Appendix 1: Environmental Performance Indicators programme indicators and current National Environmental Reporting Programme core indicators developed by the Ministry for the Environment

	Environmental Performance Indicators Programme indicators[1]	Current National Environmental Reporting Programme 22 Core Indicators **(in bold)** and their variables
Air Indicators		
Stage 1	Particulate matter (PM_{10})	**Air quality:** Particulate matter (PM_{10})
	Carbon monoxide (CO)	**Air quality:** Carbon monoxide (CO)
	Sulphur dioxide (SO_2)	**Air quality:** Sulphur dioxide (SO_2)
	Nitrogen dioxide (NO_2)	**Air quality:** Nitrogen dioxide (NO_2)
	Ground level ozone (O_3)	**Air quality:** Ground level ozone (O_3)
Stage 2	Benzene	
	Particulate matter ($PM_{2.5}$)	
	Lichen diversity/coverage	
	Visibility	
Fresh water indicators		
Stage 1	Dissolved oxygen	**River Water Quality:** Dissolved oxygen
	Ammonia	**River Water Quality:** Nutrients – Ammoniacal nitrogen, Nitrate, Dissolved reactive phosphorus
		River Water Quality: Bacteria (*E. coli*)
	Temperature	**River Water Quality:** Temperature
	Clarity	**River Water Quality:** Visual clarity
	Trophic State Index (TSI)[2]	**Lake Water Quality:** Trophic Level Index (TLI)
	% population with good water supply	

	Periphyton (effects of slime on bathing)	
		Fresh water recreational water quality: Concentrations of *E. coli*
Stage 2	Occurrence of native fish, Giant Kokopu, Red Finned Bully	
	Macroinvertebrates (insects in rivers)	**River Water Quality:** Macroinvertebrate richness (insects in rivers)
	Periphyton (effects of slime in rivers)	
	Riparian condition	
	Wetland condition and extent	
	Groundwater – Nitrates, abstraction quality	**Groundwater quality:** Nitrates, bacteria (*E. coli*)
	Water abstraction	**Freshwater demand:** Consented water abstraction
Land indicators		
Stage 1	Changes in areas susceptible to hill country erosion	**Erosion risk:** Hill country pasture at risk of erosion
	% change in area of slip at selected sites	
		Land cover: Land cover across 9 land cover classes
		Land use: Land use by18 land use classes and four land cover classes
Stage 2	Change in area susceptible to high country degradation	
	Change in area susceptible to agricultural impacts	
	Acidity or alkalinity of soil	
	Organic matter	
	Change in area susceptible to reduction in soil health	
	Bulk density of soil	
	pH soil test	**Soil health:** pH soil test
	Organic carbon	**Soil health:** Total carbon content
		Soil health: Total nitrogen content
		Soil health: Mineralisable nitrogen
		Soil health: Olsen phosphate

		Soil health: Macroporosity
Climate change indicators		
Stage 1	Total emissions (global warming potential) per sector per year	**Greenhouse gases:** Emissions of carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons, perfluorocarbons; greenhouse gas emissions removed from the atmosphere by forestry
	Background levels of greenhouse gases (CO_2, CH_4 and N_2O)	
	Monthly average New Zealand temperature	
Ozone indicators		
Stage 1	Spectroradiometer UV measurement	
	Dobson spectrophotometer ozone readings	**Stratospheric ozone:** Average yearly ozone levels over New Zealand
	Minimum ozone over Antarctica	
	The size of the Antarctic ozone hole	
	Tropospheric concentration of total active chlorine	
	New Zealand's consumption of ozone depleting substances	
Household consumption expenditure		
		Household consumption expenditure: food and beverages, clothing and footwear, housing, household goods and services, transport, hotels and restaurants, other goods and services
Waste indicators		
Solid Waste		
Stage 1	Quantity of waste disposed to landfill and cleanfill from each region	**Solid waste disposal:** The quantity (by weight) of solid waste disposed of to landfill
	Composition of waste disposed to landfill in Waste Analysis Protocol categories	**Solid waste disposal:** The composition of solid waste disposed of to landfill
	Quantity of waste recycled	

	Public access to solid waste resource recovery (recycling) facilities
Liquid waste	
Stage 1	Stock density
Stage 2	Nutrient loading to land and water Quantity of major discharges to water (biological oxygen demand) Stock effluent equivalent of total nitrogen
Hazardous waste	
Stage 1	Quantity of hazardous waste accepted at: landfills, hazardous or wastewater treatment facilities, exported (interim indicator using existing information collection systems) Quantity of priority hazardous waste generated and stored: physically hauled away, discharged on site, (interim indicator using existing information collection systems)
Stage 2	Quantity of hazardous waste accepted at: landfills, hazardous or wastewater treatment facilities, exported (under national information collection systems) Quantity of priority hazardous waste generated and stored, physically hauled away, discharged on site as required by regulation
Hazardous substances indicators (proposed)	
Stage 1	The number of incidents reported The number of new substances registered under HSNO The number of substances deregistered under HSNO The number and quantities of very toxic and ecotoxic hazardous substances: Produced, Imported, Exported
Stage 2	The number of incidents which fall into the following categories: Major, Minor

Contaminated sites indicators		
Stage 1	Total number of sites that fall into the following categories: confirmed contaminated; remediated	
Stage 2	Total number of sites that fall into the following categories: under investigation moderate to low risk sites; under investigation high risk sites; confirmed contaminated moderate to low risk sites; confirmed contaminated high risk sites; remediated sites	
Toxic contaminants indicators		
Stage 1	Toxic contaminants in meat (proposed) Toxic contaminants in human milk (proposed)	
Stage 2	Benzene in air Nitrates in groundwater Toxic contaminants in fresh water eels (proposed)	
Marine indicators		
Stage 1	Confirmed marine spills by type, source and location % monitored beaches complying with the guideline median for marine recreation waters % season beaches or coastal areas were not suitable for contact recreation or shellfish gathering Quantity and category of litter per unit area in the strand-zone of beaches % of New Zealand coastline in public ownership Number of different non-fish and protected species caught by species, per fishery, by area, by year Ratio of current biomass to target biomass for modelled fish stocks	**Coastal recreational water quality:** Concentrations of bacteria (enterococci) at coastal swimming spots

	Percentage of fish stocks modelled that are at or above target level	**Fishing activity:** Fish stocks under the quota management system – the status of fish stocks assessed under the Quota Management System
	Number of assessed fish stocks about which stock status is known or unknown	
	Level of total catch for each fish stock species by area	
	Ratio of total catch to sustainable yield for modelled fish stocks	
	Current Total Allowable Catch for each fish stock	**Fishing activity:** Fish stocks under the quota management system – total commercial catch from fish caught both inside and outside of the Quota Management System
	Ratio of Total Allowable Catch to sustainable yield for modelled fish stocks	
	% fish stocks with current biomass below target where rebuilding strategies are in place	
Stage 2	Level of fishing effort by method, by area, by year (or season)	
		Fishing activity: Seabed trawling in deep waters – the area 'swept' by commercial trawlers required to report position by latitude and longitude
		Fishing activity: Seabed trawling in deep waters – the types of fish expected to be found in areas that have been swept
	Number non-assessed species (harvested or associates/dependant) of high, medium, low or unknown value with the percentage of associated/dependant species that are fully or partially protected	
	Frequency, location, and species of toxic and non-toxic algal blooms	
	Number of taxa in IUCN and NZ threat categories	
	Abundance and distribution of adventive marine species	

	Change in catchment land use for estuaries, embayments or open coast areas susceptible to sedimentation	
	Change in sedimentation for selected estuaries, embayments or open coast areas	
	Change in a catchment land use for estuaries susceptible to eutrophication	
	Chlorophyll 'a' concentrations or Trophic Index for selected estuaries	
	Toxic and ecotoxic contaminants in shellfish at selected monitoring sites	
	Extent of selected marine habitats, ecosystems and environments	
	Biodiversity condition of selected marine habitats and communities	
	% area of each of New Zealand's different marine environments, ecosystems and habitats under protection	**Marine protected areas:** The proportion of New Zealand's territorial sea in marine reserve
		Marine protected areas: The proportion of each class of the Coastal Biogeographic Regions Classification protected by marine reserve
	Area of New Zealand coastline by region with: legally; physically; unrestricted public access	
	% of coastal environment in each category of natural character	
	Change in area of habitats covered by marine farms	
Biodiversity indicators		
Stage 1	Change in the extent of each land cover class	**Native land cover:** Area of native land cover
	% area of each of New Zealand's different environments, ecosystems and habitats under protection	**Native land cover:** Area of native land cover under legal protection
		Native land cover: Area of native land cover by Land Environments of New Zealand (LENZ) class
	The number and percentage of extinct species in selected taxonomic groups	

	The number of taxa in IUCN and NZ threat categories	
		Indicator species: Distribution of lesser short tailed bat, kiwi, kaka, kokako, yellowhead, wrybill, dactylanthus.
Stage 2	The genetic diversity of valued introduced species	
	Change in gross habitat fragmentation of indigenous vegetation cover	
	Change in the abundance and distribution of selected animal pests	
	Change in the abundance and distribution of selected weeds	
	Change in the extent of each land use pressure on biodiversity	
	The biodiversity condition of selected ecosystems and habitats compared with historic and current baselines	
	The evolutionary diversity remaining in selected taxonomic groups (first group, birds) compared to historic and current baselines	
	The extent of selected freshwater ecosystems (wetlands, lakes, rivers, karst and geothermal) compared with historic and current baselines	
Transport indicators		
Stage 1	Vehicle fleet composition	
	Usual mode of journey to work	
	Total vehicle-kms for road vehicles per year	**Vehicle kilometres travelled (VKT) by road:** By fuel type (petrol or diesel), vehicle age, and vehicle type
Stage 2	Road congestion	
	Percentage of main arterial roads with active water treatment	
Energy indicators (proposed)		

Stage 1	Total primary energy supply (TPES), by energy type per year	**Energy supply:** Total primary energy supply (TPES) (by fuel type)
	Total consumer energy (TCE), by energy type by sector per year	**Energy demand:** Total consumer energy (TCE) (by fuel type and by sector)
	TCE/TPES as a percentage per year	
		Energy supply: Electricity generation (by fuel type)
		Energy demand: Consumer energy demand compared to gross domestic product
Stage 2	Non-renewable primary energy supply as a proportion of TPES	
	National average efficiency of thermal electricity generation, including co-generation (MWh/PJ)	
	Avoidable spillage in the hydro-electricity system (GWh) per year	
	Transport sector energy use per vehicle km travelled per year (PJ/VKT)	
	Commercial sector energy use per employee per year (GJ/employee)	
	Residential energy use per household (GJ/household)	
	Industrial sector energy use as a proportion of industrial GDP (PJ/$m)	

[1] Two types of indicators were used in the Environmental Performance Indicators Programme. *Stage 1* indicators were fully developed and ready for use, with data already being collected. *Stage 2* indicators required further work to develop the monitoring and collection techniques before data collection could begin.

[2] The Trophic State Index (TSI) was proposed during the EPI programme and included measures of water clarity (Secchi disc depth), plankton abundance (chlorophyll-a concentration) and diversity, and total levels of phosphorus and nitrogen. During the development of the index, the plankton diversity component was dropped and the index was developed into the Trophic Level Index (TLI).