
- (d) Wollongong Metropolitan Area
- (e) local government areas of Blue Mountains, Cessnock, Kiama, Lithgow, Maitland, Mid-Western Regional, Muswellbrook, Port Stephens, Shoalhaven, Singleton, Wingecarribee and Wollondilly

Greater Metropolitan Region (GMR):

GMR₁: the area of greater Sydney defined by the Australian Bureau of Statistics comprising all statistical local areas and local government areas in the Sydney Statistical Division, Newcastle Statistical Subdivision, and Wollongong Statistical Subdivision

GMR₂: comprising the Sydney, Illawarra and Lower Hunter Regions

GMR₃: (Air Emissions Inventory) the area of NSW having Australian Map Grid (AMG) coordinates at the south-west corner at (Easting: 210000, Northing: 6159000, Zone 56) and north-east corner at (Easting: 420000, Northing: 6432000, Zone 56)

Greater Sydney: extends from Wyong and Gosford in the north, to the Royal National Park in the south; towards the west, the region includes the Blue Mountains, Wollondilly and Hawkesbury

greenhouse gases: atmospheric gases, including carbon dioxide, methane, chlorofluorocarbons, nitrous oxide, ozone and water vapour, which trap heat reflected from the Earth's surface

groundwater: the water beneath the Earth's surface that has filtered down to the zone where it is captured and the sediments or rocks are fully saturated

groundwater-dependent ecosystem (GDE): ecosystems where the species composition or natural functions depend on the availability of groundwater

growth form: (vegetation) the general morphology or form of a plant type

hypoxia: depletion of dissolved oxygen in an aquatic environment to a level detrimental to aquatic organisms

Indian Ocean Dipole (IOD): a coupled oceanic and atmospheric phenomenon in the Indian Ocean that affects Australia's climate

invasive species: a plant or animal that has been introduced into a region in which it does not naturally occur and that becomes established and spreads displacing naturally occurring species

invertebrates: animals without backbones, such as insects, worms, snails, mussels, prawns and cuttlefish

key threatening process (KTP): under the *Threatened Species Conservation Act 1995*, a process that significantly threatens, or may have the capability to significantly threaten, the survival or evolutionary development of species, populations or ecological communities

La Niña: the positive phase of the El Niño-Southern Oscillation, involving extensive cooling of the central and eastern tropical Pacific Ocean, often accompanied by warmer than normal sea surface temperatures in the western Pacific, and to the north of Australia. La Niña events are associated with increased probability of wetter conditions over much of Australia, particularly over eastern and northern areas

likely: in descriptions of the effect of climate change, indicates that there is a greater than 66% probability of occurrence, based on the definitions in IPCC 2007

long-term average annual extraction limit (LTAAEL): the average level of groundwater that can be extracted annually from an aquifer for extraction to be sustainable over the longer term

longwall mining: the main method of underground coal mining in Australia, it involves progressively shaving slices of coal from a longwall face under the protection of hydraulic roof supports. The coal is removed on a conveyer and as the machinery and roof supports move forward the roof and overlying rock collapse into the void left behind

macroinvertebrates: invertebrates visible to the naked eye, having a body length exceeding 1 millimetre

mafic: describes a mineral or rock that is rich in magnesium and iron

monitoring investigation level (MIL): the concentration of an air toxic which if exceeded requires an appropriate form of further investigation and evaluation (National Environment Protection (Air Toxics) Measure)

montane: of or inhabiting mountainous country

more likely than not: in descriptions of the effects of climate change, indicates that there is a greater than 50% probability of occurrence, based on the definitions in IPCC 2007

mosaic: (vegetation) a combination of distinct vegetation types within a spatial unit that often cannot be discriminated by the mapping techniques employed

non-woody vegetation: for vegetation monitoring using Landsat MSS satellite sensors, vegetation formations that are less than two metres high or with less than 20% canopy cover (mainly grasslands, arid shrublands and woodlands)

 NO_x : a generic term for a combination of the gases nitric oxide (NO) and nitrogen dioxide (NO₂); other oxides of nitrogen (e.g. nitrous oxide, N₂O are usually not regarded as a component of NO_x

off-gassing: the slow release of a gas from a solid material, such as by evaporation, desorption or chemical alteration

pathogen: a disease-causing organism

phreatic aquifer: the body of groundwater closest to the surface, the upper boundary of which corresponds to the water table

phreatophytic vegetation: deep-rooted plants that obtain a significant portion of the water they need from below the water table

planned environmental water: water committed to the environment by environmental water rules in water sharing plans

point source pollution: a source of pollution that can be pinpointed, such as a pipe outlet or chimney stack; see also diffuse source pollution

potable: water safe enough for drinking and food preparation

potential acid sulfate soils: soils generally found less than five metres above sea level that produce sulfuric acid when drained; the acid can affect groundwater and surface waters, with impacts on urban areas, farming productivity, plants and animals

primary production: (biology) the transformation of chemical or solar energy into organic matter and its accumulation in an ecosystem

productivity: (biology) the rate of accumulation of organic material in an ecosystem

projections: in the context of climate change, projections are estimates of future conditions and their effects on the environment, based on the application of a climate change model

recharge: the process whereby surface water from rain, irrigation or streams infiltrates into groundwater; the amount of water added to or absorbed into a groundwater system; or groundwater that feeds surface waters (also known as baseflow)

regulated rivers: (NSW) those rivers proclaimed under the *Water Act 1912* as having their flows controlled by the major dams; 'regulated' means that flows along the length of these rivers are controlled by releases from major dams to meet the needs of licensed users; (hydrology) rivers affected by major dams, weirs, canalisation and water transfers

remnant: (ecology) a small, fragmented portion of vegetation that once covered an area before being cleared

remote sensing: a means of acquiring information using airborne equipment and techniques to determine the characteristics of an area, commonly using aerial photographs from aircraft and images from satellites

riparian: occurring on or adjacent to a river, stream or other waterway

riparian zone: situated on or belonging to a river or a stream bank

runoff: water from rain or snow (and the substances it carries) which flows off the surface of the land into catchments

sclerophyll: vegetation with hard leaves and short internodes, adapted to dry conditions and often low levels of soil phosphorus, usually with an over-storey of eucalypts

sequestration: the long-term storage of carbon dioxide

siliceous: describes a rock which has silica (SiO₂) as its principal constituent

suspended solids: any solid substances present in water in an undissolved state, usually contributing directly to turbidity

sustainability: environmentally sound resource use; use that does not degrade ecosystems or affect the quality of the resource

Sydney Metropolitan Area: comprises 41 local government areas – Ashfield, Auburn, Bankstown, Blacktown, Blue Mountains, Botany, Burwood, Canada Bay, Camden, Campbelltown, Canterbury, Fairfield, Hawkesbury, Holroyd, Hornsby, Hunters Hill, Hurstville, Kogarah, Ku–Ring–Gai, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, North Sydney, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Strathfield, Sutherland, Sydney, The Hills, Warringah, Waverley, Willoughby, Wollondilly and Woollahra; does not include Gosford and Wyong Local Government Areas

temperature anomaly: the difference between an annual average temperature and the climatological average, which by World Meteorological Organisation convention is the average over 1961–90

total suspended solids (TSS): a measure of the inorganic salts (and organic compounds) dissolved in water

translocated native species: a plant or animal that occurs naturally in some part of Australia but has been introduced to another region in which it does not naturally occur

transpiration (evapo-transpiration): the loss of water by evaporation from the leaves of plants

turbidity: a measure of the amount of suspended solids (usually fine clay or silt particles) in water and thus the degree of scattering or absorption of light in the water

unregulated rivers: (NSW) rivers without major dams or regulating structures (cf. regulated rivers)

upwelling: divergence of water currents or the movement of warm surface water away from land leading to a 'welling up' of deeper water that is commonly richer in nutrients, with the combination of nutrients and warmth leading to abundant algal growth

vegetation class: a more detailed description of vegetation than formations, based on the dominant structure or growth-form, supplemented by selected details of plant composition, location or environmental characteristics that help to best identify it – in NSW, one of 99 classes defined by Keith 2004

vegetation community: a group or assemblage of plant species that tend to grow together in similar environmental conditions where the association of species helps to identify or describe the plant community

vegetation condition: the health of native vegetation communities which reflects the level of naturalness and is commonly assessed against a benchmark taking account of factors such as structural integrity, species composition, presence or absence of weeds and diseases and reproduction of species

vegetation formation: a very broad classification of vegetation based on the structure or growth-form of the dominant plants in the formation – in NSW, one of 16 formations defined by Keith 2004

vegetation structure: the organisation of plants within a plant stand or assemblage consisting of one or more layers or strata

vehicle kilometres travelled: a function of the number of motor vehicles on the road and the average distance travelled by each vehicle

vertebrates: animals with backbones and spinal columns – vertebrates include fishes, sharks and rays, amphibians, reptiles, mammals, and birds

very likely: in descriptions of the effects of climate change, indicates that there is a greater than 90% probability of occurrence, based on the definitions in IPCC 2007

virtually certain: in descriptions of the effects of climate change, indicates that there is a greater than 99% probability of occurrence, based on the definitions in IPCC 2007

vulnerable species: a species (or population or ecological community) facing a high risk of extinction in NSW in the medium-term future, but not considered to be endangered

wilderness: an area which, together with its plant and animal communities, is in a state that has not been substantially modified by humans, or that is capable of being restored to such a state, and is of sufficient size to make its maintenance in such a state feasible; it can provide opportunities for solitude and self-reliant recreation

woody vegetation: for vegetation monitoring using Landsat MSS satellite sensors, vegetation formations (mainly woodlands and forests) that are over two metres high and with more than 20% canopy cover; also known as 'detectable native forest'

INDEX

AAQ NEPM, see Ambient Air Quality Measure	national and interjurisdictional responses, 74–5
(AAQ NEPM) Aboriginal traditional knowledge, threatened	National Indoor Air Project, 75
species responses, 108	presentation and communication of air quality
accounting, see environmental-economic	data, 74
accounting	reducing diesel and marine emissions, 73
acidification, see soil condition	supporting climate change strategies, 74
AdaptNSW program, 190	airborne particles, see particle pollution
AEMO electricity demand forecasts, 21, 23	algal blooms, <i>179</i> , 183
ageing population, 5	alluvial aquifers, see groundwater
age profiles, 5, 5	Ambient Air Quality Measure (AAQ NEPM),
NSW Ageing Strategy, 6	66, 69
agriculture	ozone standards, 67–8, <i>67</i>
see also land clearing; soil condition; water	particle standards, <i>68</i> , 69, 74–5
resources	animals, see fish; threatened species
farm profitability and soil condition, 91	aquatic reserves, <i>see</i> marine parks and aquatic
greenhouse gas emissions and, 41	reserves
private land conservation, 126, <i>127</i> , 128, 129	aquatic weed species, 138–9, 168
unsustainable land use, 90	see also invasive pest and weed species
Air Emissions in my Community web tool, 73	Aquifer Interference Policy, 177
Air Emissions Inventory, 70	aquifer protection and research, 178
air quality, 65–77	see also groundwater
see also emissions	Australian Bureau of Statistics (ABS), AEEA
air pollutants, 66, 70	system, 14
air toxics, 69–70, 73	Australian Environmental-Economic Accounting
building codes and standards, 75	(AEEA) system, 14
climate change pressures, 71	(· ·== / · y o y o · c · · · · ·
context, 66	Basin Plan, see Murray-Darling Basin
future opportunities, 75	beaches
lead monitoring, 66, 69	beach suitability grades, 181
monitoring networks, 71	pest animals and weeds, 137
national standards and goals, 66–70	Beachwatch and Harbourwatch, 180–1
NSW indicators, 65	bicycle ownership and cycling, 31, 33
ozone concentrations, 66-8, 67, 70	BioBanking and biodiversity certification
particle concentrations, 67, 68-9, 68, 69, 70,	schemes, 108
71–2	biodiesel, see biofuels
population and, 71	biodiversity
pressures, 70–1	see also protected areas and conservation;
status and trends, 66–70	threatened species; wetlands
variations in monitored pollutant levels, 70	biodiversity corridors, 108
wood smoke management program, 73	biodiversity legislation reforms, 118
Air Quality Index, 74	biodiversity offsets policy, 108
air quality responses, 71–5	monitor conservation status of species, 106
building rating schemes, 75	weed and pest management, 130
cleaner vehicles, fuels and engines, 75	Biodiversity Assessment Methodology
controlling emissions, 71-3	(BAM), 118
managing indoor air quality, 74	biofuels, 20, 24, 40
monitoring and reporting air quality, 74	ethanol in petrol, 24

biological control agents, 137	water resources and, 149, 167
bioregions, <i>see</i> protected areas and	weed spread and, 139
conservation	Climate Change Fund, 22, 40
Biosecurity Act, 140–1	urban water and, 53
Biosecurity Strategy 2013–2021, 140–1	COAG Energy Council, Power of Choice
birds	Reforms, 26
see also waterbirds	coal and gas, 18, 21
noisy miners as threatening process, 106	coal mining emissions, 26, 37, 72
Bitou Bush Threat Abatement Plan, 130	coal seam gas (CSG) industry, groundwater
black spiny sea urchin, 187	pressures, 176
'brownfield' sites, 80	coal train loading and unloading facilities, 72
Building Sustainability Index (BASIX), 24	coal-fired power station pollution, 70
urban water and, 53	combustion efficiency improvement, 26
buildings, see indoor air quality; NABERS	diversifying energy supply and lowering coa
system; residential sector bus trips, 31, <i>31</i>	use, 23 energy market reform, 26
bushfires	gas consumption, 19, 21, 39
pollution from hazard reduction burns, 68–9	gas supply, 23–4
reserve system and, 128, 130	National Electricity Market (NEM) and, 39
reserve system and, 120, 130	Coal Innovation NSW Fund, 41
cane toads in Taren Point, 136	coastal, estuarine and marine ecosystems,
Cap and Pipe the Bores program, 177–8	179–93
carbon capture and storage, 26, 41	see also wetlands
organic soil loss and, 89	beach suitability grades, 181
carbon dioxide, <i>see</i> greenhouse gas emissions	catchment disturbance pressures, 184–5
Carbon Farming Initiative (CFI), 92	chlorophyll <i>a</i> grades, <i>183</i>
carbon price, federal, 39	climate change pressures, 187
carp, 168	coastal inundation, 188–9
see also fish	context, 180
cars, see transport; vehicles	ecosystem health, 183
catchments	eutrophication, 182-3
coastal ecosystems, 182-5, 190	faecal contamination, 181, 182
water extraction and altered flow regimes, 158	fishing pressures, 187
water quality pressures, 167	frequency of algal blooms, 179, 183
chemical contamination, see contaminated sites	future opportunities, 191
chlorophyll <i>a</i> , <i>see</i> eutrophication	invasive species pressures, 187
CINSW Fund, 26	licensed discharges to, 186
Clean Machine Program, 73	marine acidification, 187–8
clearing of native vegetation, see land clearing	monthly average sea levels, 188
climate change	NSW indicators, 179
see also greenhouse gas emissions;	nutrient and sediment loads, 185-6
temperature	pollution and refuse, 186
air quality and, 71, 74	population and demographic change
coastal ecosystems and, 187	pressures, 184
groundwater and, 176	pressures, 184–9
protected areas and, 128, 130	recreational water quality, 180–2, 181
river health and, 159	rocky reef biota and macrophyte
soil condition and, 90–1	distribution, 184
sustainable land management and, 96, 99	sea level rise and coastal inundation, 188–9
threatened species and, 106	sea surface temperature and salinity, 187
vegetation condition and, 116	status and trends, 180–4
water demand and, 49	threatened species, 183

turbidity, 183	Program, 51
water quality, 180	cycling and bicycles, 31, 33
coastal, estuarine and marine ecosystems	
responses, 189–91	dams, 51
AdaptNSW, 190	desalination, 51
Australian Government activities, 191	diesel and marine emissions, 73
catchment action plans, 190	disease microorganisms, 139
coastal reforms, 190	disposal, see litter; waste and recycling
coastal zone and estuary management	domestic emissions, 73
plans, 190	drinking water quality management, 52
·	see also water resources
legislation, 189–90	
management of water quality, 190	drought, 149
national parks and forest reserves, 167	impact on water demand, 49
policies and programs, 190–1	pressures on river health, 158
regional plans, 190	dust storms, 68-9
cold water pollution, 158	
combustion efficiency improvement	economics and the environment, 9-16
technology, 26	context, 9
commercial sector	costs from invasive species, 135-7
emissions, 73	economic growth, 10
energy consumption, 18, 20–1	economic growth pressures, 10-11
NABERS in, 25	future opportunities, 14–15
commuting, see transport	pressures, 10–11
congestion, 32	status and trends, 9-10
conservation, see private land conservation;	water consumption by major industries and
protected areas and conservation; threatened	households, 15
species	water resources, 144
contaminated sites	economics and the environment responses,
community perceptions, 82	11–15
context, 80	cost-benefit analyses, 11-12, 12
future opportunities, 84	current use of economic analysis, 11
land management framework, 80	emerging use of economic analysis, 13
NSW indicators, 79	environmental-economic accounting, 13-15
pressures, 81–2	program evaluations, 12
regional capacity building, 82	use of economic instruments in environment
regulated sites, by contamination type, 81	protection, 12
remediation, 81, 82	electric vehicles, 21, 24
status and trends, 80–1	electricity sector
total regulated and remediated sites, 80, 82	electricity consumption pressures, 21–2
contaminated sites, responses	electricity demand forecasts, 21, <i>21</i> , 23
backlog program, 83	electricity use per capita, 17
capacity building, 83–4	emissions and, 38, 39
cost recovery, 83	energy market reform, 26
legislative reforms, 82	energy production and conversion, 18
preventative approaches program, 83	renewable energy generation and growth,
strategic projects, 84	19–20, <i>20</i>
underground petroleum storage systems	smart meters and grids, 25
regulation change, 82–3	emissions
contaminated sites responses, 82–4	see also air quality; greenhouse gas
information needs, 82	emissions
notified sites, 82	air emissions decrease, 70
Country Towns Water Supply and Sewerage	commercial and domestic emissions, 73
Country Towns Water Supply and Sewerage	commercial and domestic emissions, 13

diesel and marine emissions, 73	and the environment
industrial emissions, 72	Environment Protection Authority, 12
mine emissions, 26	environmental accounts, see environmental-
particle emissions, 71–2	economic accounting
summer petrol volatility, 72	environmental water, 145-8
transport, 32, 38, 72	adaptive environmental water ('held water')
vapour recovery, 72	145–7, <i>147</i>
zero-emission energy generation	delivery, 147–8, <i>148</i>
facilities, 23	recovery, 147, 147, 148, 151, 159
Emissions Reduction Fund (ERF), 92	to restore and maintain wetlands, 164, 168
endangered populations, 105	water sharing plans, 144, 145
see also threatened species	environmental-economic accounting, 13-15
energy consumption, 17–27	rationale and history, 13
see also coal and gas; electricity sector;	System of Environmental-Economic
renewable energy sources	Accounting, 13–14
context, 18	equipment and energy efficiency, 25–6
electricity consumption and demand	erosion, see soil condition
forecasts, 21	estuaries
electricity generation from renewable	see also coastal, estuarine and marine
sources, 20	ecosystems; wetlands
final energy consumption by fuel and	chlorophyll a in, 183
sector, 18	faecal contamination in, 182, 183
final energy consumption by sector, 18	management plans, 190
future opportunities, 26	turbidity in, 183
lower emissions energy, 40–1	ethanol in petrol, 24
NSW indicators, 17	see also biofuels
pressures, 20–2	eutrophication, 182–3
status and trends, 18–20	exotic plants and animals, 134
trends in NSW energy use, 38	see also invasive pest and weed species
using energy wisely, 24–6	extinctions, 105
waste heat from power plants, 18–19	see also threatened species
energy consumption responses, 22–6	extreme weather events, see climate change
energy efficiency, 24–6	for cal contamination, represtignal water
developments, 22	faecal contamination, recreational water
using energy more efficiently, 40	quality, 181
Energy Efficiency Action Plan (EEAP), 22, 40	fauna, <i>see</i> threatened species feral animals, <i>see</i> invasive pest and weed
Energy Efficient Government Program (EEGP), 25	species
energy generation, 19–20	final energy consumption, 17–27
see also power stations	defined, 18
energy production and conversion, 18	emissions by economic sector, 39
supply mix, 19	by fuel and sector, 18
sustainable energy sources, 18	by sector, 18
sustainable growth and, 11	fire, see bushfires
zero-emission designs, 23	fire ants, 135
energy market reform, 26	fish
Energy Savings Scheme (ESS), 22, 40	blockages to fish passage, 157–8
energy supply	conservation and management, 108, 160
diversifying, 23	fish condition index, 154–5, <i>156</i>
sustainable growth and, 11	fish habitat, 108, 160
energy use, see energy consumption	fishways, 160
environment, economics and, see economics	introduced or invasive species, 135–6, 168
,	

river health responses, 160	pressures on air quality, 71
threatened species, 156	status and trends, 37-8
fishing, 127, 187	summer temperature reconstruction, 36
flooding, coastal, 188–9	from transport, 32, 38, 72
floodplains, 164	greenhouse gas emissions responses, 40-1
see also wetlands	carbon capture and storage, 41
floodplain harvesting policy, 151	carbon sequestration, 41
management plans, 151-2, 159	lower emissions energy, 40-1
food wastage, 62	using energy more efficiently, 40
Forests NSW conservation zones, 126	Greenhouse Gas Reference Network, 37
fossil fuels	gross state product (GSP), 9-10, 10
see also fuels	groundwater, 171–8
greenhouse gas emissions and, 36	see also water resources
NSW emissions components, 37	annual levels of groundwater extraction, 173
power stations, 23	context, 172
fuels	entitlements under water sharing plans, 177
see also energy supply; fossil fuels	extent and major uses, 172-4
alternative transport fuels, 21, 24	future opportunities, 178
cruise ships, 73	levels of extraction and recharge, 172-3
diesel and marine emissions, 73	long-term extraction limit, 174, 175
final energy consumption by fuel and	NSW indicators, 171
sector, 18	pressures, 175-6
national and interjurisdictional responses, 75	status and trends, 172–5
transport emissions, 32, 38, 72	understanding connections between
fungal pathogens, 139	groundwater and surface water systems, 178
	groundwater pressures
garbage, see waste and recycling	chemical contamination, 176
gas	climate change, 176
see also coal and gas	coal seam gas (CSG) industry, 176
consumption, 19, 21, 39	excessive demand and extraction, 175-6
energy market reform, 26	saline intrusion, 176
supply, 23–4	groundwater responses, 177-8
Gas Plan, 24	Aquifer Interference Policy, 177
global mean temperature, see temperature	aquifer protection and research, 178
Government Resource Efficiency Policy	Cap and Pipe the Bores program, 177–8
(GREP), 25, 40	interim aquifer interference regulation, 177
grassland	State Groundwater Dependent Ecosystems
land clearing, 115	Policy, 177
vegetation condition, pressures on, 116	Water Management Act 2000, 177
Green Star, 75	water sharing plans for groundwater, 177
Greenhouse and Energy Minimum Standards	groundwater-dependent ecosystems (GDEs),
(GEMS), 25-6	172, 174–5
greenhouse gas emissions, 35–43, 36	identification of, 175
see also climate change	subsurface, 174
Australian, 37	surface, 174
context, 36-7	Gwydir wetlands system, 167
by economic sector, 39, 39	
emissions components, 37–8, 38	habitat loss
future opportunities, 41	see also fish
global, 37, 38	biodiversity corridors, 108, 128
NSW, <i>35</i> , <i>38</i> , 39	habitat fragmentation caused by clearing, 116
pressures, 38–9	public reserves system and, 108

threatened species and, 106 hazard reduction burn operations, 130	lack of biological data, 139–40 new and emerging, 135–7, 140
see also bushfires	NSW indicators, 133
hazardous substances, 61	pathogens and diseases, 139
air toxics, 69–70, 73	pest animals, 128, 135–7, <i>137</i>
heating	pest weeds, 136–7
in homes and schools, 74	pressures, 139–40
wood smoke management program, 73	pressures on river health, 158
'held water', 147	pressures on wetlands, 168
'Hey Tosser!' anti-litter campaign, 63	status and trends, 134–9
housing, see residential sector Hunter Water	threatened species and, 106
	vegetation condition, pressures on, 116
management plans, 51	weeds, 127–8, 130, 137, <i>138</i>
water demand, 48	invasive pest and weed species responses, 140–1
illegal activities	Biosecurity Act, 140–1
illegal dumping, 60, 62	containment of new and emerging
protected areas and conservation, 128	species, 140
Illegal Dumping Strategy 2014–16, 62	Invasive Species Plan, 140
Implementation Plan for the National Water	NSW Biosecurity Strategy 2013–2021, 140–1
Initiative, 54	priorities for managing widespread invasive
Independent Biodiversity Legislation Review	species, 140
panel, 106, 108	regional weeds committees, 140
indoor air quality, 66, 70	Saving our Species program, 140
heating in homes and schools, 74	irrigation, see water extraction
home maintenance, 74	inigation, boo water extraotion
Legionnaires' disease, 74	journeys, see transport; trips
National Indoor Air Project, 75	
tobacco smoke, 74	land clearing, 114–15
industrial emissions, see coal and gas;	clearing of non-woody vegetation, 115
emissions; vehicles	clearing of woody vegetation, 114-15
industrial sector	Native Vegetation Act 2003, 117
air quality impacts from licensed activities, 72	land degradation, see soil condition
changes in, 10	land protection, see protected areas and
contaminated sites, 79, 80-4	conservation
emissions by economic sector, 39	land-based formal reserve system, see national
energy consumption, 18–21	parks and forest reserves; protected areas and
infrastructure, 32–3	conservation
insects, introduced, 134	Landcare groups, 91, 100
introduced species, see invasive pest and weed	Landsat remote sensing data, 114
species	land-use and land management regimes
invasive pest and weed species, 133-41, 137	see also sustainable land management
see also threatened species	intensifying land use, 99
categories of, 135–9	land management practices defined, 96
climate change and, 139	land management within capability, 96–7
coastal, 187	land use defined, 96
context, 134	land-use mapping, 113
extent of, 134	land-use pressure on native vegetation,
future opportunities, 141	116, <i>116</i>
impacts of, 134–5 invasive aquatic species, 138–9, <i>138</i>	LULUCF activities, 38 physical disturbance of wetlands, 167–8
key threatening processes, 138	private land conservation, 126–8, <i>127</i>
noy unoutorning processes, 100	private faria conscrivation, 120-0, 121

lead monitoring, 66, 69	National Litter Index (NLI) Annual Report, 59-60
Legionnaires' disease, 74	national parks and forest reserves, 123
liquefied natural gas, see coal and gas litter	see also marine parks and aquatic reserves; protected areas and conservation
see also waste and recycling	additions to, 129
container deposit scheme, 64	extent and types of, 124
estimated volume, 60	long-term reservation objectives, 125–6, <i>125</i>
human behaviour, 62	major threats to park values, 127
•	
litter prevention programs, 63 litter trends, 59–60	managing threats in, 130–1 new formal conservation areas added, <i>126</i>
·	•
NSW versus national averages, 60	plans of management, 129
Local Land Services	reserve fire management strategy, 129
regional weeds committees, 140	threatened species responses, 108
travelling stock routes (TSRs), 122	threats to values in, 127–8
Long Term Transport Master Plan, 32, 33	wetlands, 166–7, <i>166</i>
Lower Hunter Water Plan, 51	National Parks and Wildlife Service (NPWS), 122
and the first of the second of the second of	National Water Initiative (NWI), 54, 151
manufacturing, see industrial sector	National Water Quality Management Strategy
marine emissions, 73	(NWQMS), 191
Marine Estate Management Authority, 122	native species listed as threatened, see
marine parks and aquatic reserves, 122,	threatened species
<i>123</i> , 126	native species listed as threatening process,
see also coastal, estuarine and marine	noisy miners, 106
ecosystems; national parks and forest	native vegetation, 111–19
reserves	see also land clearing
community opinion on, 129	catchment disturbance and, 158
conservation responses, 130-1	clearing of non-woody vegetation, 115
extent of, 127	clearing of woody vegetation, 114-15, 115
threats to, 129	coastal aquatic vegetation. see coastal,
types of, 127	estuarine and marine ecosystems
marine threatened species, 183	condition classification, 113, 113
see also threatened species	context, 112
market-based information, 13	extent of, 112
metropolitan water, see urban water	extent of intact vegetation, 112-13
Metropolitan Water Plan 2010, 50-1	extent of, pressures on, 114-15, 116
microplastics in the marine environment, 61	freshwater aquatic vegetation. see wetlands
migration, population growth and, 4-5, 4	future opportunities, 118
mining, see coal and gas	invasive species and, 134-5. see also
motor vehicles, see vehicles	invasive pest and weed species
mouse-ear hawkweed (MEHW), 136	land-use pressure on native vegetation, 116
Murray-Darling Basin	management activities, 117
groundwater, 176	mapping approaches, 112
invasive pest and weed species, 135-6	NSW indicators, 111
river health, 154, 158, 159	pressures, 113-16
water resources, 149, 150-1	revegetation, 114
wetlands, 164, 168	status and trends, 112-13
	vegetation condition, pressures on, 116
NABERS system (National Australian Built	wetlands, 164, 167
Environment Rating System), 25	woody vegetation change, 115
air quality, 75	native vegetation responses, 117–18
water ratings, 53–4	biodiversity legislation reforms, 118
National Electricity Market (NEM), 39	management of native vegetation, 118

property vegetation plans, 117 natural capital, 14 natural hazards, 5 natural resources accounting for, 13–14 economics and, 10–11 New South Wales, see specific words in project titles, e.g. Gas Plan not NSW Gas Plan nitrogen oxide (NOx) emissions, 66–8, 70 noisy miners (birds), 106 non-renewable energy sources, 17	distribution, 2 growth, 1–2, 3, 4–5, 4 increasing economic activity and, 60 migration, 4–5, 4 NSW, 2, 3, 4 pressures, 4–5 pressures on air quality, 71 soil condition and, 91 status and trends, 1–4 Sydney, 2, 3 population, responses, 6
Noxious Weeds Act 1993, 137 NSW, see specific words in project titles, e.g. Gas Plan not NSW Gas Plan	NSW Ageing Strategy, 6 A Plan for Growing Sydney, 6 regional plans, 6 ports, 73
Office of Environment and Heritage (OEH), 122 older people, see ageing population online shopping, 31 Opal card, 34 orange hawkweed (OHW), 136–7 organic carbon loss, see soil condition ozone pollution, 66–8 annual maximum concentrations for, 67 exceedences of the AAQ NEPM standards, 67 ozone precursors and particles, 66–8, 70	potable water supplies, see water resources power emissions, see emissions power stations see also energy generation carbon capture and storage, 26 Coal Innovation NSW Fund, 41 combustion efficiency improvement technology, 26 NSW emissions and, 39 private land conservation, 126, 129 area protected in NSW, 127 threats to conservation on private land, 128
particle pollution, 68–9, 70 annual maximum concentrations for, 69 exceedences of the AAQ NEPM standards, 68 particle characterisation studies, 71–2	problem wastes, <i>see</i> hazardous substances product stewardship programs, 61 protected areas and conservation, 121–31 <i>see also</i> marine parks and aquatic reserves; national parks and forest reserves
pathogenic microorganisms, 139 pedestrian initiatives, 32, 33 pests, <i>see</i> invasive pest and weed species petrol stations, <i>see</i> service stations petroleum consumption, 19 pressures, 20–1	conservation on other tenures, 126–7 context, 122 extent and types of, 123, 124 Forests NSW conservation zones, 126 future opportunities, 131 illegal activities, 128
transport emissions, 72 photochemical smog, see air quality A Plan for Growing Sydney (NSW Government 2014), 6 plants, see native vegetation	land-based formal reserve system, 123 long-term reservation objectives, 125–6, 125 major threats to park values, 127 marine protected areas, 126–7 new formal conservation areas added, 126
plastics in the marine environment, 61 pollution, see air quality; contaminated sites; waste and recycling; water pollution population, 1–7 see also residential sector age profile, 5 context, 1 demographic change in coastal areas, 184 density, 2–3, 3	NSW indicators, 121 pressures, 127–9 private land conservation mechanisms, 126–9, 127 status and trends, 122–7 threats to conservation on private land, 128 threats to marine protected areas, 129 threats to values in terrestrial reserves, 127–8 travelling stock routes (TSRs), 126

protected areas and conservation responses,	resources, see coal and gas; energy generation
129–31	natural resources; water resources
additions, 129	respiratory and cardiovascular problems, 66
managing threats, 130-1	revegetation monitoring, 114
plans of management, 129	riparian zones, see river health; wetlands
private land conservation, 127, 129	River Condition Index (RCI) methodology, 154
public reserve system, see marine parks and	river flows
aquatic reserves; national parks and forest	see also water resources
reserves; protected areas and conservation	current, 145
public transport, 31–2	flow management, 159
future opportunities, 34	long-term modelling of, 145
greenhouse gas emissions and, 40	water extraction and, 157–8
major projects, 33	water storage and, 149
new residential areas, 34	river health, 153–61
Rebuilding NSW, 32–3	see also water resources
timetables, 34	climate change and, 159
trips taken, 29	context, 154
	drought and, 158
rainwater tanks, 52–3	ecosystem health, 154
Ramsar wetlands, 164, 167	fish communities, threatened species, 156
real estate values, contaminated sites, 81	fish condition index, 154–5, 156
Rebuilding NSW, 32–3	future opportunities, 160
recreational water quality, 180–2, 181	invasive species and, 158
recycled water use, 45, 51, 52	nitrogen and phosphorus levels, 156, <i>157</i>
recycling, see waste and recycling	NSW indicators, 153
red imported fire ants, 135	nutrients, 156
refuse, see waste and recycling	pressures, 157–9
regional plans	river condition index, 154, 155
coastal ecosystems responses, 190	status and trends, 154–6
responses to population growth, 6	water extraction and altered flow regimes,
sustainable growth, 6	157–8
urban water, 48, 51, 53	water quality, 156
remediation of contaminated sites, 81	water storages and regulating structures, 149
sustainable remediation, 82	river health responses, 159–60
Renewable Energy Action Plan 2013, 22, 40	fish habitat, 160
Renewable Energy Advocate, 22	pollution, 159–60
renewable energy sources, 19–22	water and flow management, 159
electricity generation from, <i>20</i> , 21	riverine ecosystems, see floodplains; river
lower emissions energy, 40	health; wetlands
NSW indicators, 17	roads, 32–3
Renewable Energy Target (RET), 41 residential sector	roof-top solar, <i>see</i> solar photovoltaic (PV)
	systems
see also buildings	Rural Fire Service, see bushfires
Building Sustainability Index (BASIX), 24 emissions, 39	saline intrusion in groundwater, 176
	sanctuary zones (marine protected areas), 127
energy consumption, 18–19, 20–2	
housing demand, 4–5 indoor air quality, 74	Saving our Species program, 107–8, 135, 140 future opportunities, 108
public transport for new areas, 34	sea levels
size of residential properties, 4, 4	monthly averages, 188
water demand, 48–9, 52	sea level rise and coastal inundation, 188–9
resource recovery, see waste and recycling	sea spurge (<i>Euphorbia paralias</i>), 137
TOUGHTUU TUUUYUTY, BEE WABIE AHU IEUVUIITU	Jou Spurgo (Eupribrida vardilas). 131

sea surface temperature and salinity, 187	stormwater
secondary energy, 18	harvesting, 160
secondary tobacco smoke, 70	recreational water quality and, 180–1
SEEA, see System of Environmental-Economic	subsurface ecosystems, 172, 174
Accounting (SEEA)	Sustainability Advantage program, 53
service stations, 82–3	sustainable land management, 95–102
contaminated sites, 81	see also soil condition
underground petroleum storage	climate variability and, 99
systems, 82–3	context, 96
service-based economy, 9	economic factors, 100
ship terminals, 73	intensifying land use, 99
shopping trips, 31	NSW indicators, 95
smart meters and grids, 25, 26	pressures, 99–100
smart phones, transport and, 31	private land conservation, 126, 127, 128, 129
Snowy Hydro, 20	soil monitoring units, 97, 98, 99
soil condition, 85–93	status and trends, 96–9
see also sustainable land management acidification, 88	sustainable land management responses, 100–1 legislation and policy framework, 100
assessing the health of soil, 86–8	programs, 100–1
changed population patterns and, 91	Soil Health Evidence Based Assessment
climate variability and, 90–1	(SHEBA) program (formerly SoilWatch), 100
context, 86	Sustainable Rivers Audit (SRA), 154
economic factors, 91	swimming sites, see recreational water quality
environmental land-use regime, 89	Sydney
increase in salinity, 88	Household Travel Survey, 30
land and soil capability (LSC), 96	population, 2, 3, 6
land degradation, 85–93, 97–8	train and bus trips, 31
NSW indicators, 85	transport plans, 33
organic carbon loss, 88–9	travel trends, 30
pressures, 90–1	water demand, 48
soil degradation processes, 87	System of Environmental-Economic Accounting
soil monitoring units, 88, 89, 90	(SEEA)
status and trends, 86-90	in Australia and NSW, 14
sustainable land management and, 96-8	international application, 13-14
topsoil loss through sheet erosion, 88	System of National Accounts (SNA), market-
topsoil loss through wind erosion, 88	based information in, 13
unsustainable land use, 90	
soil condition responses, 91-2	tanks, see rainwater tanks
legislation and policy framework, 91	temperature
programs, 91–2	Australasian summer temperature, 36
soil monitoring units (SMUs), 96	global mean temperature, 36
soil research, 92, 101	threatened species, 103–9
soil structure decline, see soil condition	see also fish
solar photovoltaic (PV) systems, 20, 23	changes in total listings, 105
lower emissions energy, 40	context, 104
solid fuel heating, 73	future opportunities, 108
species diversity, see biodiversity	invasive species and, 130, 134-5
SPOT 5 data (land clearing), 114	limited information availability for listings, 106
State conservation areas (SCAs), 123	listing of key threatening processes, 107
State Groundwater Dependent Ecosystems	marine species, 183
Policy, 177	monitoring conservation status of, 106
stationary energy, emissions components, 37-8	NSW indicators, 103

pressures, 106–7	Storage Systems), 81, 82-3
reliability of listings as indicator, 105-6	urban water, 45-55
status and trends, 104-6	context, 46
threatened species listings, 104-6, 104	demand for potable water, 49
threatened species responses, 107–8	NSW indicators, 45
biodiversity legislation reforms, 107	pressures, 48-9
biodiversity offsets policy, 108	reliability standards for water quality, 45
policy and guidelines for fish habitat	residential water consumption, 45, 50
conservation and management, 108	sources and volume of water drawn, 46–8
public reserves system, 108	status and trends, 46–8
Saving our Species program, 107–8	stormwater harvesting developments, 160
tilapia (pest fish), 135–6, 158	urban drinking water quality, 46
tobacco smoke	urban water sources, 47
indoor air quality, 74	water quality, 45
secondary tobacco smoke, 70	water recycling, <i>45</i> , 51, 52
town water, see urban water	urban water responses, 49–54
toxic substances, <i>see</i> hazardous substances	Country Towns Water Supply and Sewerage
train trips, 31, <i>31</i>	Program, 51
transport, 29–34	demand management initiatives, 52–3
alternative transport fuels, 24	drinking water quality management, 52
amount of time travelling, 32	Lower Hunter region, 51
context, 30	management plans, 50–2
emissions, 32	metropolitan water plan, 50–1
emissions from, 38, 72	national responses, 53–4
energy consumption, 18–21	NSW Government responses, 53
future opportunities, 34	urban water management, 51–2
new vehicle technology, 24	water pricing signals, 52
NSW indicators, 29	water pricing signals, 32
pressures, 32	vegetation, see invasive pest and weed species
public transport, <i>29</i> , 31–4, 40	native vegetation
	vehicles
status and trends, 30–2	
Sydney transport plans, 33 technology effect on number of trips, 31	see also petroleum consumption; transport electric vehicles, 21, 24
total trips, 30–1, 30	motor vehicle pollution, 66, 69
train trips, 31, 31	national and interjurisdictional responses, 75
travel trends, 30	vehicle kilometres travelled, 29
trips per person, 31	vehicle ownership, 31
vehicle ownership, 31	vehicle-related offences in protected
transport responses, 32–4	areas, 128
major projects, 33	volatile organic compounds (VOCs), 66-8
making journey planning easier, 33	H: 1 00 00
more public transport services, 33	walking as a mode of travel, 32, 33
strategic direction, 32–3	waste and recycling, 57–64
walking and cycling, 33	see also contaminated sites; litter; pollution
travel, see transport	changes in waste materials, 61
travelling stock routes (TSRs), 126	container deposit scheme, 64
trips, see transport	context, 58
turbidity, see eutrophication	future opportunities, 63–4
	human behaviour, 61–2
underground springs and cave systems, 172, 174	NSW indicators, 57
unflued gas heaters, 70	population growth and increasing economic
UPPS Regulation (Underground Petroleum	activity, 60

pressures, 60-2	aquatic reserves; river health
proximity principle, 63	aquatic systems health, 46
reforms to the waste regulatory framework, 63	consumption of, 14
refuse in marine areas, 186	context, 144
status and trends, 58-60	current river flows and extractions, 144, 145,
waste avoidance and recovery, 61	<i>145</i> , <i>146</i>
waste data areas, 58	drought impact on on water demand, 49
waste production, 10, 12-13	environmental water. see environmental water
waste recycled, disposed and generated, 58	future opportunities, 152
waste recycled targets, 59	importance for the environment, 144
waste streams, 59, 60	long-term modelling of river flows and
waste and recycling responses, 62-3	extractions, 145
Waste Avoidance and Resource Recovery	NSW indicators, 143
Strategy, 59, 62	nutrients, 156, 157
Waste Less, Recycle More, 62–3	physical disturbance pressures, 167–8
waste levy, 63	pressures, 149–50
water consumption	river health responses, 159
by major industries and households, 15, 15	rural floodplain management plans, 159
for metropolitan and regional centres, 45	status and trends, 144-8
water demand, 48–9	total nitrogen and total phosphorus, 157
drought and climate change impacts on, 49	urban water. <i>see</i> urban water
Lower Hunter, 48	water and flow management, 159
residential water use, 48-9	water availability pressures, 167
Sydney, 48	water quality, 156
water efficiency, 52–3	water quality pressures, 167
improvements in, 51	water quality targets, 156
water extraction, 149	water sharing plans, 159
blockages to fish passage, 157-8	water use and sources of water, 144
catchment disturbance, 158	water resources responses, 150-1
cold water pollution, 158	see also water sharing plans
infrastructure hazards, 158	environmental water recovery, 151
pressures on river health, 157-8	floodplain harvesting policy, 151
water availability in wetlands, 167	Murray-Darling Basin Plan, 150, 151
water extraction, groundwater	National Water Initiative, 151
compared to limits, 174, 175	rural floodplain management plans, 151
levels of extraction and recharge, 172-3, 173	Water Management Act 2000, 150
pressures, 175-6	water reforms, 150
water sharing plans and, 174	water resource plans, 151
Water Management Act 2000, 177	water sharing plans, 49, 150
water pollution, 48, 149-50	groundwater, 174, 177, 177, 178
coastal. see coastal, estuarine and marine	regulated river valleys, 144
ecosystems	water and flow management, 159
cold water pollution, 158, 160	Water Wise Rules, 51
diffuse source water pollution strategy, 159	waterbirds, 165-6
groundwater, 176	abundance and diversity, 163
marine parks and aquatic reserves, 129	inland wetlands, 167
microplastics in the marine environment, 61	weather, see climate change
river health responses, 159-60	Weed of National Significance (WoNS), 137
water recovery, see environmental water	weeds, see invasive pest and weed species
water recycling, 45, 51, 52	weirs, 158
water resources, 143-52	wetlands, 163-9
see also groundwater; marine parks and	see also water resources

context, 164 environmental watering and, 148 extent and condition, 164-6, 165, 166 future opportunities, 168 inland wetlands, 167 invasive species, 168 NSW indicators, 163 NSW wetlands inventory, 168 physical disturbance, 167-8 pressures, 167-8 reservation of, 166-7, 166 status and trends, 164-7 water availability, 167 water quality, 167 waterbird abundance and breeding in, 165 wetlands responses, 168 NSW policy and legislation, 168 water to restore and maintain, 168 wildfire, see bushfires wildlife, see birds; fish; threatened species wind erosion, see soil condition wind generation, 20, 40 wood smoke management program, 73 working from home arrangements, 31



New South Wales State of the Environment 2015