November 17, 2021

TO: Park Board Chair and Commissioners

FROM: General Manager – Vancouver Board of Parks and Recreation

SUBJECT: Low Intensity Turf Maintenance – Report Back

RECOMMENDATION

THAT the Vancouver Park Board direct staff to continue the transition of 37 hectares of piloted low-use turf on park managed lands to natural management, and expand to a total of 42 hectares by 2030 (7% of total park managed turf).

REPORT SUMMARY

Over the duration of the 2021 pilot, which ran from May to end of July, staff adjusted management practices, monitored the site conditions, collaborated with academic researchers, responded to public feedback, and tracked project implications. While the management strategies varied to respond to the site conditions, the challenges and benefits were fairly common across the sites. Several environmental and ecological benefits are being researched in the meadow areas, but native bee diversity and climate action (reduced emissions, natural carbon sequestration) stand out as the most significant benefits of the management changes.

The ongoing transition of 42 hectares of park and golf passive-use turf areas (7% of city-wide total) to be managed as meadows by 2030 would align with Park Board and City policy goals to increase access to nature, create new habitat areas, and support climate action.

BOARD AUTHORITY / POLICY / PREVIOUS DECISIONS

As per the Vancouver Charter, the Park Board has exclusive jurisdiction and control over parkland use in the City of Vancouver, including any structures, programs and activities, fees, and improvements that occur within parks.

A naturalized meadow project was trialed in spring of 2020 with 14.6 ha of passive-use turf (2.5 % of city-wide total) managed with reduced mowing in response to staffing limitations at the onset of the COVID-19 pandemic. The meadows were expanded following the Park Board Low Intensity Turf Maintenance motion approved on March 10, 2021, with a total of 37.2 ha park and golf course passive-use turf (6 % of city-wide total) being managed naturally this spring and summer.

On October 9, 2019, the Board approved VanPlay Report 4: The Playbook: Implementation Plan. Naturalized meadows help advance long and short term VanPlay (2020-2030) actions, including:

- N.3.1 Continue to enhance, nurture and connect existing natural areas to address impacts of threats like community use, carrying capacity, climate change, and invasive species (among others);

- N.3.3 Enhance habitat value for pollinators, insects, and birds by improving the soil nutrients and surrounding ecologies with horticultural methods and species selection (Ecological Horticulture Study), and incorporate the findings into the Horticulture Standards Policy (P.5.3);
- N.3.5 Identify locations for habitat corridors based on urban wildlife movement, bird flyways, biodiversity hotspots, hidden streams and green infrastructure gaps; and
- N.3.6 Provide access to a naturally managed area of at least 0.2 ha within a 10 minute walk of all residents.

The Environmental Education and Stewardship Action Plan (2014), Biodiversity Strategy (2016), and Bird Strategy (2020 update) all provide policy backing for the transition toward meadow management.

City policy also supports meadows through the Green Operations Plan's (2020-2030) goal to increase healthy habitat and ecosystems to 40% of all city-owned lands by 2030, and the Climate Emergency Action Plan's (2020-2050) initiative to capture carbon through land-based projects, including grassland management and soil enhancements.

BACKGROUND

Recent research shows the ecological and environmental benefits of meadows, broadly defined as infrequently mown turf grass with flowering plants. The two most notable advantages of meadow management over mown turf are their role in supporting native bees, and reliability in storing carbon. As these benefits are better understood, park managers across North America and Europe are transitioning areas from short-mown turf to longer grasslands and meadows. High profile examples can be found at Queen Elizabeth Olympic Park in the UK and Brooklyn Bridge Park in New York; however Metro Vancouver Regional Parks and many smaller municipalities have also been introducing meadow management practices.

Blooming flowers and year-round tall grasses in meadows provide important habitat for bees. Native bee species in Canada are a vital part of natural ecosystems and responsible for pollinating one third of the food we eat, yet their populations are in decline. Changing mowing schedules allows for less disturbance to nesting bees and increases food sources for bees, butterflies and other beneficial insects. While bees and butterflies are pollinators, other insects are also important food sources for native insectivores, including bats and swallows which are also experiencing global population declines. Annual or bi-annual mowing naturalized meadows supports overwintering, breeding, and feeding opportunities for pollinators and insectivores.

Naturalized meadows also contribute to climate action by reducing carbon emissions required for maintenance and can be more resilient in carbon capture than forest during periods of drought. Recent research shows that grasslands are a more reliable carbon sink than forests, since grasslands sequester more of their carbon underground. Meadow management supports healthy soils and microbes, which allows for more carbon to be stored in that ground than regularly managed turf.

DISCUSSION

Pilot Findings

The goal of the 2021 pilot in Vancouver parks was to make changes to the mowing regime in low-use passive turf areas to evaluate the environmental, ecological, economic, and feasibility of

meadow management in parks and golf courses. 18 park sites, 3 golf courses, and 8 park-managed boulevards (Figure 1) were selected by staff for the pilot based on their level of service and use. Park sites had explanatory signs, and paths cut in for public access.

Figure 1: Map of 2021 Pilot Meadow Sites

Environmental and Operational

The 2021 pilot sites were mowed once during the growing season, which reduced the carbon emissions associated with regular turf management. However, the mowing equipment that is currently available to staff is not ideal for longer grass. Specialized mowing equipment for long grasses would increase efficiency and reduce carbon emissions further.

One of the notable challenges of the 2021 meadow pilot was the potential fire-risk in parks related to the extraordinary heat and drought conditions. Fire-risk is not unique to meadow managed sites. Drought impacts trees, unirrigated turf, and woody debris, by increasing their combustibility. Staff relied on advice from the fire officer and followed a Risk Mitigation Plan to guide meadow management practices during the drought. Phase 2 of the Plan was implemented on July 14 by increasing the width of mown buffers. As no rain occurred in the next two weeks, staff moved to Phase 3 on July 27 by advancing the planned annual mowing. The fire-risk response required reprioritization of operational work and was labour intensive for staff at that time. Flexibility in the timing of the annual mow and reprioritization of staff time during maintenance are required for meadow managed sites, since weather influences the timing of the management practices.

Further, meadow management requires training to support the diversification of fieldwork roles and skill-sets. In order to steward thriving and ecologically diverse meadows, staff need a range

of skills beyond grass trimming and mowing, such as seeding, planting, weeding, invasive plant management, monitoring, paper picking, raking. While less staff time is dedicated to the regular mowing of these areas, additional staff time and more specific equipment is needed to ensure that meadows receive the unique attention they require.

Ecological

Several sites were enhanced with custom seed mixes by seeding into slits dug into the turf. The species selected for this project were mainly slower growing native flowers, including Douglas Aster, Lupines and Camas, a culturally important food for local First Nations. In addition to the seeding, staff have trialing native perennial plug plantings in three meadow sites this fall. The native perennial species were selected to provide a sustainable and long-term benefit when mowed only once annually. These native species are sustainable, provide over-winter habitat for nesting, change the soil composition, and help compete with invasive plants.

Preliminary analysis of data collected at the 2021 pilot sites shows that an increase in species diversity is one of key ecological benefits of meadow management. Researchers (see Table 1) observed that a more diverse range of bees were found foraging in the 2021 pilot sites including an endangered native bee species. Observations by Pak Operations staff also showed an increase in bird species using and breeding in the longer grasses of the meadow managed sites.

Research Area	Partner	Timing
Bees	Jens Ulrich, UBC PhD	2020-2022
Bumble bee breeding	Elena Varner, SFU Masters	2020-2021
Pollinating insects	Beaty Biodiversity Lab	2022
Native bee citizen science	SPES, JSG, ECPC, EYA	Ongoing
Bat distribution	Julia Craig, UBC PhD	2021
Bat species diversity	Echo Ecological	2021
Bat breeding	BC Bat & SPES	Ongoing
Soil conditions	Park staff	2020-2022
Soil microbes	Andrew Loudon, VIU PhD	2022

Table 1: Summary of 2021 Research Areas & Partners

The unique characteristics and management practices of each meadow site also allow for a diversity of blooming species and grass height, which influences the soil microbes and soil health. Data from the 2020 naturalized meadow project showed that meadow managed areas had higher soil moisture and lower temperature. The diversity of meadow types (species composition, grass height) maximizes cumulative biodiversity within the city and provide a variety of habitat conditions to support a richer range of annual and perennial flowers, native bees, breeding birds, and soil fungi.

CONSIDERATIONS

While meadows have many environmental and ecological benefits, they are not without their challenges, including training requirements and public concern about certain aspects. These challenges provided opportunities for staff to learn and adjust meadow management practices based on emerging best practices.

Meadows require unique management practices that take time, training, and specialized equipment to steward. Cutting the long grass and raking up the mowing trimmings are two of the unique meadow management requirements. In the summer of 2021, staff tested new equipment

during the pilot and will continue to explore options, including rented or purchased equipment. There are opportunities for meadow management resources and trainings to be developed for crew talks to grow operational practices and skills. Further, the horticulture industry training is expanding to include ecological restoration and land stewardship in the trade's gardener apprenticeship program to support land management transitions like this across Canada.

Public feedback was received through 311 calls and the project email account that was posted on in-park signs. During this pilot study, staff received both support for the aesthetic and ecological benefits, and concerned citizens regarding changes in management and accessibility. While each entire meadow is only mowed annually, the edges and trails were mowed at the same interval as other passive-use areas. Feedback was helpful in setting priorities for future years.

FINANCIAL CONSIDERATIONS

Initial findings regarding the financial demands of meadow areas show that overall cost savings are not associated with the management change, but also that costs are incurred differently. As the program progresses from 'pilot', staff and equipment will be better able to plan for this park land use so that the management transition does not require additional financial supports beyond equipment costs. The purchase of the specialized equipment itemized below in Table 2, would support both the ongoing maintenance of the meadows. It could also support a variety of natural areas management practices that currently require contracted services.

Equipment	Cost (approximate)
Mini excavator	$135,000
Truck & trailer	$35,000
Flail attachment	$20,000
Rake attachment	$10,000

Table 2: Meadow Maintenance Equipment Estimated Costs

While initial project costs for the establishment of the meadow sites could by supported by the capital budgets dedicated to expanding naturally managed areas, equipment and ongoing maintenance costs would be covered by shifts within existing operational budgets.

NEXT STEPS

The proposed further transition to meadow management provides an opportunity for increased efficiency, public education, stewardship and citizen science, enhanced meadow biodiversity, and to be leaders in innovative land management practices.

Moving forward, staff will work with park partner organizations to offer citizen science opportunities through annual bird surveys and bee counts, provide meadow education through nature walks and plant talks, and support meadow stewardship work parties. New research partnerships will be established to gather data on the ecological impacts of management practices, such as examining the correlation between meadow management and soil microbes.

Meadow enhancement will be ongoing through seeding and planting to increase the native species diversity and to further the decolonization of park practices. Staff will continue to work together to ensure meadow sites are maintained regularly and to communicate effectively with residents prior to management changes and when obstacles arise.

Park Board staff will continue to seek opportunities to share Vancouver's leadership on urban meadows as well as learning from the latest research, other land practitioners, and through the implementation process. Staff have already been collaborating with colleagues at Metro Vancouver Regional Parks and Vancouver Mountain View Cemetery who are also piloting turf conversion meadow areas. Park Board staff will be sharing lessons learned at the next Metro Vancouver Regional Park Advisory Committee (RPAC) Environment Subcommittee meeting, and have submitted a proposal to co-facilitate a Peer-to-Peer conversation on urban meadows with New York City's Brooklyn Bridge Park director of horticulture at the 2022 Greater Greener Conference.

CONCLUSION

This report provides the findings from the 2021 meadow pilot and recommends the continued conversion of 7% of the city-wide total of passive-use turf to meadows by 2030. Meadow management aligns with, and advances, Park Board and City policy goals to improve access to nature, create new naturalized habitat areas, and increase climate resilience. If this transition is further supported, staff would purchase the required equipment, diversify operational land practices and training, continue to expand biodiversity enhancements, and work with partners to increase educational, stewardship and citizen science programs. This is an opportunity for the Vancouver Park Board to be a leader in urban ecological landscape management, support native plant and bee biodiversity, and climate action.

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