Fish Habitat Assessment

PURPOSE:

This document provides guidance for the completion of a Fish Habitat Assessment, which may be required for the submission of an application under the *Planning Act*. All Fish Habitat Assessments shall follow the requirements referenced in this document.

A Fish Habitat Assessment provides information for a Planning Application which is included as part of an Environmental Impact Statement (EIS), Environmental Assessment (EA), subwatershed study, or natural areas inventory, but on occasion may be required as an independent assessment where the completion of additional study or studies is not required. Where an Environmental Impact Statement or other study is completed that includes a Fish Habitat Assessment, that information may be incorporated into the Environmental Impact Statement and a separate document is not required.

A Fish Habitat Assessment is a study that addresses the potential presence of fish or fish habitat, including aquatic Species at Risk (SAR). The assessment may be completed independently or as a part of a larger study such as an Environmental Impact Statement, Environmental Assessment, subwatershed study, or natural areas inventory, to identify species presence/absence and the location, extent, and significance/sensitivity of the fish species and habitat in the study area.

Fish habitat has been identified as a Core Area (Key Natural Heritage Feature) within the City's Natural Heritage System. The identification of species and their habitats can influence the design of a development proposal. Further, City of Hamilton staff and other agencies (such as Conservation Authorities) consider the information provided by a Fish Habitat Assessment when evaluating proposals for development or site alteration. There may be provincial or federal regulatory requirements related to Species at Risk which

must be addressed prior to the approval or implementation of an application for development or site alteration. Additionally, information regarding fish habitat is valuable to the community and landowners as it can support stewardship efforts such as planting native riparian buffers or the protection of fish habitat.

Development, as defined in the City's Official Plans, means "the creation of a new lot, change in land use, or the construction of buildings or structures, requiring approval under the Planning Act." This includes the following application types.

- Official Plan Amendment;
- Zoning By-law Amendment;
- Draft Plan of Subdivision;
- Site Plan Control;
- Consent to Sever;
- Minor Variances; and,
- Niagara Escarpment Plan amendments or development permits.

Site alteration means "activities, such as grading, excavation, and the placement of fill that would change the landform and natural vegetative characteristics of a site". Common development activities that occur in or near water include bridges, culvert installation or maintenance, recreational trails, or construction of buildings.

Fish and fish habitat has potential to be present in any ephemeral, intermittent or permanent waterbody. As such, the City may request a Fish Habitat Assessment whenever new development or site alteration is proposed within or adjacent to a lake or watercourse. Adjacency is defined in the City's Official Plan and may be as great as 120 m from the feature.

PREPARED BY:

A Fish Habitat Assessment must be prepared by a qualified expert in the field relevant to the natural environment (e.g., aquatic ecology), usually an environmental consultant. The qualified expert should have demonstrated experience and training in the identification of target species and habitat types/features.

CONTENTS:

A Fish Habitat Assessment shall contain the following:

1.1Scoping a Fish Habitat Assessment

A fish habitat assessment may be scoped by City of Hamilton staff in consultation with the proponent, to focus on areas or species such as SAR, or other sensitive or indicator species. The scope of the assessment is to be approved by Natural Heritage Planning staff prior to the start of any field work. The following sections outline the full scope of work that could potentially be required for a comprehensive assessment, but not all the listed components may be required depending on the outcome of project scoping.

1.2 Background Review

Review and analysis of existing information is a critical first step which allows a preliminary characterization of the study area and identifies data gaps which may require additional work to address. This step should be completed prior to any field investigations; it may be beneficial for the proponent to begin this process during the scoping stage so that the data gaps and assumptions are fully understood by all parties at the onset of the project.

The background review should include the entire study area limits, also including nearby or connecting waterbodies as these features may provide passage for fish. Fish can move throughout a range or territory formed of suitable habitat, so lack of past observation within the study area is not to be taken as proof of absence if that species has been observed on adjacent waterbodies containing similar habitat.

1.2.1 Preliminary SAR Screening

A preliminary list of Species at Risk (SAR) is to be compiled, including those species that have previously been or could potentially be associated with the study area and adjacent waters. Available background information sources, especially site-specific

resources, will be gathered and include previous assessment reports/studies or background information sourced from relevant agencies (e.g., Conservation Authority), stakeholders/interest groups (e.g., local nature clubs), or local residents. The City of Hamilton's Natural Areas Inventory Project (3rd Edition, 2014) and the Hamilton Natural Heritage Database (managed by the Hamilton Conservation Authority) shall be reviewed

1.2.2 Preliminary Fish Species Review

Reviewing fish species that have been previously recorded in the study area is beneficial for informing when in-water work can be conducted and for background review, if the data is recent (i.e., within five years) and site-specific. A review of fish species that has been recorded in the study area is required to determine the dates which in-water work is permitted by the Ministry of Natural Resources (MNR). Data older than five years may be utilized only to determine in-water timing windows for activities including fisheries surveys.

Following the initial screening for SAR in the study area and adjacent lands, a background review should be conducted focusing on previous environmental assessments and similar publications to understand the diversity of fish communities. Relevant organizations that may have studied the area and provide public data include Conservation Authorities, government agencies, stakeholders/interest groups (e.g., local nature clubs), or local residents. Four Conservation Authorities fall within the City of Hamilton's jurisdiction and include Conservation Halton (CH), Grand River Conservation Authority (GRCA), Hamilton Conservation Authority (HCA) and Niagara Peninsula Conservation Authority (NPCA). Municipalities and Conservation Authorities often generate subwatershed studies to guide land-use planning, which contain natural heritage system data from fisheries surveys. Conservation Authorities may create Fisheries Management Plans or similar documents, with some examples provided in Resources (Section 6.0). A valuable tool titled the Aquatic Resource Area (ARA) line and polygon datasets is also available through the MNR provided in Section 6.0.

1.3 Field Surveys

Where existing background information is not sufficient to evaluate the presence/absence and status of fish species, or data is greater than 5 years old, then field investigations shall be undertaken. The scope of field surveys will be informed by the species or habitat being targeted for confirmation, as determined through the background review and study scoping stages described above. The timing of ecological field investigations is critical for the accurate detection and identification of species. All field surveys must be completed in the appropriate season and time to detect the target species, as discussed in the following subsections. The scope and timing of field investigations will follow the City of Hamilton's EIS Guidelines (2015).

1.3.1 In-water Works Timing

Timing windows have been established by the MNR to restrict in-water work during vulnerable life stages of fish to protect these species from impacts of activities that occur in or around water. Simply put, in-water work, including fisheries surveys, development, and restoration, is restricted during spawning and migration periods to protect fish populations. Therefore, fish that have been previously recorded in the study area determine when in-water work can occur. Reproduction and spawning timing information for Ontario fish can be found through the Ontario Freshwater Fishes Life History Database, provided in Resources.

Data from the background review is required when determining timing windows, as it gives a general idea of the fish species present. For example, if Rainbow Trout was recorded in the study area (Hamilton, Southern Ontario), in-water work would be restricted from March 15 to June 15 of any given year. For study areas that have records of more than one species present, the timing windows of species shall be combined. For example, if unknown fall spawning species and Rainbow Trout was recorded in a study area (Hamilton, Southern Ontario), in-water work would be restricted from March 15 to June 15 (for Rainbow Trout), as well as October 1 to May 31 (for the fall-spawning species) of any given year. Therefore, both timing windows shall

be combined, permitting in-water work only between June 15 and October 1 of any given year. Timing windows must be determined prior to applying for permits to conduct fish community surveys, as discussed in the following subsection.

1.3.2 Permitting

Prior to conducting a fish community survey, appropriate permitting from the MNR must be obtained. A *License to Collect Fish for Scientific Purposes* (LCFSP) is required from the MNR as set out in the Ontario Fishery Regulations, 2007, under the federal Fisheries Act. A LCFSP can be applied to research, inventory, assessment, development, as well as maintenance and restoration projects. The City of Hamilton is located within the Aylmer-Guelph District for LCFSP applications. A LCFSP can be submitted through the Natural Resources Information Portal or emailed directly to the district office (scp.guelph@ontario.ca).

For most waterbodies in Southern Ontario, exclusive of restrictions relating to SAR, an LCFSP will often be granted for July 15 – October 1 of any year as vulnerable life stages of both spring and fall spawning fish lie outside of this timing window. Therefore, fish community surveying in permanent waterbodies is recommended to occur during this timeframe. Intermittent and ephemeral stream flow conditions are often limited to late April – June and September – October. In this instance, fish community surveys should be carried out when fish and water are likely to be present. If the proponent must conduct in-water work during a restricted timing window period such as late April - June, the Aylmer-Guelph District should be contacted. Please note that fish habitat surveys during winter months under snow or ice conditions are not accepted by the City of Hamilton, as indicated in the EIS Guidelines (City of Hamilton, 2015).

Other authorizations may be required for species listed under the *Species Conservation Act* and/or the *Species at Risk Act.* It is the responsibility of the proponent to determine if additional permitting or Agency review is required and should be determined during the Background Data Review phase. Along with the permits discussed in this section, land access permission must be granted by the landowner for surveying.

1.3.3 Fish Community Surveys

Field surveys are to be undertaken or supervised by qualified individuals skilled in the protocols used and the identification of Ontario freshwater fish. Field surveys should be conducted in accordance with the Ontario Stream Assessment Protocol (OSAP), which is a series of standardized methodologies used for identifying and evaluating aquatic habitat and fish communities in wade able streams, provided in Resources. OSAP guides aquatic ecology professionals in classifying the health of freshwater features in Ontario and utilizes fish as they are effective biological indicators that exhibit a wide range of tolerances to disturbances. Surveyors must meet all the guidelines and safety equipment requirements when conducting electrofishing surveys.

Fish community sampling procedures are outlined in OSAP Version 10: Section 3, Module 1: Fish Community Sampling using Screening, Standard, and Multiple Pass Electrofishing Techniques. Backpack electrofishing is a common technique used to collect information on fish communities or populations. A standard single pass survey, detailed in OSAP: S3, M1, can be used to produce a comprehensive fish species list for a site and will characterize the fish community and provide a qualitative assessment of species abundance. Field surveys are to comply with the timing windows outlined in the LCFSP issued through the MNR. If identification is lacking confidence, it is always recommended to take detailed photos or a voucher specimen, dependent on the restrictions of the LCFSP permit.

Dry site conditions are unsampleable for backpack electrofishing surveys due to the absence of habitat. Similarly, unwadeable waterbodies (i.e., those with water depths > 2 m) are unsampleable due to safety concerns. While backpack electrofishing is the most common surveying technique in wadable streams, boat electrofishing, seining, fyke and trap nets are appropriate methods for unwadeable waterbodies such as lakes and deep ponds. Industry standard procedures should be followed if utilizing these techniques.

Freshwater mussel surveys may be required alongside fish community monitoring, typically in locations where SAR mussels have been flagged by background information. Surveys shall be conducted following the ‘Survey Protocol for Species at Risk Unionid Mussels in Wetlands in Ontario’ (MNR, 2018), referenced in Appendix 1.

1.3.4 Headwater Drainage Feature (HDF) Assessments

HDF assessments may be scoped by City of Hamilton staff in consultation with the proponent if potential drainage features are present in the study area. The following sections outline the full scope of work that could potentially be required for a comprehensive assessment, but not all of the listed components may be required depending on the outcome of project scoping. HDFs can be managed and regulated as direct or contributing fish habitat under the City’s Official Plan as noted above and as such, should be evaluated following industry standard methodology, discussed hereafter.

Typically, potential HDFs are initially identified using aerial imagery and are often associated with adjacent watercourses. Where background information does not already identify HDFs or potential HDFs, historic and current aerial imagery spanning at least five years should be reviewed to identify potential low points in agricultural land that could provide hydrologic connectivity to contributing watercourses. While not required in the initial assessment, potential HDF locations can be further identified using GIS software to provide guidance for field investigations to follow.

Field surveys are to be undertaken or supervised by qualified individuals skilled in the protocols used for the identification and assessment of Headwater Drainage Features. Field surveys should be conducted in accordance with the OSAP, as well as the Evaluation, Classification and Management of Headwater Drainage Features Guidelines. The timing of field surveys is critical for data accuracy, as certain species or habitat will only be present during specific times of the year. To assess the hydrology of the features, three (3) surveys are to be completed to align with:

- The spring freshet (late March-mid April): This is critical in verifying the presence and location, as well as the flow regime, of the HDF;
- Late April, following a period without rainfall (typically 72 hours): This assessment is useful in determining the flow regime of the feature where intermittent or ephemeral features may be observed as dry; and,
- July to August, following a period without rainfall (typically 72 hours): This assessment is to occur when the water table has dropped, and hydrology classifications can be confirmed.

This timing is required to maintain compliance with the current HDF Guidelines (Evaluation, Classification and Management of Headwater Drainage Features Guidelines, CVC/TRCA, 2014), ensuring that the resulting management recommendations are accurate.

Additional data which can be useful, although not required, includes fish and fish habitat assessments (i.e., OSAP S3.M1 discussed above) and terrestrial assessments (i.e., Marsh Monitoring Protocol for amphibians). While spring sampling is recommended for fish sampling, there may be timing restrictions on when sampling can occur that must be approved by the local MNR office, as discussed above.

The potential HDFs identified through initial processes are to be assessed following OSAP: S4, M10 [Constrained Headwater Sampling] and/or OSAP: S4, M11 [Unconstrained Headwater Sampling]. Upon completion of the assessment, the features are to be characterized and mapped with appropriate management recommendations assigned, following the CVC/TRCA HDF Guidelines protocol.

1.4 Analysis and Conclusions

The information gained through the steps detailed above is to be compiled and analyzed to identify the location, extent, and significance/sensitivity of any species and habitat identified. The intended result of this exercise is to provide clear identification of areas or features which fall under the City's NHS, or which may otherwise be impacted

by the proposed development or site alteration. The proponent may then proceed with developing recommendations for site design and mitigation measures to minimize or avoid impacts to species and habitat.

1.5 Documentation

A fish habitat assessment report is to be prepared, and should include the following:

- Definition of study area, including a general site map showing main roads and the location of the site relative to the City's Natural Heritage System;
- Description of the proposed development or site alteration;
- Results of the background information review and a list of all information sources used;
- Details of all field investigations completed (e.g., methodology, timing, weather conditions, surveyors);
- Results of all field investigations completed;
- Species lists, including common and scientific names, SAR status, provincial status (S-Rank; available via NHIC or NatureServe), local/regional rarity status (per Hamilton Natural Areas Inventory, 3rd Edition Species Checklist Document 2014), and other factors as appropriate (e.g., number of individuals sampled and length range for each species);
- GPS co-ordinates for the upstream and downstream extent of sampling site;
- Water quality data such as dissolved oxygen, turbidity, pH, conductivity, TSS and temperature at the time of surveying;
- Recommendations for the proposed development or site alteration to avoid or mitigate impacts to species and habitat - e.g., the designation of particular features or areas as part of the NHS, improved buffers around particular features or areas, improved linkages between identified habitat areas, the provision of specific mitigation or protection measures (e.g., timing windows) during construction, etc.;
- Field data sheets in an appendix (if applicable).

One digital (PDF) copy of the fish habitat assessment report should be submitted to the City as part of a complete application. For sites where an EIS is also being prepared, the fish habitat assessment can be included as part of the EIS report.

PROCEDURE:

The process outlined below is designed to allow for timely and efficient review of development applications. The purpose of the Fish Habitat Assessment is to guide the design of the development proposal, such that impacts to species and habitats are minimized or avoided. The Fish Habitat Assessment must therefore be submitted, where required, as part of a complete application.

1. Identification of Study Need

As outlined within Schedule H (Rural Hamilton Official Plan) and Schedule I (Urban Hamilton Official Plan), a fish habitat assessment is required when development is located within or adjacent to certain areas. The need for a fish habitat assessment is a Locational requirement within RHOP/UHOP submission checklist for Official Plan Amendments, Zoning By-law Amendments, and Plan of Subdivision Applications. The need for a fish habitat assessment may also be identified at the Formal Consultation stage if applicable.

2. Preparation and Approval of Study Terms of Reference

Before beginning a fish habitat assessment, the applicant's qualified expert must prepare a Terms of Reference (ToR) to the satisfaction of City staff. The ToR should provide: an overview of the study area; the proposed scope and timing of work to complete the assessment; sampling methods, and the anticipated content of the report. A site visit with the proponent, their retained qualified expert, and the City's Natural Heritage Planner may be requested at this time.

The ToR is to be approved prior to the start of any field work.

3. Preparation of the Fish Habitat Assessment Report

The completion of the fish habitat assessment and preparation of the associated report should follow the procedures detailed in this guideline document.

4. Submission and Review of the Fish Habitat Assessment Report

A digital (PDF) copy of the fish habitat assessment report should be submitted to the City as part of a complete application. For sites where an EIS is also being prepared, the fish habitat assessment can be included as part of the EIS report.

The City's Natural Heritage staff will be responsible for reviewing the report. There may be occasions where the City's Environmentally Significant Areas Impact Evaluation Group (ESAIEG) is also asked to review the fish habitat assessment, particularly when it is submitted as part of an EIS. A site visit may be required at this time.

Please note that the City and individual agencies may refuse to review Fish Habitat Assessment that does not fulfill the requirements in these Guidelines or the approved Terms of Reference

5. Implementation of Recommendations

The Fish Habitat Assessment will provide guidance to the applicant on how to design the development site layout to maintain or enhance the ecological functions of the NHS. The development plan must then be updated to incorporate these recommendations. Additionally, assessments shall provide guidance to the proponent on requirements for regulatory review of proposed works. Guidance from Fisheries and Oceans Canada (DFO) and Ministry of Environment, Conservation, and Parks (MECP) shall be incorporated into the design of any project that is proposed in fish and/or SAR habitat.

6. Additional Review

DFO – Regulatory Review under the Fisheries Act and Species at Risk Act

The federal Fisheries Act requires that projects avoid causing the death of fish and the harmful alteration, disruption or destruction of fish habitat unless authorized by DFO. This applies to work being conducted in or near waterbodies that support fish at any time during any given year or are connected to waterbodies that support fish at any time during any given year.

OTHER INFORMATION:

General Resources for Fish Background Information

- DFO's online "Aquatic species at risk map": Aquatic species at risk map
- DFO has compiled critical habitat and distribution data for aquatic species listed under the Species at Risk Act (SARA). The Aquatic Species at Risk Map (DFO) should be cross-checked to investigate if there is available data regarding the presence of SAR or their habitat within the study area. The map is interactive and automatically applies a buffer of 1 km from the selected location to account for species and habitat that have been recorded nearby.
- NHIC "Make A Map: Natural Heritage Areas" website: Make A Map: Natural Heritage Areas

  The provincial Natural Heritage Information Center (NHIC) may also contain information on past aquatic SAR occurrence records.

- MNR Aquatic Resource Area Line Segment: Aquatic resource area line segment | Ontario GeoHub
- MNR Aquatic Resource Area Polygon Segment: Aquatic resource area polygon segment

The Ministry of Natural Resources (MNR) provides open data through two datasets. The Aquatic Resource Area (ARA) Line and Polygon Segments describe physical

characteristics and fish species of lakes, rivers, and streams across Ontario. ARA segments may represent a portion of a water body or an entire water body. ARA data can be used for municipal planning, natural heritage, and land use planning, issuing licenses under the Fish and Wildlife Conservation Act (1997), and fulfilling public information requests.

- MNR District Map: MNR District | Ontario GeoHub
- How to apply for a License to collect fish for scientific purposes: Licence to collect fish for scientific purposes | ontario.ca
- Ontario Fishery Regulations, 2007: Ontario Fishery Regulations, 2007
- Grand River Fisheries Management Plan (Technical Background Report): fishery_managementplan_techreport.pdf (SECURED)
- MNR in-water work timing windows: In-water work timing window guidelines | ontario.ca
- Ontario Freshwater Fishes Life History Database: The Ontario Freshwater Fishes Life History Database

Ontario Stream Assessment Protocol (OSAP) and Fish Surveying Resources

- Ontario Stream Assessment Protocol, Version 10:
- osap-master-version-10-july1-accessibility-compliant_editfootnoteS1M4.pdf
- Electrofishing Techniques outlined by OSAP and Toronto and Region Conservation Authority (TRCA): S3 M1 - Fish Community Sampling Using Single Pass and Multiple Pass Electrofishing Techniques
- Seining Techniques by OSAP and TRCA: S3 M2 - Fish Community Sampling Using Seining Techniques
- Assessing Headwater Drainage Features by OSAP and TRCA: S4 M10 - Assessing Headwater Drainage Features
- Evaluation, Classification and Management of Headwater Drainage Features Guidelines (Credit Valley Conservation and TRCA):

EvaluationClassificationandManagementofHeadwaterDrainageFeaturesJuly2013wresolutionJanuary2014v2.pdf

- Survey Protocol for Species at Risk Unionid Mussels in Wetlands in Ontario (MNR): survey_protocol_for_sar_wetland_mussel_species_2018_.pdf

REVIEWED AND APPROVED BY:

Natural Heritage, Planning and Economic Development Department

The Conservation Authority with regulatory authority over the subject lands, namely:

- Hamilton Conservation Authority
- Conservation Halton
- Niagara Peninsula Conservation Authority
- Grand River Conservation Authority

CONTACT:

Natural Heritage, Planning and Economic Development Department

Natural.Heritage@hamilton.ca

Hamilton Conservation Authority

nature@conservationhamilton.ca

Conservation Halton

envserv@hrca.on.ca

Niagara Peninsula Conservation Authority

planninginfo@npca.ca

Grand River Conservation Authority

grca@grandriver.ca

*Please note that the Ministry of Environment, Conservation and Parks is considering consolidating Ontario's 36 Conservation Authorities, creating nine Regional Conservation Authorities (RCAs), targeted to occur in early 2027. The RCAs which will cover Hamilton include the Western Lake Ontario RCA and the Eastern Lake Erie RCA. It is anticipated that CA contact information will change at this time.