


**Appendix 16:**  
**Māori Indicators for Wetland Health**

	<b>Indicator</b>	<b>Examples</b>	<b>What to measure / assess</b>
Positive indicators of wetland condition	Plants	Harakeke, raupō, tī kōuka, carex, kanuka / manuka, plants for weaving, medicinal plants, watercress	<ul style="list-style-type: none"> <li>» Extent and quantity of native species</li> <li>» Diversity</li> <li>» Obtainable yield from plants such as harakeke</li> <li>» Ratio of native plants vs exotic species</li> <li>» Health of plants</li> </ul>
	Fish / Animals	Tuna, koura, koaro, kokupu, kaakahi, pipi, flounder, karoro	<ul style="list-style-type: none"> <li>» Size, condition (colour, texture, taste), abundance of various native species</li> <li>» Percentage of area that is suitable habitat</li> <li>» Present fishing grounds vs historical fishing grounds</li> </ul>
	Birds	Pukeko, tui, kererū, weka, shags, parera	<ul style="list-style-type: none"> <li>» Observations of birds</li> <li>» Bird calls</li> <li>» Ratio of native birds vs exotic species</li> <li>» Sound (intensity) of native birds in a given time frame</li> </ul>
Negative indicators of wetland condition	Plants	Grey willow, crack willow, gorse, blackberry, pinus radiata, pondweed, water buttercup, banana passionfruit	<ul style="list-style-type: none"> <li>» Ratio of native plants vs exotic species</li> <li>» Areas of natural habitats affected</li> <li>» Extent of invasion</li> <li>» Type of exotic species present</li> <li>» Mahinga kai areas affected by exotic plants</li> </ul>
	Fish / Animals	Catfish, trout, koi carp, possums, goats, rats, stoats, ferrets, cattle, horses	<ul style="list-style-type: none"> <li>» Number, type and quantity of exotic species</li> <li>» Density of exotic species</li> <li>» Ratio of native vs exotic species</li> <li>» Affect on native habitats</li> <li>» Cost of pest control</li> <li>» Frequency / observation of exotic animals in a given time frame</li> </ul>
	Micro – organisms	Cryptosporidium, giardia, other protozoa, bacteria, viruses	<ul style="list-style-type: none"> <li>» Numbers and quantity present,</li> <li>» Illnesses associated with micro organisms</li> </ul>

	<b>Indicator</b>	<b>Examples</b>	<b>What to measure / assess</b>
Indicators that provide an assessment of te mauri (ecosystem health)	Te mauri	Mauri (life force) of the wetland, degree of naturalness, degree of modification	<ul style="list-style-type: none"> <li>» Presence and absence of culturally important species</li> <li>» Spiritual association with wetland</li> <li>» Access to wetland for tangata whenua</li> <li>» Contamination levels and contamination sources</li> <li>» Closeness to natural water levels</li> <li>» How far has the wetland system moved away from original Maori values?</li> <li>» Odour and water temperature</li> <li>» Are there problems eating kai from the wetland?</li> <li>» Nearness of industrial sites and landfills</li> <li>» Degree of livestock access</li> <li>» Ratio of exotic species vs native species</li> <li>» Land use activities in the catchment</li> <li>» Land use practices adjacent to the wetland</li> </ul>
	Water quality	Clarity, taste, feel	<ul style="list-style-type: none"> <li>» Māori water quality classifications</li> <li>» Observations of water clarity and water colour</li> <li>» Observed or measured sediment load</li> <li>» Observed or measured pollution / contaminants,</li> <li>» Water taste and feel of water</li> <li>» Frequency of floods</li> <li>» Is there mixing of waters?</li> <li>» Use of tangata whenua indicator species associated with water quality</li> </ul>
	Mahinga kai	Plant species used for weaving Plant species used for food Plant species used for medicine Customary fish species	<ul style="list-style-type: none"> <li>» Area of the wetland that is considered healthy for mahinga kai</li> <li>» Number of people with access to the area for mahinga kai purposes</li> <li>» Number of people using the area for mahinga kai</li> <li>» Amount of kai and other resources collected from the wetland in a given time frame</li> <li>» Observation and collection of quality fish and plants.</li> </ul>

	<b>Indicator</b>	<b>Examples</b>	<b>What to measure / assess</b>
	Community wellbeing / human health	Health illnesses Psychological illnesses	<ul style="list-style-type: none"> <li>» Number of people from the marae who collect kai or other resources from the wetland,</li> <li>» Reported sicknesses</li> <li>» Number of people with concerns about health of mahinga kai</li> <li>» Number of culturally significant species at risk from pollution, sediment or contaminants</li> </ul>
Cultural heritage indicators	Significant sites and places, wāhi taonga, wāhi tapu	Wāhi tapu, wāhi taonga within or adjacent to wetlands, te reo Māori terms associated with wetlands, wāhi ingoa (place names)	<ul style="list-style-type: none"> <li>» Extent of significant sites associated with wetland</li> <li>» Extent of modification or destruction of sites</li> <li>» Number of sites affected by human activity (including drainage and subdivision)</li> <li>» Number of sites recorded in district or regional plans</li> <li>» The degree to which Maori names are used</li> <li>» Type and degree of protection to protect taonga wetlands</li> </ul>

This table is based on: Harmsworth, G. 2002: Coordinated Monitoring of New Zealand Wetlands, Phase Two, Goal 2: Māori environmental performance indicators for wetland condition and trend. Landcare Research Report: LC 0102/099, Landcare Research, New Zealand.