



Red Rocks Park

MANAGEMENT PLAN UPDATE - 2022



southburlington
RECREATION & PARKS

**City of South Burlington
Natural Area Management Plan Task Force**

**Red Rocks Park
Management Plan Update 2022**

Task Force Mission –

The City of South Burlington established the Natural Area Management Plan Task Force in 2019 to ensure that there was a group focused on creating and updating management plans that would ensure the long-term sustainability of any natural area property purchased by the City. Priorities include natural resource conservation, best management practices, and preservation for public use. The City recognizes the importance of having a management plan that considers internal capacity to fulfill management plan expectations and also meet the needs of the community, while ensuring the longevity of our protected natural area lands.

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Memorandum of Adoption

The Red Rocks Park Management Plan Update was administratively adopted by the City of South Burlington Recreation & Parks Department Director on _____.

Holly Rees, Director of Recreation & Parks

Date

Red Rocks Park Management Plan Update 2022

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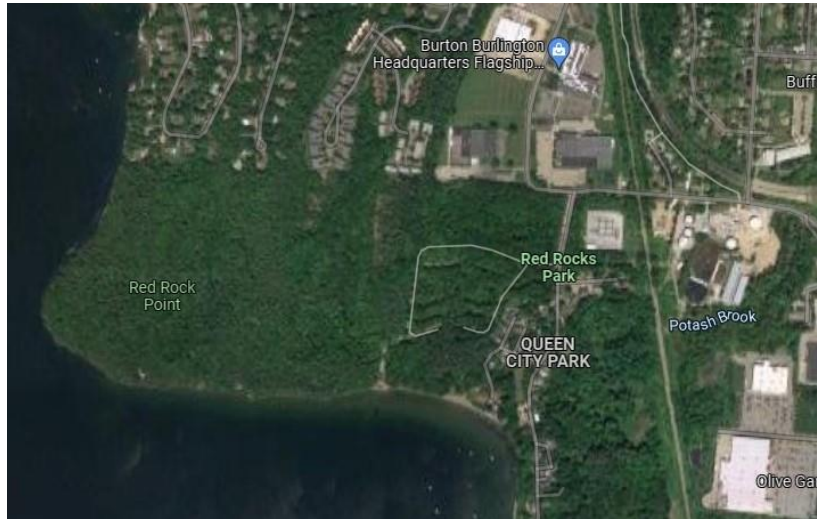
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Chapter 1. Introduction

A. Introduction & Scope of the Plan Update

Red Rocks Park is a well-loved 100-acre community park and natural area in the City of South Burlington, Vermont. It was purchased by the City in 1970, having formerly served as the Hatch Estate since the late 1800s. The roads and lookouts created by the Hatch family now provide walking trails through maple-ash-hickory-oak forest and cedars perched atop Monkton Quartzite cliffs. A City beach at the southeastern edge of the park provides 200 yards of waterfront access (the only public lake access in the City), and the Champlain Water District operates a pumping station at the western limit of the beach, along with two easements for their transmission lines.



Red Rocks occupies the westernmost corner of South Burlington, and is bordered by Lake Champlain to the south and west, Burlington to the north, and the Queen City Park neighborhood to the east. It is accessed by the public from Central Avenue. There are about 3.3 miles of trails throughout the park, including official trails and access roads, most based on the original carriage trail network that was constructed in 1891.

The park is operated by the City's Recreation & Parks Department, and is maintained by park staff from the City's Department of Public Works. A management plan was adopted for this park in 2014, and has been a guiding document for City staff to maintain the park. The overarching goals of the original plan included providing lists of best management practices, seasonal maintenance needs, and short-term and long-term management actions for maintaining and improving the ecological and recreational features of Red Rocks Park. It was also intended to be an evolving document that would require updates as new strategies and information arise.

Since the plan's initial adoption, park usage, maintenance needs, and staff capacity have changed. These factors helped drive the need for the City to take another look at the original management plan to evaluate it and determine whether it still provides the best management guidance for those charged with its implementation. As noted in the original management plan, there was a suggested revision after five years, so an evaluation was deemed appropriate and necessary.

This 2022 update includes a summary of current natural resource conditions, an overview of management actions implemented since 2014, a summary of survey results regarding public use and

valuation of the park and its resources, updated maps, and a tiered management approach to cover the next 10 years. In contrast to the 2014 management plan, this update will focus more on creating a suite of management options that address both natural resource conservation and recreation, while realizing there are limitations for implementation that will be guided by City and staff capacity over time. This update is also incorporating the experience of both City staff and state professionals in the field of conservation.

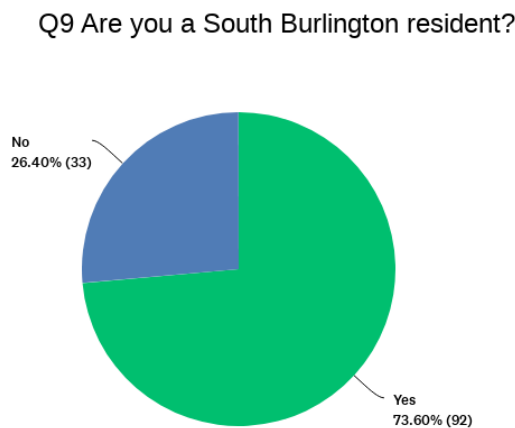
Vision for this management plan update:

Red Rocks Park is an important piece of South Burlington’s natural and cultural history. It is valued for its unique ecological connections and features, as well as the numerous recreational opportunities that are highly valued by the community. Therefore, it will be managed to provide high-quality visitor experiences without sacrificing conservation priorities.

To begin the work on this update, City staff worked to form a South Burlington Management Plan Task Force, that includes members of City staff, representatives from the Natural Resources & Conservation Committee, representatives from the Recreation & Parks Committee, and natural resources professionals at the state level. The Task Force initially kicked off in 2019, but was paused in 2020 when the COVID-19 pandemic began. The work began again in late 2020, and wrapped up in 2022.

B. Summary of Public Outreach

Public outreach was conducted to inform and consult citizens and stakeholders on the emerging management plan updates and recreational needs identified for the next ten years at Red Rocks Park.



In August 2019, the City’s Recreation & Parks Department released a survey to solicit feedback from park users to determine how Red Rocks Park is valued by users and to better understand how the park is used by visitors. City staff wanted to better understand current trends in park use so that updates to the maintenance and management tasks aligned. The goal in updating the plan was to create a document that took park use into account while also assessing staff capacity to complete necessary maintenance responsibilities.

The survey was available to anyone that wanted to take it, regardless of whether they had visited the park. It was an online survey, and links were shared via the City’s website, newsletters, Front Porch Forum, and all City Committees and City Council. Paper copies of the survey were also made available and distributed on-site during events and via volunteers.

During August 2019, there were two community hike events that were tailored to provide participants with natural resource information about the park. The first hike was led by Ethan Tapper, the Chittenden County Forester, and he shared information about forest ecology and management. The second was led by Eric Sorenson, an ecologist with the Vermont Department of Fish & Wildlife, and he spoke to participants about the many different natural plant communities that can be found at Red Rocks. At the end of each event, participants were asked to complete a paper copy of the survey.

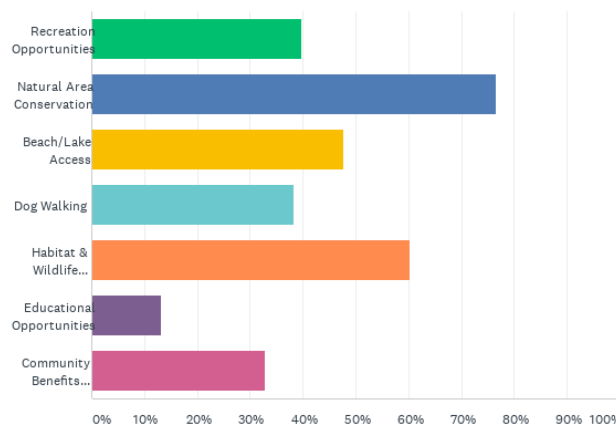
The survey ended up staying open for about a year as the COVID-19 pandemic entered in March of 2020 and it was decided to continue the survey of those coming into the park. Park usage increased during this time, and City staff wanted to try and take advantage of the potential for additional data collection. At the closing of the survey, staff had received a total of 129 completed paper or online survey forms. This information gathered so far has proven to be useful, but staff feels that additional data collection would be integral in fully understanding how many people use the park regularly and in what way. It has already been discussed that doing future park counts would provide valuable data that should be incorporated into plans like this to better determine future management and maintenance needs, especially as outdoor experiences have increased due to the pandemic. This data could also dictate future park rules and regulations as City staff become more aware as to some of the challenges facing the park. It is recommended that this survey approach be conducted at least biannually to update existing information, potentially in conjunction with other data collection methods. An overview of this round of survey results, including graphs depicting the data gathered, can be found in Appendix I.

Community Values Feedback

Summary –

- 74% of respondents were South Burlington residents.
- Visit frequency:
 - 33% of respondents visit the park 1+ days a week.
 - 26% of respondents visit the park 1+ days a month.
- How does the community value the park?
 - 75% of respondents value the ability to access nature the most.
 - Other top contenders included: Trails, Peace & Quiet, and Undeveloped Open Space.
- What aspects of the park are most important?
 - 77% of respondents feel that natural area conservation is most important to them.
 - Habitat & Wildlife Connectivity was the next highest.
- Non-recreational benefits of the park:
 - 77% indicated wildlife habitat was a benefit.
 - 68% noted the lake; 66% find the park benefits their mental wellness.

Q2 Why is Red Rocks Park important to you?



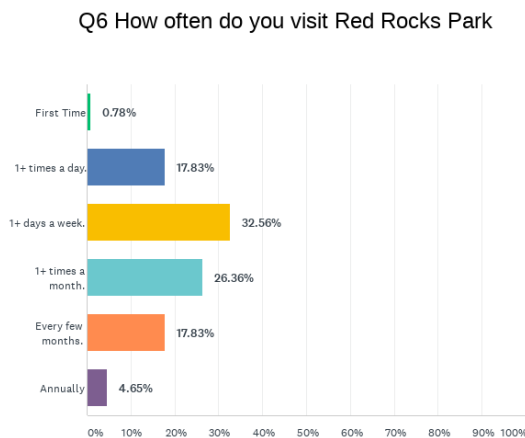
- Favorite Park Uses:
 - Overwhelming 88% of users hike during their visit.
 - 42% walk their dogs; 40% go swimming.
 - 38% use the park to meditate.

Community Perception of Park Health & Management Feedback Summary –

- Are the park natural communities healthy?
 - 44% of respondents felt the park was mostly healthy, but 30% did not know.
- What management actions would you like to see?
 - About 64% of respondents would like to see more trail maintenance.
 - Invasive plant removal and erosion control both received the next highest totals.

In reviewing this data, some important trends can be noted. Natural Area Conservation is valued more than recreation at Red Rocks Park. Visits to the park are high, and staff recommends doing more counts to better document the actual number of visitors. Most of those that took this survey were South Burlington residents, but staff is aware that the actual number of non-residents coming to the park is also on the high side. This is another reason why doing further counts is important. Having a high number of non-residents visiting the park may mean that the City needs to expand its outreach and communication about park rules and management expectations, possibly working with other municipalities to standardize language related to many land management issues in natural area parks.

It was clear that the park is popular to many different kinds of recreational activity, and really varies according to the user. Based on these results, staff should be aware that hiking is the primary function of the park, with dog walking and swimming following close behind. These are all fairly impactful uses and bring different types of users to the park. Any potential impacts from these uses should be considered in this update to the management plan, as well as note that trail maintenance should be a priority every year to match the amount of and type of use the trails in this park get.



Many of the management concerns identified through this survey did pair well with the higher rated park uses. Park visitors wanted management to focus on trail maintenance, erosion, and invasive plants; and the plan update should incorporate these items based on how the uses identified through the survey connect the two. Based on issues that have been ongoing in the park for years, there is no question that many of the issues along the park’s trails and erosion throughout are the result of use and activity, and the plan should look to identify

strategies that give the City the ability to be more proactive in its management and maintenance activities there.

Other items worth noting were issues associated with dogs in the park. At least 10 respondents added comments related to off-leash dogs being a problem, and that dog waste in the park is a problem. The City is aware of these issues, and there is a Common Areas for Dogs Committee that has been established to address them. This plan update should also consider incorporating potential tasks to help address this ongoing problem.

City staff want to continue tracking these trends to monitor changes in use and impacts resulting from those uses. This is especially important as COVID-19 led to a dramatic increase in park usage, and City staff capacity decreased during this time. As stated earlier, City staff have an interest in doing regular park counts to get a better sense of the number of people using the park. It will also be a good idea to consider additional surveys in the future to track changes in use or impacts to the park's conserved natural resources.

Chapter 2. Natural Resource Stewardship

A. General Existing Conditions & Natural Communities Assessment

The first natural resource assessment done for Red Rocks Park was completed in April 2013. It was intended to serve as a guiding framework for making informed management decisions; and it was written for park managers, park users, and the present and future stewards of the park.

This assessment explored the park's land history, its geology, soils, hydrology, natural communities, and wildlife. It also went into management concerns for the park, which then served as the framework for the existing management plan document. The natural resources assessment was a great first step in identifying all of the natural resource assets within Red Rocks, but staff have identified a need to do a more current assessment to really understand what resources are on-site, where those resources might be, potential management concerns and considerations for these resources, and collect



updated resource maps. It has been noted that portions of the proposed assessment update may be included in this management plan update document, so that anyone using this document to manage or maintain the park have access to new information. It is also being suggested that the original assessment be attached to the existing management plan and any future updates for reference by park managers.

The [final version of the original assessment](#) can be found on the City's Recreation & Park's website under the Red Rocks Park tab.

The Natural Communities map from the 2013 assessment (Appendix II) continues to be the best source of information regarding existing plant communities and habitats found at Red Rocks. The City

coordinated this update with Eric Sorenson, an Ecologist with the State Department of Fish & Wildlife, to ensure that information related to these natural communities is accurate and up-to-date. This includes any potential management strategies that should be considered for implementation to maintain the health of all plant communities at Red Rocks. A valuable resource for future managers is the book, *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont* (Thompson & Sorenson, 2005), and any future variations or updates to this copy. It describes all of the named natural communities in the state, and provides guidance for management of these communities. It is a helpful tool for any land manager looking to understand what plant communities exist on a site.

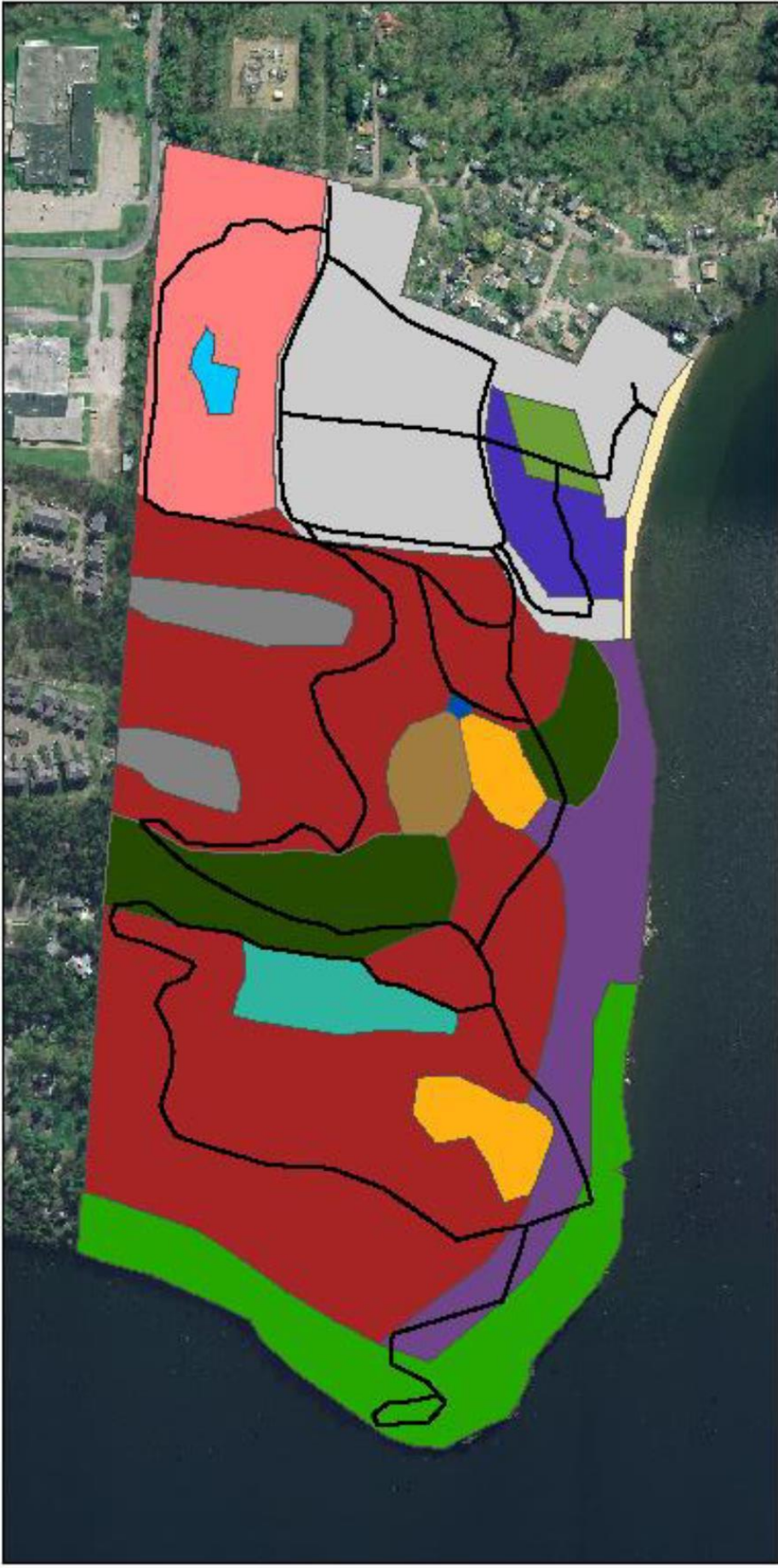
Table 2.1: Natural Communities Identified at Red Rocks and Management Considerations

Natural Community Identified	Management Considerations
Dry Oak-Hickory-Hophornbeam Forest	Limited in extent. Occurs upslope of the cliffside limestone bluffs.
Hemlock Forest	Dominates in areas with shallow soils and a steep cliff. Creates dark forest with few flowering plants.
Hemlock-White Pine-Northern Hardwood Forest	Dominates in areas with shallow soils and a steep cliff. Creates dark forest with few flowering plants.
Lake Sand Beach/Lake Cobble Beach	The public sand beach has been maintained by supply of sediment from the mouth of Potash Brook and also human additions of sand.
Limestone Bluff Cedar-Pine Forest	Rare plant community, and state-significant natural community (S2). Many existing cedars may be centuries old. Little to no soil. Receives significant foot traffic due to location of cliffs which results in social trails, vegetation trampling, littering, and invasive plants.
Temperate Calcareous Cliff	Occurs on the cliffs (where slopes exceed 60-degrees).
Mesic Maple-Ash-Hickory-Oak Forest	The most common plant community in the park.
Pine Plantation	Found in the picnic grove area of the park. Trees are old and very tall.
Red Maple-Black Ash Swamp	Located in an area that is inundated seasonally. Originally cleared for agriculture. Now includes early successional species. Highly impacted by invasive shrubs.
Seep	Frequently floods adjacent trail. Clear of trees and shrubs.
Temperate Calcareous Outcrop	Sparsely vegetated openings where bedrock is exposed.
Transition Hardwood Limestone Forest	Rare plant community. Occurs near the cliff edges where the bedrock is closer to the soil surface. Good for spring ephemerals.
Vernal Pool	Temporary pools that provide breeding habitat for frogs and salamanders.
Wet Clayplain Forest	Wetland area that likely contains vernal pools. Pre-clearing and agricultural use, area was likely forested.
White Pine-Northern Hardwood Forest	Located west of the pine plantation and picnic grove. Dominated by maple and pine. May be present due to past use of site.

It is important to understand which plant communities exist at Red Rocks so that managers can better understand what management strategies will best support both plant and animal communities into the future. In addition to the work done for this update, managers should look to assess regeneration that is happening within each community to also gauge what amount of management might be needed. The

strategies below have been provided without this insight. It is also important to take note of the Source Protection Plan for South Burlington Fire District #1 (Appendix IX). This is the source of drinking water for the adjacent Queen City Park neighborhood, and it's important for managers to be aware of it and the potential impact of future management decisions to that drinking water supply.

To the extent practicable, managers should work to incorporate strategies that support resource conservation and compliment both the need to protect rare resources but also allow for the continued use of the park. This work could follow a tiered approach that would allow managers to adjust management strategies based on capacity and availability of resources. This could resemble a hierarchy of approaches ranking from optimal to bare minimum. The optimal approach (Tier 1) would include strategies that would require the greatest amount of resources and staff capacity, while the bare minimum (Tier 3) would require the least amount of resources. Any management strategy that is considered should not negatively impact any of the existing rare and unique plant communities found in the park, and an outreach and engagement strategy should be developed to communicate the value and importance of these communities and the management of them to park users. Here are some initial strategies to consider with the natural communities listed in Table 2.1.



Natural Communities of Red Rocks Park

- Developed Area
- Dry Oak-Hickory-Hophornbeam Forest
- Hemlock Forest
- Hemlock-White Pine-Northern Hardwood Forest
- Lake Sand Beach/Lake Cobble Beach
- Limestone Bluff Cedar-Pine Forest
- Mesic Maple-Ash-Hickory-Oak Forest
- Pine Plantation

- Red Maple-Black Ash Swamp
- Seep
- Temperate Calcareous Outcrop
- Transition Hardwood Limestone Forest
- Vernal Pool
- Wet Clayplain Forest
- White Pine-Northern Hardwood Forest
- Main trails



South Burlington, VT
 Map created by Sophie Mazowita, UVM
 for South Burlington Recreation & Parks
 February 2013
 Data: VCGI, Local Motion

Dry Oak-Hickory-Hophornbeam Forest –

As described in the 2013 assessment, this is a limited plant community and exists as an open forest with sparse shrubs and a domination by sedges. It does occur upslope of the sensitive limestone bluffs, so management strategies should take that into consideration.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Regeneration and Sustainability	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: Due to the location of this community, any invasive plant removal should focus on efforts that disturb surrounding soils less and maintains root structures to prevent additional erosion. If there are trails located in this zone, it is recommended that the existing tread should be maintained, prevent social trails from forming, consider trail closures if social trails persist (especially towards the area of the cliffs), and work with a trail professional if existing trails need to be rerouted.

Hemlock Forest –

This plant community is scattered through other community types in the park, but the 2013 assessment does indicate that it dominates in two areas. These areas have shallow soils and a steep cliff, which indicates that management considerations should be sensitive to the importance of root structures in preventing erosion.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Regeneration and Sustainability	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: Since the location of this plant community is in an area with shallow soils and a steep cliff, care should be taken prevent soil disturbance during any management activity. Invasive plant management should focus on techniques that maintain some root structure to prevent erosion. Maintaining trail corridors and preventing creation of additional social trails should also be an important consideration. When looking to create a forest management plan for hemlock forest, one should consider long-term successional trends, and keep an eye on the hemlock woolly adelgid, a non-native insect pest that threatens these forests.

Hemlock-White Pine-Northern Hardwood Forest –

The 2013 Ecological Assessment only noted one small patch of this forest type at the park. It is also found in an area with shallow soils and a steep cliff, so management considerations should be similar to those recommended for the hemlock forest community.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Regeneration and Sustainability	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: As with the hemlock forest, any forest management plan should take into consideration the long-term ecological trends of the site, as well as limitations related to the steepness of the landscape and shallow soils. Any invasive plant removal work should also be aware of these concerns and make an effort to utilize techniques that maintain root structure to prevent erosion. Maintaining trail corridors and preventing the creation of additional social trails should also be an important consideration.

Lake Sand Beach/Lake Cobble Beach –



The beach area is specific to the southern edge of the park along the lake. This is a heavily used section of the park, as it has been consistently managed for recreational users. Every season, the Red Rocks Park Rangers clean and rake the beach to remove debris. Buoys are also placed out in the water to mark the public swimming area.

Management Recommendations:		
Tier 1	Beach Management Plan focused on Sustainable Recreation & Erosion Prevention	15K
Tier 2	Prevention of Social Trails leading to/from the Beach	7K
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: This location will need to take recreational use into consideration for any management action. Management actions should incorporate education and outreach to users regarding the importance of staying on beach access trails and not creating social trails. This work could include the following: utilizing the Red Rocks Park Rangers as advocates when out in the park during the summer months, implementing the Volunteer Stewardship Program and empowering the volunteers to engage with users, and considering additional signage (as a last resort). Wherever possible, invasive beach vegetation should be discouraged, and if hotspots are identified, set up zones for the public to avoid and consider those restoration areas. This work could be done in collaboration with the Vermont Department of Fish & Wildlife. In terms of future additions of beach sand, management could look at whether additional deposits of sand are necessary in order to promote a more natural approach to maintenance of the public beach.

In addition, staff could consider monitoring and managing the lake for zebra mussels. This may require more specialized staff or partnership with a state entity to implement.

Limestone Bluff Cedar-Pine Forest –

This forest wraps around the entire eastern portion of the park. Since it is an incredible rare habitat, care should be taken in deciding what management actions to take, and continued education and outreach is important to prevent continued disturbance from users.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer.	No Cost – 7K
Tier 2	Invasive Plant Management	7K
Tier 3	Minimize cutting of the cedar trees and allow natural process to occur undisturbed.	No Cost

Management Notes: A hands-off approach should be taken with this forest community. All efforts should be focused on maintaining what’s there, while also incorporating any existing allowed uses (i.e.: trails and overlooks). Cedars regenerate well on their own, so efforts don’t need to focus on sustaining this community. Plans should focus more on overlook maintenance that allows for the cedars to grow and exist with minimal cutting and no topping. Invasive plant management should be a focus, and outreach will be important to prevent users from accessing the cliffs via the land and water, and then damaging habitat.



Temperate Calcareous Cliff –

This habitat is not called out in the 2013 assessment map, but it is found adjacent to the limestone bluffs. This area is also potentially prone to impacts from users that ignore the signage warning of fines for accessing the cliff area.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer.	No Cost – 7K
Tier 2	Education & Outreach Campaign: Leave No Trace, Do not Climb, Take only Pictures	10K – 50K
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: This is a sensitive and easily disturbed ecosystem, and should be left as-is. More effort should be put into educating the public about the importance of staying off the cliffs to protect the rare plants found there and the wildlife that uses it (i.e.: peregrine falcons).

Mesic Maple-Ash-Hickory-Oak Forest –

It is the most common natural community found in the park, and is widespread throughout it. The canopy is a mixture of maples and beech, alongside oaks and hickories. The Dry Oak-Hickory-Hophornbeam forest is the closest relative to this community.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Regeneration and Sustainability	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost



Management Notes: The management focus here should be on invasive plant management and trail maintenance to promote a healthy ecosystem. Invasive plant management techniques should also focus on the prevention of soil erosion, and social trails should be discouraged. As the two examples of the dry oak-hickory-hophornbeam forest are found interspersed with this community, it is likely that natural succession may lean towards allowing for more of that forest type to take hold.

Pine Plantation –

This is a community noted on the 2013 assessment map of the park. There is not a description of this plant community in the book, *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont* (Thompson & Sorenson, 2005). As such, the following recommendations are based on existing knowledge of the area, including its use.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer and monitoring trees for the safety of park users.	No Cost – 7K
Tier 2	Education & Outreach Campaign: Leave No Trace, Take only Pictures	10K – 50K
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: This community appears to run across the picnic grove section of the park. It is important to monitor the health of these tall, old pines for the health and safety of park users. As the trees age, they could pose hazards to trails, picnic areas, and adjacent homes. There does not appear to be a need to manage this area for habitat as it is used by the public, but trails should be maintained to prevent future erosion, which leads down to the beach and the lake.

Red Maple-Black Ash Swamp –

This area was historically cleared for agriculture, but now has early successional species dominating. It is seasonally inundated, includes the location of a vernal pool, and is heavily impacted by invasive shrubs.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Regeneration and Sustainability	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: Given the location of this community being in a seasonally inundated region of the park, any management activity should be mindful of potential impacts to these wet areas and timed to occur in drier or colder times of the year. Maintenance of all trails in this area will be important to prevent future erosion and social trails. Invasive plant management will give this community a chance to regenerate naturally, but it should be done with techniques that prevent erosion.

Seep –

There is one known location of a seep in the park. It frequently floods the nearby trail.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer.	No Cost – 7K
Tier 2	Trail Maintenance	7K – 10K
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: Management decisions should take into consideration that the landscape surrounding the seep will continuously be inundated, even in colder months of the year, and machinery moving through this area should be kept to a minimum. Trail maintenance should be the highest priority here, as the user experience is already affected by the presence of the seep. It might be worthwhile to see if it might be possible to move the trail at this location or provide a crossing that would keep users out of the mud. This would also assist in preventing the creation of social trails during the wet periods. Maintenance of a forested buffer will be important, and the state recommends at least 100 feet of forest buffer around the seep with no logging and only selective thinning within it. If this type of management is selected, a clear communications plan relaying the objectives and benefits should be developed and shared with the public.

Temperate Calcareous Outcrop –

Sparsely vegetated opening where bedrock is exposed in the park.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer.	No Cost – 7K
Tier 2	Education & Outreach Campaign: Leave No Trace, Do not Climb, Take only Pictures	10K – 50K
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: This is a sensitive and easily disturbed ecosystem, and should be left as-is. More effort should be put into educating the public about the importance of staying off the exposed bedrock to protect the rare plants found there and the wildlife that uses it. Trail maintenance may be necessary to help prevent the creation of social trails that are directed at the exploration of the bedrock.

Transition Hardwood Limestone Forest –

This is a rare plant community that occurs near the cliff edges where the bedrock is calcareous and closer to the soil surface. It is well known for its wealth of spring wildflowers.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer.	No Cost – 7K
Tier 2	Invasive Plant Removal	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: A hands-off approach should be taken with this forest community. All efforts should be focused on maintaining what’s there, while also incorporating any existing allowed uses (i.e.: trails and overlooks). Invasive plant management should be a focus, and outreach will be important to prevent users from accessing the cliffs and damaging habitat.



Vernal Pool –

The 2013 assessment indicates that vernal pools can be found in the red maple swamp and wet clayplain forest. These pools form in depressions that can fill with water during the spring and fall. They can provide breeding habitat for frogs and salamanders. The park had a wetland delineation completed in 2020 as part of trail and stormwater work being done. This identified several wetlands that were mapped and officially recognized by the state of Vermont (Appendix III). While these wetlands weren’t officially labeled as vernal pools, it is highly likely that they act similarly and should be managed appropriately.

Management Recommendations:		
Tier 1	Maintaining a natural forest buffer (see below for specific buffer recommendations)	No Cost – 7K
Tier 2	Invasive Plant Removal (when seasonally appropriate)	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: Vernal pools are very sensitive ecosystems and can easily be disrupted by any activity that alters the hydrology and substrate of the pools, as well as any significant alteration of the surrounding forest. The state recommends that there be no activity within the vernal pool depression or the adjacent 50 feet. State experts also recommend that from 50 feet to a distance of at least 200

feet from the edge of the pool, and preferably 500 feet, there should only be light, selective cutting conducted when the ground is frozen and covered with snow. The focus should be on ensuring all trails go around these spaces, and that all social trails be discouraged. Invasive plant removal in the vicinity of any vernal pool should only take place during the winter months.

Wet Clayplain Forest –

There is likely a vernal pool located within this community at the park. This community is classified as wetland and was officially noted as such during a wetland delineation completed for the City in 2020. Prior to clearing and agricultural use of the site, this area was likely the site of a clayplain forest of pine and oak trees on fine clay soils. Typically has wet soils which causes the trees to have shallow roots that can be easily blown over during high wind events. Tip-up mounds are a common site in these communities.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Regeneration and Sustainability	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

Management Notes: Given the location of this community being in a seasonally inundated region of the park, any management activity should be mindful of potential impacts to these wet areas and timed to occur in drier or colder times of the year. Maintenance of all trails in this area will be important to prevent future erosion and social trails. Invasive plant management will give this community a chance to regenerate naturally, but it should be done with techniques that prevent erosion.

White Pine-Northern Hardwood Forest –

This community was identified west of the pine plantation in the 2013 park assessment. The state notes that they no longer recognize this specific community because white pine is usually present in Northern Hardwood Forests as a result of past disturbance. The plant community at the park is dominated by maple and pine trees.

Management Recommendations:		
Tier 1	Forest Management Plan focused on Evaluation and Monitoring	10K for a plan
Tier 2	Invasive Plant Management and/or trail maintenance as needed.	7K annually
Tier 3	Allow natural process to occur undisturbed.	No Cost

A consideration for management of this plant community should be to monitor it over time and determine whether white pine is likely to persist or not. This could be done during the creation of a forest management plan, and by looking at the soils and determining whether pine is regenerating in

the understory on its own. Another key component is continuing the management of invasive plants here, which would also assist in better understanding the regeneration happening in the understory. Managers should consider removing this plant community from the list, or updating its status, after determining what it actually is.

B. Physical Resources

1. Update on Actions Taken & Current Conditions

The physical resources of Red Rocks Park were identified in the 2013 assessment, but not addressed individually in the 2014 management plan. Below, each physical resource is noted with an update on current management actions

Geology

The City revised and updated its Conduct in Parks Ordinance since the original management plan was written. The new ordinance was adopted on March 18, 2019 (Appendix IV). This revised ordinance includes language that gives the Director of Recreation and Parks the authority to close any area of any park to the public for any interval of time.

Conduct in Parks Ordinance, Section 13:

Any area of any Park may be declared closed to the public by the Director of Recreation and Parks at any time for any interval of times. When so closed, the Director shall cause notice to be posted at the entrances to said Park and at the closed area so as to notify the public that the area of the Park is closed. A person shall not enter, pass through, or remain in the closed area of any Park except with the written permission of the Director.

Shortly after this ordinance went into effect, the Director issued notices that the cliff area was closed for access, and specifically no jumping or diving off the cliffs is allowed. This was in response to issues around health and safety of users choosing to jump off the cliffs at Red Rocks, as well as the need to better protect the sensitive habitat found on the cliffs.

In addition to the cliff specific signage, the Director also issued notice that certain areas near the cliffs were closed for restoration purposes. Areas with these signs also include the sensitive habitat found along the cliffs and within the limestone bluff-cedar pine forest plant community.

Fines posted on both closure signs are \$600 for users not abiding by the notice. To-date, enforcement of these closures has been and continues to be a problem for City staff, with the South Burlington Police Department being the only City entity deputized to enforce the ordinance. Police staffing resources are limited, but there is a placeholder for a seasonal, part-time police staff to monitor and patrol City parks for FY23.



Soils

Soil erosion was a focus of the last management plan since the park has areas of shallow soils or slopes greater than 20%. Many of the projects utilizing Open Space Project funds are focused on trail improvements that will decrease opportunities for soil erosion along trails and down slopes. These projects are also looking at incorporating stormwater facilities that will manage stormwater that comes from the park. These projects are currently in design and permitting, with implementation expected in 2022/2023.

Invasive plant management has also been ongoing since the creation of the last management plan. It's worth noting that the removal technique utilized incorporates leaving root stock in the ground, especially in areas with little soil. This helps hold soil in place while also killing the undesirable vegetation.



Hydrology

The 2013 assessment noted that a full wetland delineation should be completed to accurately identify and locate wetlands at the park. This was completed in 2020, and included the identification of five Class 2 wetlands and three Class 3 wetlands (Appendix III). The wetlands were confirmed by the Vermont Agency of Natural Resources, and they should be considered when thinking about project needs in the park.

There is also an increased focus on managing dog waste that is left in the park. This includes additional signage related to the City Conduct in Parks Ordinance, as well as volunteer events focused on the removal of dog waste. The revised Conduct in Parks Ordinance also states the following:

Conduct in Parks Ordinance, Section 9(f):

All dogs must be leashed on a maximum 6' leash. Dog feces shall be removed From the Recreation Path and the right-of-way by the person responsible for the dog.

These efforts are all aimed at improving the water quality that drains into Lake Champlain, which is a priority for the City and other municipalities in the region.

2. Recommended 10-year Actions for Physical Resources

Future management should focus on protecting the cliffs and the habitats that surround them, as they are the most unique and sensitive ecosystems found at the park and around South Burlington. This would include continued messaging and outreach to users around the closure of the cliff area, and any adjacent restoration area, to users in order to protect the habitat and allow for use of the habitat by wildlife, including Peregrine Falcons. It may be useful to consider additional restrictions in the Conduct in Parks Ordinance to specifically call for better protection of these sensitive spaces. Work will continue on improving erosion in the park to protect existing soils and water quality in the lake. Additional effort should be considered for increased public engagement around dog waste and impacts to water quality. Recommendations include additional bag dispensers so at least dog waste is bagged. Perhaps one could go at the entrance, while another one could go where the main trails start.



Sophie Mazowita - 2018

C. Trails

1. Update on Actions Taken & Current Conditions

The original management plan noted several areas of concern throughout the Red Rocks Park trail network. This included noting wet areas and areas experiencing erosion. It also mentioned the network of unofficial trails in the park and the impacts these social trails have on the ecosystem there. The plan included a map showing the distance from any point in the park to the nearest trail (the farthest being 300 feet), and how this small distance can affect wildlife within the park. Goals for management included: minimizing disturbance to soils, vegetation, and wildlife; provide an enjoyable and safe trail network for all users; and make clear which trails are open for use and which trails are not.

Since the management plan was finalized, the City has completed a new wayfinding package for the park which includes all park signage (from kiosks to interpretive signs to trail directional signage). Staff have also installed signs in areas of closure for restoration, natural resource protection, or safety. These signs have improved user experience, but there is still a significant inventory of social trails in use, including those in the areas of natural resource significance.



Annually, the trails have problems managing large amounts of rain when storm events pass through the park. Erosion is a major problem, and will likely continue to be a problem given the terrain. There are Open Space Projects in the works that include improvements to trails that have experienced a large amount of erosion. These projects have been delayed due to permitting requirements, but staff expects implementation on these to occur in 2022 and 2023. Once completed, the trail network will once again be in 'like new' condition. These trail projects also consider closure to various social trails, or reroutes to avoid sensitive areas.

2. Recommended 10-year Actions for Trails

Future trail management recommendations are not that different than what the original management plan covers. There should be a prioritization for monitoring visits, at least bi-annually, to assess trail conditions, document imminent

needs, and evaluate success of social trail closures. These monitoring visits could be conducted by staff, a consultant, or volunteers.

Maintenance of the trail network should be an annual budget item to include any needs that arise in the given fiscal year. Any related tasks could be completed by staff, a consultant, and perhaps volunteers. Once the trail projects in process are completed, maintenance should become the priority to ensure erosion doesn't again become a problem.

Consider additional restrictions to the park ordinance pending continued use of the cliffs for jumping. During the COVID pandemic, the park saw increased use and more users were accessing the cliffs than normal. This increased use did affect the rare habitat there, as well as the ability of the nesting Peregrine Falcons to have young. If continued use of the cliffs affects wildlife use and quality of the habitat along the cliff, additional measures may need to be taken. This could also include other means of closing social trails to users. Current social trail closure strategies have included signage and the use of vegetation and debris to block passage. Staff should continue to assess the success of these methods, and consider other means of closing social trails, whether that's through repeated communications or the use of some type of fencing.

D. Forest Health & Wildlife Management

1. Update on Actions Taken & Current Conditions

Forest and wildlife management goals include creating a healthy ecosystem that provides for a diversity of wildlife species, and to protect the park's rare flora, fauna, and their natural communities. The original management plan focused on managing the forest passively, leaving it in an as-is condition. Trees are to be felled only if they pose a threat to park users (i.e.: snags hanging over a trail).

Consideration was given to ensure that there is regeneration occurring in the understory. There was some discussion that perhaps additional measures could be taken pending public buy-in. Overall, not much has been done since this plan was written. There has been some invasive plant management work to improve the biodiversity in the forest and allow for long-term sustainability of the existing ecosystems. When trees are felled, there is an effort to leave debris in the



park to provide additional habitat. However, that has not always been possible, thereby leading to disagreements between the public and City staff on management considerations for the park. Ultimately, City staff are responsible for management decisions related to the park, and will do the best they can to incorporate recommendations and best practices into those decisions.

2. Recommended 10-year Actions for Forest Health & Wildlife Management

By far the biggest threat to the health of ecosystems at Red Rocks is the presence of invasive exotic plants. These plants, including common buckthorn (*Rhamnus cathartica*) and shrub honeysuckle (*Lonicera spp.*), are a major threat to biodiversity, the health and viability of Red Rocks' natural communities and wildlife, and the natural processes that govern them. Unless these plants are actively and aggressively managed, they will only become worse – and more difficult and costly to manage – over time. Mechanical treatment methods are currently being used to control invasive plants at Red Rocks. The targeted use of herbicide as part of an integrated and adaptive pest management approach is employed by most conservation organizations in the State, and maybe necessary to meaningfully address this problem in the long-term.

In addition to prioritizing the management of invasive plants, there could be opportunities to manage sections of the park actively, to improve wildlife habitat, forest health, diversity, complexity and resilience, and to demonstrate responsible forest management. If the City chooses to prioritize this effort, it is recommended that a detailed Forest Management Plan be developed before any forest management occurs. One of the considerations could be to differentiating sections of the park and identifying locations that are better for leaving downed trees and other debris. For example, the eastern end of the park with the larger access roads may be better suited for removal of debris to keep the access roads clear for emergency vehicles.

Additional management needs include monitoring of forest health, forest regeneration, and signs of non-native insects (including: Emerald Ash Borer, Asian Longhorned Beetle, and Hemlock Woolly Adelgid). This is another opportunity to work with volunteers and other experts in the field.

Future wildlife management considerations include the installation of several wildlife cameras in the park to document animals that use the park. These images could also be shared with the public to increase awareness and engagement associated with the park and the City's natural resources in general. The City would also benefit from prioritizing monitoring of different wildlife, including birds. This could be done utilizing volunteers or local college students.

E. Invasive Plants

1. Update on Actions Taken & Current Conditions

Since the management plan was drafted, the City has taken a more proactive approach to the management of invasive plants found in the park. A lot of this work also includes educating the public on why invasive plants are a problem and the various techniques one can use to remove them. As a starter, the City recognizes the following definitions of invasive species and invasive exotic plants:



Invasive Removal Complete Rt of Red Line

Invasive Species –

Invasive species are plants, animals, and other organisms that are introduced to a non-native ecosystem and also cause harm to the environment, economy, or human health.

Invasive Exotic Plants –

Invasive exotic plants are non-native plants that invade and alter both natural and managed areas. When invasive, exotic plants reach new areas where they are free from their natural predators and persist and proliferate to the detriment of native plants and animals. It's

important to remember that not all non-native plants are invasive and not all invasive plants are non-native.

In addition to these definitions, the City has also acknowledged the following additional impacts invasive plants can have:

- Their presence can change the way natural systems look and function, by disrupting forest succession, species composition, water absorption and circulation, and nutrient cycling.
- They can change the composition of native ecosystems because native plants and wildlife may not have evolved defense mechanisms against the invader, and the native species may not be able to compete for needed resources.
- They can prey on native species.
- Some can carry disease that can impact the local ecosystem.
- Invasive species can prevent native species from reproducing or killing their young.
- New research is also suggesting that invasive species can be harmful to human health.

In addition to these reasons for managing invasive plants, it is important to remember that it should also be considered a public safety measure, as well as a biodiversity management strategy. In many cases,

invasive plants (like bittersweet) have the ability to weaken trees and create hazardous situations for users of the park. By targeting those plants listed in the isolated occurrences/early detection category, the City can save on the resources (i.e.: time and money) needed to manage them once they get out of control and begin to damage habitat or affect the park user experience.

Since 2018, the City has invested resources in bringing on a professional consultant that focuses on invasive plant management. This consultant has determined a seasonal strategy for targeting and removing invasive plants at the park. The current strategy involves the physical removal and cutting of plants. The City currently does not use herbicide as part of this approach, but instead places more emphasis on long-term monitoring and maintenance.

In 2019, the City implemented its Weed Warrior Program in the park. It is a program focused on engaging residents and other interested volunteers in the process of removing invasive plants found at the park. Interested volunteers participate in a training led by the City's invasive plant consultant, where they learn how to identify and remove the invasive plants found in the park. The long-term goal of the program is to create a corps of volunteers that can help the City manage the impact invasive plants have on City parks, as the City does not have the capacity to do this work on its own.



During the growing season, there is usually one or two City-sponsored Weed Warrior events at the park. Those participants that have completed the training and are interested in doing additional work in the park, are allowed to go back and continue removing invasive plants. These individuals generally connect with the City staff or the City's consultant to discuss locations for removal, report work that was completed, and to complete any waivers necessary for working in the City's parks.

There have been changes to resources and partnerships available to assist in this effort. For example, the state created a website dedicated to providing Vermonters with information on invasive insects, plants, and pathogens. It provides information on how one can become involved in various monitoring, management, and outreach efforts. The website is a joint effort between the University of Vermont Extension, the Vermont Department of Forests, Parks & Recreation, the Vermont Department of Environmental Conservation and the Vermont Chapter of The Nature Conservancy. The website is: www.vtinvasives.org.

Another great partner to consider is Audubon Vermont. They have been engaging with landowners in invasive plant removal as a means of habitat restoration with the US Fish & Wildlife to promote various bird species. The City has worked with them at Wheeler Nature Park on habitat management there.

Table 1. Invasive species inventory TYPE 1 – Widespread Species Requiring Long-Term Removal Efforts	Location and Abundance	Management Update (2021)
Common and Glossy Buckthorn <i>Rhamnus cathartica</i> and <i>Frangula alnus</i>	Dominant understory shrub in parts of the limestone bluff cedar-pine community (particularly the cliff jumping area), the parking areas, the northeast corner of the park, and recently disturbed areas (e.g. windthrow gaps). Scattered patches and trees throughout the rest of the forest; absent only from heavily shaded areas, e.g. dense hemlock and cedar growth.	Buckthorn removal has been a focus over the last two seasons. Consistent removal and cutting has led to a decrease in population and regrowth. Continued management and monitoring is needed.
Shrub Honeysuckles <i>Lonicera sp.</i>	Small to large patches of variable density found throughout park, often alongside buckthorns (though less common). Particularly concentrated toward the east side of the park and along the southern lakeside trail to the main overlook points.	No 2021 Update
Japanese Barberry <i>Berberis thunbergii</i>	Individual plants and small patches found at low density throughout park.	Minor infestation. Acting aggressively to eradicate through physical removal and cutting. Seed production has been broken over the last two seasons. As of 2020, this species is considered more of an early detection species.
TYPE 2 – Isolated Occurrences and Early Detections	Location and Abundance	Management Update (2021)
Burning Bush or Winged Euonymus <i>Eunonymus alatus</i>	Isolated plants along the entrance road and lakeside trail, with several plants concentrated along the far western (“turnabout”) overlook trail.	Minor infestation. Acting aggressively to eradicate through physical removal and cutting. Seed production has been broken over the last two seasons. Mostly under control.
Norway Maple <i>Acer platanoides</i>	Scattered trees near the park entrance, along both sides of entry road, and near the high point of the E loop trail. Other scattered undetected infestations likely.	No 2021 Update
Periwinkle <i>Vinca minor</i>	Isolated dense patches at the top end of the western loop trail, encroaching in from nearby houses. Growing in thick mats.	No 2021 Update
Asiatic or Oriental Bittersweet <i>Celastrus orbiculatus</i>	Isolated patches and individual plants throughout park, at low density.	Lots of new growth and new seedlings. Initial removal started via physical and mechanical means. Seed production has been broken over the last two seasons. There are 12 early detection locations in the park. Future management is recommended as bittersweet

		does pose a public safety threat as a result of the stress it puts on trees in the park.
Garlic Mustard <i>Alliaria petiolata</i>	Expanding patch near the southeast corner of the parking loop road, towards the beach and Queen City Park (QCP); removed in 2013 but found even more widespread in 2014. There was a robust population found just beyond the eastern border of the park, along the road in QCP, which could be the source. A second, isolated patch growing near the park entrance, to the north of the road just beyond the entry kiosk, was removed in 2013. There was no sign of return in 2014.	Minor infestation. Acting aggressively to eradicate through physical removal. Seed production has been broken over the last two seasons. Mostly under control in one location. Some spread coming from Queen City Park.
Purple Loosestrife <i>Lythrum salicaria</i>	Several isolated plants and patches along the shoreline, including the beach area by CWD and shallows to the west, plus around the point and north of the western loop trails.	No 2021 Update
Multiflora Rose <i>Rosa multiflora</i>	Isolated occurrences near western loop trail and around parking area.	Minor infestation. Acting aggressively to eradicate through physical removal and cutting. Seed production has been broken over the last two seasons. Mostly under control.
Goutweed <i>Aegopodium podagraria</i>	Isolated occurrence along northern boundary of park.	No 2021 Update
Japanese Knotweed <i>Fallopia japonica</i>	One isolated occurrence just beyond the park boundary, near a condo development and adjacent network of side trails leading into the park.	No 2021 Update
Black Locust <i>Robinia pseudoacacia</i>	Present near the entrance of the park, by the kiosk. Not clear to what extent this species is present in the park.	Currently on the state's watch list.

2. Recommended 10-year Actions for Invasive Plants



As the City continues advancing the management of invasive plants, staff should work to create a plan that outlines the work to be performed, plants to be targeted, the technique used for removal, and any resources used. At the end of each season, managers should compile a report that documents the work done that year, monitoring recommendations, and the recommended work plan and costs associated with it for the next season.

Update plant debris removal options to include the following: 1. Brush piling; 2. Bagging and removal; and 3. Burning. Also note that it is not recommended to have volunteers use chainsaws to

remove any vegetation due to safety and liability concerns. Any educational information the City puts out regarding invasive plant removal, should include information on why various methods of removal are used so that the general public understands and knows what to expect when they visit the park.

Future effort should continue to employ techniques that are mindful of the sensitive ecosystems, presence of slopes, and the high rate of erosion throughout the park. This would include cutting of vegetation, which would allow for the maintenance of a root stock to hold down soil and prevent soil disturbance where rare flora may be present.

The City should continue to hold volunteer trainings and workdays through the established Weed Warrior program to increase the capacity of City staff by solidifying a strong corps of community volunteers in the field. There should also continue to be consideration for a consultant that can be brought on board to provide additional removal services during the growing season when staff does not have the capacity.

Long-term monitoring is also going to be important to help staff evaluate the success of invasive plant removal in the park and to determine whether native plant regeneration is taking place. Future monitoring efforts could be sustained by volunteers. Monitoring efforts may identify areas that need replanting. Any planting need could be accomplished with volunteers.

Additional effort should go into educating the public (park users) on why they should avoid the “restoration areas”. This could include efforts to distribute information to the public through signage, events, newsletters and social media.

F. Off-Leash Dogs

1. Update on Actions Taken & Current Conditions

The park is experiencing many of the same issues associated with off-leash dogs as it was when the management plan was written. City staff are also still experiencing many of the same capacity issues related to enforcement of existing ordinances. In addition, there was an increase in the use of the park during the COVID pandemic, both by humans and their dogs. There was also an increase in off-leash usage during this time, and City staff did increase messaging related to the leash ordinance through signage, social media posts, and articles in The Other Paper.



Staff Service Day (2021) - Poop Fairies 1

The City also drafted a report aimed at assessing current issues associated with off-leash dogs, including impacts on wildlife, water quality, and humans. There is a Common Area for Dogs Committee now, and their charge from the City Council is to look at all of these issues and determine strategies for creating spaces where humans, dogs, and nature can co-exist.

There is a movement to continue engagement and outreach to the community to encourage leashing of dogs at Red Rocks. Social trails and dog waste have increased in the last several years, and this should be a concern moving forward. In April 2019, 170 pounds of dog waste was removed from the park through the April Stools event led by the Lake Champlain Byways and Magic Hat.

Over the summer of 2021, the Animal Control Officer made more trips to Red Rocks and engaged with users to encourage leashing. By the end of the 2021 season, there was an increase in the number of users that were leashing their dogs while visiting the park.

2. Recommended 10-year Actions for Off-Leash Dogs

Review recommendations from the Common Area for Dogs Committee and incorporate into off-leash requirements as necessary. Continue efforts to engage and educate residents on the benefits of leashing and removing dog waste from the park. Maintain internal discussions to determine how best to enforce the existing ordinance, while also considering whether there is a need to update/revise ordinance based on park conditions and user experiences.

G. Beach Management

1. Update on Actions Taken & Current Conditions

The existing management plan focuses on recreational use of the beach and user experience. City staff have continued maintaining the beach for users, including raking of the algae, and conducting water quality monitoring for E. coli and blue-green algae.

Current open space projects are also looking at removing the exposed pipe on the beach, and pushing it back to avoid impacting the user experience. There is also an assessment of the shoreline taking place to determine the needs for stabilization.

2. Recommended 10-year Actions for Beach Management

Staff to complete the exposed pipe project on the beach and include the recommendations from the recently completed shoreline assessment noted below to document shoreline stabilization needs over time. Staff should also continue raking algae and conducting the water quality monitoring.



In 2021, staff worked with Fitzgerald Environmental Associates to complete a shoreline stability assessment for the park. The complete report can be found in Appendix V, but staff want to move forward their “no-action” recommendation to implement a monitoring protocol of the shoreline to document changes associated with five areas showing some erosion due to wave erosion. This includes annual monitoring of these identified areas to specifically document changes to erosion

extent or severity. Monitors should take photographs of each area from a fixed location, using a reference point marked with orange flagging. Photographs should occur at times when leaves are not on the trees, either the spring or fall. If annual monitoring identifies significant changes, the report identifies potential fixes the City could implement. However, it may be necessary to bring in a consultant to assess severe erosion, as that may require additional engineering and permitting review.

In addition to these ongoing tasks, it’s also important to note some changes in state requirements for activities along the beach and along the shoreline.

The [Shoreland Protection Act](#) was established in 2014 and regulates activities within 250 feet of the mean water level of lakes greater than 10 acres in size. The intent is to allow reasonable development along the shorelands of lakes and ponds while protecting aquatic habitat, water quality, and maintain the natural stability of shorelines.

As the Red Rocks shoreline is included in this 250-foot regulatory zone, it is important to be mindful of the requirements. There are standards for slope, impervious surface, and cleared area, which include:

1. Beach/shoreland area must have a slope less than 20%
2. No more than 20% of the parcel within this area may consist of impervious surface
3. No more than 40% of the parcel may consist of cleared area

The state recommends contacting a regional permit analyst to provide more guidance and discuss management needs. They also provide an overview of “Best Management Practices” to consider for managing shoreline in Vermont. [This list should be referenced when considering any project on the shoreline or on the beach.](#) Additional management practices [can be found here.](#)

There should also be a discussion regarding future maintenance of the beach area, namely should the City continue to bring in sand. This will likely need to involve representatives at the state level, and a review of what practices are allowable versus in the past.

H. Parking & Traffic Management

1. Update on Actions Taken & Current Conditions

There is year-round parking continues to be available off Central Avenue, and City staff are working on plans that will upgrade this parking area to improve access and safety. There is still seasonal parking available in the two grass lots inside, and that is available from 8 AM – 7 PM, daily, from mid-June to mid-August. There is no fee assessed at this time for users that want to park in those lots.



Another issue for consideration is the impact to users at the entrance of the park, off Central Avenue, when there are cross country meets held. Neighbors report cars everywhere on both sides of Central, making it difficult to access the park, the Queen City Park neighborhood, and prohibits emergency vehicle access.

2. Recommended 10-year Actions for Parking & Traffic Management

It is recommended that staff consider implementing two ADA parking spaces at the beach house for handicap users to have better access to the beach and the lake. There are plans for a new performance venue at the Burton property in Burlington that could have an impact on the park, and use of the park after-hours. This is something that should be monitored as the plans progress. Requests for funding of elements to improve park safety have been submitted by the City as part of the review process for this performing venue, and could be implemented if the venue is approved.

In addition, staff should monitor parking outside the park during events and try to work with event staff to minimize disruptions and allow for emergency vehicle access. As the plans for the renovation of the Central Avenue gravel parking area continue, considerations should be given to add signage that states there is “No Parking Overnight”.

I. Recreation & Education

1. Update on Actions Taken & Current Conditions

The City has continued use of the park for recreation and educational purposes in the same manner as it was when the management plan was drafted. No additional or new facilities have been built. There is a plan to revamp the boat house, but there is not a plan to increase its usage or alter its usage. City staff have continued to advocate for funding of the beach house improvements through the CIP process, though these have not been approved to-date.



There are projects in development that would enhance recreation experiences on the beach (i.e.: pipe removal, renovation of the Central Avenue parking area, and erosion control projects). New signage has recently been installed to better identify the trail networks and rules/regulations for users.

The park has become a hub for various programs, including: summer camps, school educational field trips, the Weed Warriors, and the Community Hike Series. Each brings an opportunity for park users to learn more about the natural resources there, including how to assist City staff in stewardship practices. These are ongoing annual programs that add to the City's existing educational programming.

2. Recommended 10-year Actions for Recreation & Education

Assess the capacity to implement a Volunteer Stewardship Program that would train volunteers in various park maintenance duties. These volunteers would serve as the City's eyes and ears on the ground in the park, and report maintenance needs to staff. There would be training involved to bring volunteers up-to-speed on different stewardship tasks. There could also be an opportunity to train volunteers to do various tasks, like invasive plant removal, cleaning of waterbars, etc. City staff did receive an overview of what this program could look like as part of a UVM NR206 project. This could serve as the foundation of a permanent volunteer effort.

Staff should evaluate the scenic overlooks and determine what the management needs are there. The issue will be the growth of trees that now block the view. Given the location of all the overlooks, consideration should be given to pruning branches of those trees that have grown up. As noted in the original management plan, tree removal should not occur given the location of the overlooks in the lakeshore buffer zone. Care should also be given to not top trees that are growing up in these overlook areas as that is not good for the trees.

The Recreation & Parks Department has interest in conducting a Master Plan for all parks in the City, and this could help assess whether this park has capacity for additional recreation and educational opportunities given the unique natural resources found there. Funding for this effort will be requested for FY24.

J. Champlain Water District Easement

1. Update on Actions Taken & Current Conditions

Since the management plan was written, City staff have worked to maintain a good working relationship with representatives at the Champlain Water District (CWD). This includes discussion regarding CWD's use of their easements, as well as City needs associated with various projects adjacent to their pump station.



In 2019, the CWD agreed to provide funds to replace trees that needed to be removed near the pump station as they had been found to impact the operation and maintenance of the pump station. These funds went towards the projects being planned in the vicinity of the pump station, including: trail reroute away from the pump station; revegetation of the slope immediately adjacent to the pump station; design and installation of a stormwater facility in the area; and restoration of the slope leading to the beach.

The trail reroute would take users away from the pump station, and lead them to the beach via a new trail that would empty out on the beach access trail. CWD has supported this project due to their desire to keep the general public away from their infrastructure. They will install a gate at the top of the stairs that lead down to the pump station, and will allow the City to revegetate and stabilize the adjacent slope.

2. Recommended 10-year Actions for Champlain Water District Easement

Maintain working relationships with the representatives at the CWD. Consider discussion associated with future adjustments to their parking area that reduce erosion by considering stormwater technologies. Also continue sharing major projects and/or changes to the pump station and easement areas with the neighbors and community at-large.

K. Signage, Wayfinding, & Park Information

1. Update on Actions Taken & Current Conditions



Recently, new wayfinding signs were installed throughout Red Rocks Park. Many of the existing management plan recommendations were taken into consideration. The sign package for Red Rocks included multiple kiosks, trail directionals, interpretive panels, and regulatory signage. The new signs have been well received by the community since installation, though there has been significant vandalism and staff is already trying to budget for replacement signs in this park.

2. Recommended 10-year Actions for Signage, Wayfinding, & Park Information

Evaluate existing signage and determine whether there is a need for additional signs in various areas, or whether new language is needed to relay expectations for users. Monitoring of the new signs should also take place to determine how the signs are holding up in the park. Staff have already noticed attempts at vandalism, including peeling of vinyl letters, graffiti, etc.

Consideration should continue to be given to changes in language associated with any of the ongoing user issues, including: dogs off leash, trash, bikes in the park, social trails, camping in the park, restoration areas, etc. Staff should update sign language based on changing park needs. Given the increased use of the park during the pandemic, staff was installing many rounds of temporary signage to update users on expectations as health guidance rapidly changed. While the City cannot easily plan for temporary signs, staff should look into whether there are strategies and/or tools for engaging with the public that don't necessarily rely on signage to more cost effectively communicate and share information with the public. It may be possible to incorporate recommendations from one of the UVM NR206 groups by utilizing their social media graphics to share information on park updates or new issues. Moving forward, staff should look into methods for evaluating the effectiveness of physical signage versus social media messaging; as well as, ways to engage with users that might be coming from other communities.

L. Funding

1. Update on Actions Taken & Current Conditions

In 2016, South Burlington voters approved a ballot measure that authorized the City Council to borrow an amount not to exceed \$1.3 million, that would be financed for a term of 10 years, to fund enhancement projects on City-owned open space and natural areas as described in the Open Space and Natural Area Enhancement Plan that was adopted by Council in 2016. Red Rocks Park was one of the properties included in this enhancement plan, and many projects that are being actively worked on now

were also included in this plan. The Open Space Project Fund is documented in the City’s Capital Improvements Program, and staff updates it annually.

The City is also no longer charging park users to gain entry into the park during the summer, as the staffing expenses were more costly than the revenues being received.

GENERAL FUND - OPEN SPACE
CAPITAL IMPROVEMENT PROGRAM EXPENDITURE

PROJECT: Red Rocks Improvements		STATUS: Invasive plant management is ongoing. Initial concepts for erosion issues and parking concept received in FY19. Brought in a consultant to assist in bringing all identified projects through the permitting process. VT ANR required a wetland delineation, and that work was completed in FY21. Wayfinding was completed in FY21. In FY22, staff is planning on implementing work on at least two trails, complete 1 or 2 stormwater facilities, and reroute a trail.									
DESCRIPTION: Make improvements to the Park in accordance with Management Plan and the recommendations made by the Open Space Task Force. Identified projects in the pipeline include: trail improvements and reroutes, stormwater management, beach culvert replacement, beach access trail upgrade, Central Ave parking update, and assessment of the shoreline. Continue removing invasive plants.		OPERATING BUDGET IMPACT: none									
JUSTIFICATION: Long ignored, Red Rocks now needs major upgrades to its trail systems, corrections to erosion issues both on trails and on the beach, renovations to parking areas, access offerings, and maintenance of invasive species. Projects originally identified as part of the Open Space Task Force priority list.											
FINANCIALS COMMENT: Open Space Project funds as recommended by the Open Space Task Force in 2016.		AVE ESTIMATED REVENUES PER YEAR: 0									
		DEPARTMENT/STAFF CONTACT: Open Space Projects Ashley Parker									
FINANCIALS (in \$1,000)	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 31	Total:
Estimated Costs:											
Studies, Design, Engineering, Inspection, GC, Legal	10										10
Land/ROW/Easement Acquisition											-
Construction	150	40									190
Furniture & Equipment											-
Anticipated Debt Repayment											-
<i>TOTAL ESTIMATED COSTS:</i>	160	40	-	-	-	-	-	-	-	-	200
Funding Sources:											
General Fund											-
Grant/Donation/Developer Contribution											-
Current Bond-(Open Space)	160	40	-	-	-	-	-	-	-	-	200
Anticipated Debt											-
Current Bond- (Penny for Path)											-
Recreation Impact Fee											-
Trade-In Generated Revenues											-
Other: Open Space Fund											-
<i>TOTAL FUNDING SOURCES:</i>	160	40	-	-	-	-	-	-	-	-	200

2. Recommended 10-year Actions for Funding

Staff is focused on implementing the projects proposed at the park. There may be a need to go after supplemental funding, in the form of grants, to complete some of the work. It is also recommended that the City consider another round of Open Space Project funding when the 10 years are up to continue progress on planned projects or consider new projects as they arise.

It is also recommended that many of the annual maintenance/management tasks be included in the City’s Annual Budget. This would include annual trail maintenance and invasive plant removal work. These are items that need to be done every year, and to-date, there hasn’t been a noted source of funding. Staff should also consider other Red Rocks maintenance needs that aren’t covered by the CIP, including funds that could be used to upgrade the bath house. There are some facility needs at the park that do not have a source of funding at this time. This would include: annual trail maintenance, annual invasive plant removal, beach house renovations, wayfinding sign replacement, enforcement of City ordinances, park use monitoring (counts), wildlife camera for monitoring, Volunteer Stewardship Program, gazebo replacement, and long-term beach maintenance.

Chapter 3. Park Maintenance Update

A. Overview of Existing Maintenance Activity Timeline

The existing management plan provided a park maintenance activity timeline. This timeline considered all activities that could occur seasonally in the park, and the assumption seems to be that this list of activities be completed by City staff. There was no funding attached to any of the proposed tasks, or inclusion of actual maintenance activities completed by City staff at the time of drafting. There has not been assignment of resources to adequately complete any of the tasks identified in this timeline, and City staff have regularly called for a more realistic version of this list that incorporates all needs at the park, while also taking staffing capacity to complete tasks at the park.

B. Update to Maintenance Activity Timeline

The following maintenance activity timeline has been revised to include a column to highlight an entity to be assigned to a task. It also now includes several tasks that DPW Parks Crew identified as missing from the original task list that they complete every year. Those are highlighted in green.

One of the biggest issues with the original timeline was the fact that the tasks were not associated with a funding source or took staff capacity into consideration. The updated list doesn't tackle the funding issue, but it does associate various entities that could be assigned each task, which would provide flexibility for the use of City resources. A common capacity issue is that there often are not enough staff to complete all of the identified tasks, and annual budgets do not include funding to hire the additional staff needed to fully complete all park maintenance activities. The timeline below acknowledges that and allows room for the City to bring on both consultants and volunteers to complete various tasks, pending available funding. There is an updated partnership list immediately following the maintenance list to reflect additions and changes to potential partners since the original management plan was drafted. As staffing capacity evolves, this partnership list should be evaluated to determine whether there are opportunities for utilizing partners for maintenance needs.

Many of the noted activities are ongoing, while some have never been initiated. Moving forward with this list, staff should constantly evaluate the needs at the park and note whether some activities are no longer necessary or if there are new ones that take a higher priority.

In addition to this revised list of needs, staff should work to create a monitoring checklist that could be used by staff or volunteers to conduct seasonal visits. This checklist would serve as a report on park conditions to document maintenance needs or safety concerns. Staff should also consider taking photos of park needs during monitoring visits to document site conditions and track changes in the landscape over time. This series of photos would help justify the need for additional resources or provide documentation on how a completed project has functioned over time. A monitoring report template is shown in Appendix VI as an example of what could be used to fulfill this need.

Spring Maintenance Activities	
Maintenance Activity	Entity Assigned
Invasive plant monitoring walk-through	Mike Bald (Got Weeds) &/or Weed Warriors
Remove garlic mustard by mid-May (generally target herbaceous invasives before they go to seed)	Mike Bald (Got Weeds) &/or Weed Warriors
Trail flooding assessment and minor repairs	Timber & Stone, WVPD, VYCC, Volunteers
Community Trail Stewardship Day(s) (i.e.: May Green Up Day, June National Trails Day)	WVPD, VYCC, Volunteers
Potential Shoreline Monitoring	City Staff or Volunteers
Clean beach of debris	Red Rocks Park Rangers
Hook up water in bath house, toilets, etc.	City Department of Public Works
Clean areas that will be mowed	City Department of Public Works

Early Summer	
Maintenance Activity	Entity Assigned
Train seasonal staff on identification of invasive species	Mike Bald (Got Weeds) &/or Weed Warriors
Remove herbaceous invasive species before they go to seed	Mike Bald (Got Weeds) &/or Weed Warriors
Beach opening (ahead of June park "open" season)	Recreation & Parks Department Staff
Breeding bird surveys at this time of year indicate species nesting in the park	Audubon Vermont

Summer	
Maintenance Activity	Entity Assigned
Major trail repair/construction/rerouting projects	Timber & Stone, WVPD, VYCC, Volunteers
Regular park walk-throughs	City Department of Public Works &/or Recreation & Parks Department Staff
Rake beach daily	Red Rocks Park Rangers
Monitor water quality for blue green algae	Red Rocks Park Rangers
Monitor water quality for E. coli	City Water Quality Department
Mow grass areas	City Department of Public Works

Fall	
Maintenance Activity	Entity Assigned
Clear waterbars	Timber & Stone, WVPD, VYCC, Volunteers
Remove woody invasive species, as they go dormant	Mike Bald (Got Weeds) &/or Weed Warriors
Prune/clear view corridors	City Arborist
Invasive plant monitoring walk-through	Mike Bald (Got Weeds) &/or Weed Warriors
Community trail stewardship day	Timber & Stone, WVPD, VYCC, Volunteers
Potential Shoreline Monitoring	City Staff or Volunteers
Shut down bath house plumbing, winterize system	City Department of Public Works
Clear leaves from grass areas and roadway	City Department of Public Works

Winter	
Maintenance Activity	Entity Assigned
Tracking surveys allow for assessment of wildlife habitat	
Plow parking area on Central Ave.	City Department of Public Works
Plow main road in the park	City Department of Public Works

Year Round	
Maintenance Activity	Entity Assigned
Weekly Trash Pickup	City Department of Public Works
Respond to any tree issues	City Department of Public Works
Respond to any special requests or problems	City Department of Public Works

Updated Listing of Partnership Opportunities

Partner	Possible Role
Chittenden County Forester	Forest Management Plan assistance
UVM NR206 Class (possibly other programs)	Completion of projects targeting specific park needs identified by staff
Mike Bald, Got Weeds?	Invasive Plant Management & Weed Warriors
Audubon Vermont	Bird Monitoring Funding Source (for habitat management) Outreach/Education
US Fish & Wildlife Service	Management knowledge Funding Source (for habitat management)
VYCC	Trail Maintenance Invasive Plant Management
VT Invasives (www.vtinvasives.org)	State of Vermont website dedicated to invasive plant management
Queen City Park Neighborhood Group	Residents living immediately adjacent to the park General property monitoring Outreach/Education Potential source of volunteers for the Volunteer Stewardship Program
City Volunteer Stewardship Program	Park Monitoring & Reporting Minor Trail Maintenance Invasive Plant Removal Photo Documentation Outreach/Education
Weed Warriors	Invasive Plant Management & Monitoring Outreach/Education
Winooski Valley Park District	Minor Trail Maintenance & Monitoring Wayfinding Sign Installation Native Plantings & Invasive Plant Removal
Winooski Valley Conservation District	Outreach/Education Native Plantings
Champlain Valley Conservation Partnership	Regional Stewardship/Management Coordination Outreach/Education Regional Connectivity
Vermont Master Naturalist Program	Outreach/Education Monitoring Photo Documentation
Timber & Stone LLC	Major Trail Maintenance Annual Trail Monitoring & Assessment
Friends of the Dog Parks	Outreach/Education Volunteer Events related to dog waste removal
Vermont Department of Fish & Wildlife	Natural Community & Wildlife Monitoring Knowledge Sharing Management Recommendations
Local Businesses	Source of Volunteers for various management needs