DRAFT - Recommendations to the MPRB Board of Commissioners – April 3, 2019
Natural Areas/Wetlands Subcommittee (woodlands, prairies, savannas, and wetlands)
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Introduction:

Our committee has spent the last several months studying the challenges faced by the Minneapolis Park and Recreation Board (MPRB) and MPRB staff in maintaining and improving the natural areas managed by the MPRB. Management must be sensitive to the health and safety of park users, MPRB staff, and the environment, while addressing the unique pressures on these urban wildlands. As we had a limited amount of time to study the options, these recommendations are preliminary and only the first steps in assisting MPRB Commissioners in developing a comprehensive, integrated, and effective pest management policy going forward. Given the short timeframe, our recommendations have been developed with a focus on pest management for the short term (i.e., the 2019 growing season) and further study will be needed to elaborate on our recommendations and formulate a long-term strategy. The remainder of this document reflects the committee's consensus about goals and rationales, and the recommendations are supported by examples and resources to help guide further investigation and, ultimately, discussions about policy by the MPRB Board of Commissioners.

Goals:

In an effort to reduce the use of pesticides and achieve the goal of, “urban forests, natural areas, and waters that endure and captivate,” and understanding that ecological restoration is a complicated process and an evolving science, the following recommendations aim to meet the MPRB’s ecological management goals while minimizing risk to the public, MPRB staff, and the environment. The long-term goal for MPRB natural areas should be that lands are ecologically intact and achieve a high level of ecological function, reducing the need for direct intervention against specific weeds with a recognition that invasive species cause significant negative impacts in natural areas and will require thoughtful and effective management. Because MPRB natural areas are part of a dense, urban environment, they present a unique set of challenges. The park system is accountable to the citizens who use these natural areas every day, the lands face many ecological challenges from the pressures of urban development, and the Minneapolis Park and Rec Board is responsible for the responsible management of these resources in perpetuity. We recognize that hands-on management of these areas will continue indefinitely. However, we hope these recommendations will improve the safety, efficiency, and effectiveness of MPRB natural areas management.

General Recommendations:

1. We recognize the diligence of MPRB staff in identifying and managing pests responsibly throughout the MPRB system, and the efforts and progress that has been made in recent years to reassess the tools they use to manage park lands and reduce the use of pesticides by relying on the principles of Integrated Pest Management (IPM) to manage pests responsibly; we encourage the MPRB Board of Commissioners to recognize the expertise of their staff and trust them to manage pests in a safe and effective manner.

2. The existing MPRB IPM Plan should be expanded to include a more detailed definition of IPM (see below) and a specific listing of the known and potential threats to MPRB resources along with strategies for mitigating those threats.

3. The IPM plan should be reviewed and updated once every three years or other reasonable interval to account for and include new threats and the latest pest management research as it arises.

4. Increase active scouting and monitoring for new pest infestations so they may be treated at an earlier stage to increase management effectiveness and success.

5. Assess and rank the tools and methods used to manage natural areas based on their suitability, effectiveness, risk of harm to non-target organisms, the environment, and park users and MPRB staff.

6. Ensure that any methods used to manage weeds and other pests will include all necessary measures to reduce risks to the staff, public and the environment.

7. Clearly communicate the risks and benefits of selected management practices and their alternatives to all stakeholders. Require public and readily available documentation of the justification for all pest management decisions, including pesticide applications, in accordance with the MPRB IPM Plan and specific to the pest and circumstances involved.

8. Chemical control applications should be visibly marked in multiple languages to indicate that the public should not enter, and signage should remain for a period that meets or exceeds label requirements.

9. Conduct post-treatment monitoring to assess the effectiveness of all treatments on the target organisms, and assess impacts to non-target organisms, including soil biota, invertebrates, aquatic organisms, and use this information to inform MPRB pest management practices in the future.

10. Support ongoing professional development for staff in best pest management techniques and natural areas management, inclusive of pesticides and pesticide alternatives to ensure proficiency with the best tools and practices.

11. Provide opportunities to study and test new pest management techniques/practices as they arise, and a mechanism to adopt them, if appropriate.

12. Expand partnerships with other organizations and facilitate volunteer stewardship to provide labor and expertise for projects.

Pest Management Recommendations:

We are confident MPRB staff are familiar with the management alternatives for invasive plants and noxious weeds compiled by the committee. We have included them to assist in the discussion about strategies to pursue this season. The following recommendations are organized by plant life cycle:

Note: The recommendations in this list are incomplete.

Woody Perennials (trees, shrubs, & woody vines)

Key Species Currently Documented on MPRB Properties: Amur Maple (*Acer tataricum* subsp. *ginnala*, *Acer ginnala*), Black Locust (*Robinia pseudoacacia*), Common/European Buckthorn (*Rhamnus catharticus*), Glossy Buckthorn (*Frangula alnus*), Oriental Bittersweet (*Celastrus orbiculatus*), Poison Ivy (*Toxicodendron radicans*; native and a valuable component of native ecosystems; should only be controlled in public areas immediately adjacent to trails and other areas where inadvertent contact would be likely and pose a hazard to people; educational signage is also a potential tool for reducing accidental exposures), Siberian elm (*Ulmus pumila*; not currently regulated in Minnesota, but widespread and problematic), and Tatarian Honeysuckle (*Lonicera tatarica*).

Species of Potential Concern (watch list): Amur Honeysuckle (*Lonicera maackii*), Bell's Honeysuckle (*Lonicera* x *bella*), Common Barberry (*Berberis vulgaris*), Japanese Barberry (*Berberis thunbergii*), Multiflora Rose (*Rosa multiflora*), and Morrow's Honeysuckle (*Lonicera morrowii*).

Management Options:

1. Cultural Control

- Healthy environment (prairie and lake shore maintenance, prescribed fire, shade, avoiding external stresses on the site) - maintaining natural processes in an area can help discourage invasion by woody invasive species.
- Competition (Properly selected seed mixes, maintain native plant communities, density of plantings and planting to fill in bare ground etc.) - in natural areas, maintaining and fostering a healthy well adapted plant community makes the site less prone to invasion. Provides long term control, low intervention in long run, provides environmental and aesthetic benefits.
- Soil protection (intact native soils, leaf litter, mulch) - not disturbing soil makes fewer opportunities for new woody perennials to invade, less labor in long run.
- Prevention - scouting and control of new infestations before they expand, preventing seed production from adult plants and providing alternative food for birds which spread invasive shrub seeds.
- Prescribed Fire - suitable for large areas, can be labor cost intensive and requires preparation and has a narrow window of effectiveness; smoke is a concern as well as risk to public and structures; promotes fire tolerant vegetation including herbaceous vegetation.

2. Mechanical Removal/Treatment

- Hand Pulling – suitable for seedlings and smaller saplings; labor intensive; not suitable for extensive infestations due to fatigue, expense, and soil disturbance (erosion and promotes the germination and establishment of new seedlings and other invasive plants).
- Mechanical Extraction (Weed Wrench, Uprooter, Root Talon, Pullerbear, Extractigator, etc.) – suitable for larger saplings and some small trees; labor intensive; not suitable for extensive infestations due to fatigue, expense, and soil disturbance (erosion and promotes the germination and establishment of new seedlings and other invasive plants), etc. Only suitable as part of an intensive revegetation effort.
- Hand Cutting (bypass pruners, loppers/lopping shears, hand saws; chainsaws) – suitable for larger saplings to trees; labor intensive; not suitable for extensive infestations due to fatigue and expense; generally will not kill plants so not a stand-alone solution of eradication is the goal (re-sprouting); however prevents seed production and dispersal if timed properly; typically combined with systemic herbicide treatments to achieve eradication.
- Large-Scale Cutting/Forest Mowing (various rotary brush cutters) – best for medium to relatively large plants; relatively fast and inexpensive; generally, will not kill plants so not a stand-alone solution if eradication is the goal; prevents seed development and dispersal if timed properly; damage to non-target species and soil compaction may be concerns.
- Fire (prescribed burning, torching) – effectiveness variable and generally unreliable; must have a fuel source to sustain a fire hot enough to kill woody vegetation; not usually sufficient to kill large plants to the ground; individual plants can be torched to kill back to the ground; Fire

typically is only sufficient to kill above ground portions of woody plants, and does not kill the roots, repeat burns often not possible due to lack of fuel; timing and logistics of planning and executing a burn can be difficult, weather, smoke considerations, preparation for containment and skilled staff required.

- Cut-stump + Stump Covers (Buckthorn Baggie, ???) – suitable for small infestations and larger plants; labor intensive and expensive; not suitable for large infestations due to expense; reduced non-target effects; can be reused; not as effective as cut-stump plus herbicide (see below under *Chemical Treatment*).

3. Biological/Biorational Controls

- Grazing (goats, cattle) – generally will not kill plants so not a stand-alone solution if eradication is the goal; significant potential for ecological damage; long term, can prevent seed development and dispersal; relatively expensive due to fencing requirements; grazing must be used in combination with other control methods.
- No other biological control options are currently available for the species of concern; research ongoing for some species.

4. Chemical Treatment (herbicides labeled for the specific use and applied according to label requirements and using the specified personal protective equipment/PPE).

- Foliar Treatments (spray, wick, or wipe-on applications) – suitable for large expanses of seedlings and low-growing species; damage to non-target species can be a concern because of overspray; spraying and foliar applications of herbicide are relatively more likely to expose the public to pesticide.
- Cut Surface Treatments (stem girdling, hack & squirt, frill method, and cut stump) – usually combined with herbicide applications to the cut surfaces; stem-girdling, hack & squirt, and frill cut treatments are usually less labor intensive and expensive when stems remain standing; aesthetics (standing dead plants) are a consideration; for cut stump applications the brush may be removed or left to decay over time (involves labor, cost, and aesthetic considerations); reduced non-target effects with highly targeted application of herbicide only to the plant intended for control; relatively low risk of public being exposed to herbicide.
- Basal Bark Treatments – less labor intensive and expensive because stems remain standing; aesthetics (standing dead plants) are a consideration; reduced non-target effects.
- Injection/Hypo-Hatchet – less labor intensive because the stems remain standing, but the tools are expensive; aesthetics (standing dead plants) are a consideration; reduced non-target effects.

Herbaceous Perennials (including grasses, ferns and “fern allies”, and vines)

Key Species Currently Documented on MPRB Properties: Canada Thistle (*Cirsium arvense*), Common Reed (non-native; *Phragmites australis* ssp. *australis*), Common Tansy (*Tanacetum vulgare*), Crown Vetch (*Securigera varia*), Cattails - Common/Broad-leaved Cattail (*Typha latifolia*), Narrow-leaved Cattail

(*Typha angustifolia*; non-native???), and Hybrid/White Cattail (*Typha* x *glauca*; the sterile hybrid of these two species; not currently regulated in Minnesota), Knotweed Complex/Japanese and Bohemian Knotweed (*Polygonum cuspidatum* and *Polygonum* x *bohemicum*???), Leafy Spurge (*Euphorbia esula*), Purple Loosestrife (*Lythrum salicaria* and *Lythrum, virgatum*), Reed i9 (*Phalaris arundinacea*; non-native genotypes; not currently regulated in Minnesota), Quackgrass (*Elytrigia repens*; not regulated in Minnesota, but problematic), and Spotted Knapweed (*Centaurea stoebe*; may also act as a biennial).

Species of Potential Concern (watch list): Black swallow-wort (*Cynanchum louiseae*), Non-Native Common Reed (*Phragmites australis* subsp. *australis*), Crown Vetch (*Securigera varia*), Dalmatian Toadflax (*Linaria dalmatica*), Flowering Rush (*Butomus umbellatus*???), and?

Common Landscape Weeds - Blackseed Plantain (*Plantago rugelii*), Dandelion (Taraxacum officinale), etc.???

<u>Management Options</u>:

1. Cultural Control

- Healthy environment (prairie and lake shore maintenance, prescribed fire, shade, avoiding external stresses on the site) - maintaining natural processes in an area can help discourage invasion by herbaceous invasive species.
- Competition (Properly selected seed mixes, maintain native plant communities, density of plantings and planting to fill in bare ground etc) - in natural areas, maintaining and fostering a healthy well adapted plant community makes the site less prone to invasion. Provides long term control, low intervention in long run, provides environmental and aesthetic benefits.
- Soil protection (intact native soils, leaf litter, mulch) - maintain integrity and biological function of native soils by protecting them from compaction, nutrient pollution, excessive turbation etc. makes fewer opportunities for new herbaceous perennials to invade, less labor in long run.
- Prevention - scouting and control of new infestations before they expand, preventing seed production and vegetative reproduction from adult plants. [Examples: preventing spread of early detection and response to Oriental Bittersweet.]
- Prescribed Fire - suitable for large areas, can be labor cost intensive and requires preparation and has a narrow window of effectiveness; smoke is a concern as well as risk to public and structures; promotes fire tolerant vegetation including herbaceous vegetation.
- Hydrology and water quality manipulation -

2. Mechanical Removal

- Hand Pulling (suitable for seedlings and smaller saplings; labor intensive; not suitable for extensive infestations due to fatigue, expense, and soil disturbance (erosion and promotes the germination and establishment of new seedlings and other invasive plants);
- Mowing

- Cut and submerge (Cattail)
- Dredging aquatic and wetland vegetation
- Scraping to remove seedbed and rhizomes
- Smothering
- Fire (torching)

3. Biological/Biorational Controls

- Grazing (goats, cattle) – generally will not kill plants so not a stand-alone solution if eradication is the goal; significant potential for ecological damage; long term, can prevent seed development and dispersal; relatively expensive due to fencing requirements; grazing must be used in combination with other control methods. Grazers are not selective and will impact desirable vegetation as well.
- Biocontrol agents (Purple Loosestrife, leafy spurge, Spotted Knapweed, Canada Thistle) - Several herbaceous plants have approved biocontrol agents; establishing and maintaining biocontrol populations is relatively low cost; does not eliminate invasive plants, but keeps them at a lower level than they would otherwise be; there may be situations where invasive plant population is not large enough to support a stable biocontrol population.
- Native herbivores (Deer, muskrats, beavers, etc) - native herbivores may cause harm to native vegetation or help control invasive plants depending on the situation.

4. Chemical Treatment (herbicides labeled for the specific use and applied according to label requirements and using the specified personal protective equipment/PPE).

- Foliar Treatments (spray, wick, or wipe-on applications) – suitable for large expanses of seedlings and low-growing species; damage to non-target species can be a concern because of overspray; spraying and foliar applications of herbicide are relatively more likely to expose the public to pesticide.

Biennials (including winter annuals; herbaceous species that complete their life cycle in two growing seasons)

Key Species Currently Documented on MPRB Properties: Cutleaf Teasel (*Dipsacus laciniatus*), Garlic Mustard (*Alliaria petiolata*), Common Burdock (*Arctium minus*), Grecian Foxglove (*Digitalis lanata*); has only been formally reported in Washington County - if actually present should be reported), Narrowleaf Bittercress (*Cardamine impatiens*), Wild Carrot/Queen Anne's Lace (*Daucus carota*), and Wild Parsnip (*Pastinacea sativa*).

Species of Potential Concern (watch list): Common Teasel (*Dipsacus fullonum*), Poison Hemlock (*Conium maculatum*), and?

<u>Management</u> <u>Options</u>:

1. Cultural Control

- Healthy environment (prairie and lake shore maintenance, prescribed fire, shade, avoiding external stresses on the site) - maintaining natural processes in an area can help discourage invasion by herbaceous invasive species.
- Competition (Properly selected seed mixes, maintain native plant communities, density of plantings and planting to fill in bare ground etc.) - in natural areas, maintaining and fostering a healthy well adapted plant community makes the site less prone to invasion. Provides long term control, low intervention in long run, provides environmental and aesthetic benefits.
- Soil protection (intact native soils, leaf litter, mulch) - maintain integrity and biological function of native soils by protecting them from compaction, nutrient pollution, excessive turbation etc. makes fewer opportunities for new herbaceous perennials to invade, less labor in long run.
- Prevention - scouting and control of new infestations before they expand, preventing seed production and vegetative reproduction from adult plants. [Examples: preventing spread of early detection and response to Oriental Bittersweet.]
- Prescribed Fire - suitable for large areas, can be labor cost intensive and requires preparation and has a narrow window of effectiveness; smoke is a concern as well as risk to public and structures; promotes fire tolerant vegetation including herbaceous vegetation.
- Timed treatments - working with life cycles of plants, timed mowing, burning or herbicide sprays can maximize effectiveness due to bi-annual lifecycle of these plants.

2. Mechanical Removal

- Hand Pulling (suitable for seedlings and smaller saplings; labor intensive; not suitable for extensive infestations due to fatigue, expense, and soil disturbance (erosion and promotes the germination and establishment of new seedlings and other invasive plants); generally, not suitable for Grecian Foxglove, Poison Hemlock, and Wild Parsnip due to toxicity concerns?
- Mowing - timed mowing to remove seed heads before seeds ripen prevents or reduces seed production???
- Parsnip Predator???
-

3. Biological Control

- ???

4. Chemical Control

- Chemical control is often used in combination with other treatments such as prescribed fire to initiate many new seedlings and rosettes which can be easily treated with a targeted foliar application of systemic herbicide.???

Annuals (herbaceous species that complete their life cycle in a single growing season; summer annuals)

Key Species Currently Documented on MPRB Properties: ???

Species of Potential Concern (watch list): Japanese Hops (*Humulus japonicus*), Palmer Amaranth (*Amaranthus palmeri*),???

Management Options:

1. Cultural Control

- Healthy environment (prairie and lake shore maintenance, prescribed fire, shade, avoiding external stresses on the site) - maintaining natural processes in an area can help discourage invasion by herbaceous invasive species.
- Competition (Properly selected seed mixes, maintain native plant communities, density of plantings and planting to fill in bare ground etc) - in natural areas, maintaining and fostering a healthy well adapted plant community makes the site less prone to invasion. Provides long term control, low intervention in long run, provides environmental and aesthetic benefits.
- Soil protection (intact native soils, leaf litter, mulch) - maintain integrity and biological function of native soils by protecting them from compaction, nutrient pollution, excessive turbation etc. makes fewer opportunities for new herbaceous perennials to invade, less labor in long run.
- Prevention - scouting and control of new infestations before they expand, preventing seed production and vegetative reproduction from adult plants. [Examples: preventing spread of early detection and response to Oriental Bittersweet.]
- Prescribed Fire - suitable for large areas, can be labor cost intensive and requires preparation and has a narrow window of effectiveness; smoke is a concern as well as risk to public and structures; promotes fire tolerant vegetation including herbaceous vegetation.

2. Mechanical Removal

- Hand Pulling (suitable for seedlings and smaller saplings; labor intensive; not suitable for extensive infestations due to fatigue, expense, and soil disturbance (erosion and promotes the germination and establishment of new seedlings and other invasive plants); generally, not suitable for Grecian Foxglove, Poison Hemlock, and Wild Parsnip due to toxicity concerns?

3. Biological Control

- ???

4. Chemical Control

- ???
- ???

“Blank Slate reconstructions” completely restarting a site (i.e. lawn to meadow, or invasive dominated shoreline to native plant community)

In situations where an area is converted to a completely new plant community and elimination of existing vegetation is desired, in addition to established practices, the park board should consider organic alternatives. Synthetic pesticide-free methods nicely are summarized in Xerces Society publication “Organic Site Preparation for Wildflower Establishment” (See link below). Practices including solarization, smother cropping, sheet mulching, repeated shallow cultivation, soil inversion, organic herbicides, sod removal (could include soil removal where fill soil exists, eg urban shorelands), and heavy goat grazing should be considered and weighed against the specific needs and limitations of the site and staff.

https://xerces.org/wp-content/uploads/2016/10/2016-027_Organic-Site-Prep-Guidelines_May2017_web.pdf

Appendices

List of attached documents to include in our recommendations

A1: Summary and explanation of IPM

A2: Example of an IPM plan section covering Common Buckthorn

A3: MIPN Invasive Species Management Methods spreadsheet (See attached spreadsheet)

Supporting References

Midwest Invasive Plant Network (https://www.mipn.org)

Ontario Invasive Plant Council (https://www.ontarioinvasiveplants.ca)

Working Definition of IPM

The Minneapolis Park and Recreation Board supports and encourages the use of Integrated Pest Management (IPM), a deliberative, comprehensive, science-based, and common-sense approach to pest management that identifies and reduces risks from pests and pest management strategies. IPM \ coordinates the use of pest biology, environmental information, and the most current technology available to prevent unacceptable levels of pest damage by the most economical means, while posing the least possible risk to people, property, resources, and the environment. IPM is an informed and iterative pest management strategy wherein the pest control strategies employed are evaluated and modified based on their effectiveness in controlling pests in a responsible, judicious, and cost-effective manner. IPM provides an effective strategy for managing pests in all arenas, from developed agricultural, residential, and public areas to wild lands. IPM serves as an umbrella to provide an effective, all encompassing, low-risk approach to protecting resources and people from pests.

The primary components of a comprehensive IPM program include being aware of prospective pests and their harmful effects, defining unacceptable pest or damage levels as a guide for future pest control decisions (site- and pest-specific action thresholds), ongoing pest monitoring (scouting) and proper identification, understanding the life cycles of potential pests and their interactions with the environment, using proactive cultural practices as the first line of defense to help prevent pests from becoming a threat (site-specific crop selection, crop rotation, plant quarantine, sanitation, etc.), enacting appropriate pest control measures based on an evaluation of need and their effectiveness and risk, continued monitoring of pest levels and evaluation of the effectiveness of the pest management strategies employed, and using additional or alternative pest control measures if needed. Less risky pest control measures that are effective are chosen first when action thresholds are exceeded, and pest control is needed. While controlling pests and the damage they cause is the primary objective of IPM, the pest control, damage prevention, and risk reduction goals of IPM are usually not absolute. With occasional exceptions, the intent is usually not the complete elimination of pests, damage, and risk, it is to keep pest populations and damage within acceptable levels and to minimize, not eliminate, the associated risks. When needed, potential IPM pest control options include mechanical controls (hand-picking insects, pulling weeds, barriers, traps, pruning, cultivation, etc.), biological controls (beneficial insects, biological pesticides, pheromones, sterile insect techniques, etc.), genetic resistance (plant breeding and selection, pest-resistant varieties), and chemical controls (the appropriate and targeted use of synthetic pesticides in strict compliance with the requirements developed by the US EPA and included on the pesticide label.

IPM Example for Common Buckthorn

Common Buckthorn *Rhamnus cathartica*

Since buckthorn is an ecological invasive species that is easily spread into natural and semi-natural areas in urban areas like Minneapolis, and when uncontrolled causes significant harm to habitat quality and quantity for songbirds, pollinators and other wildlife. When uncontrolled, it also affects water quality in our rivers by increasing soil erosion and increasing runoff. Control of common buckthorn in city park lands is a high priority. Other woody invasive plants are also of concern and measures will also be taken to reduce or eliminate their populations whenever possible.

Close and careful attention should be given to eliminating conditions that are conducive to buckthorn invasion. Healthy natural areas are better able to resist invasion by many invasive species, and all measures to restore and support natural processes in city natural areas should be used. Buckthorn seedlings grow slower and are less numerous when competing with a dense mixture of native plants working in a natural community.

Because buckthorn reproduces primarily by berries being carried by birds, minimizing the number of mature buckthorn trees that produce large quantities of berries will be critical to prevent the spread and re-infestation of restored areas. Areas with infestations of mature buckthorn will require intervention to prevent and reduce the number of berries being produced.

Example for light buckthorn infestation below the action threshold:

In areas with good habitat quality, and light buckthorn infestation, hand pulling by volunteers or contractors before the buckthorn is large enough to make berries is warranted.

Larger buckthorns that are too large for hand pulling or with a weed wrench or dense patches of buckthorn will need to be cut-and-stump treated (to minimize pesticide use) by a licensed pesticide applicator to minimize the risk of harming nearby desirable vegetation using the least toxic and most targeted herbicide possible.

Example of moderate buckthorn infestation above the action threshold, but below the injury threshold:

In areas with moderate to heavy infestations of buckthorn, where few desirable native species of plants are present. For example, areas that had mature buckthorn removed in past, and now have many resprouts, or areas that had some disturbance in the past which has eliminated native plant community. Action will be required to prevent buckthorn from reestablishing and spreading by new berries and interventions will be larger than what can be managed by volunteers and manual means.

list of options:

Forestry mowing, brush sawing… Fill this in

Area will be monitored and assessed before and after treatments for buckthorn density and native species recovery. If native target plant community is not showing signs of recovery, other interventions will need to be considered.

Example of heavy buckthorn infestation above the injury threshold:

In areas where buckthorn infestation is heavy and there is significant impacts to habitat and environmental quality, intensive measures to control will be required. Examples of significant buckthorn infestations include mature stands of buckthorn with little or no vegetation underneath besides buckthorn seedlings.

Intensive ecological restoration will be required.

Outline process of eliminating buckthorn. Monitoring reestablishment. What measures will be taken to restore native species. What process will be required to eliminate buckthorn trees and seedlings. What measures will be taken to educate the public about the process and interventions and how to protect the public and environment from the harms caused by the treatments.

Implementation of these pest control methods will require written consent of the Minneapolis park board (or their appointed responsible party).

**Note: Measures will be taken to notify the public and educate them to prevent their exposure to pesticides…