
TO: CHIEF ADMINISTRATIVE OFFICER **DATE:** 2023 March 21

FROM: DEPUTY GENERAL MANAGER **FILE:** 02410-20
PARKS, RECREATION & CULTURE

SUBJECT: CENTRAL PARK POND REDEVELOPMENT STUDY

PURPOSE: To seek Council approval for the renewal strategy for Central Park and the Pond Redevelopment Program.

RECOMMENDATIONS:

1. **THAT** Council direct staff to develop a Central Park Master Plan; and
2. **THAT** a copy of this report be forwarded to the Parks, Recreation & Culture Commission and the Environment Committee for information.

REPORT

1.0 EXECUTIVE SUMMARY

The Central Park pond system was created 60 years ago as a visual attraction in Burnaby's largest and oldest urban park. In 2009, a comprehensive review of the park called the Central Park Management Plan was brought forward and approved by Council.

The pond systems were described in the management plan as a passive man-made landscape feature that attracts bird wildlife, and provides a pastoral setting for recreation trails. The construction methods used to create the ponds, typical of the 1960's era, included dug out basins with sandbag edges and a clay bottom.

In the 60 years since their construction, the ponds have degraded past the point of general repair and although scenic to look at, they have unsafe banks and edges that are collapsing, and stagnant water causing ongoing algae blooms. In short, the ponds are time-worn and polluted with excess nutrients that continue to cause algal blooms and fish deaths. They are in need of a complete overhaul to achieve a biodiverse and compelling park amenity.

To: Chief Administrative Officer
From: Deputy General Manager Parks, Rec and Culture
Re: CENTRAL PARK POND REDEVELOPMENT
STUDY

..... Page 2

With Council's adoption of the Central Park Management Plan in 2009, a number of priorities were identified. A detailed study of the pond conditions and opportunities for reconstruction was identified as a lower priority and work began in early 2023.

The findings of the initial investigations are being advanced as an early indicator of the extent of reconstruction required to re-establish a man-made water feature in the park.

Since 2009, population densification in the area has changed the use and interest in various park attractions. Prior to committing to redevelopment of the park ponds, a review of public support for the ponds features through a comprehensive park masterplan review is advisable.

The options for the Central Park Pond Redevelopment Program are:

- proceed from concept refinement to construction in a phased development program; or
- revisit the pond features in the Park, and examine the land-use possibilities for the area within the Park through the development of a Master Plan.

2.0 BACKGROUND

Following the adoption of the Management Plan by Council 2009, staff were directed to focus initial work on the restoration and resiliency planning and replanting work on the heart of the park, Douglas Fir forest. Work included the consolidation of forest trail systems in the forest into the Trail of Hope and the establishment of the 4 km rubberized walking trail around the perimeter of the park from 2017 to 2020. As work on the Perimeter trail was completed, the focus was turned to the Central Park ponds and the evaluation of the condition that would determine the reinvestment required to re-establish them as feature within the Park. The evaluation included a review of the quantity of water usage; the option for a new water source; and development a new pond edge configuration to improve biological function.

The Central Park pond and stream system (Appendix A), consists of the two artificial open water ponds and the artificially created streams that link them. The water supply for the ponds is a municipal water source that enters the upper (northern) pond in the system and flows downstream into the lower pond. The drainage of the ponds is connected to Kaymar Creek through a stream and series of culverts around the Ocean View Burial Park to the south. The water conveyance system is operational and runoff into Kaymar Creek is minimal due to ground water seepage.

To: Chief Administrative Officer
From: Deputy General Manager Parks, Rec and Culture
Re: CENTRAL PARK POND REDEVELOPMENT
STUDY

..... Page 3

Today, the banks of the ponds are easily accessed by the public. They are degraded and eroded and in some locations fostering invasive plant growth. The lawns that once extended to the pond edges have been trampled by both geese and humans along the entire shoreline. On the lower pond, there is one formal access point into the water that model boating community uses.

The water quality is poor; water fowls such as Canada geese dirty the water, and high summer temperatures exacerbate these problems. Lack of riparian zones, habitat complexity, and disturbance from dogs and people limit wildlife value in and around the ponds.

There is a co-dependent relationship between the condition of the ponds and the recreation activities around them that have contributed negatively to the edge conditions. A redevelopment strategy for the Ponds has been explored, however staff recognize that nearly 15 years have passed since the original Management Plan was adopted. The City has also initiated a number of other plans related to amenities in the park including a study of Swangard Stadium, an Outdoor Pool Strategy, installing a temporary cover over the existing Central Park Outdoor Pool, and development of a destination Playground. Given the above, staff believe it is necessary to consider a holistic plan for the entire park, including the ponds.

3.0 DISCUSSION

Pond Redevelopment Strategy

To improve the aquatic sustainability of the ponds, a detailed review of the water feed, water consumptions and water losses and gains was undertaken. The findings show that at present the ponds are dependent on treated municipal water and consume 100,915 m³ per year. To understand the quantity of water, this amount could fill the Central Park Pool 69 times a year, or, once every five days.

The largest loss of water in the system is due to seepage through the pond floor into the ground. This accounts for a loss of 88,000 m³ per year. Additional minor losses are attributed to the lack of controls on the water feed and evapo-transpiration. While a significant amount of water is being lost through seepage, the residual water is being directed to the Kaymar Creek, which has in fact been supporting the health of stream by adding water when flows are low. The redevelopment of the ponds and the installation of a new water recirculation system with a controlled water input source and lined pond basins, could reduce water losses by 88,982 m³ per year, or 88%. However, the ponds will still require potable water as no groundwater source is available to feed the ponds.

To: Chief Administrative Officer
From: Deputy General Manager Parks, Rec and Culture
Re: CENTRAL PARK POND REDEVELOPMENT
STUDY

..... Page 4

The retention and reconstruction of the pond system in Central Park is consistent with the goals of the Climate Action Plan adopted by Council in 2019 and the Central Park Management Plan approved by Council in 2009. The Central Park Management Plan public consultation results conducted in 2008-2009 demonstrated that 92% of respondents supported the restoration of ecological systems in the park (Appendix B). While these results likely remain valid, they are nearly 15 years old and the community has changed significantly in that time.

To transform the existing pond system into a long term, sustainable ecosystem, the redevelopment strategy would need to address both recreation use patterns and the terrestrial and aquatic interface zones and aquatic system functions. Each of these areas were explored in the concept plan for the project and are summarized in Appendix C. Through a redevelopment program new habitat areas could be created to support an extensive variety of wildlife and aquatic life listed in Appendix D.

It is clear that substantial work would be required to redevelop the ponds. Many structural elements including the water body edges, aquatic system and water circulation system need to be replaced or redeveloped. In addition, recreational amenities including new fixed decks, floating dock, fencing and planting are also required. Based on the concept plan that has been developed, the total cost of redeveloping the ponds and surrounding recreation amenities is estimated at \$14-16 million. It is a significant investment to make at Central Park in the absence of a holistic Master Plan that fully captures the needs and interests of the community and what amenities are needed in the park.

Master Plan Development

The development of a Central Park Master Plan would provide a vision and principles to guide development of the park over the next 5-10 years. Similar to the development of the Management Plan, it would include a large degree of public consultation to seek input from residents regarding their current use and future desires for the park, as well as a study of trends, best practices and consideration of current and future demographic changes that will influence use of the park. An extensive City wide Playground Development Strategy was approved by Council in 2022. This study identified Central Park Triangle as the first location for a destination playground. Work on this initiative would continue while a Master Plan review of the remainder of the park is undertaken. While staff recognize there is some urgency to repairing the ponds and that the ponds are popular amenities, staff also recognize the small environmental value they currently hold and the significant investment that would be required to create a more sustainable asset. There is also an opportunity for Council and the community to consider other amenities that could potentially supplement or replace the ponds and provide a desired amenity that meets the needs of residents. This could include active recreation attractions, cultural art and entertainment zones, forest interpretive and restoration, environmental learning, and demonstration centres, as examples.

To: Chief Administrative Officer
From: Deputy General Manager Parks, Rec and Culture
Re: CENTRAL PARK POND REDEVELOPMENT
STUDY

..... Page 5

If Council supports staff’s recommendation, funding for the development of a Master Plan would be identified in the 2024-2028 Financial Plan. The process would likely take approximately 12-18 months with the support of a consultant. The implementation of the Master Plan could be phased with the ponds identified as an early deliverable to address the water leakage issues previously identified.

Given the degree of investment required and the other planning projects ongoing that may impact amenities at Central Park, staff recommend completing a Master Plan prior to making significant investment in the current ponds.

4.0 FINANCIAL IMPLICATIONS

The pond reconstruction program (earthworks, soft landscapes, hydrological systems) has an estimated cost of \$4–6 million for the pond systems. The addition of structures to support recreational activities such as docks, boardwalks, and shade structures, trails, other recreational facilities would be in the range of \$10 million.

The development of a Central Park Master Plan will be brought forward in the 2024 - 2028 Financial Plan.

5.0 POLICY SECTION

This plan is in alignment with City efforts to support climate change initiatives improving the community and are aligned with the following Council-adopted policies and plans/strategies: Climate Action Framework (2019), Corporate Strategic Plan (2017), Environmental Sustainability Strategy (2016), Social Sustainability Strategy (2011) and the Healthy Community Policy (1991).

To: Chief Administrative Officer
From: Deputy General Manager Parks, Rec and Culture
Re: CENTRAL PARK POND REDEVELOPMENT
STUDY

..... Page 6

6.0 RECOMMENDATION

The pond reconstruction project identified in the 2009 Central Park Management Plan has been investigated and has revealed the extent of reconstruction required to create a viable aquatic ecosystem in the park. Prior to investing in this initiative, a comprehensive park masterplan is recommended to explore alternate land use options in the area. It is recommended that Council instruct staff to pursue a masterplan review of the park.



Carmen Gonzalez
DEPUTY GENERAL MANAGER PARKS, RECREATION AND CULTURE

HE:CG:tc

Attachments: Appendix A
Appendix B
Appendix C
Appendix D

Appendix B

Central Park Management Plan Public Consultation Results

Vision Statement 96%

The vision is to restore, manage and enhance Central Park's forest and heritage resources and its diversity of leisure and recreation amenities for the enjoyment of present and future generations.

Goal 1 92%

Support ecological initiatives and public education/involvement with the initiatives.

Goal 2 93%

Recognize and protect heritage and cultural values and environmental features of Central Park.

Goal 3 93%

Provide for a variety of recreational and leisure uses, with associated support facilities.

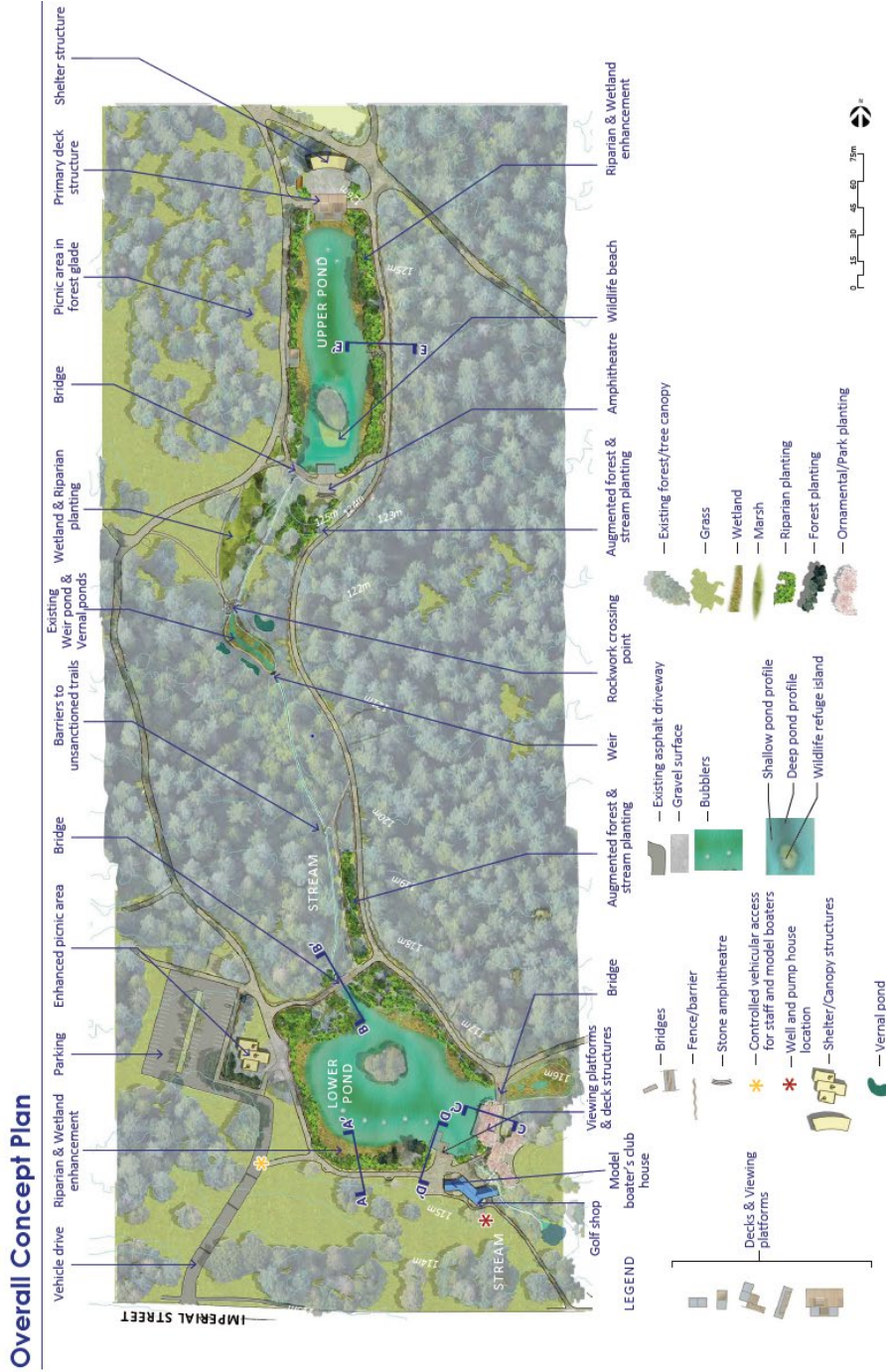
Goal 4 91%

Improve safety through separation and reconfiguration of pedestrian and vehicular systems through the park.

Goal 5 86%

Develop a unified design expression for the park.

Conceptual Redevelopment Plan for the Ponds



Appendix C (Page 2 of 3)

Upper Pond Concept Enlargement



Appendix C (Page 3 of 3)

Lower Pond Concept Enlargement



Appendix D (Page 1 of 2)

Habitat Descriptions to be Re-Established in the Pond Redevelopment Plan

Habitat Descriptions

Habitat Area	Descriptor / Objective	Target Species	Habitat Requisites / Descriptor	Design Considerations
Ponds	<p>"Deepening / dredging of the ponds with potential aeration and reduction/elimination of chlorinated municipal supply to facilitate recolonization / introduction of endemic fish species. Improving fish access between upper and lower ponds- widening / deepening channel and constructing riffles/pools to accommodate fish movement when sufficient flow (e.g., storm events). Climate Change: Hotter, drier summers and increased evaporation from the pond surface due to climate change makes the depth of the ponds to the greatest extent possible an important measure to mitigating summer water temperatures."</p>	<p>Three-spined Stickleback (TSB: <i>Gasterosteus aculeatus</i>) Cutthroat Trout (<i>Oncorhynchus clarkii clarkii</i>) Rainbow Trout (<i>Oncorhynchus mykiss</i>)</p>	<p>DO: 1-2 mg/L; Temp: 20C+ DO: 4-5 mg/L; Temp: Lakes/ponds: 13C +/- 4C. DO: 4-5 mg/L; Temp: 15.5C- ~20C for upper maximum</p>	<p>Three-spined Stickleback are a hardy species capable of inhabiting a variety of aquatic habitat conditions and wide thermal tolerance. Removal of the weir and enhancing stream flows to facilitate fish access between ponds is recommended. Deepening of the ponds may enable this species, but to be determined based on water quality sampling. An aquatic thermocline and aeration is needed to accommodate this species. Deepening of the ponds may enable this species, but to be determined based on water quality sampling. Removal of the weir and enhancing stream flows to facilitate fish access between ponds is recommended. An aquatic thermocline and aeration is needed to accommodate this species. Deepening of the ponds may enable this species, but to be determined based on water quality sampling. Removal of the weir and enhancing stream flows to facilitate fish access between ponds is recommended.</p>
	<p>Habitat Islands- construction of partially vegetated, southern aspect exposure habitat islands using excavated dredgate material and imported materials, as needed. The proper material for nesting beaches will likely need to be brought in for Western Painted Turtle habitat.</p>	<p>Western Painted Turtle (<i>Chrysemys picta</i>)</p>	<p>Logs for basking. Sufficient depth for winter hibernation. South-facing sand-dominated islands for digging nesting beaches.</p>	<p>Western Painted Turtles prefer ponds with muddy bottoms and emergent vegetation. They bask on logs, mudbanks and other objects above water, so opportunities for basking can be added along habitat island edges and wetland fringe areas. Juveniles feed mainly on small invertebrates and wetland areas will support these species. Adults are omnivorous. Nests are excavated by digging out holes on slopes with southern exposure and good drainage. Habitat refuge islands will need new beach material to support nesting areas.</p>
Wetland	<p>"Cattail marshes are a common shallow wetland designation and are present throughout the coast at low elevations in subzones with warm summers. They occur in protected lake and pond embayments, small depressions or even roadside ditches where surface substrate remains saturated for most of the growing season. These areas are utilized by a variety of bird, insect and amphibian species (and seasonally by fish) and can also be used periodically by wading birds, shore birds, and dabbling ducks / geese. Wetland Code: WM05- Cattail Marsh. Climate Change: Wetlands are also highly productive ecosystems that sequester carbon and increase resilience to climate change. Because wetland soils are wet, oxygen is not readily available to facilitate decomposition so carbon that is captured from the air by the plants' leaves. Roots that die decompose slowly while new roots continue to be produced, which leads to accumulation of organic matter in the soil. Carbon makes up approximately 50 percent of this organic matter ((Kraus, Zhu, & Stagg, 2021)."</p>	<p>Northwestern Salamander (<i>Ambystoma gracile</i>); Long-toed Salamander (<i>Ambystoma macrodactylum</i>); Marsh Wren (<i>Citrothorus palustris</i>); Red-winged Blackbird (<i>Agelaius phoeniceus</i>); Common Yellow-throat (<i>Geothlypis trichas</i>); Great Blue Heron (<i>Ardea herodias</i>);</p>	<p>Cattails are dominant (<i>Typha latifolia</i>) with Beaked Sedge (<i>Carex utriculata</i>), Great Bulrush (<i>Sclerocletoctus acutus</i>) and Duckweed (<i>Lemna spp.</i>). Marsh cinquefoil, Water Smartweed, Common Spikerush, Hardhack and yellow pond-lily may also be present. Soil is generally humisols or humic gleysols.</p>	<p>Existing ponds will be tapered into new / expanded functional semi-aquatic habitat areas that are seasonally inundated by water, and would typically have a minimum of 5-10 cm of water for the majority of year, partially drying (with saturated soil conditions) in the drier months (July - August).</p>

Appendix D (Page 2 of 2)

Habitat Area	Descriptor / Objective	Target Species	Habitat Requisites / Descriptor	Design Considerations
Riparian Areas	<p>"Riparian areas are essential areas for many wildlife species by providing food and nesting areas, as well as protected access to waterways and ponds. They will help shade the ponds and will contribute food and nutrients to the aquatic environment. These areas go hand in hand with the wetland areas to provide a continuous gradient of habitats from fully aquatic to terrestrial. Amphibian species that use wetlands may also use adjacent riparian areas during certain seasons and life cycles. Riparian areas have many features, functions, and conditions that help protect aquatic habitats including:</p> <ul style="list-style-type: none"> Sources of large organic debris, such as fallen trees and tree roots Areas for stream channel migration Vegetative cover to help moderate water temperature Provision of food, nutrients and organic matter to the stream Stream bank stabilization Buffers for streams from excessive silt and surface run-off pollution <p>Climate Change: Riparian areas provide shade for aquatic habitats to mitigate water temperatures and support biodiversity."</p>	<p>Northwestern Salamander (Ambystoma gracile); Long-toed Salamander (Ambystoma macrodactylum); Marsh Wren (Cistothorus palustris); Red-winged Blackbird (Agelaius phoeniceus); Common Yellow-throat (Geothlypis trichas); Great Blue Heron (Ardea herodias); Tree swallows (Tachycineta bicolor);</p>	<p>Riparian area include a variety of plant species that prefer moist soils but can also tolerate summer droughts. Species should be chosen to provide food sources for wildlife (i.e. nuts and berries).</p>	<p>The riparian areas should be widened to the greatest extent possible and should include a variety of shrub and tree species, planted densely and protected with fencing at key locations. Fencing will prevent trampling of vegetation and disturbance of wildlife by people and dogs. Riparian area zone of influence can extend 15 meters or more from the pond edges, but in most cases the riparian zone is less than this.</p>
Vernal Ponds	<p>"Vernal ponds confer unique seasonal aquatic habitats in forested areas or riparian fringe areas consisting of shallow ponds that typically dry up during the summer months and are utilized by invertebrates and amphibian species. Vernal ponds are largely absent in the region as a result of development. In the spring, these areas can be important breeding grounds for native amphibians such as frogs and salamanders. Climate Change: Seasonal vernal ponds are at risk of further loss due to reduced rainfall and higher temperatures during spring and summer months."</p>	<p>Pacific Chorus Frog / Tree Frog (Pseudacris regilla) Long-toed Salamander (Ambystoma macrodactylum)</p>	<p>Standing water for egg laying. Sufficient cover and depth to avoid predation. Water must be present until mid/late spring until adults metamorphose.</p>	<p>Shallow, seasonally inundated ponds that dry up in the summer months. Do not need to be directly connected via surface flow to other aquatic habitats.</p>
Upland Forest	<p>"Central Park has extensive second and third growth forests dominated by evergreen trees (Douglas fir and western redcedar) with some native deciduous trees (big leaf maple, vine maple). These forest areas provide habitat for a variety of urban wildlife including birds and mammals. They also improve air quality, cool the local climate, absorb rainwater, and improve human health and well-being (City of Burnaby, 2022). Climate Change: Upland forests contribute to climate resilience by helping cool the local climate. They also absorb rainwater to help reduced flooding during wetter winters and support local stream network base flows during drier summers."</p>	<p>Upland Douglas fir and western redcedar forests are home to many urban wildlife species of birds, mammals, amphibians, and invertebrates including squirrels, coyotes, raccoons, owls, woodpeckers, and many others.</p>	<p>Upland forests</p>	<p>Upland forest planting areas should have adequate topsoil and organic matter to maximize absorption of rainfall to support trees and shrubs and reduce runoff. Keeping declining trees as wildlife snags for cavity nesting species is an important biodiversity enhancement and management tool. The quality of the habitat is affected by the amount of disturbance and edge effects, but many species are adapted to the urban environment.</p>
Stream connecting the Upper and Lower Ponds	<p>"The connecting stream has potential for improved invertebrate productivity as forage for amphibian and fish species utilizing the ponds, and to increase overall pond biodiversity and ecosystem health. Reducing streambank trampling and increasing habitat complexity within the stream will enhance the habitat value. Climate Change: Drier summers may result in periods of low to no water in the connecting stream unless supplemental water is added."</p>	<p>Macroinvertebrates: Damselflies / larvae; Stoneflies / larvae; Diving Beetles; snails; worms; isopods, caddisflies, mayflies, backswimmers, boatman, water striders</p>	<p>Maintain year-round flow to maintain healthy invertebrate population(s).</p>	<p>Provide a variety of stream substrates to provide suitable habitat for different macroinvertebrate guilds, including muddy/organic dominated substrate (e.g., deeper ponded areas) and gravel/cobble dominated areas (e.g., riffle/step pools), as well as boulders/large cobble and coarse woody debris.</p>