

# Appendix E

## Greater Cardinal Creek Subwatershed Management Plan

- Watercourse Classification and Recommended Setbacks

## Watercourse Classification and Setbacks

Watershed science has demonstrated that the protection of water quality, aquatic habitats and fish habitat depends upon the conservation and protection of headwater areas and watercourses. Watersheds function very much like human lungs. In human lungs, the most important areas for gas exchange are not the main passages, but the numerous alveoli: the small sacs, deep in the lungs, where the ratio of surface area to volume is highest. Impairment of these alveoli through smoking, exposure to toxic fumes, or infection quickly leads to the collapse of the respiratory system. Similarly, most of the water in a watershed originates in headwater areas, entering the numerous small watercourses – sometimes ephemeral, sometimes permanent – where the ratio of shoreline and streambed to water volume is highest. These are the areas where the exchange of materials and energy between the terrestrial and aquatic systems is greatest. Consequently, they are the areas in which the protection of watercourse features is most important to the overall health of the watershed.

Ottawa's Official Plan requires development setbacks to protect watercourses and watersheds. The need for watercourse setbacks may vary by watercourse. Consequently, they will often be identified by subwatershed studies (SWS) and environmental management plans (EMP). They are implemented by zoning at the time of development review and building permit processes. Where watercourse setbacks are not established through a SWS or EMP, or those management plans do not address minimum watercourse setbacks, then Section 4.7.3 (2) of the Official Plan states that the *greater* of the following setbacks will apply:

- The regulatory flood line, where such exists;
- The geotechnical limit of the hazard lands, as established using the City of Ottawa Slope Stability Guidelines;
- 30 m from the normal high water mark of rivers, lakes and streams;
- 15 m from the existing top of bank, where there is a defined bank.

If the watercourse in question has been identified as a municipal drain through a Drainage Act process, then a larger setback may also be established through the applicable Drain Engineer's report. A larger setback requirement may also be identified through an Environmental Impact Statement where a watercourse is identified as part of a natural corridor or part of any other feature of the City's natural heritage system described in Section 2.4.2 (1) of the Official Plan (e.g. a watercourse associated with a significant woodland)

With some exceptions for activities subject to specific approval processes (as specified in Policy 4.7.3 (4)), the Official Plan does not permit site alteration or development within the applicable watercourse setback. Exceptions to the standard, minimum setbacks may be requested in three circumstances (Policy 4.7.3 (6)):

- On existing lots, where the standard minimum setback is not achievable (see Policy 4.7.3 (6) for details);

- “Adjacent to a minor tributary that serves primarily a surface water function and that may have only an intermittent flow.”
- “Adjacent to an existing top of bank where the regulatory floodline and the geotechnical limit of the hazard lands are within 15 metres from the existing top of bank.”

A request for an exception to the standard, minimum setbacks or to the prohibition on development and site alteration will only be considered if it is supported by a study that identifies and addresses the following:

- The floodplain (regulated or not) and the geotechnical limits;
- Impacts on the natural vegetation and ecological functions of the setback area, including protective functions with respect to the watercourse, intrinsic values, and intrinsic functions;
- The nature of the watercourse, including: thermal regime; sensitivity to sediments, pollutants, anthropogenic nutrient inputs; light regime; the relative importance of groundwater inputs, interflow, and surface water inputs; in-stream and near-stream structure; natural nutrient inputs and balance.

Request for exceptions to the standard, minimum setbacks are often made for headwater watercourses, based on claims that these are “minor tributaries” as *per* Policy 4.7.3 (6b). Interpretation of this policy has been complicated in the past by the lack of explicit criteria for the assessment of whether a watercourse qualifies as a minor tributary. Ottawa is currently developing standard guidelines for application of the minor tributary policy, based upon two recent documents: Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC and TRCA 2013); Ecological Buffer Guideline Review (Beacon Environmental Ltd. 2012). A minor tributary will normally fall within one of the following recommended management categories:

- Mitigation
- Recharge Protection
- Maintain Terrestrial Linkage
- No Management Required.

The Greater Cardinal Creek Subwatershed Study takes a risk-based approach to establishing watercourse setbacks, based recommendations in the Ecological Buffer Guideline Review (Beacon Environmental Ltd. 2012). In some cases, these setbacks supersede the minimum setbacks in the Official Plan, in order to protect “critical function zones” (Beacon Environmental Ltd. 2012). Table X cross-references the recommended management categories in the Headwater Drainage Feature Guidelines (CVC and TRCA 2013) to development setbacks based on Table 7 in the Ecological Buffer Guidelines (Beacon Environmental Ltd. 2012). The development setback distances are intended to reduce the risk of not achieving the intended buffer functions to moderate or low (Beacon Environmental Ltd. 2012).

**Table 1. Recommended Minimum Watercourse Setbacks for Development Proposals**

<b>Management Recommendation (CVC and TRCA 2013)</b>	<b>Minimum Setbacks</b>
Permanent Watercourse (Headwater Drainage Feature Guidelines do not apply)	Greater of: <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• 30 m from normal high water mark</li> <li>• 25 m from top of bank</li> <li>• Setback as determined through an Environmental Impact Statement</li> <li>• Setback as determined through a Drain Engineer's Report</li> </ul>
Protection	Greater of: <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• 30 m from normal high water mark</li> <li>• 25 m from top of bank</li> <li>• Setback as determined through an Environmental Impact Statement</li> <li>• Setback as determined through a Drain Engineer's Report</li> </ul>
Conservation	Greater of: <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• 30 m from normal high water mark</li> <li>• 25 m from top of bank</li> <li>• Setback as determined through an Environmental Impact Statement</li> <li>• Setback as determined through a Drain Engineer's Report</li> </ul>
Mitigation (with direct fish habitat)	Greater of: <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• 25 m from top of bank, where there is a defined top of bank.</li> <li>• 25 from the watercourse centre line, where there is no defined top of bank</li> <li>• Setback as determined through an Environmental Impact Statement</li> <li>• Setback as determined through a Drain Engineer's Report</li> </ul>
Mitigation (with	Greater of:

indirect fish habitat)	<ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• 15 m from top of bank, where there is a top of bank.</li> <li>• 15 m from the watercourse centre line, where there is no defined top of bank</li> <li>• Setback as determined through an Environmental Impact Statement</li> <li>• Setback as determined through a Drain Engineer's Report</li> </ul>
Recharge Protection	<p>Greater of:</p> <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• Setback as determined through a source water protection plan, subwatershed study, environmental management, an Environmental Impact Statement or other planning study.</li> </ul>
Maintain Terrestrial Linkage	<p>Greater of:</p> <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> <li>• Setback as determined through an Environmental Impact Statement</li> </ul>
None	<p>Greater of:</p> <ul style="list-style-type: none"> <li>• Regulatory flood line</li> <li>• Geotechnical limit of hazard lands</li> </ul>

Watercourses in the Greater Cardinal Creek Subwatershed have been provisionally classified through a desktop analysis, using criteria and classes from the "Evaluation, Classification and Management of Headwater Drainage Features Guidelines" (CVC/TRCA 2013). The desktop analysis used aerial photography, topographic mapping, soils, and municipal drain classifications, as well as aquatic habitat information and fisheries information from the Existing Conditions Report. Where insufficient information exists for a preliminary assessment, the watercourse has been classified as "unknown."

*These classifications are intended primarily for screening and high-level planning purposes. Any specific development or site alteration proposal adjacent to one of the illustrated headwater watercourses must be accompanied by a site investigation using the methodology of the Headwater Drainage Feature Guidelines (CVC/TRCA 2013).*

Table X+1 and attached figure present the results of the watercourse classification.

**Table X+1. Watercourse Classification and Recommended Setbacks**

Number	DRAIN NAME	Watercourse Type	Hydrological Function	Riparian Function	Fish Habitat	Terrestrial Habitat	Management Recommendation
0		Altered Watercourse	Important	Important	Valued	Valued	Protection
1		Altered Watercourse	Important	Important	Valued	Important	Protection
2		Altered Watercourse	Important	Important	Contributing	Valued	Protection
3		Altered Watercourse	Valued	Valued	Unknown	Contributing	Unknown
4		Altered Watercourse	Important	Important	Important	Limited	Protection
5		Restricted Valley	Important	Important	Contributing	Limited	Protection
6		Ditch	Unknown	Limited	Unknown	Limited	Unknown
7		Altered Watercourse	Valued	Valued	Unknown	Limited	Unknown
8	Penning	Municipal Drain A	Important	Valued	Important	Limited	Protection
9	Arnold Scharfe	Municipal Drain A	Important	Important	Valued	Limited	Protection
10	Arnold Scharfe (Br 1)	Municipal Drain F	Valued	Important	Contributing	Contributing	Conservation
11	Chartrand	Municipal Drain A	Important	Valued	Important	Limited	Protection
12	Scharfe	Municipal Drain F	Valued	Important	Contributing	Important	Protection
13	Borden Scharfe (West Branch)	Municipal Drain F	Valued	Limited	Unknown	Limited	Unknown
14	Borden Scharfe (East Branch)	Municipal Drain F	Valued	Limited	Unknown	Limited	Unknown
15	Mercier	Municipal Drain A	Important	Important	Important	Contributing	Protection
16	Mercier Br	Municipal Drain F	Valued	Limited	Unknown	Limited	Unknown
17	William Hayes	Municipal Drain F	Valued	Valued	Unknown	Limited	Unknown
18	Garvock	Municipal Drain F	Valued	Important	Contributing	Important	Protection
19	Eric Deavy	Municipal Drain F	Valued	Limited	Unknown	Limited	Unknown
20	Garvock (Br 1)	Municipal Drain F	Valued	Important	Contributing	Limited	Conservation
21	John Smits	Municipal Drain F	Valued	Limited	Unknown	Limited	Unknown
22	Antonio Farley	Municipal Drain F	Valued	Valued	Unknown	Limited	Unknown
23	Bella Vista	Municipal Drain U	Important	Important	Contributing	Valued	Protection
24		Altered Watercourse	Important	Important	Contributing	Valued	Protection
25		Altered Watercourse	Important	Important	Contributing	Valued	Protection
26		Altered Watercourse	Important	Important	Contributing	Important	Protection
27		Ditch	Valued	Limited	Unknown	Limited	Unknown
28		Altered Watercourse	Important	Important	Contributing	Valued	Protection
29		Ditch	Important	Important	Contributing	Valued	Protection

30		Ditch	Contributing	Important	Limited	Limited	Conservation
31		Restricted Valley	Valued	Valued	Unknown	Limited	Unknown
32		Restricted Valley	Valued	Important	Contributing	Important	Protection
33		Restricted Valley	Contributing	Important	Limited	Limited	Conservation
34		Urban Watercourse	Contributing	Important	Limited	Contributing	Conservation
35		Restricted Valley	Valued	Valued	Unknown	Limited	Unknown
36		Ditch	Unknown	Limited	Contributing	Limited	Unknown
37		Urban Watercourse	Contributing	Important	Limited	Important	Protection
38		Urban Watercourse	Important	Limited	Important	Limited	Protection
39		Urban Watercourse	Valued	Important	Limited	Important	Protection
40		Restricted Valley	Valued	Important	Contributing	Contributing	Conservation
41		Ditch	Contributing	Limited	Important	Limited	Conservation
42		Ditch	Contributing	Important	Contributing	Contributing	Conservation
43		Restricted Valley	Contributing	Important	Contributing	Contributing	Conservation
44		Ditch	Contributing	Limited	Unknown	Limited	Unknown
45		Ditch	Contributing	Limited	Unknown	Limited	Unknown
46		Ditch	Contributing	Limited	Unknown	Limited	Unknown
47		Restricted Valley	Important	Valued	Important	Contributing	Protection
48		Ditch	Valued	Valued	Valued	Limited	Unknown
49		Ditch	Contributing	Important	Valued	Contributing	Conservation
50		Ditch	Contributing	Important	Limited	Limited	Conservation
51		Ditch	Valued	Important	Valued	Contributing	Conservation
52		Swale	Contributing	Limited	Unknown	Limited	Unknown
53		Ditch	Contributing	Limited	Unknown	Limited	Unknown
54		Ditch	Contributing	Limited	Unknown	Limited	Unknown
55		Ditch	Contributing	Limited	Unknown	Limited	Unknown
56		Ditch	Contributing	Limited	Unknown	Limited	Unknown
57		Ditch	Contributing	Limited	Unknown	Limited	Unknown
58		Altered Watercourse	Important	Important	Important	Valued	Protection
59		Ditch	Valued	Important	Valued	Limited	Conservation
60		Altered Watercourse	Important	Important	Important	Important	Protection
61		Swale	Contributing	Limited	Unknown	Limited	Unknown
62		Ditch	Contributing	Limited	Unknown	Limited	Unknown
63		Ditch	Valued	Important	Contributing	Important	Protection
64		Ditch	Valued	Important	Valued	Important	Protection

65		Swale	Contributing	Valued	Contributing	Valued	Unknown
66		Swale	Contributing	Limited	Unknown	Limited	Unknown
67		Swale	Contributing	Limited	Unknown	Limited	Unknown
68		Ditch	Valued	Important	Contributing	Contributing	Conservation
69		Swale	Valued	Important	Contributing	Valued	Conservation
70		Ditch	Valued	Important	Valued	Valued	Conservation
71		Ditch	Contributing	Limited	Unknown	Limited	Unknown
72		Ditch	Contributing	Limited	Unknown	Limited	Unknown
73		Ditch	Valued	Important	Contributing	Limited	Conservation
74		Swale	Contributing	Limited	Unknown	Limited	Unknown
75		Ditch	Valued	Important	Limited	Contributing	Conservation
76		Swale	Contributing	Limited	Unknown	Limited	Unknown
77		Swale	Contributing	Limited	Unknown	Limited	Unknown
78		Ditch	Contributing	Limited	Unknown	Limited	Unknown
79		Ditch	Contributing	Contributing	Limited	Limited	Mitigation
80		Ditch	Contributing	Important	Contributing	Contributing	Conservation
81		Restricted Valley	Valued	Important	Contributing	Valued	Conservation
82		Restricted Valley	Valued	Important	Contributing	Valued	Conservation
83		Restricted Valley	Valued	Important	Contributing	Valued	Conservation
84		Restricted Valley	Valued	Important	Contributing	Valued	Conservation
85		Restricted Valley	Contributing	Important	Contributing	Valued	Conservation
86		Restricted Valley	Contributing	Important	Contributing	Valued	Conservation
87		Restricted Valley	Valued	Important	Contributing	Valued	Conservation
88		Ditch	Contributing	Limited	Limited	Limited	Mitigation
89		Swale	Contributing	Limited	Limited	Limited	Mitigation
90		Ditch	Contributing	Important	Limited	Valued	Conservation
91		Ditch	Contributing	Limited	Limited	Limited	Mitigation
92		Ditch	Contributing	Limited	Limited	Limited	Mitigation
93		Ditch	Contributing	Limited	Limited	Limited	Mitigation
94		Municipal Drain U	Important	Limited	Important	Contributing	Protection
95		Ditch	Contributing	Limited	Limited	Limited	Mitigation
96		Ditch	Contributing	Limited	Limited	Limited	Mitigation
97		Ditch	Contributing	Limited	Limited	Limited	Mitigation
98		Ditch	Contributing	Limited	Limited	Limited	Mitigation
99		Ditch	Contributing	Limited	Limited	Limited	Mitigation



## Cardinal Creek Subwatershed Study Headwater Drainage Feature Recommended Setbacks

This figure illustrates and provisionally classifies those watercourses that may qualify for a development or site alteration setback different from those provided in Section 4.7.3, Policy 2 of the Official Plan. All other watercourses identified as part of the stream network are subject to the greater of: 30 m from the normal high water mark; 25 m from the top of bank; any setbacks necessary for protection of the natural heritage system; any setbacks in applicable Municipal Drain Engineer's reports; and any setbacks required by the conservation authorities under their regulations and authority.

The watercourse classifications shown in this figure are based upon a desktop analysis, using criteria and classes from the "Evaluation, Classification and Management of Headwater Drainage Features Guidelines" (CVC/TRCA 2013). They are intended primarily for screening and high-level planning purposes. Any specific development or site alteration proposal adjacent to one of the illustrated headwater watercourses must be accompanied by a site investigation using the methodology of the Headwater Drainage Feature Guidelines (CVC/TRCA 2013).

The recommended setbacks are the greater of:

- a) The limit of hazard lands;
- b) The access allowance established in the Drain Engineer's Report;
- c) The following setbacks:
  - i. Protection: the greater of 30 m from the centreline, 30 m from the normal high water mark, 25 m from the top of bank, or 15 m from the top of slope;
  - ii. Conservation: the greater of 30 m from the centreline, 30 m from the normal high water mark, 25 m from the top of bank, or 15 m from the top of slope;
  - iii. Mitigation with direct fish habitat: the greater of 25 m from the top of bank, or 25 m from the watercourse centre line where there is no defined top of bank;
  - iv. Mitigation with indirect fish habitat: the greater of 15 m from the top of bank, or 15 m from the watercourse centre line where there is no defined top of bank;
  - v. None: no setback required;

0 495 990 1,980 Meters

