

Healthy Aquatic Ecosystems (March 2009)						
Rec #	Recommendation	Implementer(s)	Implementation Target	Latest Status Update (Year provided)	2021 Status	Comments from Latest Update (Please include any new comments in track changes)
						The Healthy Aquatic Ecosystem recommendations is work that AEP will always be doing as new science, information, and data becomes available. The recommendations are a part of AEP's routine and evolving work. The Department will continue to update the AWC members on HAE progress through presentations and information opportunities at board meetings, such as the GOA Update.
1	Test for contaminants that affect human health in traditional subsistence foods in key areas across the province.	Government of Alberta	July 1, 2012	Implemented – as written (2018)	Previously Implemented or Closed	A review of fish contaminant programs in North America and Alberta was completed and released in 2008. Focused testing on fish contaminants is completed in various areas throughout the province with the intensity higher in areas of identified concern or where an incident has occurred.
2	Select, modify or develop a measure of aquatic ecosystem health based on key traditional subsistence foods.	Government of Alberta	July 1, 2012	Implemented: Alternative Approach (2020)		A study of contaminants (mercury) in gull and tern eggs (traditional food) was conducted in the Peace-Athabasca Delta area in support of oil sands monitoring conducted by AEMERA and Environment Canada. This study supports recommendations 1 and 2 in that mercury exposure can have health implications for humans and ecosystem health. Two peer reviewed publications:  Hebert, C.E., Weseloh, D.C., MacMillan, S., Campbell, D. and Nordstrom, W., 2011. Metals and polycyclic aromatic hydrocarbons in colonial waterbird eggs from Lake Athabasca and the Peace–Athabasca Delta, Canada. Environmental toxicology and chemistry, 30(5), pp.1178-1183.  Hebert, C.E., Campbell, D., Kindopp, R., MacMillan, S., Martin, P., Neugebauer, E., Patterson, L. and Shatford, J., 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. Environmental science & technology, 47(20), pp.11785-11792.  Fish that are consumed in a traditional diet including pike, walleye and whitefish have been being assessed in the lower Athabasca River and Athabasca River Delta for polyaromatic hydrocarbons and mercury. Exposure to mercury and polyaromatic hydrocarbons can have human health implications.  In selecting indicators for ecological monitoring there is a balance among sensitivity, capacity to predict ecological harm, cultural relevance and ecological relevance. Indicators that are culturally relevant may not necessarily be sensitive to environmental pressure. Culturally relevant endpoints may not be measured directly; rather, the most sensitive monitoring indicators that are predictive of harm to culturally relevant indicators are favoured. In this context, the sensitive indicators serve as monitoring endpoints that support a management endpoint defined by the culturally relevant indicator. This is the approach favoured by AEMERA and Environment Canada in their implementation of oil sands monitoring. The OSM program has gone through a series of integration workshops across multiple themes, including Water and Aquatic Biology, in late 2018 and early 2019. The purpose of these workshops was to scientifically assess programs from an integration perspective where the outcomes of the workshops are being used to guide the OSM Program and work planning starting in 19/20. Workshop participation includes OSM Principal Investigators, whose projects are impacted by the recommendation from these workshops, and representatives of Indigenous communities, industry, monitoring organizations, and other experts as relevant  Further updates will be provided by Environment and Parks as monitoring programs are developed and implemented.
3	In collaboration with other key indicator development efforts, select, modify or develop measures of aquatic ecosystem health for each ecosystem type (wetland, stream, lake, etc.) or significant aquatic resource	Government of Alberta	January 2011 – interim report	Implemented: Alternative Approach		A report that identifies foundational indicators to support watershed planning was released in October 2012 by Alberta Environment.

	(fish, aquatic vegetation, etc). The progress on this recommendation should be presented to Council within 18 months.			(2020)	<p>The condition, pressure, response and performance indicators according to media such as air, land, water and biodiversity have also been developed by Alberta Environment.</p> <p>A science based 5-year lotic monitoring, evaluation and reporting plan for the Province is complete and public release is imminent. This plan identifies key science questions related to watershed integrity and ecosystem health.</p> <p>New provincial lentic groundwater monitoring, evaluation, reporting and science programs are being redesigned and implemented. There is an aim to assess and inform management of ecosystem health at the watershed level. Pace and roll out across the province is dependent on resource allocation/capacity.</p> <p>A draft Biodiversity Management Framework, with indicators, has been developed for the Lower Athabasca and South Saskatchewan Regions. AEP Planning Branch leads this. Monitoring systems are not in place.</p> <p>This recommendation has had considerable advancements based on work by fisheries management since the 2009 recommendation and the 2011 interim report. We have developed standards for lentic monitoring, completed that monitoring at all high-priority lakes in Alberta for the two highest profile fishes (walleye and pike) and the results are on our publically facing web pages (<a href="http://aep.alberta.ca/fish-wildlife/fisheries-management/fall-index-netting/fall-index-netting-summaries/default.aspx">http://aep.alberta.ca/fish-wildlife/fisheries-management/fall-index-netting/fall-index-netting-summaries/default.aspx</a>). The lotic monitoring standards are recently completely and the status of most high-profile lotic species are also on the web (<a href="http://aep.alberta.ca/fish-wildlife/fisheries-management/fish-sustainability-index/fsi-species-maps/default.aspx">http://aep.alberta.ca/fish-wildlife/fisheries-management/fish-sustainability-index/fsi-species-maps/default.aspx</a>).</p>
4	Develop a model for collaborative sampling and monitoring based on the suite of provincial measures of aquatic health.	Government of Alberta	July 1, 2012	Implemented: Alternative Approach (2020)	<p>The joint Canada/Alberta implementation plan for oil sands monitoring between the Federal and Provincial governments began implementation in February 2012. The three-year monitoring has been completed. Governments have renewed their joint monitoring program for the oil sands (<a href="https://www.alberta.ca/release.cfm?xID=51208CDB7F109-EEBD-B031-30B7D3AE61C14F68">https://www.alberta.ca/release.cfm?xID=51208CDB7F109-EEBD-B031-30B7D3AE61C14F68</a>) and maps/data/reports can be found at <a href="http://osip.alberta.ca/map/">http://osip.alberta.ca/map/</a>.</p> <p>In 2018, an Oil Sands Monitoring Program letter of agreement and operational framework were ratified. <a href="https://open.alberta.ca/publications/9781460142363">https://open.alberta.ca/publications/9781460142363</a></p>
5	Form a project team to review aquatic ecosystems education programs, describe their elements, examine why they are successful, identify gaps in program delivery, and look for opportunities for collaboration.	AWC	July 1, 2012	Implemented – as written (2018)	<p>The AWC’s Water Literacy Project Team surveyed Alberta stakeholders regarding their water education programs. Part of the team’s mandate included reviewing factors that made a program successful, identifying gaps and offering recommendations to improve water education programs and water literacy levels of Albertans.</p>
6	Conduct a provincial assessment of non-point source pollution data, knowledge and tools. This includes: (1) compiling a list of data sources for non-point source contaminant information, (2) compiling a list of non-point source pollution assessment tools, (3) evaluating the state of knowledge and analyzing it for gaps, and, finally, (4) recommending next steps for improving non- point source pollution management in Alberta.	AWC	July 1, 2012	Implemented – as written (2018)	<p>The Council completed work to address HAE recommendations 6 &amp; 7 in 2013. The report “<i>Recommendations to improve non-point source pollution in Alberta</i>” includes recommendations on how to better manage the total non-point source contaminant loadings in our watersheds to achieve <i>Water for Life</i> goals and is available on the website <a href="http://awchome.ca">awchome.ca</a>.</p>
7	Review public policies and regulations in Alberta regarding non-point sources of pollution. Review policies and regulations in other jurisdictions to find innovative tools to manage them, and suggest next steps for the improvement of non- point source pollution management.	AWC	July 1, 2012	Implemented – as written (2018)	
8	Select, modify or develop criteria to identify areas within a watershed that are significant to the maintenance of aquatic ecosystem health.	AWC	July 1, 2012	Implemented – as written (2018)	<p>In August 2009, the Council established project team to develop a suite of criteria that can be used to identify areas that are significant to the maintenance of aquatic ecosystem health. In order to do this, the project team built on the Provincial Government's Environmentally Significant Areas (ESA) report, which was updated and released in late 2009. The ESA process uses the science of systematic conservation planning and GIS technology to identify and map those areas of the province that are important to the long-term maintenance of biodiversity and ecosystem processes. In January 2010, the Council released the final report entitled Provincial Ecological Criteria for Healthy Aquatic Ecosystems. The report outlines seven criteria that can be used to</p>

						identify areas that are significant to the maintenance of aquatic ecosystem health. This work is a first step towards fully including the aquatic ecosystem lens in this type of work in Alberta. A report and map product identifying aquatic environmentally significant areas in Alberta based on the criteria was released in 2011 and can be found here: ( <a href="http://www.waterforlife.alberta.ca/03325.html">http://www.waterforlife.alberta.ca/03325.html</a> ).
9	Report to the Alberta Water Council effective or successful sector best management practices that support healthy aquatic ecosystems.	AWC & Industry	July 1, 2012	Closed – not a priority (2018)		The Council chose to work on higher priority work in support of WFL and at this time has no immediate plan to do work in this area.