Feedmill Creek
Stream Rehabilitation Measures
Class Environmental Assessment

Prepared By:

City of Ottawa
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 Introduction

The City of Ottawa has undertaken a Municipal Class Environmental Assessment (Class EA) for the stream rehabilitation measures proposed in the Feedmill Creek Stormwater Management Criteria Study (JF Sabourin and Associates, April 2018). This study was required to confirm quantity control criteria for the remaining future development in the Feedmill Creek subwatershed. As part of the results, an optimal combination of stormwater management and in-stream works was developed in order to mitigate the impacts of future development on stream function, peak flows and water levels.

As shown on the **Figure 1.1**, the limit of the study area corresponds to the limit of Feedmill Creek subwatershed.

This document provides a summary of the planning process used to evaluate and select the optimal combination of stormwater management and in-stream measures.

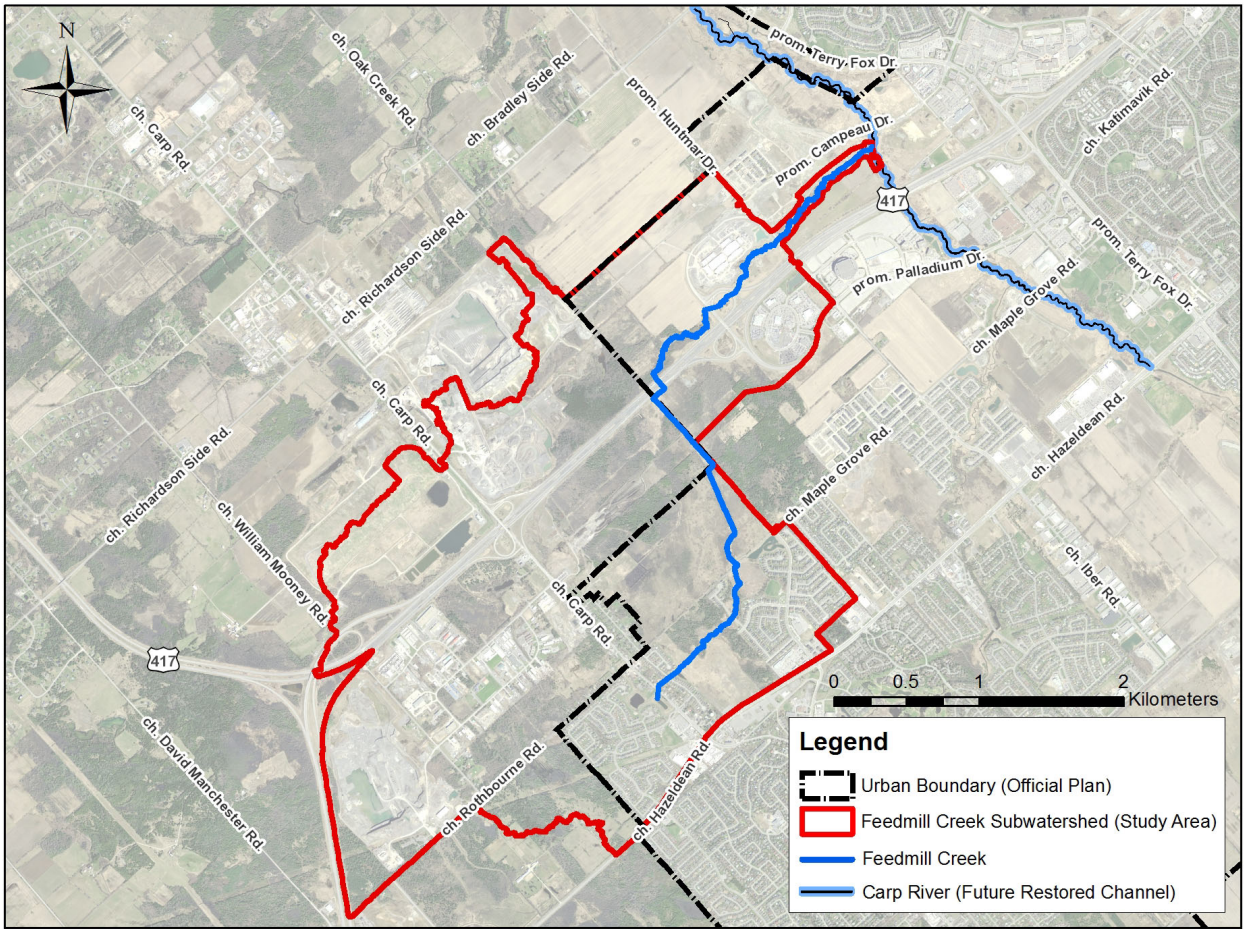

Figure 1.1. Feedmill Creek Study Area

1.1 The Class EA Process

Under the provisions of the *Environmental Assessment Act*, a Municipal Class EA is a requirement for the implementation of in-stream rehabilitation measures. The Municipal Class EA provides a planning process for infrastructure projects that are routine and have predictable environmental impacts. The following steps are part of a typical Class EA study:

- project need;
- documentation of the existing environment;
- identification, evaluation and selection of the recommended solutions; and public notice of completion.

Figure 1.2 provides further details of the steps involved in the Municipal Class EA Planning and Design Process.

The Municipal Class EA includes three project schedules (Schedules A, B, and C) that categorize the magnitude of anticipated environmental impacts by different types of projects and activities. Schedule A projects are minor in nature and are "pre-approved," that is, they may proceed without following the procedures required by the Municipal Class EA process.

Schedule B projects are more complex in nature than Schedule A projects and must satisfy Phases 1 and 2 of the Municipal Class EA process. At Phase 1, the problem or opportunity presented by the undertaking is described. At Phase 2, alternative solutions to the problem or opportunity are developed and evaluated with the purpose of identifying a preferred solution. At the end of Phase 2, the findings of Phases 1 and 2 are presented to the public and review agencies. The project is implemented and environmental impacts, if any, are to be monitored during and following project implementation.

Schedule C projects are more complex in nature than Schedule B projects and must satisfy all Phases of the Municipal Class EA process. After completing Phases 1 and 2, Phase 3 requires that alternative design concepts for the preferred solution be developed and evaluated to identify the preferred design alternative. At Phase 4, an Environmental Study Report (ESR) is completed that documents the environmental assessment process.

At the end of Phase 2 of a Schedule B undertaking, and at the end of Phase 4 of a Schedule C undertaking, the proponent must notify the public and agencies that the Class EA process has been completed and offer the opportunity to request that the Minister of Environment "bump-up" the Class EA to a Full Environmental Assessment that is subject to approvals under Part II of the *EAA*.

The in-stream rehabilitation measures proposed in the Feedmill Creek Stormwater Management Criteria Study are being planned as a Schedule "B" project ("flood and erosion control works").

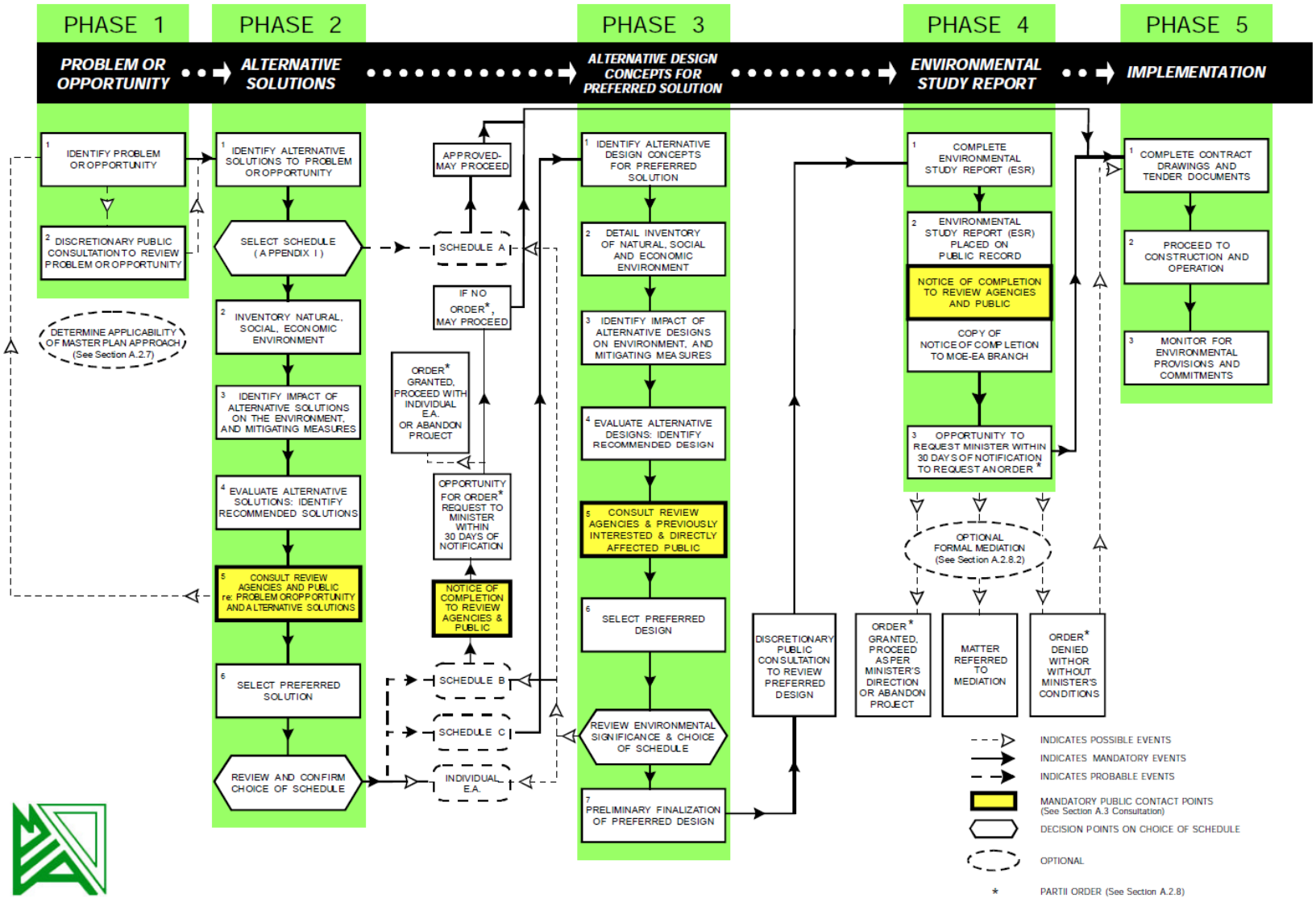

Figure 1.2. Municipal Class EA Planning and Design Process

1.2 Previous Studies

Previous studies include:

i) Carp River Watershed/Subwatershed Study Volume 1 – Main Report (Robinson Consultant Ltd. December 2004). This study identifies a long-term environmental management strategy to protect, enhance or restore environmental quality in light of current and future demands on resources.

   a. Appendix B: detailed morphologic assessment of the stream system with recommendations as to which reaches need to be restored.

ii) Kanata West Master Servicing Study, Volume 1 and 2 (Stantec Consulting Ltd. June 2006): This study identified the need for Master Plans to service the proposed development within the Kanata West plan, including future developments located within the Feedmill Creek subwatershed.

iii) Carp River, Poole Creek and Feedmill Creek Rehabilitation Project Class Environmental Assessment (TSH, Parish Geomorphic, June 2006). This study identifies the preferred alternative and conceptual design for the Carp River rehabilitation, including Poole Creek and Feedmill Creek within the Kanata West development area.

i) Carp River, Poole Creek and Feedmill Creek Rehabilitation Design Brief (TSH, April 2007). This report identifies the conceptual design of the rehabilitation projects approved by Council in May 2006.

ii) Carp River PCSWMM Model Documentation Draft Report (City of Ottawa, March 2016).

2 Existing Environmental Conditions

Feedmill Creek flows in a northeasterly direction starting at the outlet of the stormwater pond at Lloydalex Cresent (see **Figure 2.1**). Shortly downstream from this, the creek enters a wetland that is divided by Overland Drive. After crossing the Maple Grove footpath, the creek enters agricultural land and in some sections has been channelized and straightened. After crossing Highway 417, the creek enters a wooded area and takes on a meandering form. The creek crosses Palladium Drive and the Highway. 417 West off-ramp at Palladium Drive via three culverts and then runs northwest to Huntmar Drive. Downstream of Huntmar Drive, the creek first follows a meandering form before entering the Carp River via a straightened section. The final channelized section bypasses an old natural channel and, based on aerial photographs, was constructed sometime between 1976 and 1991. Small tributaries, both natural and constructed, join the creek at various points along its length.

In support of the Feedmill Creek Stormwater Management Criteria Study, a fluvial geomorphologic assessment was completed. On the basis of typical geomorphic assessment techniques, 7 out of the 8 reaches studied rate rather poorly as ‘in adjustment’ or of ‘moderate stability’ (see reach delineation on **Figure 2.1**). While bank erosion and tree-fall are evident throughout many of the reaches (see **Figure 2.2**), there is very limited evidence of active channel migration. Changes in meander patterns from the 1940s to the present have virtually all been associated with anthropogenic activities. The exception to this is Reach 5 (between Palladium Drive and Highway 417) which does exhibit some natural meander migration.

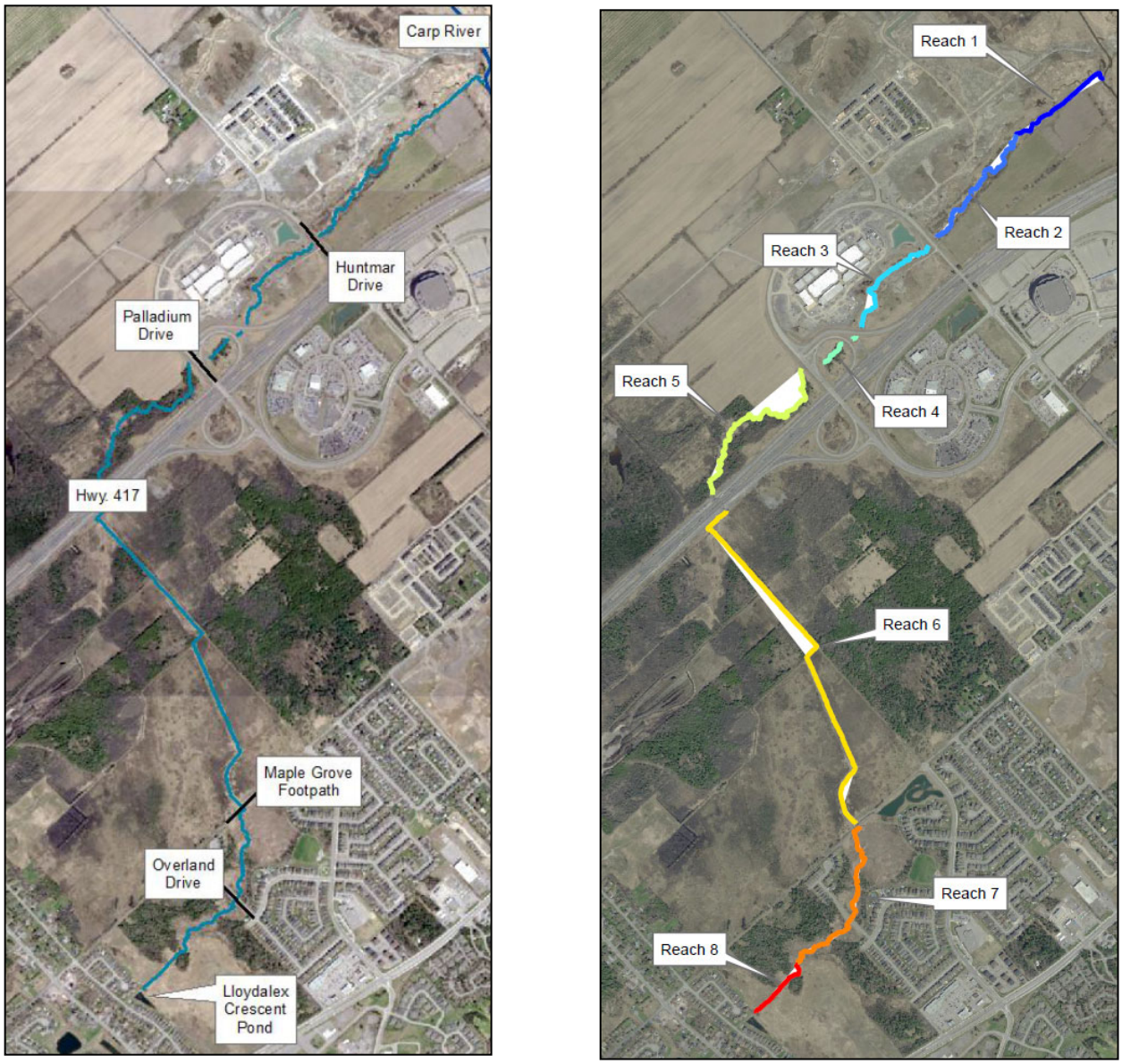

Figure 2.1. Feedmill Creek and Landmarks (on the left); Reach Delineation (on the right)

The Feedmill Creek subwatershed is mostly comprised of soils with poor infiltration characteristics. From downstream (east) to upstream (west) the subwatershed has marine clays within 2.5 km of the Carp River followed by organics (marshy areas) and exposed bedrock on the east side of Carp Road. The exception is from about 300m east of Carp Road and continuing on the west side of Carp Road where there are gravel and sand deposits

Blanding's turtles have been observed by City staff, residents and Provincial biologists at several locations along Poole Creek and within Stittsville. The Ministry of Natural Resources and Forestry (MNRF) considers all of Feedmill Creek to be potential habitat for Blanding's turtle. In particular, the presence of deep pools along the lower reach of Feedmill Creek could provide critical over-wintering habitat, which the MNRF considers to be most sensitive.

Figure 2.2. Channel in Straightened Reach 3 (on the left); Failure of Creek Bank from Scour in Reach 6 (on the right)

In addition, the following information was extracted from the Carp River, Poole Creek and Feedmill Creek Rehabilitation and Class Environmental Assessment (TSH, June 2006):

- Headwater wetlands contribute to creek baseflow;
- Localized groundwater discharge areas are present;
- Creek channel is in a well defined valley;
- Channel does not have the capacity to absorb any increase in in-stream erosion potential;
- Creek has a dynamic meander pattern with varied channel cross-sections;
- Evidence of sediment accumulating at the mouth;
- Channel width varies from 2 to 10m and has an average depth of approximately 0.6m;
- Supports a tolerant cold water fish community and a diverse warm water fishery;
- Temperatures remain in the range suitable for cold water species and are generally 3-5°C lower than Carp River;
- Aquatic habitats are unspecialized, but are utilized by turtles and freshwater mussels;
- Narrow and fragmented deciduous forest riparian borders provide some watercourse buffering and limited corridor and wildlife functions.

3 Project Need

3.1 Background

Through the update and conversion of the Carp River model to the PCSWMM platform, City staff identified that significant peak flow and flood level increases would occur on Feedmill Creek if future development were to apply the previously approved flood control criteria (Kanata West Master Servicing Study, Stantec, 2006). In light of these results, a SWM criteria study has been undertaken to confirm flood and erosion control criteria for the remaining future development in the Feedmill Creek subwatershed and any required in-stream works. Under the provisions of the Environmental Assessment (EA) Act, a Municipal Class EA is a requirement for the implementation of in-stream rehabilitation measures.

3.2 Project Purpose

The stream rehabilitation measures proposed in the Feedmill Creek Stormwater Management Criteria Study are intended to mitigate the impacts of future development on Feedmill Creek.

4 Evaluation of Alternative Solutions

A qualitative evaluation of two alternative solutions was undertaken and is summarized below. Preliminary cost estimates for the alternative solutions are provided in **Appendix A**. The two alternatives considered included:

1. Do Nothing" (Alternative 1);
2. Stormwater management + in-stream measures (Alternative 2).

Both scenarios assume the full build out of the subwatershed as per the City's Official Plan and 2013 updates from the City's Reseach and Forcasting Unit. The evaluation of both alternatives is provided in **Table 4.1**.

4.1 Alternative 1: "Do Nothing"

Alternative 1 "Do Nothing" assumes development proceeding without any stormwater management controls. Based on previous recommendations presented in the approved Carp River Watershed/Subwatershed Study (Robinson, 2004) this alternative is not a viable solution as the resulting impacts would be unacceptable (increased flooding at MTO structures, increased erosion, etc.).

4.2 Alternative 2: Stormwater Management + In-stream Measures "

The "Stormwater Management + In-stream Measures" alternative is based on the preferred approach presented in Feedmill Creek Stormwater Management Criteria Study.

Based on the results of the hydrologic, hydraulic and geomorphic assessments, stormwater management will not be sufficient to adequately mitigate the impacts of future development. In addition to the recommended SWM controls, a suite of in-stream works is required (see **Appendix A** for more information).

Note: the Class EA requirements for the proposed stormwater management facilities will be addressed through the planning approval process.

Table 4.1. Evaluation of Alternative Solutions

Criteria	**Alternative 1:** "Do Nothing"	**Alternative 2:** "Stormwater Management + In-stream Measures "
Environmental		
Construction impacts	N/A	Vegetation removal to access site; some disturbance to creek bank/toe of slope to implement the measures
Fisheries	Continued erosion negatively impacts fish habitat	Existing habitat to be enhanced; improved riparian vegetation
Species at Risk (SAR)	Gradual degradation of the natural habitat	Existing SAR and their habitat will be maintained and improved
Impact of erosion	Continued toe erosion will reduce stability of existing slope and eventually impact existing table lands, future developable lands and MTO structures	Existing table lands, and future developable lands and MTO structures protected by the proposed SWM measures and in-stream rehabilitation measures
Social		
Health of the creek corridor	Gradual degradation of the natural environment, becoming a less attractive area for pedestrians	Healthy meandering stream. Flora to encourage birds and other predators to help reducing mosquitoes population
Impact on private property	N/A	Minor disruption during construction period
Financial		
Estimated project cost	N/A in short-term; loss of table land in long-term; damage to existing property and infrastructure	Cost of $1.76M for in-stream work
Other Benefits		
	N/A	N/A

5 Preferred alternative

As evaluated in Section 4, **the preferred alternative is Alternative 2** “Stormwater Management + in-stream measures” to mitigate the impact of future development on Feedmill Creek. **Figure 5.1** provides a summary of the proposed in-stream rehabilitation measures.

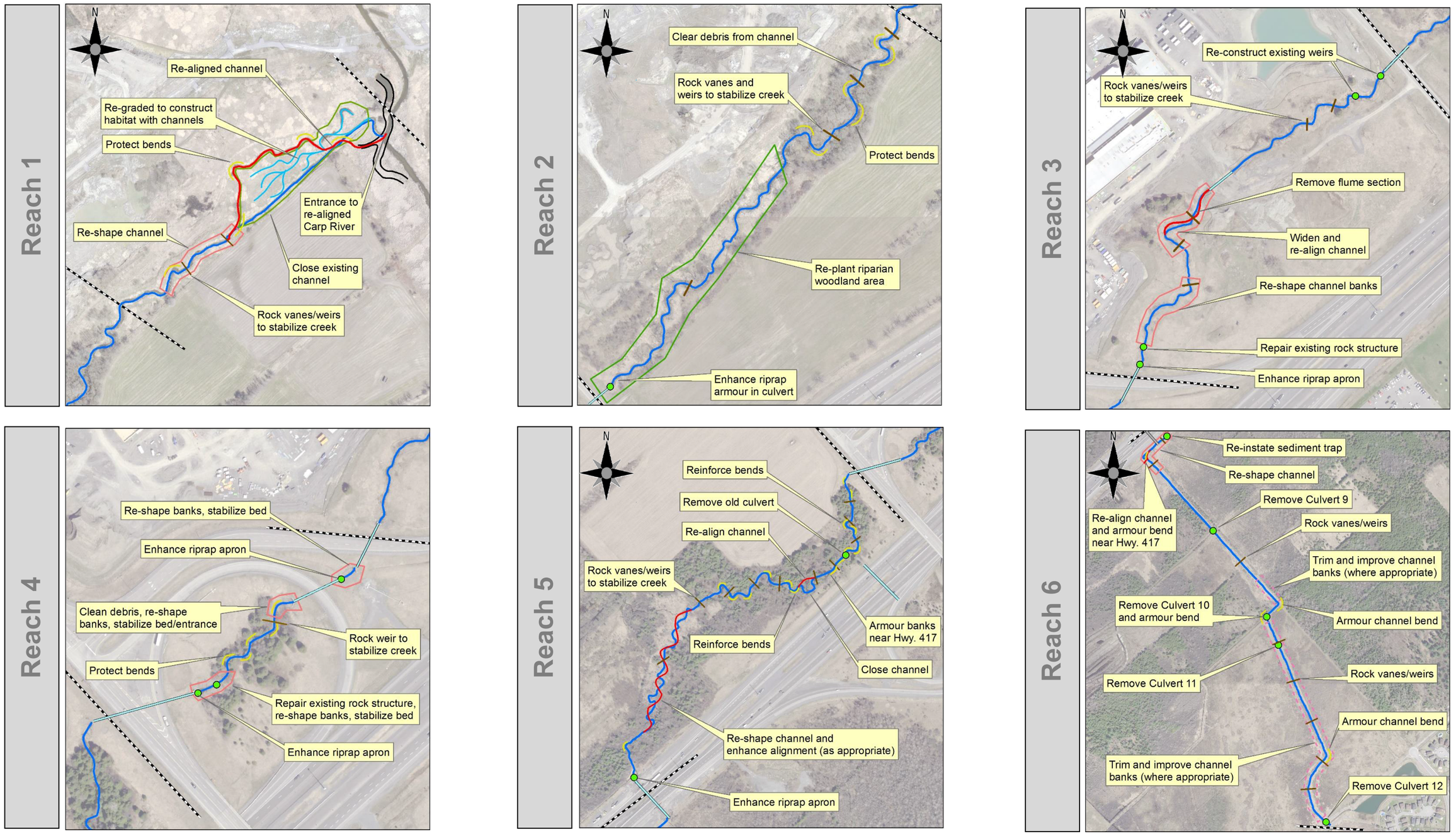

Figure 5.1. In-stream rehabilitation measures required for the preferred alternative – Reach 1 to Reach 6

6 Public Consultation

Public consultation included the following:

i) Notice of Study Commencement and Online Information Session advertised in the community newspaper Le Droit and EMC West on November 24 and December 1, 2016.
ii) A notification e-mail was sent to all stakeholders including Provincial Ministries, development proponents and their respective engineering consultants, Mississippi Valley Conservation, various Community Associations, First Nations, and other interested members of the public.
iii) Online Information Session posted on the City's website from November 24 to December 9, 2016 (Ottawa.ca/feedmillcreek) to present the projects to the public and request comments.
iv) Comments received during the review period (summarized in **Appendix B**).

Appendix B provides documentation associated with the public consultation component of the Class EA.

7 Conclusions

A Class EA has been completed for the stream rehabilitation measures proposed on Feedmill Creek. An evaluation of two different alternatives was undertaken based upon environmental, economic and social factors. The preferred solution is Alternative 2 (Stormwater Management + in-stream measures).

Subject to comments received following the posting of the Notice of Completion, the proposed in-stream works will proceed to detailed design and construction. The proposed in-stream rehabilitation measures will have to comply with Provincial requirements (e.g. MNRF may require an Overall Benefit Permit).

8 References

1. Municipal Class Environmental Assessment (Municipal Engineers Association, June 2000) ;

2. Carp River Watershed/Subwatershed Study (Robinson Consultant Ltd. December 2004);

3. Kanata West Master Servicing Study, (Stantec Consulting Ltd. June 2006) ;

4. Carp River, Poole Creek and Feedmill Creek Rehabilitation Project Class Environmental Assessment (TSH, Parish Geomorphic, June 2006);

5. Carp River, Poole Creek and Feedmill Creek Rehabilitation Design Brief (TSH, April 2007);

6. Carp River PCSWMM Model Documentation Draft Report (City of Ottawa, March 2016).

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Appendix A: Feedmill Creek SWM Criteria Study (JFSA, April 2018)

Appendix B: Public Consultation