From:	"Mochrie, Paul" <paul.mochrie@vancouver.ca></paul.mochrie@vancouver.ca>
To:	"Direct to Mayor and Council - DL"
Date:	6/8/2022 7:55:14 PM
Subject:	Council Memo - Aquatic Environments Action Plan - Progress Update RTS 14883
Attachments:	Memo to Mayor and Council - RTS 14883 - Aquatic Environments Action Plan
	Progress Update - June 8 2022.pdf

Dear Mayor and Council,

Please find attached a Memo to Council which provides an update on progress being made in implementing the City's Aquatic Environments Action plan (Aquatics Plan). This Memo provides an update on action taken over the past 2 years for improving water quality in False Creek as well as other priority Vancouver waterbodies in accordance with the Aquatics Plan. Action taken in previous years has been provided in prior update reports to Council. The attached Memo also responds to a related Council referral pertaining to the City's mobile pump-out service as well as 2 associated Council motions.

Links to the Aquatic Environments Action Plan RTC, mobile pump-out referral and Council motions being responded to are provided below:

- Standing Committee on Policy and Strategic Priorities Agenda and Minutes February 12, 2020 (Item 2)
  - Aquatic Environments Action Plan RTC
  - Mobile Pump-Out RTC and Referral
- Council motions
  - Seabin and Volunteer Cleanups and Indigenous Guardian Program (Item 14)

Should you have any questions, please contact Armin Amrolia at armin.amrolia@vancouver.ca.

Best, Paul

Paul Mochrie (he/him) City Manager City of Vancouver paul.mochrie@vancouver.ca



The City of Vancouver acknowledges that it is situated on the unceded traditional territories of the x<sup>w</sup>məθk<sup>w</sup>əýəm (Musqueam), Skwxwú7mesh (Squamish), and səlilwəta<del>l</del> (Tsleil-Waututh) Nations.



# MEMORANDUM

June 8, 2022

- TO: Mayor and Council
- CC: Paul Mochrie, City Manager, Karen Levitt, Deputy City Manager Katrina Leckovic, City Clerk Lynda Graves, Administration Services Manager, City Manager's Office Maria Pontikis, Director, Civic Engagement and Communications Anita Zaenker, Chief of Staff, Mayor's Office Neil Monckton, Chief of Staff, Mayor's Office Alvin Singh, Communications Director, Mayor's Office Theresa O'Donnell, General Manager, Planning, Urban Design and Sustainability Donnie Rosa, General Manager, Board of Parks and Recreation Lon LaClaire, General Manager, Engineering Services Lisa Prescott, Director, Strategic operations, Planning and Program Management, REFM Margot Davis, Manager, Environmental Services FROM: Armin Amrolia, Acting General Manager, REFM SUBJECT: RTS# 14883 - Aquatic Environments Action Plan – Progress Update

## Purpose

In February 2020, Council adopted the City's Aquatic Environments Action Plan (Aquatics Plan). This plan included a commitment that regular updates would be provided to Council. The purpose of this memo is to provide an update on the progress made during the past two years. This memo also responds to the following Council motions:

- THAT Council endorse the Vancouver Plastic Cleanup, Seabin Project and ask staff to report back on the feasibility for the City of Vancouver becoming a host location and coalition partner;
- THAT Council direct staff to report back on new initiatives to support volunteer cleanups and Indigenous Guardian Programs to Council in 2022, as part of the annual Aquatic Environmental Action Plan report.
- 3. THAT staff provide annual updates to Council on service performance as part of the City's False Creek Water Quality Improvement Initiative, as well as additional options

City of Vancouver, REAL ESTATE AND FACILITIES MANAGEMENT 507 W Broadway, Vancouver, British Columbia V5Z 0B4 Canada



for full cost recovery beyond those articulated in the Report dated January 14, 2020 entitled "Aquatic Environments: Mobile Pump-out Service Delivery", including but not limited to senior government funding.

### Background

Improving aquatic environments is complex, taking time and sustained investment. This is particularly the case in highly urbanized areas where aquatic environments have been and continue to be heavily impacted.

Council's adopted Aquatic Environments Action Plan (Aquatic Plan) seeks to achieve meaningful results, achievable within the City's capacity. To do this, the plan sets out a two-prong strategy:

- City Planning integrating aquatic health objectives into the Vancouver Plan and other key City plans
- Action short-term action implemented through the City's aquatic environments improvement programs and initiatives

This approach, action while planning, enables the City to make concrete improvements in the short-term while also directing energy and focus towards broader systemic changes to result in more significant impacts over the longer term.

#### **Progress Update**

#### 1. City Planning - Integration of Aquatic Health Considerations

Over the last 2 years, the City has been developing the Vancouver Plan, engaging with the community on aspirations, challenges and key priorities to develop a plan to guide growth and change until 2050 and prioritize future directions for the city. With land use decision-making being a key determinant of aquatic environmental health, the Vancouver Plan is an important opportunity for the City to make systemic changes needed to result in fundamental changes to environmental conditions. Integration of aquatic health and community planning also helps to better ensure that action is being driven by reconciliation goals as well as a shared vision considerate of the suite of community uses and objectives.

A draft plan is currently out for public review and feedback. This draft plan includes a vision statement that recognizes the need for improved balance with ecological systems. Incorporating this recognition upfront as part of the overall vision sets a strong foundation for supporting the changes needed to improve ecological and, by extension, community well-being. Three big ideas are envisioned to set the pathway for achieving the envisioned future, one of which includes a focus on restoring ecosystems. This means making space for nature, particularly along Vancouver's waterfront and waterways. Aquatic health cannot be achieved without healthy riparian areas.

"Vancouver is a city that lives in greater balance with our ecological systems while providing more complete, inclusive and resilient neighbourhoods where people of all ages, incomes, abilities and backgrounds thrive."

> Draft Vancouver Plan, April 2022

If approved by Council, the vision and key directions will set a strong foundation for moving forward on ecological health protection and rehabilitation objectives. Further work will need to be done in implementation phases to activate the policy directions in order to achieve the envisioned improvement.

Considerations of aquatic health objectives are also being done in other key City plans, including the City's Healthy Water Plans. Whereas the Vancouver Plan is seeking to ensure that there is space for nature, the Healthy Waters Plan, among other goals, is seeking to reduce pollution (i.e., loads and impacts) from the City's sewage and urban runoff management system into aquatic areas.

### 2. Action - Implemented through City's Aquatic Environments Improvement Programs

#### False Creek Water Quality Improvement Initiative

The False Creek Water Quality Improvement Initiative is one concrete action program under the Aquatic Environments Action Plan. This interdepartmental program seeks to reduce sources of pollution and improve ecological conditions in False Creek by advancing action across priority areas, including deepening understanding of the False Creek system, reducing pollutant sources, improving natural conditions and strengthening partnerships.

The last update report on concrete action being done to improve water quality in False Creek was provided in 2019. Details on action taken in 2020 and 2021 are provided in Appendix A.

Some highlights include:

- A Neighbourhood Energy Utility catchment investigation identified sections of storm sewer to be removed from the sanitary system (i.e., sewer separation), which will reduce combined sewer overflows (CSOs) into False Creek;
- Several new green rainwater infrastructure (GRI) assets were constructed within the False Creek watershed;
- Initiation of a GRI maintenance program and maintenance of existing green infrastructure located within the False Creek watershed;
- Continuation of the City's marina compliance program with 100% compliance with City bylaw requirements;
- Continuation of stationary and mobile sewage pump-out services for recreational boats;
- Advancement of expanded water quality assessment and pollution investigation studies; and,
- Continuation of the promotion of marine pump-out services.

In 2021, the City also partnered with the University of British Columbia to assess pacific herring larvae abundance in False Creek. Pacific herring are considered a foundation species, playing a critical role in the ecosystem by supporting numerous species including seabirds, salmon and other fish, as well as orcas and other marine mammals. Since 2011, Squamish Streamkeepers have been working to provide artificial substrate to support Pacific herring spawning in False Creek. These efforts have been successful, resulting in the return of herring to False Creek. The UBC study supported by the City aimed to assess potential limiting factors to herring egg and larvae abundance and survival in False Creek, identify areas of highest herring larvae abundance within False Creek and assess influence of enhanced herring spawning habitat by the Squamish Streamkeepers. Results from studies suggest that herring larvae abundance in

False Creek appears to be significantly improved by spawning substrate enhancement at Fisherman's Wharf with the greatest larvae abundance observed at this location.

#### Action in Other Aquatic Environments

During 2020 and 2021, the City also participated in the BC Environmental Assessment reconsideration review of the Trans Mountain Pipeline project (Project), working jointly with səlilwətał (Tsleil-Waututh) and Skwxwú7mesh (Squamish) Nations. These joint efforts led to specific changes that served to strengthen requirements to better protect marine waters from potential Project-related spills. The City also supported the development of the Greater Vancouver Regional Integrated Response Plan for Marine Pollution Incidents (GVIRP). This plan, led by the federal Coast Guard, was developed to guide multi-agency response to marine pollution incidents of potential significance in waters surrounding the Greater Vancouver Area. Various organizations participated in the development of the plan including First Nations, federal departments, provincial ministries, industry response agencies and other municipalities. The City also participated in the Burrard Inlet Water Quality Roundtable, a cooperative effort being led by the Tseil-Waututh Nations and involving federal and provincial agencies, Metro Vancouver and other local governments, to update ambient water quality objectives.

Park Board also continued to conduct water quality monitoring in Trout Lake with water quality exceedances appearing to be correlated to geese populations. Park Board has initiated the development of a goose management plan for Trout Lake and are currently in the data collection phase which is to continue through the summer season of 2022. The intent is to complete the goose management plan by spring 2023.

In 2021, the City along with Metro Vancouver also joined a Musqueam-led initiative seeking to identify and remedy pollution sources to Musqueam Creek and developed a water quality assessment program to evaluate potential sources within the City's jurisdiction.

### **Response to Associated Council Motions**

1. Seabin Project

Motion: THAT Council endorse the Vancouver Plastic Cleanup, Seabin Project and ask staff to report back on the feasibility for the City of Vancouver becoming a host location and coalition partner.

Park Board and City staff have investigated the feasibility of becoming a host location for the Seabin Project. Seabins are stationary interception devices that can be installed in marinas and other calm water bodies to collect floating debris. Three Seabins were installed at marinas around Granville Island by the Vancouver Plastic Cleanup coalition, a partnership led by the environmental community non-profit organization Swim Drink Fish.

Unfortunately, Seabin device production has been discontinued and maintenance of existing units may not be feasible due to lack of parts. The Vancouver Plastic Cleanup coalition are exploring options for next steps, including considering installing different floating debris skimmers in False Creek. Alternative units are larger, collect triple the volume and double the capital cost to install (i.e., \$20,000 - 25,000) compared to the Seabin unit.

Park Board and City staff intend to review effectiveness, costs and stability of unit production associated with any new skimmers being advanced by the Vancouver Plastic Cleanup coalition in 2022.

#### 2. Volunteer Cleanups and Indigenous Guardian Program

Motion: THAT Council direct staff to report back on new initiatives to support volunteer clean-ups and Indigenous Guardian Programs to Council in 2022, as part of the annual Aquatic Environmental Action Plan report.

The federal Indigenous Guardian Program serves to provide greater opportunity for Indigenous communities to exercise their rights and responsibilities in the stewardship of their lands. Funding has been provided to Indigenous groups across Canada, supporting various initiatives pursuing a wide range of objectives, including improving understanding of ecological conditions, advancing habitat restoration and better integrating traditional knowledge into land management decision-making. City staff are not aware of any initiatives situated within the boundaries of the City of Vancouver. City staff will continue to monitor the Indigenous Guardian Program in 2022 and explore any potential partnership opportunities. No dedicated funded program exists for supporting volunteer clean-ups. However, City staff will continue to engage with the Vancouver Plastic Cleanup and other environmental groups to determine if additional blueway clean-ups that are brought to the City's attention can be supported as existing resources enable.

#### 3. Mobile Pump-out Service Funding

Motion: THAT staff provide annual updates to Council on service performance as part of the City's False Creek Water Quality Improvement Initiative, as well as additional options for full cost recovery beyond those articulated in the Report dated January 14, 2020 entitled "Aquatic Environments: Mobile Pump-out Service Delivery", including but not limited to senior government funding.

In 2017, a seasonal, mobile sewage pump-out service was piloted by the City. It was expanded in 2018 and again in 2019, with additional service hours and a new boat. Over five seasons, the boat has conducted over 3450 pump-outs, directing approximately 272,000 L of sewage to the sanitary sewer system.

The mobile pump out service is being funded by the sewer utility. Alternative funding sources, including user pay options, have been investigated. An evaluation of a "pay at the pump" option found that it is likely to be less effective in achieving the desired outcome of preventing illegal discharges and reducing microbial inputs. This assessment is based on survey input from boaters and marina operators who have indicated that boaters are less likely to use the service if payment is required at the time of service. In this respect, cost recovery at the point of contact would likely work against the primary program goal of reducing barriers to using pump-out services. The application of a nominal fee that did not act as a disincentive is projected to be more costly to administer than amounts recovered.

Consideration was also given to increasing business licensing fees for marinas in False Creek as a source of funding, envisioning that fees would be passed on to marina users. This approach to user pay is advantageous to the "pay at the pump" option as it would not discourage usage of the service. However, this options has other challenges. Not all service users would be captured as not all marinas require a business license and not all users belong to a False Creek marina. Additionally, marinas have already invested into implementing and maintaining pump-out infrastructure and services as required under the City's Health By-law.

Sponsorship opportunities were explored but none could be identified given limitations of the relative low-visibility of the program and lack of alignment with the City's broader sponsorship program goals. Staff also further evaluated senior government grants (e.g. under the Oceans Protection Program) but were not able to find a grant structure that was available to local government for a program of this nature. Staff will continue to track grant programs, and will continue dialogue with Metro Vancouver and other levels of government to explore cost-sharing opportunities.

#### **Next Steps**

The City and the Park Board have advanced a number of initiatives to improve water quality in aquatic environments. The Vancouver Plan provides a critical opportunity to embed ecological health objectives into City planning. Aquatic health objectives cannot be achieved without making space for nature in land-use decision-making. Reducing pollution from the City's sewage and urban runoff management system is also critical and is being worked on as part of the City's Healthy Waters Plan.

Work is also advancing on-the-ground tactical level and initiatives such as the herring spawning study demonstrate that progress is being made. Unfortunately, given the level of impact that has occurred, improving overall water quality and aquatic health is a long-term endeavour. The City's continued commitment directed at both the strategic and tactical levels serves to provide a comprehensive approach, one set for changing conditions over time.

Future updates on the City's efforts in implementing the Aquatic Environments Action plan will continue to be provided. Please do contact me should you have any questions or wish for any further information.

Sincerely,

Armin Amrolia Acting General Manager, Real Estate and Facilities Management 604 -873-7627 | armin.amrolia@vancouver.ca



# False Creek Water Quality Improvement Initiative

# Progress Report 2020 and 2021

# Introduction

False Creek is an iconic waterway that once provided valuable fishing, harvesting and hunting resources for the x<sup>w</sup>məθk<sup>w</sup>əyəm (Musqueam), Skwxwú7mesh (Squamish), and səlilwətał (Tsleil-Waututh) Nations. The waterway once extended to Clark Drive prior to infilling during the early 1900s that created the shoreline present today. Through to the 1950s, False Creek served as the industrial heartland of Vancouver with sawmills, ship building, coal gasification plants, small port operations, and other industries serviced by the railway terminal. Waste was discharged directly to False Creek for many years. Efforts to redevelop the area began in the late 1960s with a vision to transform the area into a vibrant mixed-used community.

Following infilling and the industrialization of the land around False Creek, the aquatic habitat and water quality deteriorated significantly. The City and Park Board have been pursuing efforts to improve water quality in False Creek with both short-term and long-term initiatives. In accordance with Council's adopted Aquatic Environments Action Plan, the focus of the work has mainly been on microbial impacts to water quality, but many of the initiatives contribute to overall improvements in other ways. In 2017, the False Creek Water Quality Improvement Initiative was established to consolidate action under one umbrella and provide an overarching framework for prioritizing advancing future work. As part of this initiative, annual progress reports are provided to Council to provide a summary of key actions taken in the past year. This report serves to provide an update on those actions taken by the City and Park Board in 2020 and 2021 to improve water quality in False Creek.



## Background

A significant pollutant of concern affecting water quality in False Creek is microbial contamination, which is assessed through measurements of indicator bacteria such as *Escherichia coli (E.coli)*. The assessment of its sources, migration, and impacts is challenging due to the spatial and temporal variability of multiple sources and conditions within False Creek (e.g., low tidal flushing, etc.).

Given the complexity of the False Creek system, improving water quality necessitates a long-term approach involving multiple stakeholders and jurisdictions, and is dependent upon systematic effort across a suite of prioritized action areas. The City's False Creek Water Quality Improvement Initiative (FCWQII) categorizes the actions advanced by the City and the Park Board in five priority areas:

- 1. Source Control
- 2. Research and Assessment
- 3. Ecosystem Health Improvement
- 4. Strategic Planning
- 5. Engagement, Partnerships and Inter-agency Coordination

# Source Control Reducing Land-based Discharges

Sewage discharges from land are one source of microbial contamination in False Creek. Potential sources include combined sewer overflows. As the vast majority of these discharges occur during the fall and winter rainy seasons, it is not yet clear how significant these discharges are in impacting conditions during the summer period when recreational use is the highest. Regardless, reducing land-based sewage discharges is important for reducing overall loadings, as well as improving the ecological health of False Creek. Other potential land-based sources include cross-connections and polluted rainwater runoff.

# Reducing Combined Sewer Overflows (CSOs)

The original sewer system in Vancouver combined stormwater/rainwater with sanitary sewage in what is known as a combined sewer system. These systems were built with sufficient capacity to handle sanitary flows but only a portion of stormwater runoff. During some high-precipitation events, pipe capacity can be exceeded and combined sewage and stormwater overflow into local water bodies, including False Creek. These occurrences are called combined sewer overflows (CSOs).

The City has been replacing combined sewers with a separated sanitary and stormwater sewer system for many decades. Three City of Vancouver outfalls and one Metro Vancouver outfall that receive periodic CSOs remain in False Creek. In 2020 to 2021, an investigation of the Crowe St CSO catchment was conducted to identify immediate opportunities for reducing CSO discharge. Urban runoff from four properties and seven catchbasins were removed from the sanitary sewer and redirected to a stormwater outfall. These efforts removed 8,500 m<sup>2</sup> of catchment area from the combined sewer system. Currently, design work is underway to redirect an additional 18,000 m<sup>2</sup> of area from the Crowe St CSO.

# Addressing Cross-Connections

Cross-connections occur when sanitary systems are accidentally or illegally connected to stormwater systems. They are a common problem in many urban areas. The City conducts ongoing inspections throughout the sewer system to identify and address any cross-connections where sanitary wastewater is connected to stormwater that discharges to False Creek or other water bodies.

In 2020 to 2021, cross-connections were investigated in the Crowe St CSO catchment, which is south of Olympic Village. The investigation identified and removed four cross-connections. Additionally, an investigation in the Terminal CSO catchment identified one cross-connection that will be removed in 2022.

# Green Rainwater Infrastructure Program

The City's Green Rainwater Infrastructure (GRI) initiatives provide a wide range of rainwater and urban runoff management services, including absorbing rainwater, replenishing groundwater, reducing drainage needs and in some situations, improving the water quality of urban runoff. GRI initiatives also contribute to reduced frequency and intensity of CSOs by decreasing the amount of rainwater that enters the piped sewer system.

In 2020 and 2021, several additional GRI assets were installed on City lands within the catchment areas that drain to False Creek. Eight blocks of blue-green network were completed on Richards Street, the green infrastructure portion being rainwater tree trenches and permeable pavers managing runoff for over 10,000 m<sup>2</sup> of street. It is estimated that the Richards Street network captures and re-absorbs about 15 million litres of urban runoff annually and supports the health of over 100 trees. Additional new GRI assets included permeable pavements along the reconstructed West 10th Avenue and bio-retention bulges at Pine near 7th Ave that were installed in 2021. In 2021, a green infrastructure maintenance program was initiated and significant infiltration improvement was achieved in the permeable pavements at Olympic Village. Work also resulted in plans for 14 blocks of GRI assets as part of the Broadway Plan. Community engagement and detailed design work was also advanced for the St. George Rainway - a neighbourhood blue green system.



# Source Control Supporting Responsible Sewage Management by Boaters

While regulating and enforcing marine vessel sewage disposal is a federal responsibility, the City and Park Board are working to support responsible sewage management by boaters through use of available local government tools. Focus areas to date include education and engagement, provision of pump-out facilities and services, strengthening by-law requirements, and facilitating compliance at marinas.

# Marina Compliance Promotion

Initiated in 2018, the City's Marina Compliance Promotion program continued in 2020 and 2021. This program seeks to ensure compliance with the City's *Health By-law* which:

- prohibits boaters from discharging any polluting substance,
- prohibits marina operators from allowing boaters to discharge polluting substances in their marinas, and,
- requires all marinas to have an operational pumpout facility by January 1, 2019.

All marinas in False Creek achieved 100% compliance with the signage requirements in 2018 and this was maintained in 2019, 2020, and 2021. In 2020, all marinas met the requirement to have an operational pump-out facility and this was maintained in 2021.

# Providing Pump-out Services for Boaters

Since 2015, the Park Board has made stationary sewage pump-out facilities at the two civic marinas in False Creek available year-round (and at no cost) to all boaters. This service continued in 2020 and 2021.

In 2017, a seasonal, mobile sewage pump-out service was piloted by the City. It was expanded in 2018 and again in 2019, with additional service hours and a new boat. Since 2017, the City has been providing the mobile pump-out boat. This service provides a convenient option for boaters and also assists those where access to the stationary pump-outs is difficult. In 2020, the boat conducted 915 pump-outs totalling approximately 67,000 L of sewage and in 2021, the boat conducted 898 pumpouts totalling approximately 69,900 L. Over five seasons, the boat has conducted over 3450 pump-outs, directing approximately 272,000 L of sewage to the sanitary sewer system.



# **Research and Assessment** Investigating Pollutant Sources and Strengthening Understanding of False Creek

The complex nature of False Creek and limitations in conventional water quality testing makes it difficult to pinpoint pollution sources and impacts. Gaining a better understanding of system conditions, including basin flow and the distribution and fate of pollutants, and developing measures to better assess and identify pollution sources will enable the City and Park Board to better direct investments towards priority areas.

## Undertaking Water Quality Assessment Studies

Annual efforts by Metro Vancouver as part of the beach water quality program provide general trends of the level of microbial pollution.

In 2018, the City launched a supplemental seasonal water quality assessment program to develop a greater understanding of water quality conditions throughout the basin and undertake targeted pollution studies. This work has continued through 2021. Results to-date have found that water quality within marinas generally meets water quality objectives, indicating that boats in marinas are unlikely to be a significant source of pollution.

## **Monitoring Sewer Flow**

The City started monitoring combined sewer overflows around False Creek in 2019, installing ten sensors at potential overflow locations. In addition, the City started monitoring sewer flow at strategic locations in the pipe network to support better understanding of sewer system dynamics. In 2020, 3 new flow monitoring stations were installed and in 2021, 12 stations were installed in the catchments surrounding False Creek for a total of 46 stations monitoring flow.

In 2021, one new CSO monitoring location was installed within the Terminal catchment, and two were removed due to maintenance issues. There are a total of nine active stations monitoring CSO discharges to False Creek.

# Developing a Hydraulic and Conceptual Site Model

The City is developing a hydraulic flow and water quality model for False Creek in order to better define the complex nature of the basin and better understand opportunities for water quality improvement. The primary objectives of the model are to:

Improve System Understanding - by describing tidal and other circulation patterns in False Creek and the effect on the distribution and fate of *E. coli* from key sources;

Assist Communication and Engagement - by creating visual and narrative tools that demonstrate the system's behaviour; and

Facilitate Scenario/Intervention Assessment - by providing a decision-making tool that assists with the evaluation of alternative actions.

In 2020, work began with development of a *Conceptual Basin Model*. This qualitative model, based on existing data from available sources, identifies and characterizes the major inputs, outputs and fluxes that impact water quality in the basin. It also identifies and prioritizes data needs to support future numerical models. The conceptual basin model may also serve as a communication tool to further collaboration and drive better understanding of False Creek as a dynamic ecosystem. The model and report is planned to be completed in 2022.



A school of stickleback fish in False Creek. Photo by Fernando Lessa on behalf of Vancouver Park Board

# **Ecosystem Health Improvements**

Efforts to address water quality in False Creek can be further advanced by improving overall ecosystem health. For example, restoring natural shorelines (such as those found on Habitat Island) supports ecological processes including temperature regulation, nutrient cycling, sediment trapping, and water filtration, while also providing habitat and food for wildlife. When these processes are functioning, water quality can be improved naturally.

## Conducting Assessments of Artificial Spawning Nets

In 2020, the City worked with University of British Columbia Environmental Science students and CityStudio to conduct an assessment of the success of the Pacific herring artificial spawning nets deployed in False Creek by the Squamish Streamkeepers Society.

The Squamish Streamkeepers Society is a volunteer organization that has a passion for improving fish habitat. For the past eight years, they have installed herring nets in Fisherman's Warf to act as artificial kelp for spawning Pacific herring. Anecdotally, the nets have appeared to be very successful and many herring eggs have been observed on the nets. The work of the UBC students focused on documenting the practices of the Streamkeepers, monitoring the nets' success, and communicating the results to allow replication. The study found that the nets were very successful and that by mid-way through the spawning season most of the nets had up to 80% egg coverage.

Pacific herring are arguably one of the most important marine species in British Columbia's waters. The annual spawning season for Pacific herring causes there to be a feeding frenzy for the entire ecosystem. Marine life such as salmon, seals, sea lions, dolphins, and orcas all rely on these small fish, and because of that herring tie this whole ecosystem together. The presence and success of herring spawning in False Creek is promising.



A herring fry in False Creek. Photo by Fernando Lessa on behalf of Vancouver Park Board



# False Creek Herring Larvae and Plankton Monitoring Program

In 2021, the City supported University of British Columbia graduate student's study of Pacific herring larvae abundance in False Creek, which expanded on their sampling of larval herring conducted in 2020 near Fisherman's Wharf, by adding sample locations throughout False Creek.

The study sampled water for nutrients, chlorophyll, physical water parameters, larval herring, and zooplankton (e.g., prey and predators of herring larvae) in False Creek. The goal of the sampling was to compare 2021 results with the 2020 sampling regarding 1) potential limiting factors to herring egg and larvae abundance and survival in False Creek, and 2) areas of highest herring larvae abundance and if they are influence by the enhanced herring spawning habitat.

The study concluded that herring larvae abundance in False Creek appears to be significantly improved by spawning substrate enhancement at Fisherman's Wharf with the greatest larvae abundance observed at this location. The hope is that the results can inform restoration planning and further biological research in False Creek.

# Strategic Planning Integrating Water Quality Considerations

While the City's most visible efforts are its tangible actions such as the mobile pump-out service, the City is also working to advance longer-term systemic change by integrating water quality considerations into its strategic plans and initiatives. These strategic initiatives provide an opportunity to manage land, foreshore and on-water uses which are important factors that affect the quality of a surface-water body such as False Creek.

# **Healthy Waters Plan**

The Healthy Waters Plan (formerly described as "Sewage and Rainwater Management Plan") is being developed in response to 2019 Council and Park Board directions to accelerate action on combined sewer overflow mitigation, implementation of the Rain City Strategy, and other directions that fundamentally shift the way that water is valued and managed within the city.

A request for proposals was issued in 2020 and contract award was approved by Council. The Healthy Waters Plan will be a City-wide action and strategic investment plan to guide priority actions, policy, regulation, advocacy and long range investments in sewer and stormwater management. The work will focus on developing both short-term and long-term actions to meet the City's goals, which include: address pollution arising from sewage and urban runoff, strategically based on environmental and access to water priorities; minimize climate change, growth, aging asset-based and other risks to service levels and affordability; enhance biodiversity and improve health and well-being through fostering natural systems; ensure efficient, cost-effective investments and regulations; and support equity for all Vancouverites and Reconciliation with Indigenous communities. An update memo on this initiative will be shared with Council in the coming weeks.

# Land Use Planning

In late 2020, the North East False Creek park design was updated with input from a Coast Salish design firm and input from a cultural lens. New design approaches were developed to recentre x<sup>w</sup>mə0k<sup>w</sup>əyəm (Musqueam), Skwxwú7mesh (Squamish), and səlilwətał (Tsleil-Waututh) Nation values in False Creek. The process for designing East Park was also initiated in 2020, which will reimagine a portion of the shoreline in the east end of False Creek. With a key focus of both park designs being access to nature and water, the outcomes will enhance biodiversity and improve marine and terrestrial ecology.

In connection with the Broadway Plan, the Charleson Catchment Integrated Rainwater Study was also initiated in 2020. The scope of the project includes an assessment and analysis of the existing sewer system and infrastructure, followed by the development and assessment of stormwater management opportunities within the catchment. Through integrated planning and design, this project will address the challenges brought by population growth, CSO mitigation, planning for climate change, and the need for green space in the Charleson Catchment. The study has just recently been completed.



# **Engagement, Partnerships, and Inter-agency Coordination**

While the City has a key role to play, improving water quality in False Creek is ultimately dependent upon a community-wide effort and action across multiple governmental agencies. As such, improving conditions requires a commitment to public engagement, partnerships, and collaborative efforts. To encourage a broad-based approach, the City and Park Board delivers targeted education and awareness campaigns as well as foster inter-agency coordination.

# Outreach Campaigns

Various campaigns have been advanced over the years to engage the community in reducing pollution. For example, the Park Board ran the Pump Don't Dump campaign in 2017.

In 2020, the City continued promotion of the sewage pump out service offered to boaters to encourage responsible sewage management by boaters. As part of this effort, social media posts, signage, and a website presence all promoted the nocharge mobile service and pump-out stations at both civic marinas. The program was continued in 2021.

## False Creek Water Quality Working Group

The False Creek Water Quality Working Group (FC Working Group) is a multi-agency group convened in 2015 by the City of Vancouver and comprised of representatives from the City, Park Board, Vancouver Coastal Health (VCH), Metro Vancouver, and Transport Canada. The purpose of the group is to foster a strategic and coordinated approach to water quality improvement and enforcement in False Creek through interagency collaboration and partnership.

As a result of the COVID pandemic, meetings have been suspended for the FC Working Group. The City will be looking to resume meetings in the upcoming year.

## Burrard Inlet Water Quality Objectives Update

During 2020 and 2021, the City continued its participation on an interagency collaborative effort, led in partnership by the Ministry of **Environment and Climate Change** Strategy and salilwatał (Tsleil-Waututh) Nations, to update the Burrard Inlet water quality objectives (WQOs). Originally developed in 1990 by the Province, Burrard Inlet WQOs are intended to promote the protection of water quality and associated water values. The development of updated objectives is a first of its kind initiative that is blending western science with traditional Indigenous values and knowledge. Through the end of 2021, ten WQOs have been approved, consisting of both new and updated objectives.



## Conclusion

Despite the pandemic, the City and Park Board were able to advance several initiatives in 2020 and 2021, building on actions conducted in previous years to improve water quality in False Creek. Actions were advanced across key priority areas, including research and assessment, source control, ecosystem health improvement, strategic planning and partnerships and engagement. While on-the-ground efforts continued to be largely focused on measures to reduce impacts, action was also directed towards supporting beneficial improvements and ecological restoration works. The return of the herring spawning in False Creek, as a result of efforts from the Squamish Streamkeepers, is an exciting development. City efforts in 2020 and 2021 served to help contribute to the long-term success of these valuable enhancement efforts.

While improvements have been made, sustained efforts are needed given the magnitude of impacts that have occurred to the False Creek watershed. Efforts at the tactical level are important for realizing short-term improvements and preventing further impacts. It is also essential that aquatic environmental health considerations continue to be integrated as part of land use planning and strategic water planning in order for the level of improvement that is needed to be achieved.

