

# Acronyms and abbreviations

|                 |  |        |  |
|-----------------|--|--------|--|
| AAQ NEPM        | National Environment Protection Measure for Ambient Air Quality          | DECC   | Department of Environment and Climate Change NSW                         |
| ABARE           | Australian Bureau of Agricultural and Resource Economics                 | DECCW  | Department of Environment, Climate Change and Water NSW                  |
| ABARES          | Australian Bureau of Agricultural and Resource Economics and Sciences    | DEWHA  | Department of the Environment, Water, Heritage and the Arts (Cwlth)      |
| ABS             | Australian Bureau of Statistics  | DII    | Department of Industry and Investment (NSW)                              |
| ANZECC          | Australian and New Zealand Environment and Conservation Council          | DLWC   | Department of Land and Water Conservation (NSW)                          |
| ARMCANZ         | Agriculture and Resource Management Council of Australia and New Zealand | DoH    | NSW Health   |
| BASIX           | Building Sustainability Index  | DPI    | Department of Primary Industries (NSW)                                   |
| BFCC            | NSW Bush Fire Coordinating Committee                                     | DTIRIS | Department of Trade and Investment, Regional Infrastructure and Services |
| BFMC            | Bush Fire Management Committee   | DWE    | Department of Water and Energy (NSW)                                     |
| BioBanking      | Biodiversity Banking and Offsets Scheme                                  | EBMP   | Enhanced Bushfire Management Program                                     |
| BITRE           | Bureau of Infrastructure, Transport and Regional Economics               | EC     | electrical conductivity  |
| BoM             | Bureau of Meteorology  | EEA    | European Environment Agency  |
| BREE            | Bureau of Resources and Energy Economics                                 | ENSO   | El Niño–Southern Oscillation (Index)                                     |
| BRIMS           | Bushfire Risk Information Management System                              | EOAM   | Environmental Outcomes Assessment Methodology                            |
| C&D             | construction and demolition (waste)                                      | EPA    | NSW Environment Protection Authority                                     |
| C&I             | commercial and industrial (waste)  | EPHC   | Environment Protection and Heritage Council                              |
| CAHC            | Clean Air, Healthy Communities program                                   | ERA    | Extended Regulated Area (waste)  |
| CAP             | catchment action plan  | FDI    | Fire Danger Index  |
| CAR             | comprehensive, adequate and representative (reserve system planning)     | FM Act | <i>Fisheries Management Act 1994</i>                                     |
| CCA             | Comprehensive Coastal Assessment (Biodiversity)                          | FMS    | Fire management strategy   |
| CCF             | Climate Change Fund  | FMZ    | Forest Management Zone   |
| CFC             | chlorofluorocarbon   | FSANZ  | Food Standards Australia New Zealand                                     |
| CLM Act         | <i>Contaminated Land Management Act 1997</i>                             | GDE    | groundwater-dependent ecosystem  |
| CMA             | catchment management authority   | GGAS   | Greenhouse Gas Abatement Scheme  |
| CO              | carbon monoxide  | GMR    | Greater Metropolitan Region (see Glossary)                               |
| CO <sub>2</sub> | carbon dioxide   | GSP    | gross state product  |
| COAG            | Council of Australian Governments  | HWC    | Hunter Water Corporation   |
| CSG             | coal seam gas  | IBRA   | Interim Biogeographic Regionalisation for Australia                      |
| CSIRO           | Commonwealth Scientific and Industrial Research Organisation             | IMCRA  | Interim Marine and Coastal Regionalisation of Australia                  |
| DCC             | Department of Climate Change (Cwlth)                                     | IPCC   | Intergovernmental Panel on Climate Change                                |
| DEC             | Department of Environment and Conservation NSW                           |        |  |

|                 |  |                   |  |
|-----------------|--|-------------------|--|
| IUCN            | International Union for the Conservation of Nature               | PAH               | polycyclic aromatic hydrocarbon  |
| KTP             | key threatening process (see Glossary)                           | PAS               | priorities action statement  |
| LGA             | local government area  | PM                | particulate matter   |
| LSC             | land suitability class   | PM <sub>2.5</sub> | particulate matter less than 2.5 micrometres (10 <sup>-6</sup> metres) |
| LTAAEL          | long-term average annual extraction limit (see Glossary)         | PM <sub>10</sub>  | particulate matter less than 10 micrometres (10 <sup>-6</sup> metres)  |
| LWU             | local water utility  | POEO Act          | <i>Protection of the Environment Operations Act 1997</i>               |
| MDB             | Murray–Darling Basin   | PVP               | property vegetation plan   |
| MDBA            | Murray–Darling Basin Authority                                   | RAMAs             | routine agricultural management activities (by local government)       |
| MDBC            | Murray–Darling Basin Commission                                  | RFS               | Rural Fire Service (NSW)   |
| MDBMC           | Murray–Darling Basin Ministerial Council                         | RIS               | regulatory impact statement  |
| MER             | monitoring, evaluation and reporting                             | RMS               | Roads and Maritime Services  |
| MIL             | monitoring investigation level                                   | RRA               | Regional Regulated Area (waste)  |
| MPA             | Marine Parks Authority (NSW)                                     | SCA               | Sydney Catchment Authority   |
| NABERS          | National Australian Built Environment Rating System              | SD                | statistical division   |
| NCT             | Nature Conservation Trust of NSW                                 | SEPP              | state environmental planning policy                                    |
| NEPC            | National Environment Protection Council                          | SLA               | statistical local area   |
| NEPM            | National Environment Protection Measure                          | SMA               | Sydney Metropolitan Area (waste)                                       |
| NHMRC           | National Health and Medical Research Council                     | SMU               | soil monitoring unit   |
| NICNAS          | National Industrial Chemicals Notification and Assessment Scheme | SO <sub>2</sub>   | sulfur dioxide   |
| NLWRA           | National Land and Water Resources Audit                          | SRA               | Sustainable Rivers Audit   |
| N               | nitrogen   | SSD               | statistical subdivision  |
| NO <sub>2</sub> | nitrogen dioxide   | STA               | State Transit Authority (NSW)  |
| NOW             | NSW Office of Water  | STP               | sewage treatment plant   |
| NO <sub>x</sub> | oxides of nitrogen   | SWC               | Sydney Water Corporation   |
| NPI             | National Pollutant Inventory                                     | TAP               | threat abatement plan  |
| NPWS            | NSW National Parks and Wildlife Service                          | TLM               | The Living Murray program  |
| NRA             | Non-Regulated Areas (waste)                                      | TN                | total nitrogen   |
| NRC             | Natural Resources Commission                                     | TP                | total phosphorus   |
| NRM             | natural resource management                                      | TSC Act           | <i>Threatened Species Conservation Act 1995</i>                        |
| NRS             | National Residue Survey (Land)                                   | TSR               | travelling stock route   |
| NRS             | National Reserve System (Biodiversity)                           | TSS               | total suspended solids   |
| NTU             | nephelometric turbidity unit                                     | UNESCO            | United Nations Environmental, Scientific and Cultural Organization     |
| NV Act          | <i>Native Vegetation Act 2003</i>                                | VKT               | vehicle kilometres travelled   |
| NWI             | National Water Initiative  | VOC               | volatile organic compound  |
| OECD            | Organisation for Economic Cooperation and Development            | VR1               | Stage 1 vapour recovery (motor vehicle emissions)                      |
| OEH             | NSW Office of Environment and Heritage                           | VR2               | Stage 2 vapour recovery (motor vehicle emissions)                      |
| O <sub>3</sub>  | ozone  | WHO               | World Health Organization  |
| P               | phosphorus   |                   |  |

# Units

|                    |   |        |                               |
|--------------------|---|--------|-------------------------------|
| $\mu$              | micro ( $10^{-6}$ )                               | PJ     | petajoule ( $10^{15}$ joules) |
| $\mu\text{g}$      | microgram ( $10^{-6}$ grams)                      | ppb    | parts per billion             |
| $\mu\text{g/L}$    | micrograms per litre                              | ppm    | parts per million             |
| $\mu\text{g/m}^3$  | micrograms per cubic metre                        | t      | tonne                         |
| $\mu\text{m}$      | micrometre ( $10^{-6}$ metres)                    | t/ha   | tonnes per hectare            |
| $\mu\text{S/cm}$   | microSiemens per centimetre                       | t/ha/y | tonnes per hectare per year   |
| cm                 | centimetre  | t/y    | tonnes per year               |
| cm/y               | centimetres per year                              | y      | year                          |
| CO <sub>2</sub> -e | carbon dioxide-equivalent units<br>(see Glossary) |        |                               |
| EC units           | electrical conductivity units<br>(see Glossary)   |        |                               |
| GL                 | gigalitres ( $10^9$ litres)                       |        |                               |
| GL/y               | gigalitres per year                               |        |                               |
| GWh                | gigawatt-hour                                     |        |                               |
| ha                 | hectare   |        |                               |
| ha/y               | hectares per year                                 |        |                               |
| kg                 | kilogram  |        |                               |
| kg/y               | kilograms per year                                |        |                               |
| kL                 | kilolitre ( $10^3$ litres)                        |        |                               |
| kL/y               | kilolitres per year                               |        |                               |
| km                 | kilometre   |        |                               |
| km/h               | kilometres per hour                               |        |                               |
| km <sup>2</sup>    | square kilometres                                 |        |                               |
| kWh                | kilowatt-hour                                     |        |                               |
| L                  | litre   |        |                               |
| L/s                | litres per second                                 |        |                               |
| m                  | metre   |        |                               |
| m <sup>3</sup>     | cubic metre                                       |        |                               |
| mg                 | milligram ( $10^{-3}$ grams)                      |        |                               |
| mg/kg              | milligrams per kilogram                           |        |                               |
| mg/L               | milligrams per litre                              |        |                               |
| ML                 | megalitre ( $10^6$ litres)                        |        |                               |
| mL                 | millilitre ( $10^{-3}$ litres)                    |        |                               |
| ML/d               | megalitres per day                                |        |                               |
| ML/y               | megalitres per year                               |        |                               |
| mm                 | millimetre  |        |                               |
| Mt                 | megatonne ( $10^6$ tonnes)                        |        |                               |
| MW                 | megawatt ( $10^6$ watts)                          |        |                               |
| MWh                | megawatt-hour                                     |        |                               |
| nm                 | nanometre ( $10^{-9}$ metres)                     |        |                               |
| pH                 | measure of acidity or alkalinity                  |        |                               |

# Glossary

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

**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, plant and animal life

**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 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

**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

**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

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

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

**CO<sub>2</sub>-equivalent (CO<sub>2</sub>-e):** a measure used to compare the global warming potential (GWP) of various greenhouse gases relative to the concentration of CO<sub>2</sub> (which is defined as having a GWP of 1); methane, for example, is 21 times more effective than CO<sub>2</sub> at heating the atmosphere and therefore has a GWP of 21; thus five tonnes of methane is equivalent to  $5 \times 21 = 105$  tonnes of CO<sub>2</sub>

**connectivity:** the degree to which the landscape facilitates animal movement and ecological flows

**Country:** the term used by Aboriginal people to describe both the land and waters, including the sea, to which they have a strong cultural connection

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

**disturbance:** (ecology) any discrete event in time which disrupts ecosystem structure and resource availability

**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

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

**ecosystem processes:** the numerous interactions between different components (both 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

**electrical conductivity:** a measure of charged particles in water used to estimate salinity in microSiemens per centimetre ( $\mu\text{S}/\text{cm}$ )

**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

**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) which are then allocated to scheme participants

**endangered species:** a species, 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 emerge and die in a seasonal cycle or plants that emerge and grow in response to short wet periods in arid climates

**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 water body or aquifer for use (also called abstraction)

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

**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 (such as 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, section 3) and comprising the:

- (a) Central Coast Metropolitan Area
- (b) Newcastle Metropolitan Area
- (c) Sydney Metropolitan Area
- (d) Wollongong Metropolitan Area
- (e) the 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<sub>1</sub>):** 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

**greater metropolitan region (GMR<sub>2</sub>):** comprising the Sydney, Illawarra and Lower Hunter regions

**greater metropolitan region (GMR<sub>3</sub>):** (Air Emissions Inventory) the area of NSW having Australian Map Grid (AMG) coordinates at the south-west corner at (Easting: 21000, Northing: 6159000, Zone 56) and north-east corner at (Easting: 420000, Northing: 64320000, Zone 56)

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

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

**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 at the expense of naturally occurring species

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

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

**long-term average annual extraction limit (LTAEL):** the level of groundwater that can be extracted from an aquifer sustainably on an annual basis

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

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

**non-woody vegetation:** vegetation formations that are less than two metres high or with less than 20% canopy cover (mainly grasslands, arid shrublands and woodlands)

**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

**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 productivity/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

**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 a vegetation type 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

**sclerophyll:** vegetation type consisting of plants with hard, short and often spiky leaves, adapted to the low-phosphorus soil conditions often found in Australia

**sequestration:** the long-term storage of carbon dioxide

**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

**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

**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

**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 (compare 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 plant 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 (VKT):** 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, including fishes, sharks and rays, amphibians, reptiles, mammals and birds

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

**vulnerable species:** a species, 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:** 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