

For Interested Party Review – December 2010 Draft

3745-1-43 **Water quality criteria for the tiered aquatic life use designations.**

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules and federal statutory provisions referenced in this rule, see rule 3745-1-03 of the Administrative Code.]

[Comment: For definitions of the use designations, see rule 3745-1-07 of the Administrative Code. For all other definitions, see rule 3745-1-02 of the Administrative Code.]

(A) In addition to the base aquatic life use designation in rule 3745-1-42 of the Administrative Code, ten tiered aquatic life uses are currently utilized by Ohio EPA in its regulatory and water quality management work. One or more of these tiered aquatic life uses typically apply to water bodies shown on maps with a 1:24,000 scale.

- (1) Warmwater habitat. See paragraph (D)(1) of this rule.
- (2) Exceptional warmwater habitat. See paragraph (D)(2) of this rule.
- (3) Modified warmwater habitat. See paragraph (D)(3) of this rule.
- (4) Coldwater habitat. See paragraph (D)(4) of this rule.
- (5) Seasonal salmonid habitat. See paragraph (D)(5) of this rule.
- (6) Limited resource water. See paragraph (D)(6) of this rule.
- (7) Limited warmwater habitat. See paragraph (D)(7) of this rule.
- (8) Lake habitat. See paragraph (D)(8) of this rule.
- (9) Primary headwater habitat. See paragraph (D)(9) of this rule.
- (10) Wetland. See paragraph (D)(10) of this rule.

(B) Biological criteria.

- (1) Three tiers of aquatic life uses have numeric biological criteria: warmwater habitat; exceptional warmwater habitat; and modified warmwater habitat. Biological criteria are in tables 43-1, 43-2 and 43-5 of this rule. The biological criteria associated with warmwater habitat or exceptional warmwater habitat may apply to waters designated as native cold water fauna

streams if that fact is noted in the appropriate use designation rule (rules 3745-1-08 to 3745-1-30 of the Administrative Code) in the comment column.

- (2) Biological criteria are applied differently than chemical specific criteria and whole effluent toxicity because they are an expression of the biological condition of the receiving water and are not measurable in a wastewater effluent. The need for chemical specific or whole effluent toxicity effluent limits is often confirmed by the biological criteria results generated through biological surveys. However, the attainment of the aquatic life use, the absence of biological survey data or inconclusive biological survey results does not obviate the need for chemical specific or whole effluent toxicity water quality based effluent limits where such limits are needed to maintain water quality standards (chemical specific criteria and whole effluent toxicity). The relationship of biological criteria to the application of chemical specific criteria and whole effluent toxicity provisions in the setting of water quality based effluent limits is described in rule 3745-2-03 of the Administrative Code.
- (3) Biological criteria presented in tables 43-1, 43-2 and 43-5 of this rule provide a direct measure of attainment of each respective subcategory of aquatic life use and the specific water quality goals established pursuant to the Clean Water Act. The results of integrated biological and water quality surveys (provided they are properly designed and carried out using the methods prescribed in rule 3745-1-03 of the Administrative Code) shall be the basis of determining if a water body is attaining its aquatic life use designation.
- (4) The measurement, assessment and interpretation of biological data associated with the criteria shall meet the following requirements.

 - (a) The attributes of species composition, diversity and functional organization shall be measured using the index of biotic integrity, the modified index of well-being and the invertebrate community index as defined in "Biological Criteria for the Protection of Aquatic Life: Volume II, Users Manual for Biological Field Assessment of Ohio Surface Waters." However, a narrative macroinvertebrate assessment of aquatic life use attainment may be used in lieu of the invertebrate community index at sampling stations if the invertebrate community index is not available, or is deemed inappropriate for use, and the applicable index of biotic integrity and modified index of well-being are available for the same stations.
 - (b) Episodes of stream desiccation. Biological criteria presented in tables 43-1, 43-2 and 43-5 of this rule shall not be applicable in situations, as determined by the director, where desiccation of the stream bed, as a result of drought or other natural phenomena, is of such an extent and magnitude that a water body so affected lacks the reasonable potential to

support aquatic life, due to the absence of suitable aqueous habitat. This temporary exclusion of the applicability of biocriteria in desiccated streams is limited to the observed time period of desiccation and its attendant after effects, as determined by the director.

[Comment: The designation of tiered aquatic life uses is determined by the potential of the water body to support an aquatic community in years with normal precipitation.]

- (c) Limit of calibration – Except in circumstances documented through site specific data collection and use attainability analyses, biological criteria shall not apply at stream locations where the drainage area is less than 1.0 square mile. If the stream is designated upland drainage, the drainage area cut off point for the applicability of biological criteria is 3.1 square miles.

Where site specific data are available at locations with drainage areas below the limit of calibration thresholds, the director shall consider that data, along with all available information on sampling methods, specialized habitats, prevailing environmental conditions and other factors that influence biological criteria scoring, to determine if biological criteria should apply and to determine the existing use to protect under rule 3745-1-05 of the Administrative Code.

[Comment: Water bodies designated in rules 3745-1-08 to 3745-1-32 of the Administrative Code for tiered aquatic life uses with applicable biological criteria shall retain those designated tiered aquatic life uses while subject to the limit of calibration thresholds.]

- (C) The chemical specific criteria listed in this rule apply as "outside mixing zone" or "inside mixing zone maximum." For the purpose of setting water quality based effluent limits, the criteria that apply "outside mixing zone" shall be met after the effluent and the receiving water are reasonably well mixed as provided in rules 3745-2-05 and 3745-2-08 of the Administrative Code. The criteria listed as "inside mixing zone maximum" shall be applicable as end of pipe maximum effluent limits or as criteria to be met within a short distance of the effluent pipe except as provided in rule 3745-2-08 of the Administrative Code. Possible exceptions regarding the application of these criteria may apply as described in paragraph (B) of this rule.

(D) Water quality criteria that apply in addition to, or in lieu of, the base aquatic life use criteria in rule 3745-1-42 of the Administrative Code are found in this paragraph.

(1) Warmwater habitat. In addition to the base aquatic life use criteria in rule 3745-1-42 of the Administrative Code, the warmwater habitat biological criteria in table 43-1 of this rule apply.

Table 43-1. Biological criteria for warmwater habitat. Description and derivation of indices and ecoregions are contained in "Biological Criteria for the Protection of Aquatic Life: Volume II, Users Manual for Biological Field Assessment of Ohio Surface Waters." These criteria do not apply to the Ohio river, Ohio river backwaters, lakes or lake Erie lacustraries.

<u>Index</u> <u>Sampling site</u>	<u>Ecoregion¹</u>				
	<u>ECBP</u>	<u>EOLP</u>	<u>HELP</u>	<u>IP</u>	<u>WAP</u>
<u>Index of biotic integrity (fish)</u>					
<u>Boat sites²</u>	<u>42</u>	<u>40</u>	<u>34</u>	<u>38</u>	<u>40</u>
<u>Wading sites²</u>	<u>40</u>	<u>38</u>	<u>32</u>	<u>40</u>	<u>44</u>
<u>Headwater sites³</u>	<u>40</u>	<u>40</u>	<u>28</u>	<u>40</u>	<u>44</u>
<u>Modified index of well-being (fish)⁴</u>					
<u>Boat sites²</u>	<u>8.5</u>	<u>8.7</u>	<u>8.6</u>	<u>8.7</u>	<u>8.6</u>
<u>Wading sites²</u>	<u>8.3</u>	<u>7.9</u>	<u>7.3</u>	<u>8.1</u>	<u>8.4</u>
<u>Invertebrate community index</u> <u>(macroinvertebrates)</u>					
<u>Artificial substrate samplers²</u>	<u>36</u>	<u>34</u>	<u>34</u>	<u>30</u>	<u>36</u>

¹ ECBP = eastern corn belt plains ecoregion. EOLP = Erie/Ontario lake plain ecoregion. HELP = Huron/Erie lake plain ecoregion. IP = interior plateau ecoregion. WAP = western Allegheny plateau ecoregion.

² Sampling methods descriptions are found in the "Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices."

³ Modification of the IBI that applies to sites with drainage areas less than twenty square miles.

⁴ Does not apply to sites with drainage areas less than twenty square miles.

(2) Exceptional warmwater habitat. The water quality criteria in this paragraph apply in lieu of or in addition to the water quality criteria for the base aquatic life use in rule 3745-1-42 of the Administrative Code.

(a) The exceptional warmwater habitat biological criteria in table 43-2 of this rule apply.

Table 43-2. Biological criteria for exceptional warmwater habitat. Description and derivation of indices and ecoregions are contained in "Biological Criteria for the Protection of Aquatic Life: Volume II, Users Manual for Biological Field Assessment of Ohio Surface Waters." These criteria do not apply to the Ohio river, Ohio river backwaters, lakes or lake Erie lacustuaries.

<u>Index</u>	<u>All Ecoregions</u> ¹
<u>Sampling site</u>	
<u>Index of biotic integrity (fish)</u>	
<u>Boat sites</u> ²	<u>48</u>
<u>Wading sites</u> ²	<u>50</u>
<u>Headwater sites</u> ³	<u>50</u>
<u>Modified index of well-being (fish)</u> ⁴	
<u>Boat sites</u> ²	<u>9.6</u>
<u>Wading sites</u> ²	<u>9.4</u>
<u>Invertebrate community index (macroinvertebrates)</u>	
<u>Artificial substrate samplers</u> ²	<u>46</u>

¹ Ohio ecoregions consist of eastern corn belt plains (ECBP), Erie/Ontario lake plain (EOLP), Huron/Erie lake plain (HELP), interior plateau (IP), and western Allegheny plateau (WAP).

² Sampling methods descriptions are found in the "Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices."

³ Modification of the IBI that applies to sites with drainage areas less than twenty square miles.

⁴ Does not apply to sites with drainage areas less than twenty square miles.

- (b) The criteria in table 43-3 of this rule apply in lieu of the base aquatic life use criteria for those chemicals.

Table 43-3. Exceptional warmwater habitat criteria.

<u>Chemical</u>	<u>Form¹</u>	<u>Units²</u>	<u>IMZM³</u>	<u>OMZM³</u>	<u>OMZA³</u>
<u>Ammonia-N</u>	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>Table 43-4</u>	<u>Table 43-4</u>
<u>Dissolved oxygen⁴</u>	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>5.0</u>	<u>6.0</u>
<u>pH</u>	<u>--</u>	<u>s.u.</u>	<u>--</u>	<u>--</u>	<u>a</u>
<u>Temperature</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>b</u>	<u>b</u>

¹ T = total.

² mg/l = milligrams per liter (parts per million); s.u. = standard units.

³ IMZM = inside mixing zone maximum; OMZM = outside mixing zone maximum; OMZA = outside mixing zone average.

⁴ For dissolved oxygen, OMZM means outside mixing zone minimum and OMZA means outside mixing zone minimum twenty-four-hour average.

^a pH is to be 6.5-9.0, with no change within that range attributable to human-induced conditions.

^b At no time shall the water temperature exceed the temperature which would occur if there were no temperature change attributable to human activities.

Table 43-4.

(A) Exceptional warmwater habitat and lake habitat outside mixing zone maximum total ammonia-nitrogen criteria (mg/l).

pH	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.8	9.0	
Temp. (°C)																							
0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	10.9	9.3	7.8	6.6	5.2	4.2	3.3	2.6	2.1	1.7	1.1	0.7	
1	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.4	10.7	9.1	7.7	6.5	5.2	4.1	3.3	2.6	2.1	1.7	1.1	0.7	
2	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.6	9.0	7.6	6.4	5.1	4.1	3.2	2.6	2.1	1.6	1.1	0.7	
3	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.4	8.9	7.5	6.3	5.0	4.0	3.2	2.5	2.0	1.6	1.1	0.7	
4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.3	8.8	7.4	6.2	5.0	4.0	3.2	2.5	2.0	1.6	1.0	0.7	
5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.8	10.2	8.7	7.3	6.2	4.9	3.9	3.1	2.5	2.0	1.6	1.0	0.7	
6	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.6	10.1	8.6	7.3	6.1	4.9	3.9	3.1	2.5	2.0	1.6	1.0	0.7	
7	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.5	9.9	8.5	7.2	6.0	4.8	3.8	3.1	2.5	2.0	1.6	1.0	0.7	
8	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.4	9.8	8.4	7.1	6.0	4.8	3.8	3.0	2.4	2.0	1.6	1.0	0.7	
9	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.9	11.3	9.8	8.3	7.1	5.9	4.7	3.8	3.0	2.4	1.9	1.6	1.0	0.7	
10	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.8	11.2	9.7	8.3	7.0	5.9	4.7	3.7	3.0	2.4	1.9	1.6	1.0	0.7	
11	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.7	11.1	9.6	8.2	6.9	5.8	4.7	3.7	3.0	2.4	1.9	1.5	1.0	0.7	
12	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	11.0	9.5	8.1	6.9	5.8	4.6	3.7	3.0	2.4	1.9	1.5	1.0	0.7	
13	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	10.9	9.4	8.1	6.8	5.8	4.6	3.7	2.9	2.4	1.9	1.5	1.0	0.7	
14	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.4	10.8	9.4	8.0	6.8	5.7	4.6	3.7	2.9	2.4	1.9	1.5	1.0	0.7	
15	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.3	10.8	9.3	8.0	6.8	5.7	4.6	3.6	2.9	2.4	1.9	1.5	1.0	0.7	
16	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.7	9.3	7.9	6.7	5.7	4.5	3.6	2.9	2.4	1.9	1.5	1.0	0.7	
17	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.7	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.5	1.0	0.7	
18	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.6	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.0	0.7	
19	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.6	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.7	
20	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.2	7.8	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8	
21	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.1	7.8	6.6	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8	
22	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.1	7.8	6.6	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8	
23	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.5	9.1	7.8	6.6	5.6	4.5	3.6	2.9	2.4	2.0	1.6	1.1	0.8	
24	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.5	9.1	7.8	6.6	5.6	4.5	3.6	3.0	2.4	2.0	1.6	1.1	0.8	
25	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.5	9.1	7.8	6.6	5.6	4.5	3.7	3.0	2.4	2.0	1.6	1.1	0.8	
26	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	11.1	9.8	8.5	7.3	6.2	5.3	4.2	3.4	2.8	2.3	1.9	1.5	1.1	0.8	
27	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.7	10.4	9.1	7.9	6.8	5.8	4.9	4.0	3.2	2.6	2.1	1.8	1.5	1.0	0.8	
28	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.9	9.7	8.5	7.4	6.4	5.4	4.6	3.7	3.0	2.5	2.0	1.7	1.4	1.0	0.7	
29	13.0	13.0	13.0	13.0	13.0	12.4	11.3	10.2	9.1	8.0	6.9	6.0	5.1	4.3	3.5	2.8	2.3	1.9	1.6	1.3	0.9	0.7	
30	13.0	13.0	13.0	13.0	12.6	11.6	10.6	9.5	8.5	7.5	6.5	5.6	4.8	4.1	3.3	2.7	2.2	1.8	1.5	1.2	0.9	0.7	

Table 43-4.

(B) Exceptional warmwater habitat and lake habitat outside mixing zone average total ammonia-nitrogen criteria (mg/l).

pH	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.8	9.0
Temp. (°C)																						
	<u>The following criteria apply during the months of December to February:</u>																					
0-10	13.0	13.0	13.0	12.6	11.7	10.7	9.7	8.6	7.6	6.6	5.6	4.8	4.0	3.3	2.8	2.3	1.9	1.5	1.2	1.0	0.7	0.5
11	13.0	13.0	12.4	11.6	10.8	9.9	8.9	8.0	7.0	6.1	5.2	4.4	3.7	3.1	2.6	2.1	1.7	1.4	1.2	0.9	0.6	0.4
12	13.0	12.6	11.5	10.8	10.0	9.2	8.3	7.4	6.5	5.6	4.8	4.1	3.4	2.9	2.4	2.0	1.6	1.3	1.1	0.9	0.6	0.4
13	12.3	11.6	10.6	10.0	9.2	8.5	7.7	6.8	6.0	5.2	4.5	3.8	3.2	2.7	2.2	1.8	1.5	1.2	1.0	0.8	0.6	0.4
14	11.4	10.8	9.8	9.3	8.6	7.9	7.1	6.3	5.6	4.8	4.2	3.5	3.0	2.5	2.1	1.7	1.4	1.1	0.9	0.8	0.5	0.4
15	10.6	10.0	9.1	8.6	8.0	7.3	6.6	5.9	5.2	4.5	3.9	3.3	2.8	2.3	1.9	1.6	1.3	1.1	0.9	0.7	0.5	0.3
16	9.8	9.3	8.5	8.0	7.4	6.8	6.1	5.5	4.8	4.2	3.6	3.0	2.6	2.1	1.8	1.5	1.2	1.0	0.8	0.7	0.5	0.3
17	9.1	8.6	7.8	7.4	6.8	6.3	5.7	5.1	4.5	3.9	3.3	2.8	2.4	2.0	1.7	1.4	1.1	0.9	0.8	0.6	0.4	0.3
18	8.5	8.0	7.3	6.9	6.4	5.8	5.3	4.7	4.2	3.6	3.1	2.6	2.2	1.8	1.5	1.3	1.1	0.9	0.7	0.6	0.4	0.3
19	7.9	7.4	6.8	6.4	5.9	5.4	4.9	4.4	3.9	3.3	2.9	2.4	2.1	1.7	1.4	1.2	1.0	0.8	0.7	0.5	0.4	0.3
20	7.3	6.9	6.3	5.9	5.5	5.0	4.6	4.1	3.6	3.1	2.7	2.3	1.9	1.6	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.3
	<u>The following criteria apply during the months of March to November:</u>																					
10	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.9	0.7	0.5	0.4	0.4	0.2	0.2
11	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.8	0.7	0.5	0.4	0.4	0.2	0.2
12	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.8	0.7	0.5	0.4	0.4	0.2	0.2
13	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.8	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
14	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
15	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
16	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
17	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
18	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
19	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
20	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
21	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.7	1.4	1.2	1.0	0.8	0.6	0.5	0.4	0.3	0.2	0.2
22	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.6	1.3	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.2
23	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.4	1.2	1.0	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.1
24	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.3	1.1	1.0	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.1
25	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.3	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.1
26	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.2	1.0	0.8	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.1
27	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1
28	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	0.9	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1
29	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1
30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1

(3) Modified warmwater habitat. The water quality criteria in this paragraph apply in lieu of or in addition to the water quality criteria for the base aquatic life use in rule 3745-1-42 of the Administrative Code.

(a) The modified warmwater habitat biological criteria in table 43-5 of this rule apply.

Table 43-5. Biological criteria for modified warmwater habitat. Description and derivation of indices and ecoregions are contained in "Biological Criteria for the Protection of Aquatic Life: Volume II, Users Manual for Biological Field Assessment of Ohio Surface Waters." These criteria do not apply to the Ohio river, Ohio river backwaters, lakes or lake Erie lacustuaries.

(A) Modified warmwater habitat - channel modification.

<u>Index</u> <u>Sampling site</u>	<u>Ecoregion¹</u>	
	<u>HELP</u>	<u>All other ecoregions</u>
<u>Index of biotic integrity (fish)</u>		
<u>Boat sites²</u>	<u>20</u>	<u>24</u>
<u>Wading sites²</u>	<u>22</u>	<u>24</u>
<u>Headwater sites³</u>	<u>20</u>	<u>24</u>
<u>Modified index of well-being (fish)⁴</u>		
<u>Boat sites²</u>	<u>5.7</u>	<u>5.8</u>
<u>Wading sites²</u>	<u>5.6</u>	<u>6.2</u>
<u>Invertebrate community index</u> <u>(macroinvertebrates)</u>		
<u>Artificial substrate samplers²</u>	<u>22</u>	<u>22</u>

(B) Modified warmwater habitat – impounded.

<u>Index</u> <u>Sampling site</u>	<u>Ecoregion¹</u>	
	<u>HELP</u>	<u>All other ecoregions</u>
<u>Index of biotic integrity (fish)</u>		
<u>Boat sites²</u>	<u>22</u>	<u>30</u>
<u>Wading sites²</u>	<u>--</u>	<u>--</u>
<u>Headwater sites³</u>	<u>--</u>	<u>--</u>
<u>Modified index of well-being (fish)⁴</u>		
<u>Boat sites²</u>	<u>5.7</u>	<u>6.6</u>
<u>Wading sites²</u>	<u>--</u>	<u>--</u>
<u>Invertebrate community index</u> <u>(macroinvertebrates)</u>		
<u>Artificial substrate samplers²</u>	<u>--</u>	<u>--</u>

(C) Modified warmwater habitat - mine affected.

<u>Index</u> <u>Sampling site</u>	<u>Ecoregion</u> ¹	
	<u>WAP</u>	<u>All other ecoregions</u>
<u>Index of biotic integrity (fish)</u>		
<u>Boat sites</u> ²	<u>24</u>	<u>--</u>
<u>Wading sites</u> ²	<u>24</u>	<u>--</u>
<u>Headwater sites</u> ³	<u>24</u>	<u>--</u>
<u>Modified index of well-being (fish)</u> ⁴		
<u>Boat sites</u> ²	<u>5.4</u>	<u>--</u>
<u>Wading sites</u> ²	<u>5.5</u>	<u>--</u>
<u>Invertebrate community index</u> <u>(macroinvertebrates)</u>		
<u>Artificial substrate samplers</u> ²	<u>30</u>	<u>--</u>

¹ Ohio ecoregions consist of eastern corn belt plains (ECBP), Erie/Ontario lake plain (EOLP), Huron/Erie lake plain (HELP), interior plateau (IP), and western Allegheny plateau (WAP).

² Sampling methods descriptions are found in the "Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices."

³ Modification of the IBI that applies to sites with drainage areas less than twenty square miles.

⁴ Does not apply to sites with drainage areas less than twenty square miles.

(b) The criteria in table 43-6 of this rule apply in lieu of the base aquatic life use criteria for those chemicals.

Table 43-6. Modified warmwater habitat criteria.

<u>Chemical</u>	<u>Form</u> ¹	<u>Units</u> ²	<u>IMZM</u> ³	<u>OMZM</u> ³	<u>OMZA</u> ³
<u>Ammonia-N</u>	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>a</u>	<u>Table 43-7</u>
<u>Dissolved oxygen</u> ⁴	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>3.0</u> ^b	<u>4.0</u> ^b

¹ T = total.

² mg/l = milligrams per liter (parts per million).

³ IMZM = inside mixing zone maximum; OMZM = outside mixing zone maximum; OMZA = outside mixing zone average.

⁴ For dissolved oxygen, OMZM means outside mixing zone minimum and OMZA means outside mixing zone minimum twenty-four-hour average.

^a The modified warmwater habitat OMZM ammonia criteria are the same as the base aquatic life use OMZM ammonia criteria in rule 3745-1-42 of the Administrative Code.

^b The dissolved oxygen minimum at any time criterion for modified warmwater habitats in the Huron/Erie lake plain ecoregion, as identified in rules 3745-1-08 to 3745-1-30 of the Administrative Code, is 2.5 mg/l.

Table 43-7.
Modified warmwater habitat outside mixing zone average total ammonia-nitrogen criteria (mg/l).

pH	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.8	9.0	
Temp. (°C)																							
	<u>The following criteria apply during the months of December to February:</u>																						
0-10	13.0	13.0	13.0	12.6	11.7	10.7	9.7	8.6	7.6	6.6	5.6	4.8	4.0	3.3	2.8	2.3	1.9	1.5	1.2	1.0	0.7	0.5	
11	13.0	13.0	12.4	11.6	10.8	9.9	8.9	8.0	7.0	6.1	5.2	4.4	3.7	3.1	2.6	2.1	1.7	1.4	1.2	0.9	0.6	0.4	
12	13.0	12.6	11.5	10.8	10.0	9.2	8.3	7.4	6.5	5.6	4.8	4.1	3.4	2.9	2.4	2.0	1.6	1.3	1.1	0.9	0.6	0.4	
13	12.3	11.6	10.6	10.0	9.2	8.5	7.7	6.8	6.0	5.2	4.5	3.8	3.2	2.7	2.2	1.8	1.5	1.2	1.0	0.8	0.6	0.4	
14	11.4	10.8	9.8	9.3	8.6	7.9	7.1	6.3	5.6	4.8	4.2	3.5	3.0	2.5	2.1	1.7	1.4	1.1	0.9	0.8	0.5	0.4	
15	10.6	10.0	9.1	8.6	8.0	7.3	6.6	5.9	5.2	4.5	3.9	3.3	2.8	2.3	1.9	1.6	1.3	1.1	0.9	0.7	0.5	0.3	
16	9.8	9.3	8.5	8.0	7.4	6.8	6.1	5.5	4.8	4.2	3.6	3.0	2.6	2.1	1.8	1.5	1.2	1.0	0.8	0.7	0.5	0.3	
17	9.1	8.6	7.8	7.4	6.8	6.3	5.7	5.1	4.5	3.9	3.3	2.8	2.4	2.0	1.7	1.4	1.1	0.9	0.8	0.6	0.4	0.3	
18	8.5	8.0	7.3	6.9	6.4	5.8	5.3	4.7	4.2	3.6	3.1	2.6	2.2	1.8	1.5	1.3	1.1	0.9	0.7	0.6	0.4	0.3	
19	7.9	7.4	6.8	6.4	5.9	5.4	4.9	4.4	3.9	3.3	2.9	2.4	2.1	1.7	1.4	1.2	1.0	0.8	0.7	0.5	0.4	0.3	
20	7.3	6.9	6.3	5.9	5.5	5.0	4.6	4.1	3.6	3.1	2.7	2.3	1.9	1.6	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.3	
	<u>The following criteria apply during the months of March to November:</u>																						
10	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.9	2.5	2.1	1.7	1.3	1.1	0.9	0.7	0.6	0.4	0.2
11	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.9	2.5	2.1	1.7	1.3	1.1	0.8	0.7	0.6	0.4	0.2
12	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.9	2.4	2.1	1.6	1.3	1.1	0.8	0.7	0.5	0.4	0.2
13	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.9	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.2
14	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.9	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.2
15	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.2
16	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.3
17	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.3
18	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.6	0.4	0.3
19	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.6	0.4	0.3
20	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	2.8	2.4	2.0	1.6	1.3	1.0	0.8	0.7	0.6	0.4	0.3
21	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.6	2.2	1.9	1.5	1.2	1.0	0.8	0.6	0.5	0.4	0.3
22	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	2.1	1.7	1.4	1.1	0.9	0.7	0.6	0.5	0.3	0.2
23	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.3	1.9	1.6	1.3	1.0	0.8	0.7	0.6	0.5	0.3	0.2
24	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.1	1.8	1.5	1.2	1.0	0.8	0.6	0.5	0.4	0.3	0.2
25	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.0	1.7	1.4	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.2
26	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.6	1.3	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.2
27	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.7	1.5	1.2	1.0	0.8	0.7	0.5	0.4	0.4	0.3	0.2
28	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.6	1.4	1.2	0.9	0.8	0.6	0.5	0.4	0.3	0.2	0.2
29	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.5	1.3	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.2
30	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.4	1.2	1.0	0.8	0.7	0.5	0.5	0.4	0.3	0.2	0.2

- (4) Coldwater habitat. The water quality criteria in table 43-8 of this rule apply in lieu of the water quality criteria for the base aquatic life use in rule 3745-1-42 of the Administrative Code.

Table 43-8. Coldwater habitat criteria.

<u>Chemical</u>	<u>Form¹</u>	<u>Units²</u>	<u>IMZM³</u>	<u>OMZM³</u>	<u>OMZA³</u>
<u>Ammonia-N</u>	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>Table 43-9</u>	<u>Table 43-9</u>
<u>Cyanide (Ohio river drainage basin)</u>	<u>free</u>	<u>µg/l</u>	<u>45</u>	<u>22</u>	<u>5.2</u>
<u>Dissolved oxygen⁴</u>	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>6.0</u>	<u>7.0</u>
<u>pH</u>	<u>--</u>	<u>s.u.</u>	<u>--</u>	<u>--</u>	<u>a</u>
<u>Temperature</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>b</u>	<u>b</u>

¹ T = total.

² mg/l = milligrams per liter (parts per million); µg/l = micrograms per liter (parts per billion); s.u. = standard units.

³ IMZM = inside mixing zone maximum; OMZM = outside mixing zone maximum; OMZA = outside mixing zone average.

⁴ For dissolved oxygen, OMZM means outside mixing zone minimum and OMZA means outside mixing zone minimum twenty-four-hour average.

^a pH is to be 6.5-9.0, with no change within that range attributable to human-induced conditions.

^b At no time shall the water temperature exceed the temperature which would occur if there were no temperature change attributable to human activities.

Table 43-9.

(A) Coldwater habitat and seasonal salmonid habitat outside mixing zone maximum total ammonia-nitrogen criteria (mg/l).

pH	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.8	9.0	
Temp. (°C)																							
0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	10.9	9.3	7.8	6.6	5.2	4.2	3.3	2.6	2.1	1.7	1.1	0.7	
1	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.4	10.7	9.1	7.7	6.5	5.2	4.1	3.3	2.6	2.1	1.7	1.1	0.7	
2	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.6	9.0	7.6	6.4	5.1	4.1	3.2	2.6	2.1	1.6	1.1	0.7	
3	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.4	8.9	7.5	6.3	5.0	4.0	3.2	2.5	2.0	1.6	1.1	0.7	
4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.3	8.8	7.4	6.2	5.0	4.0	3.2	2.5	2.0	1.6	1.0	0.7	
5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.8	10.2	8.7	7.3	6.2	4.9	3.9	3.1	2.5	2.0	1.6	1.0	0.7	
6	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.6	10.1	8.6	7.3	6.1	4.9	3.9	3.1	2.5	2.0	1.6	1.0	0.7	
7	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.5	9.9	8.5	7.2	6.0	4.8	3.8	3.1	2.5	2.0	1.6	1.0	0.7	
8	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.4	9.8	8.4	7.1	6.0	4.8	3.8	3.0	2.4	2.0	1.6	1.0	0.7	
9	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.9	11.3	9.8	8.3	7.1	5.9	4.7	3.8	3.0	2.4	1.9	1.6	1.0	0.7	
10	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.8	11.2	9.7	8.3	7.0	5.9	4.7	3.7	3.0	2.4	1.9	1.6	1.0	0.7	
11	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.7	11.1	9.6	8.2	6.9	5.8	4.7	3.7	3.0	2.4	1.9	1.5	1.0	0.7	
12	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	11.0	9.5	8.1	6.9	5.8	4.6	3.7	3.0	2.4	1.9	1.5	1.0	0.7	
13	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	10.9	9.4	8.1	6.8	5.8	4.6	3.7	2.9	2.4	1.9	1.5	1.0	0.7	
14	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.4	10.8	9.4	8.0	6.8	5.7	4.6	3.7	2.9	2.4	1.9	1.5	1.0	0.7	
15	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.3	10.8	9.3	8.0	6.8	5.7	4.6	3.6	2.9	2.4	1.9	1.5	1.0	0.7	
16	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.7	9.3	7.9	6.7	5.7	4.5	3.6	2.9	2.4	1.9	1.5	1.0	0.7	
17	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.7	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.5	1.0	0.7	
18	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.6	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.0	0.7	
19	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.6	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.7	
20	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.1	7.8	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8	
21	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	11.2	9.8	8.5	7.3	6.2	5.2	4.2	3.4	2.7	2.2	1.8	1.5	1.0	0.7	
22	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.7	10.4	9.1	7.9	6.8	5.8	4.9	3.9	3.2	2.6	2.1	1.7	1.4	1.0	0.7	
23	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.9	9.7	8.5	7.4	6.3	5.4	4.6	3.7	3.0	2.4	1.9	1.6	1.3	0.9	0.6	
24	13.0	13.0	13.0	13.0	13.0	12.4	11.3	10.2	9.1	7.9	6.9	5.9	5.0	4.3	3.4	2.8	2.2	1.8	1.5	1.2	0.9	0.6	
25	13.0	13.0	13.0	13.0	12.6	11.6	10.6	9.5	8.4	7.4	6.4	5.5	4.7	4.0	3.2	2.6	2.1	1.7	1.4	1.2	0.8	0.6	
26	13.0	13.0	13.0	12.6	11.7	10.8	9.9	8.9	7.9	6.9	6.0	5.2	4.4	3.7	3.0	2.4	2.0	1.6	1.3	1.1	0.8	0.6	
27	13.0	13.0	12.4	11.7	10.9	10.1	9.2	8.3	7.4	6.5	5.6	4.8	4.1	3.5	2.8	2.3	1.9	1.5	1.2	1.0	0.7	0.5	
28	13.0	12.7	11.6	10.9	10.2	9.4	8.6	7.7	6.9	6.0	5.2	4.5	3.9	3.3	2.6	2.1	1.7	1.4	1.2	1.0	0.7	0.5	
29	12.6	11.9	10.8	10.2	9.5	8.8	8.0	7.2	6.4	5.6	4.9	4.2	3.6	3.1	2.5	2.0	1.6	1.3	1.1	0.9	0.7	0.5	
30	11.8	11.1	10.1	9.5	8.9	8.2	7.5	6.8	6.0	5.3	4.6	4.0	3.4	2.9	2.3	1.9	1.5	1.3	1.1	0.9	0.6	0.5	

Table 43-9.
(B) Coldwater habitat outside mixing zone 30-day average total ammonia-nitrogen criteria (mg/l).

pH	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.8	9.0
Temp. (°C)																						
0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.1	1.8	1.5	1.2	0.9	0.8	0.6	0.5	0.4	0.2	0.2
1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.1	1.8	1.5	1.2	0.9	0.7	0.6	0.5	0.4	0.2	0.2
2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.1	1.7	1.5	1.2	0.9	0.7	0.6	0.5	0.4	0.2	0.2
3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.0	1.7	1.4	1.1	0.9	0.7	0.6	0.5	0.4	0.2	0.2
4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.0	1.7	1.4	1.1	0.9	0.7	0.6	0.5	0.4	0.2	0.2
5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.0	1.7	1.4	1.1	0.9	0.7	0.6	0.5	0.4	0.2	0.2
6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.0	1.7	1.4	1.1	0.9	0.7	0.6	0.5	0.4	0.2	0.2
7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	1.9	1.6	1.4	1.1	0.9	0.7	0.6	0.4	0.4	0.2	0.2
8	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.4	1.1	0.9	0.7	0.6	0.4	0.4	0.2	0.2
9	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.9	0.7	0.6	0.4	0.4	0.2	0.2
10	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.9	0.7	0.5	0.4	0.4	0.2	0.2
11	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.8	0.7	0.5	0.4	0.4	0.2	0.2
12	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.3	1.1	0.8	0.7	0.5	0.4	0.4	0.2	0.2
13	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.8	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
14	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.6	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
15	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.8	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.4	0.2	0.2
16	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.7	1.4	1.2	1.0	0.8	0.6	0.5	0.4	0.3	0.2	0.2
17	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.6	1.3	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.1
18	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.5	1.2	1.0	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.1
19	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.4	1.2	1.0	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.1
20	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.3	1.1	0.9	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.1
21	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.2	1.0	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.1
22	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1
23	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	0.9	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.1	0.1
24	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	0.8	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.1
25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
27	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1
28	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1
29	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1
30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1

- (5) Seasonal salmonid habitat. During the time this use is in effect (October 1 to May 31) there shall be no discharge of chlorine into these waters and the maximum ammonia criteria are the values listed in table 43-9(A) of this rule for the coldwater habitat use designation.
- (6) Limited resource water. The water quality criteria in this paragraph apply in lieu of the water quality criteria for the base aquatic life use in rule 3745-1-42 of the Administrative Code.
- (a) Except as identified in paragraph (E)(6)(b) of this rule, the outside mixing zone average criteria do not apply.
- (b) The criteria in table 43-11 of this rule apply in lieu of the base aquatic life use criteria for those chemicals.

Table 43-11. Limited resource water criteria.

<u>Chemical</u>	<u>Form¹</u>	<u>Units²</u>	<u>IMZM³</u>	<u>OMZM³</u>	<u>OMZA³</u>
<u>Dissolved oxygen⁴</u>	<u>T</u>	<u>mg/l</u>	<u>--</u>	<u>2.0</u>	<u>3.0</u>
<u>pH</u>	<u>--</u>	<u>s.u.</u>	<u>--</u>	<u>--</u>	<u>6.5-9.0^a</u>
<u>Temperature</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>98(37)</u>	<u>94(34)</u>

¹ T = total.

² mg/l = milligrams per liter (parts per million); s.u. = standard units.

³ IMZM = inside mixing zone maximum; OMZM = outside mixing zone maximum; OMZA = outside mixing zone average.

⁴ For dissolved oxygen, OMZM means outside mixing zone minimum and OMZA means outside mixing zone minimum twenty-four-hour average.

^a Acid mine drainage streams over sandstone geotype are exempt from the pH criterion.

- (7) Limited warmwater habitat. Water quality criteria for the support of this use designation are the same as the criteria for the warmwater habitat use designation. However, individual criteria are varied on a case-by-case basis and supersede the criteria for warmwater habitat where applicable. Any exceptions from warmwater criteria apply only to specific criteria during specified time periods or flow conditions. The adjusted criteria and conditions for specified stream segments are denoted as comments in rules 3745-1-08 to 3745-1-30 of the Administrative Code.

(8) Lake habitat.

- (a) The water quality criteria in table 43-12 of this rule apply in lieu of or in addition to the water quality criteria for the protection of the base aquatic life use in rule 3745-1-42 of the Administrative Code.
- (b) For the purposes of the water quality criteria in table 43-12 of this rule, the following four lake types are recognized.
- (i) Dugout lake is a lake formed by the accumulation of rainfall or ground water in a hole excavated in an upland area including, but not limited to, borrow pits, ponds, and quarries.
- (ii) Impoundment is a lake formed by an impoundment structure, such as a dam, within a flowing body of water such that the normal water flow is interrupted, resulting in a residence time index of 0.5 or greater.
- (iii) Natural lake is a lake formed without human intervention, including, but not limited to, kettle lakes formed from glacial outwash.
- (iv) Upground reservoir is a lake constructed of earthen dikes separate from the water source primarily used to store drinking water. Surface water or ground water is pumped into the lake to fill the basin.

Table 43-12. Lake habitat criteria. All criteria apply outside the mixing zone.

Parameter Lake type	Form ¹	Units ²	Statewide criteria	Ecoregional criteria				
				ECBP	EOLP	HELP	IP	WAP
Ammonia	T	mg/l	Table 43-4	--	--	--	--	--
Chlorophyll a ³								
Dugout lakes	T	µg/l	6.0	--	--	--	--	--
Impoundments	T	µg/l	--	14.0	14.0	14.0	14.0	6.2
Natural lakes	T	µg/l	14.0	--	--	--	--	--
Upground reservoirs	T	µg/l	6.0	--	--	--	--	--
Dissolved oxygen ⁴								
All lake types	T	mg/l	5.0 OMZM 6.0 OMZA	--	--	--	--	--
Nitrogen ³								
Dugout lakes	T	µg/l	450	--	--	--	--	--
Impoundments	T	µg/l	--	930	740	930	688	350
Natural lakes	T	µg/l	638	--	--	--	--	--
Upground reservoirs	T	µg/l	1,225	--	--	--	--	--
pH								
All lake types	--	s.u.	a	--	--	--	--	--
Phosphorus ³								
Dugout lakes	T	µg/l	18	--	--	--	--	--
Impoundments	T	µg/l	--	34	34	34	34	14
Natural lakes	T	µg/l	34	--	--	--	--	--
Upground reservoirs	T	µg/l	18	--	--	--	--	--
Secchi disk transparency ⁵								
Dugout lakes	--	m	2.60	--	--	--	--	--
Impoundments	--	m	--	1.19	1.19	1.19	1.19	2.16
Natural lakes	--	m	1.19	--	--	--	--	--
Upground reservoirs	--	m	2.60	--	--	--	--	--
Temperature								
All lake types	--	--	b	--	--	--	--	--

¹ T = total.² m = meters; mg/l = milligrams per liter (parts per million); µg/l = micrograms per liter (parts per billion); s.u. = standard units.³ These criteria apply as medians from May through October in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.⁴ For dissolved oxygen, OMZM means outside mixing zone minimum and OMZA means outside mixing zone minimum twenty-four-hour average. The dissolved oxygen criteria apply in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.⁵ These criteria apply as minimum values from May through October.^a pH is to be 6.5-9.0, with no change within that range attributable to human-induced conditions.^b At no time shall the water temperature exceed the average or maximum temperature that would occur if there were no temperature change attributable to human activities.

(9) Primary headwater habitat.

(a) Except as stated in paragraph (D)(9)(b) of this rule, the water quality criteria in rule 3745-1-42 of the Administrative Code apply to water bodies designated primary headwater habitat.

(b) Class III. The water quality criteria for the coldwater habitat use (see paragraph (D)(4) of this rule) apply to primary headwater habitats assigned class III pursuant to paragraph (F)(9) of rule 3745-1-07 of the Administrative Code.

(10) Wetland. The water quality criteria in rule 3745-1-42 of the Administrative Code apply.

Replaces Part of 3745-1-07

Effective:

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Certification

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