IRON MOUNTAIN RESTORATION PLAN

City of Lake Oswego,
Parks and Recreation Department
Natural Resource and Outdoor Recreation Division

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INTRODUCTION

Iron Mountain Park is a 51 acre hybrid character park on a hillside within the City of Lake Oswego. The park is within the Oswego Lake Watershed with a portion of Springbrook Creek running through it. Runoff from the park collects on the southern portion of the park where an intermittent stream, which is severely degraded, collects and eventually dissipates into a wetland located on the Oswego Hunt Club property and Park property eventually connecting with Springbrook Creek which empties into Oswego Lake.

The park is a dramatic setting with a 310 foot elevation difference from south which is the lowland of the park to the north along a ridge. The park has one of the last examples of an Oregon White Oak Upland left in Lake Oswego.

In the late 1860's through 1928 Iron Mountain was the site of the Prosser Iron Mine which was one of the sites supplying ore to the Oregon Iron Company (later the Oregon Iron and Steel Company), of which one of the examples of the iron furnace is located in George Rogers Park. After the close of the Oregon Iron & Steel Company in the 1920's some of the area was used by riders from the Oswego Hunt Club and much of the property was purchased by private parties.

HOW TO USE THIS PLAN

PURPOSE

The restoration plan will provide the framework, approach and a list of projects/steps to guide restoration of the flora (plant species) of Iron Mountain Park to a balanced healthy state[1]. Additionally the plan will:

1. Provide an overview of Iron Mountain Park relating to invasive species,
2. Highlight goals for the restoration plan and guidelines to prioritize projects and,
3. Provide a guide to focus restoration efforts in Iron Mountain Park for City staff and the Friends of Iron Mountain Park.

BACKGROUND INFORMATION DEVELOPMENT

The restoration plan goal and priorities were established through the community and Friends of Iron Mountain Park through working group meetings and a public open house. A public open house was held providing an opportunity for the community to respond to Goals and Guidelines and areas of concentration for restoration of the park. Several professional consultants were also involved in developing supplemental information such as a general plant inventory and habitat overview, both of both of which included restoration/improvement recommendations. Input and supplemental information was utilized in developing guidelines and recommendations. Additionally, supplemental information was developed utilizing "boots on the ground individuals" (staff and volunteers) who are closely familiar with the park.

RESTORATION GOAL AND GUIDELINES

The basis of the restoration plan is to assist in the ecological health recovery of the park which is stated in the restoration goal. This goal provides a clear simple statement and identifies and focuses the purpose of the restoration plan. The following is the restoration goal for Iron Mountain Park:

GOAL: STABILIZE AND RESTORE THE FOREST TO A PREDOMINANTLY HEALTHY BALANCED STATE.

> Any projects developed from this plan will need to ultimately satisfy the restoration goal. With the restoration goal stated a laundry list of projects are discovered that need to be completed to reach restoration. To help prioritize the long list of projects multiple guidelines were developed. The intent of the guidelines is to provide focus when choosing projects. If a project meets several guidelines, then the project should be considered a priority over projects that do not necessarily meet the same

1 Healthy Balance State - A restorative state through purposeful acts which achieves functional, ecological integrity, sustained by natural succession and ongoing maintenance. OR An approach to restoration that utilizes integrated pest management (IPM) principles to restore an area to a predominately native state with an emphasis on ecological integrity and tolerance of non-native species that do not pose serious threats.

number of guidelines. Again these guidelines are meant to guide. The following are the restoration guidelines for Iron Mountain Park:

GUIDELINE 1 (GL1): PROTECT AREAS THAT HAVE BEEN STABILIZED AND RESTORED.

With limited resources, it is more important to protect past efforts rather than restore new areas. If past efforts are not maintained over time, labor and money can be lost. Protection of past work takes precedent unless there is a compelling need to shift resources to address other significant concerns.

GUIDELINE 2 (GL2): INVEST IN AREAS OF PARTICULAR SIGNIFICANCE OR THAT POSE SAFETY CONCERNS.

When additional resources are available, concentrate on areas of particular significance such as:

- Decreasing high fire risk
- Protecting sensitive species
- Protecting dense populations of native species
- Focusing on areas that would likely have higher levels of probable restoration success

GUIDELINE 3 (GL3): FOCUS ON PROJECTS AND ACTIVITIES THAT PROVIDE MULTIPLE BENEFITS, MAXIMIZING EFFECTIVENESS OF COMMUNITY RESOURCES.

When reviewing projects, take into account,

- Is the project a partnership with other agency or group?
- Will this project accomplish more than one goal or action?

GUIDELINE 4 (GL4): DEVELOP PARTNERSHIPS AND UTILIZE PROGRAMS THAT PROVIDE ADDITIONAL ASSISTANCE FOR RESTORATION AND STABILIZATION.

Look for opportunities that can leverage additional community support, or take advantage of programs and partnerships such as Clackamas County Fuels Reduction Funds, the Friends of Iron Mountain and other community volunteer resources. When seeking assistance, look for complementary opportunities where the long-term gain outweighs the initial investment.

PARK SUB-AREAS

Iron Mountain Park is a large linear forested mass within an urban area. As one large parcel, planning restoration of the park is a monumental task. To approach restoration of the Park in a more practical manner the restoration plan has divided the Park into eight sub areas. These areas are delineated by existing trails, topography or other physical park attributes (see map and general implementation timeline on page 9).

Within the plan, each designated sub-area has its own section providing an overview of sub-area information, Friends Group and City project lists, an implementation matrix and sub-area map/planning worksheet.

These tools provide a guide to focus restoration projects for both the City and Friends Group. The tools are intended to be utilized in the following manner

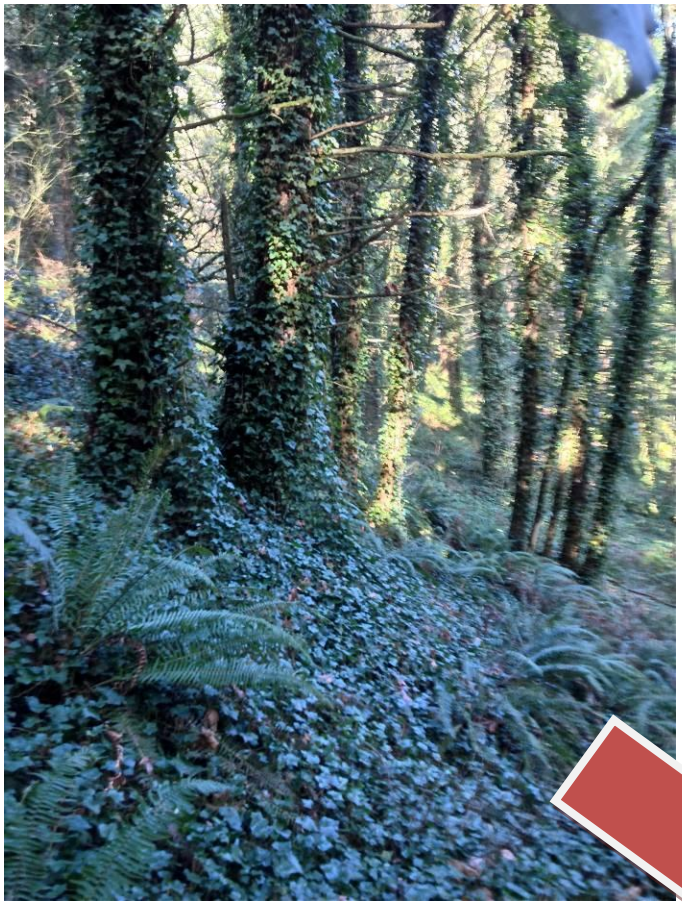
- **General information:** provides an overview of the site conditions including topography and sub-area size.
- **Priority Level:** This indicates the order in which an area and its projects take precedent over other sub-areas. Priority levels are different according to the group providing the restoration (Friends Group and City). Sub-area prioritization has been developed according to an overall restoration strategy maximizing restoration efforts and focus.

- **Restoration Projects:** There are two project lists per sub-area, a Friends Group and City list. These project lists indicate the projects that each group will need to accomplish to complete the restoration.
- **Implementation Matrix:** Each sub-area also includes an implementation matrix that indicates the general timeline that each project will need to occur to restore the area. The purpose of the implementation matrix is to guide restoration efforts methodically and achieve a healthy balanced restoration of Iron Mountain Park. In some cases it will make sense to have one project come before another such as Air-gapping ivy from trees before removing ground ivy. The implementation matrices have been aligned among all sub-areas and between the City and Friends Group projects.
- **Sub-Area Map and Planning Worksheet:** Each sub-area has a map with important information such as existing trails, topography, restriction areas, sensitive species location (general location). The purpose of the sub-area map is to provide the Friends group and City to visualize where opportunities and constraints are located and to plan annual work plans/restoration activities. The Project Planning Worksheet portion is an area provided to Friends Group to plan projects (drawing and note taking) within sub-area according to the implementation matrix.
- **Invasive Species/Tolerance Treatment Table (Invasive Table):** The invasive table is a guide regarding removal of invasive species within the Park. Use this table when determining which invasive species take priority for removal over others. The table also provides general information for appropriate removal techniques. Additionally some species require chemical treatment for removal which is indicated. Public property is restricted from application of chemicals and use of power equipment by the public, only certified applicators and trained professionals are allowed to use these tools in public spaces. Utilize the table when making decisions regarding limited resources and invasive removal.

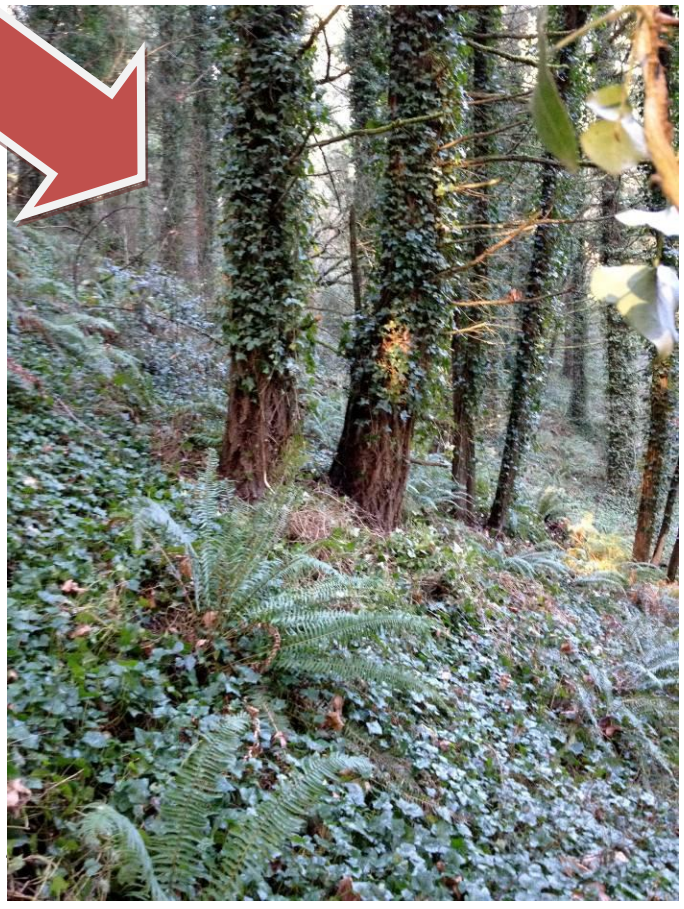
INVASIVE SPECIES TOLERANCE/TREATMENT TABLE

Non Native - Invasive Species	Tolerance Level	General Removal Technique (Check IPM for complete set of tools)	Allowed to Remove
Blackberry	Medium	Cut, Dig roots, Treat	All Groups
Cherry	High	Cut	City/Contractor
Clematis	Medium	Cut, Pull Roots, and Discard or Treat	All Groups
Creeping Buttercup	Medium	Dig or Treat	All Groups
English Ivy	Medium	Pull Roots, Air Gap Trees or Treat	All Groups
Garlic Mustard	Low	Pull and discard or Treat	All Groups
Geranium (Herb Robert)	Medium	Pull or Treat	All Groups
Geranium (Shining Star)	Medium	Pull or Treat	All Groups
Hawthorne	High	Cut and Treat	City/Contractor
Holly	Medium	Cut and Treat	City/Contractor
Japanese Knotweed	Low	Treat	City/Contractor
Lesser Celandine	Low	Dig and Discard or Treat	All Groups
Scotch Broom	Medium	Cut or Treat	All Groups
Vinca	Medium	Pull or Ttreat	All Groups
Native Plants			
Poison Oak	High	Treat Only	City/Contractor

***Treatments may only be done by licensed city employee or city contractor.**



RESTORATION GUIDE



IRON MOUNTAIN PARK SITE WIDE PROJECTS

The following "site wide" projects are projects that possibly pertain to all sub-areas. Many of these projects are by nature planning, research or educationally oriented and should be developed while keeping all sub-areas in mind.

- Develop a buffering strategy to use along road ways and areas where infestation of low tolerance invasives is likely. In the interim try ivy buffer along roadways. (City)
- Investigate adopt a plot program. (City, Friends Group)
- Complete a master planning process for the park. (City)
- Further study park natural systems. (City)
- Work with neighbors to address private property invasive species. (Friends Group, City)
- Voluntary project documentation where possible, this could involve a short summary of what activities occurred, dates, observed outcomes, photographs, and observations of previous projects. (Friends Group, City)
- Survey boundaries. (City)
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). City will develop guidelines for protection, tracking and propagation utilizing thoughtful approaches and Integrated Pest Management tools. The City will organize, lead and in some instances delegate the task of partnering with other organizations to collect seeds and propagate these species (City, Friends Group, State).

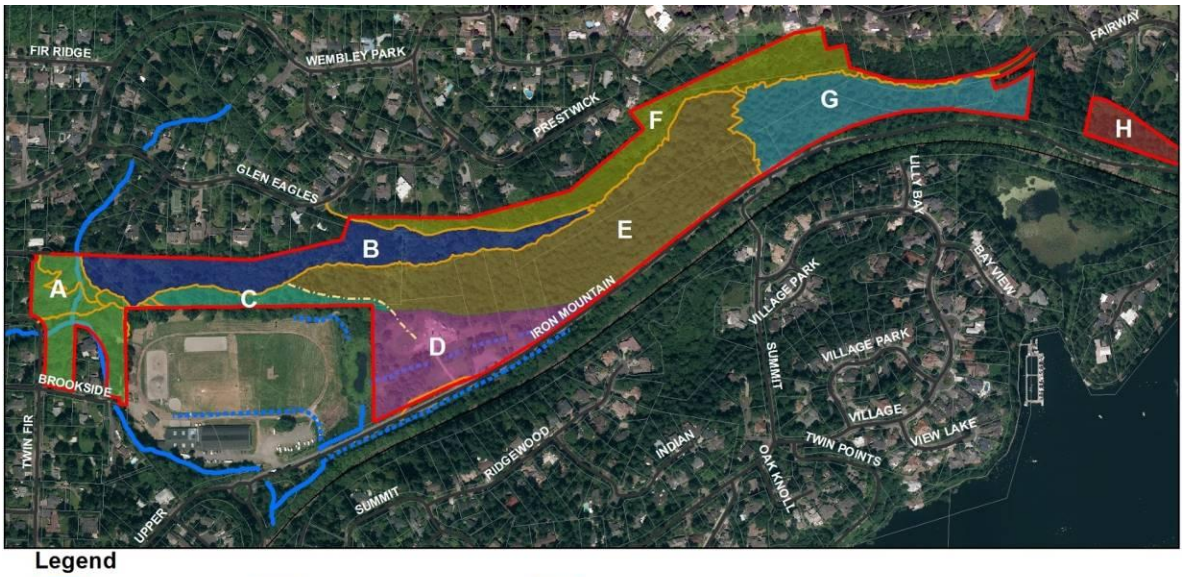
Parkwide Projects Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Investigate adopt a plot program (City, Friends Group)	X		X	X		X	X						
Voluntary project documentation where possible, this could involve a short summary of what activities occurred, dates, observed outcomes, photographs, and observations of previous projects.				X		X	X	X	X	X	X	X	X
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).The City will organize, lead and in some instances delegate the task of		X	X	X		X	X	M.	M.	M.	M.	M.	M.
Parks and Recreation Department (City) Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Develop a buffering strategy to use along road ways and areas where infestation of low tolerance invasives is likely. In the interim try ivy buffer along roadways. (City)				X	X	X	X						
Investigate adopt a plot program (City, Friends Group)	X		X	X		X	X	X					
Complete a master planning process for the park (City)							X	X					
Further study park natural systems (City)							X	X					
Work with neighbors to address private property invasive species. (Friends Group, City)			X	X			X	X					
Voluntary project documentation where possible				X		X	X	X	X	X	X	X	X
Survey boundaries (City)						X	X	X	X	X	X		
Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). City will develop guidelines for protection, tracking and propagation utilizing thoughtful approaches and Integrated Pest Management tools. The City will organize, lead and in some instances delegate the task of partnering with other organizations to collect seeds and propagate these species (City, Friends Group, State)		X		X		X	X	X	M.	M.	M.	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

IRON MOUNTAIN PARK SUB-AREA PROJECTS

The implementation matrix indicates the overall implementation of each sub-area according to priority.



Legend

- Iron Mountain Park
- Railroads
- All Streets
- Existing Trail
- Master Planned Trail
- Brookside - A
- Brookside Transition Area - B
- Eastern Island - H
- Eastern Slopes - G
- Lowland - D
- Midland Forest - E
- North Hunt - C
- White Oak Upland - F

IRON MOUNTAIN SUB-AREA IMPLEMENTATION PRIORITIZATION

Sub Area		Proposed Implementation Year								
Friends and Volunteer Groups	**Priority**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Area A - Brookside	1	X	X	X	M.	M.	M.	M.	M.	M.
Area B - Brookside Transition Area	2			X	X	X	M.	M.	M.	M.
Area F - White Oak Upland	2			X	-	-	-	-	-	-
Area C - North Hunt	3				X	X	X	M.	M.	M.
Area E - Midland Forest	4						X	X	M.	M.
Area H - Eastern Island	5	-	-	-	-	-	-	X	X	M.
Area D - Lowland	n/a	-	-	-	-	-	-	-	-	-
Area G - Eastern Slopes	n/a	-	-	-	-	-	-	-	-	-

Parks and Recreation Department (City)		**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Area F - White Oak Upland	1			X	M.	M.	M.	M.	M.	M.
Area B - Brookside Transition Area	2			X	X	X	M.	M.	M.	M.
Area D - Lowland	2		X	X	X	X	M.	M.	M.	M.
Area C - North Hunt	3				X	X	X	X	M.	M.
Area E - Midland Forest	4						X	X	M.	M.
Area G - Eastern Slopes	5							X	X	M.
Area H - Eastern Island	6							X	X	M.
Area A - Brookside	*Support*	X	X	X	S.	S.	S.	S.	S.	S.

M. = This indicates an area is restored and at a state of continual maintenance.

S. = This indicates a supportive role by the City

ACTION AREA A – BROOKSIDE

AREA – 4.27 acres
TOPOGRAPHY – Moderate incline from south to north (see map, 5' contour interval)
ECOSYSTEM TYPE – Doug Fir Forest

PRIORITY – 1 Friends of Iron Mountain, (City of Lake Oswego support)

PROJECTS:
Friends of Iron Mountain restoration/stabilization projects:

- Maintain restored areas, annual invasive sweep
- Limited planting in areas with sparse native coverage
- Complete ivy removal on ground and in trees, maintain ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)
- Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).The City will organize, lead and in some instances delegate the task of partnering with other organizations to collect seeds and propagate these species. *See Page 9 for details.*
- Adopt a plot (work with City on a possible adopt a plot program)

Parks and Recreation Department restoration/stabilization projects:

- Survey Boundaries
- Spot treat any invasives restricted to City/Contractor only removal (see invasive matrix)
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*

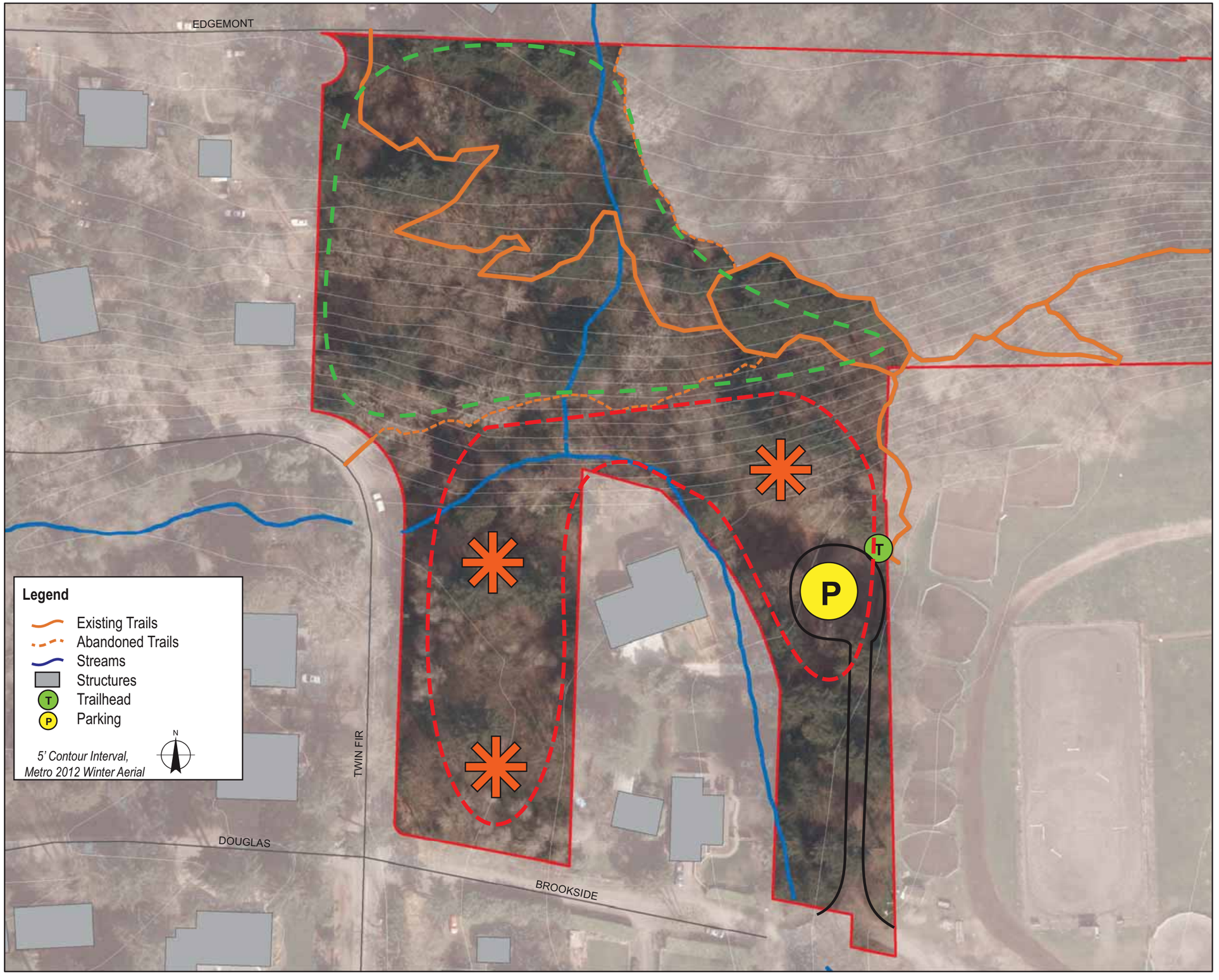
Area A - Brookside Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	**GL1**	**GL2**	**GL3**	**GL4**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Limited planting in areas with sparse native coverage					X	X	X						
Complete ivy removal on ground and in trees, maintain ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)				X	X	X							
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X				X	X						
Adopt a plot (work with City on a possible adopt a plot program)	X		X	X		X	X						
Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X	M.	M.	M.	M.	M.	M.	M.	M.	M.
Parks and Recreation Department (City) Projects	**GL1**	**GL2**	**GL3**	**GL4**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Survey Boundaries						X							
Spot treat any invasives restricted to City/Contractor only removal (see invasive matrix)							X						
Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X	X	X	X						
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X		X	X	X	M.	M.	M.	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

S. = This indicates a supportive role by the City.

ACTION AREA "A" - BROOKSIDE



Friends of Iron Mountain restoration/stabilization projects:

Maintain restored areas, annual invasive sweep

Limited planting in areas with sparse native coverage

Complete ivy removal on ground and in trees, maintain ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)

Protect Euonymus occidentalis (Western Wahoo)
Introduce Cedar seedlings?

Adopt a plot (work with City on a possible adopt a plot program)

Friends of Iron Mountain Project Planning Worksheet:

2014

2015

2016

N

0 50 100 200

Feet

ACTION AREA B – BROOKSIDE TRANSITION AREA

AREA – 7.38 acres
TOPOGRAPHY – Steep incline from south following trail to north (see map, 10' contour interval)
ECOSYSTEM TYPE – Doug Fir Forest with tailings of a white oak forest and populations of Madrone and Maple

PRIORITY – 2 Friends of Iron Mountain, 2 City of Lake Oswego

Projects:

Friends of Iron Mountain restoration/stabilization projects* (westside concentration only):

- Ground ivy removal within designated area (not in volunteer restricted area)
- Priority invasive removal, Scotch Broom, Shining start geranium, blackberry. (See Invasive Maps)
- Free the trees, ivy removal from trees within designated area (not in volunteer restricted area)
- Protect sensitive species once City develops guidelines (Madrone and Larkspur), work with City and other organizations to collect seeds for propagation.
- Protect Trillium Patch, (develop protection/propagation project, acquire city approval)
- Plant native species in recently cleared areas
- Free the trees with neighbors (work with private property owners to free the trees on the boundary of the park)
- Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*

**NOTE: LIMITED ACCESS TO VOLUNTEERS AND FRIENDS MEMBERS SEE MAP*

Parks and Recreation Department restoration/stabilization projects:

- Holly removal
- Ivy removal in volunteer restricted areas
- Plant native species in recently cleared areas
- Eastside of Area B is restricted for friends groups and volunteers, only the City will be concentrating on this area.
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*

Area B - Brookside Transition Area Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	**GL1**	**GL2**	**GL3**	**GL4**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Ground ivy removal within designated area (not in volunteer restricted area)							X	X					
Priority invasive removal, Scotch Broom, Shining start geranium, blackberry. (See Invasive Maps)							X						
Free the trees, ivy removal from trees within designated area (not in volunteer restricted area)			X	X			X	X					
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X			X	X	X				
Protect Trillium Patch, (develop protection/propagation project, acquire city approval)		X		X			X	X					
Plant native species in recently cleared areas	X						X						
Free the trees with neighbors (work with private property owners to free the trees on the boundary of the park)				X			X						
Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X				M.	M.	M.	M.	M.	M.
Parks and Recreation Department (City) Projects	**GL1**	**GL2**	**GL3**	**GL4**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Holly removal								X	X				
Ivy removal in volunteer restricted areas								X	X				
Plant native species in recently cleared areas							X	X					
Eastside of Area B is restricted for friends groups and volunteers, only the City will be concentrating on this area.							X	X					
Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X			X	X					
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X				X	M.	M.	M.	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

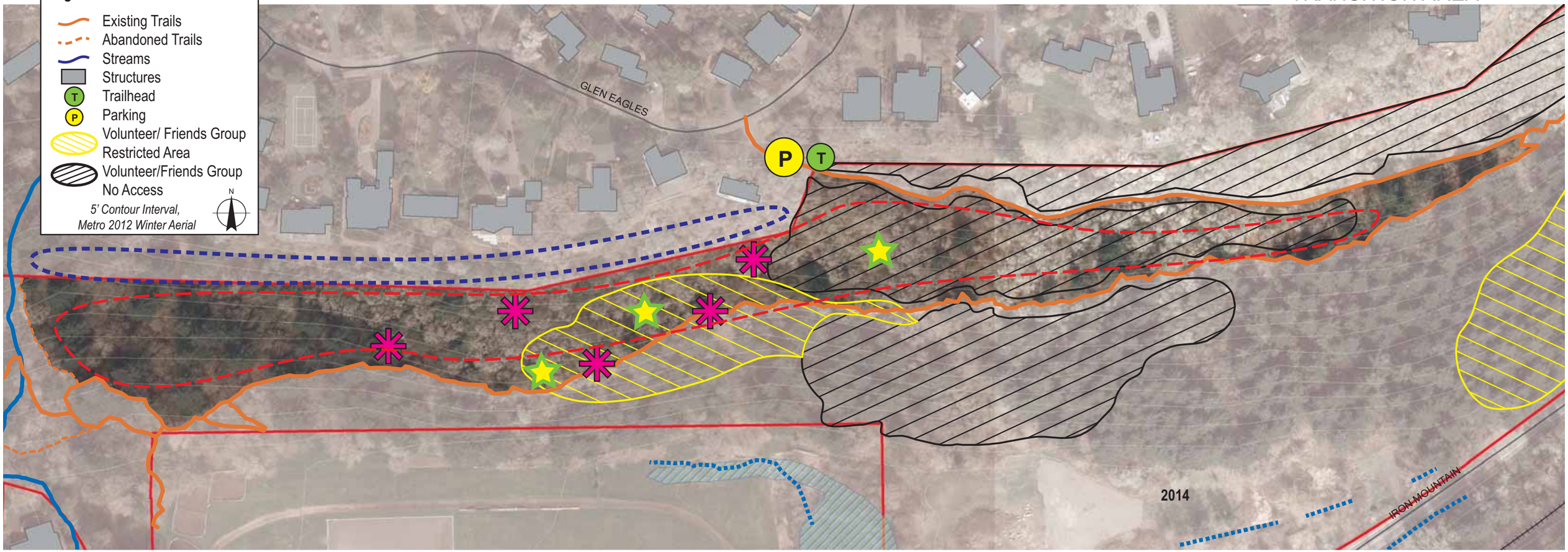
ACTION AREA "B" - BROOKSIDE TRANSITION AREA

Legend

- Existing Trails
- Abandoned Trails
- Streams
- Structures
- Trailhead
- Parking
- Volunteer/ Friends Group Restricted Area
- Volunteer/Friends Group No Access

5' Contour Interval, Metro 2012 Winter Aerial

N



Friends of Iron Mountain restoration/stabilization projects* (westside concentration only):

- Ground ivy removal/ Free the trees, ivy removal from trees within designated area (not in volunteer restricted area), Plant native species in recently cleared areas
- Priority invasive removal, Scotch Broom, Shining start geranium, blackberry. (See Invasive Maps)
- Protect sensitive species once City develops guidelines (Madrone and Larkspur) , work with City and other organizations to collect seeds for propagation.
- **N/A** Protect Trillium Patch, (develop protection/propagation project, acquire city approval)
- Free the trees with neighbors (work with private property owners to free the trees on the boundary of the park)

Friends of Iron Mountain Project Planning Worksheet:

2016	2017	2018

N

0 100 200 400

ACTION AREA C – NORTH HUNT

AREA – 1.78 acres
TOPOGRAPHY – Moderate incline from south to north (see map, 10' contour interval)
ECOSYSTEM TYPE – Doug Fir Forest
PRIORITY – 3 Friends of Iron Mountain, 3 City of Lake Oswego

PROJECTS

Friends of Iron Mountain restoration/stabilization projects*:

- Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*
- Remove invasive species in non restricted areas – target areas with higher concentration of native species (use these areas as a "beachhead")
- Free the Trees within non restricted areas.

**NOTE: LIMITED ACCESS TO VOLUNTEERS AND FRIENDS MEMBERS SEE MAP*

Parks and Recreation Department restoration/stabilization projects:

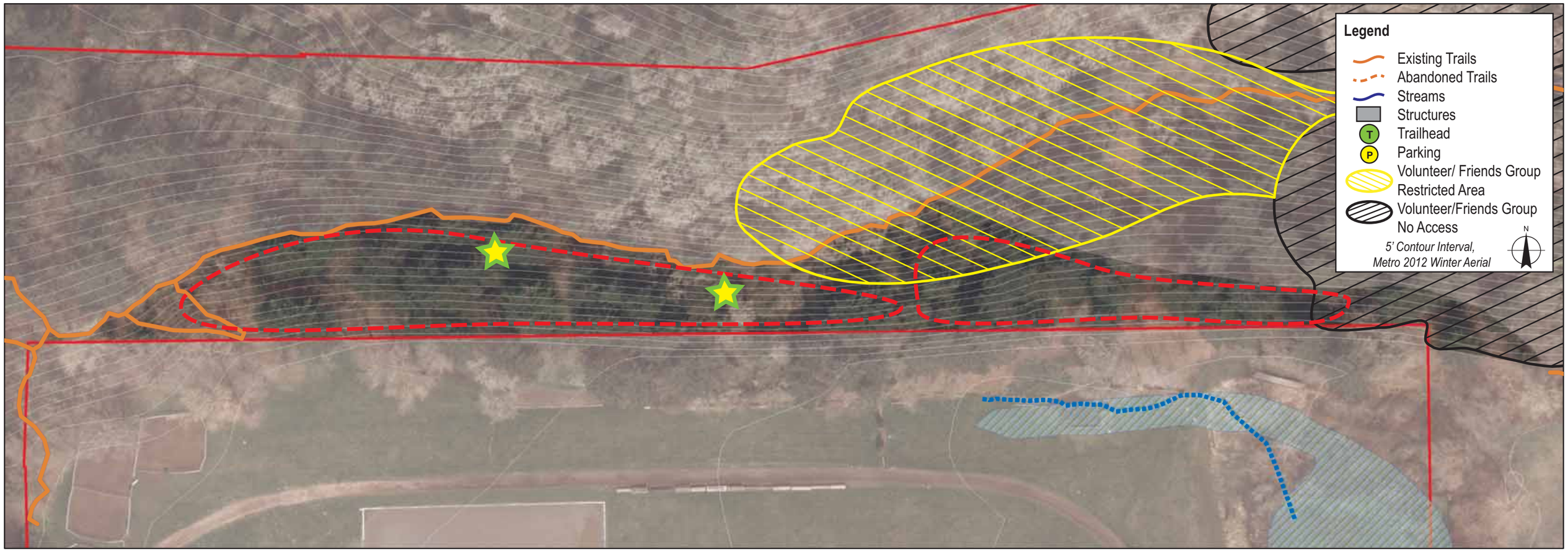
- When funding is available treat restricted area for all invasive species and Poison Oak
- Remove invasive trees Holly, Hawthorne and Cherry. (Utilize Invasive Matrix for priority removal guidance)
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*

Area C - North Hunt Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X				X	X				
Remove invasive species in non restricted areas – target areas with higher concentration of native species (use these areas as a "beachhead")									X				
Free the Trees within non restricted areas.			X					X	X	X			
Maintain Restored Areas (Develop Maintenance program with the	X		X	X					X	M.	M.	M.	M.
Parks and Recreation Department (City) Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
When extra funding is available treat restricted area for all invasives including Poison Oak		X						X					
Remove invasive trees Holly, Hawthorne and Cherry. (Utilize Invasive Matrix for priority removal guidance)								X	X				
Develop a maintenance plan and maintain restored areas	X		X	X					X	M.	M.	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

ACTION AREA "C" - NORTH HUNT



Friends of Iron Mountain restoration/stabilization projects:

Protect sensitive species once city develops guidelines (Madrones)

Remove invasive species in non restricted areas and Free the Trees within non restricted areas. – target areas with higher concentration of native species (use these areas as a "beachhead")

Friends of Iron Mountain Project Planning Worksheet:

2016	2017

0 50 100 200 Feet

ACTION AREA D – LOWLAND

AREA – 6.45 acres
TOPOGRAPHY – Flat with stream resources slight incline on northern boundary of area(see map, 2' contour interval)
ECOSYSTEM TYPE – Meadow land (homesteads in the past, with domestic trees) with intermittent stream and wetlands
PRIORITY – 2 City of Lake Oswego

PROJECTS

Friends of Iron Mountain restoration/stabilization projects*:

- No actions/projects for this area.

**NOTE: NO ACCESS TO VOLUNTEERS AND FRIENDS MEMBERS SEE MAP*

Parks and Recreation Department restoration/stabilization projects:

- Stabilize the area from further degradation.
- Work with the LOIS and LOTWP projects to provide stabilization and possibly some restoration of the area.
- Develop a stream stabilization and restoration plan after the master planning process.
- Stabilize and Restore the stream resources.
- Implement Master Plan restoration recommendations.

Area D - Lowland Proposed Implementation

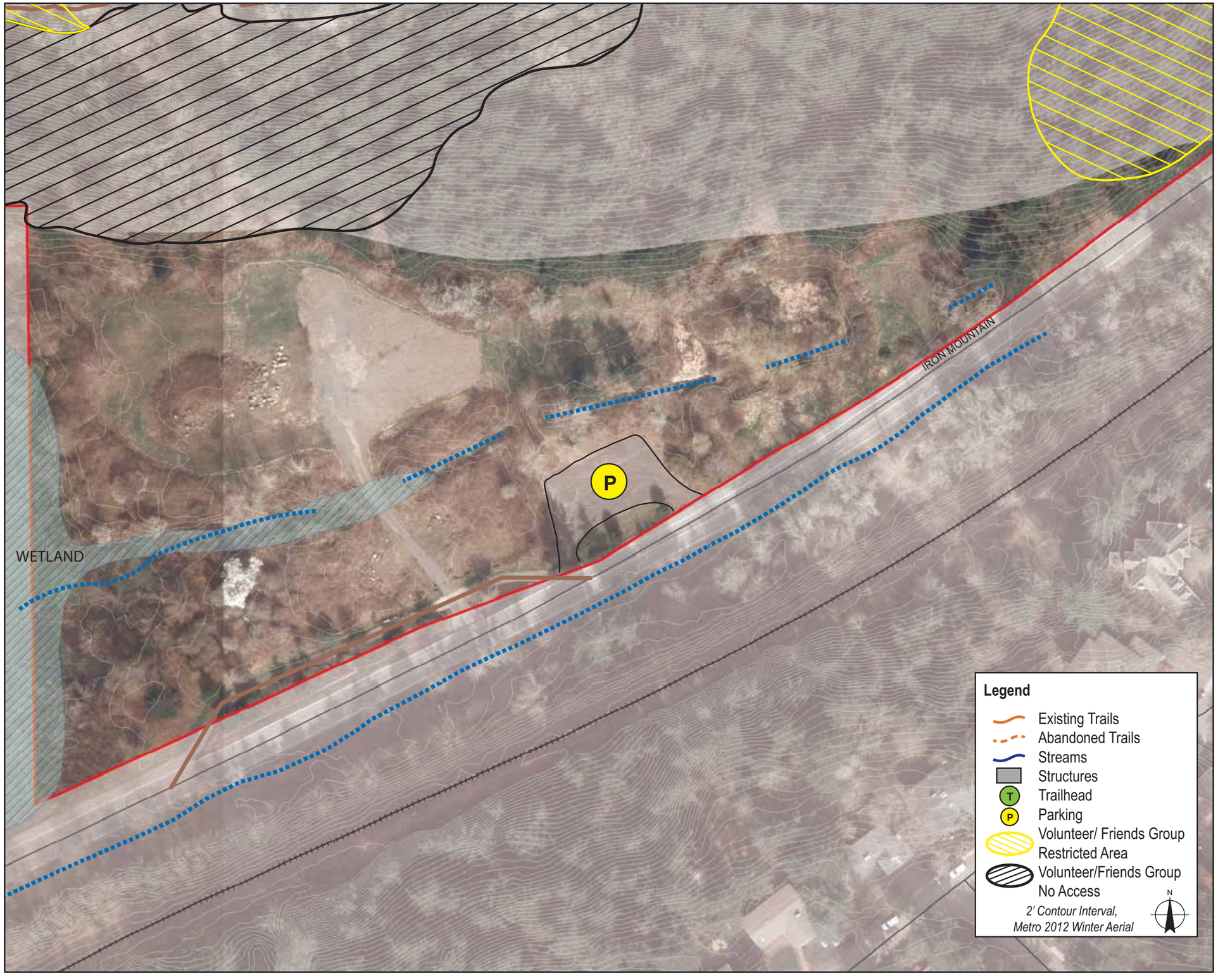
Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
No actions/projects for this area.	-	-	-	-	-	-	-	-	-	-	-	-	-
Parks and Recreation Department (City) Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Stabilize the area from further degradation			X					X	X				
Work with the LOIS and LOTWP projects to provide stabilization and possibly some restoration of the area.			X	X		X	X	X					
Develop a stream stabilization and restoration plan after the master planning process			X	X				X	X				
Stabilize and Restore the stream resources		X							X	X			
Implement Master Plan restoration recommendations									X	X	X	X	X
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X						X	M.	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

ACTION AREA "D" - LOWLAND

Friends of Iron Mountain restoration/stabilization projects*:

No actions/projects for this area.



ACTION AREA E – MIDLAND FOREST

AREA – 15.94 acres
TOPOGRAPHY – Moderate to steep slope from south to north, the eastern half of area is inaccessible to friends and volunteer groups due to steep slopes (see map, 10' contour interval)
ECOSYSTEM TYPE – Douglas Fir Forest, eastern half of area is inaccessible to friends and volunteer groups due to high occurrence of poison oak
PRIORITY – 4 Friends of Iron Mountain, 4 City of Lake Oswego

PROJECTS

Friends of Iron Mountain restoration/stabilization projects*:

- Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*
- Free the trees of Clematis and Ivy within designated area (not in volunteer restricted area).
- Remove invasive species in non restricted areas – target areas with higher concentration of native species (use these areas as a "beachhead").
- Utilize this area as an experimental/example of low chemical or chemical free restoration (Excludes City projects).
- Plant native species where needed. Track Results.
- Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered).
- Provide heightened restoration efforts around the unique boulders within this area.

**NOTE: LIMITED ACCESS TO VOLUNTEERS AND FRIENDS MEMBERS SEE MAP*

Parks and Recreation Department restoration/stabilization projects:

- Invasive removal where volunteers are restricted (poison oak, ivy, clematis).
- Remove holly trees.
- Investigate and develop a ground cover strategy to provide invasive buffer along roads.
- Work with street department and railroad to address re-infestations of low tolerance invasives (see invasive species matrix).
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*

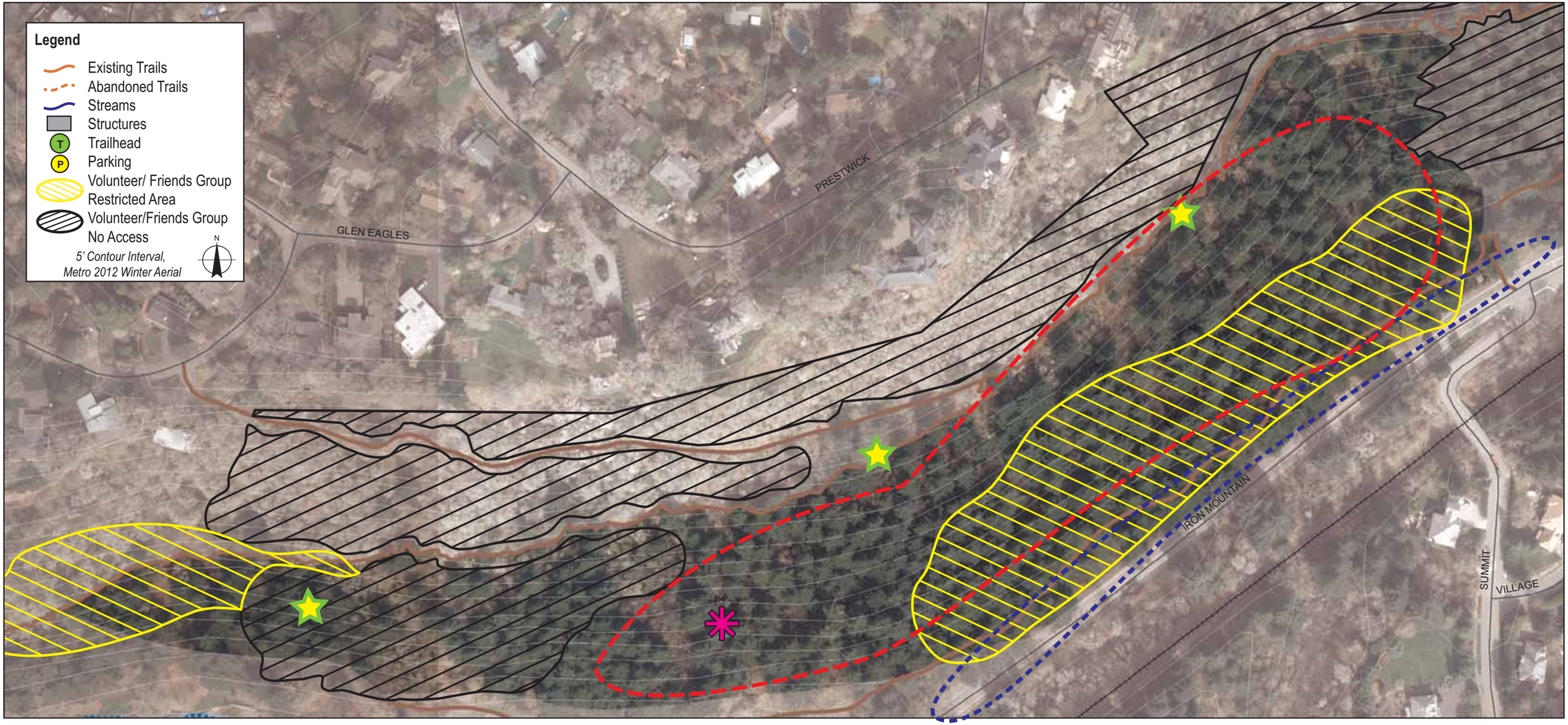
Area E - Midland Forest Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	**GL1**	**GL2**	**GL3**	**GL4**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X						X	X		
Free the trees of Clematis and Ivy within designated area (not in volunteer restricted area)			X							X	X		
Remove invasive species in non restricted areas – target areas with higher concentration of native species (use these areas as a "beachhead")										X	X		
Utilize this area as an experimental/example of low chemical or chemical free restoration (Excludes City projects). Track results			X	X						X	X		
Plant native species where needed.										X	X		
Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)										X	X		
Provide heightened restoration efforts around the unique boulders within this area.		X								X	X		
Maintain restored areas (Develop maintenance program with the City)	X		X	X							X	M.	M.

Parks and Recreation Department (City) Projects	**GL1**	**GL2**	**GL3**	**GL4**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 - 25**	**2025 - 30**	**2031 - 35**
Invasive removal where volunteers are restricted (poison oak, ivy, clematis)										X	X		
Remove holly trees										X	X		
Investigate and develop a ground cover strategy to provide invasive buffer along roads		X	X	X						X	X		
Work with street department and railroad to address re-infestations of low tolerance invasives (see invasive species matrix)				X						X	X		
Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and encourage propogation of sensitive/endangered species.		X	X	X						X	X		
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X							X	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

ACTION AREA "E" - MIDLAND FOREST



Friends of Iron Mountain restoration/stabilization projects*:

Protect sensitive species once City develops guidelines (Madrone, Trillium and Larkspur), work with City and other organizations to collect seeds for propagation.

Free the trees of Clematis and Ivy within designated area, remove invasive species in non restricted areas – target areas with higher concentration of native species (not in volunteer restricted area, use these areas as a "beachhead")

N/A Utilize this area as an experimental/example of low chemical or chemical free restoration (Excludes City projects).

Plant native species where needed.

N/A Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)

Provide heightened restoration efforts around the unique boulders within this area.

Friends of Iron Mountain Project Planning Worksheet: 2019 +

N

0 100 200 400 Feet

ACTION AREA F – WHITE OAK UPLAND

AREA – 6.85 acres
TOPOGRAPHY – Ridgeline along trail, rocky and steep, area is restricted for friends group and volunteers, staff/contractors use extreme caution. (see map, 5' contour interval)
ECOSYSTEM TYPE – Oregon White Oak Upland, high occurrence of poison area restricted for friends group and volunteers.
PRIORITY – 2/3 Friends of Iron Mountain, 1 City of Lake Oswego

PROJECTS

Friends of Iron Mountain restoration/stabilization projects*:

- Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*
- Work with neighbors to address private property invasive species.
- Area is restricted to volunteer projects due to slope and poison oak infestation.

**NOTE: LIMITED ACCESS TO VOLUNTEERS AND FRIENDS MEMBERS SEE MAP*

Parks and Recreation Department restoration/stabilization projects:

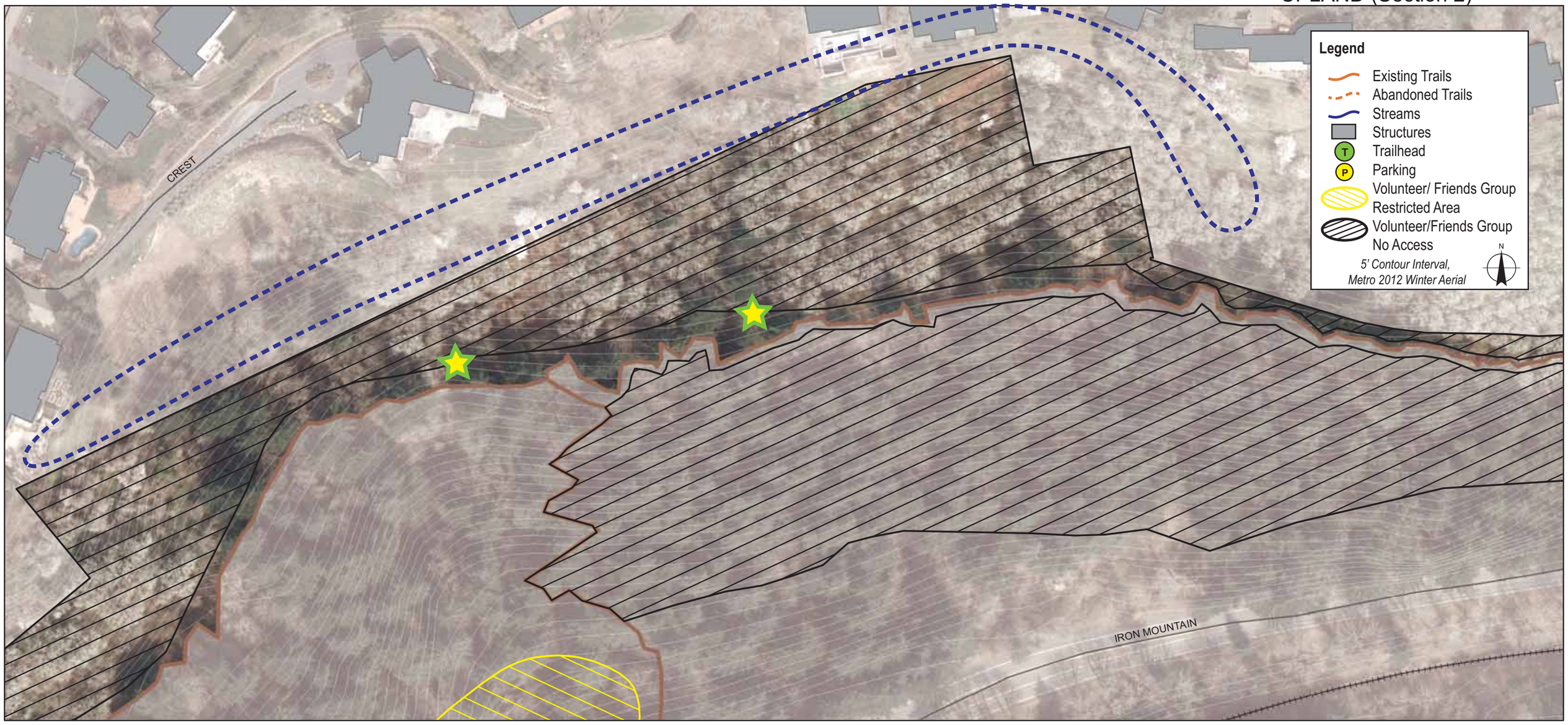
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*
- Survey boundaries.
- Work with neighbors to address private property invasive species.
- Remove invasive species according to threat in area (ivy, blackberry, scotch broom, refer to invasive species matrix for guidance).
- Address poison oak infestation, (consider keeping poison oak or limited amounts of the plant throughout the area, incentive to protect White Oak Upland from trespass.).
- Plant native species appropriate for the terrain (licorice fern).

Area F - White Oak Upland Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Area is restricted to volunteer projects due to slope and poison oak infestation.	-	-	-	-	-	-	-	-	-	-	-	-	-
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X	X	X							
Work with neighbors to address private property invasive species.				X		X							
Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X		X	M.	M.	M.	M.	M.	M.	M.
Parks and Recreation Department (City) Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and encourage propogation of sensitive/endangered species.		X	X	X	X	X	X	X	X	X			
Survey boundaries.					X	X							
Work with neighbors to address private property invasive species.		X	X	X		X							
Remove invasive species according to threat in area (ivy, blackberry, scotch broom, refer to invasive species matrix for guidance).						X							
Address poison oak infestation, (consider keeping poison oak or limited amounts of the plant throughout the area, incentive to protect White Oak Upland from trespass.).		X				X	X						
Plant native species appropriate for the terrain (licorice fern).						X	X						
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group).	X		X	X		X	M.	M.	M.	M.	M.	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

ACTION AREA "F" - WHITE OAK UPLAND (Section 2)



Friends of Iron Mountain Project Planning Worksheet:

2016	2017+

**Friends of Iron Mountain restoration/stabilization projects*
(Eastside concentration only):**

Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).

Work with neighbors to address private property invasive species.

N

0 55 110 220 Feet

ACTION AREA "F" - WHITE OAK UPLAND (Section 1)

Friends of Iron Mountain Project Planning Worksheet:

2016	2017+

PRESTWICK

Legend

- Existing Trails
- Abandoned Trails
- Streams
- Structures
- Trailhead
- Parking
- Volunteer/ Friends Group Restricted Area
- Volunteer/Friends Group No Access

5' Contour Interval, Metro 2012 Winter Aerial

N

Friends of Iron Mountain restoration/stabilization projects* (westside concentration only):

Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).

Work with neighbors to address private property invasive species.

N

0 55 110 220 Feet

ACTION AREA G – EASTERN SLOPES

AREA – 6.88 acres
TOPOGRAPHY –Relatively flat along southern right-of-way, very steep slope from right of way north, area restricted for friends group and volunteers, staff/contractors use extreme caution. (see map, 5' contour interval)
ECOSYSTEM TYPE – Douglas Fir Forest, area is restricted to friends and volunteer groups due to high occurrence of poison oak, staff/contractors use extreme caution.
PRIORITY – 5 City of Lake Oswego

PROJECTS

Friends of Iron Mountain restoration/stabilization projects*:

- Restricted area, No actions/projects for this area.

**NOTE: NO ACCESS TO VOLUNTEERS AND FRIENDS MEMBERS SEE MAP*

Parks and Recreation Department restoration/stabilization projects:

- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*
- Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered).
- Remove all invasive species from ground and trees. If limited removal is the only option choose areas that have high concentration of native species and areas that will protect existing restoration efforts.
- Plant native species appropriate for site and location.

Area G - Eastern Slopes Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Restricted area, No actions/projects for this area	-	-	-	-	-	-	-	-	-	-	-	-	-
Parks and Recreation Department (City) Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)				X							X		
Remove all invasive species from ground and trees. If limited removal is the only option choose areas that have high concentration of native species and areas that will protect existing restoration efforts.											X		
Plant native species appropriate for site and location											X		
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X							X	M.	M.

M. = This indicates an area is restored and at a state of continual maintenance.

ACTION AREA "G" - EASTERN SLOPES

Friends of Iron Mountain restoration/stabilization projects*:

No actions/projects for this area.

ACTION AREA H – EASTERN ISLAND

AREA – 1.52 acres
TOPOGRAPHY – Relatively flat along southern right-of-way, very steep slope from right of way north, area restricted for friends group and volunteers, staff/contractors use extreme caution.
ECOSYSTEM TYPE – Douglas Fir Forest, area is restricted for friends and volunteer groups due to high occurrence of poison oak, staff/contractors use extreme caution.
PRIORITY – 6 City of Lake Oswego

PROJECTS

Friends of Iron Mountain restoration/stabilization projects:

- Free the trees from ivy and clematis.
- Invasive removal within non restricted space.
- Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*

Parks and Recreation Department restoration/stabilization projects:

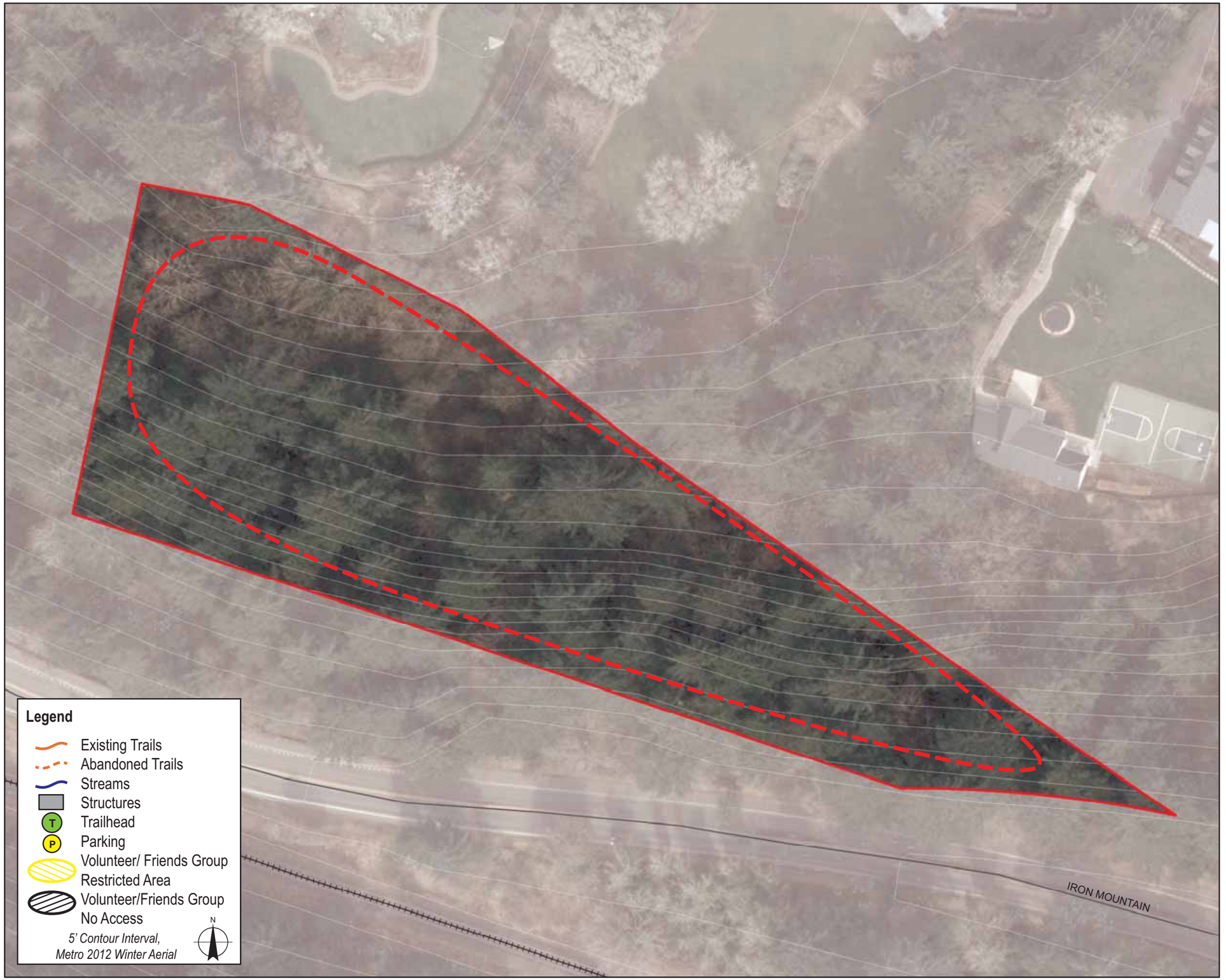
- Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). *See Page 9 for details.*
- Survey boundaries.
- Work with neighbors to address private property invasive species.
- Invasive removal.
- Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered).

Area H - Eastern Island Proposed Implementation

Projects	Priorities Met				Proposed Implementation Schedule								
Friends/Volunteer Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Free the trees from ivy and clematis			X								X	X	
Invasive removal within non restricted space											X	X	
Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).		X	X	X									
Maintain restored areas (Develop Maintenance program with the City)	X		X	X								X	M.
Parks and Recreation Department (City) Projects	GL1	GL2	GL3	GL4	2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
Survey boundaries											X	X	
Work with neighbors to address private property invasive species.		X		X							X	X	
Invasive removal											X	X	
Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)											X	X	
Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X								X	M.

M. = This indicates an area is restored and at a state of continual maintenance.

ACTION AREA "H" - EASTERN ISLAND



Legend

- Existing Trails
- Abandoned Trails
- Streams
- Structures
- Trailhead
- Parking
- Volunteer/ Friends Group Restricted Area
- Volunteer/Friends Group No Access

5' Contour Interval, Metro 2012 Winter Aerial

N

Friends of Iron Mountain restoration/stabilization projects:

Ivy and Clematis removal from trees and ground. Tree's are priority.

Friends of Iron Mountain Project Planning Worksheet: 2025 +

N

0 30 60 120

Feet

Master Project Implementation Plan
Friends of Iron Mountain

Sub-area	Priority Level	Projects: Friends/Volunteer Projects	Priorities Met: GL1	GL2	GL3	GL4	Proposed Implementation Schedule: 2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
All	N/A	Investigate adopt a plot program (City, Friends Group)	X		X	X		X	X						
All	N/A	Voluntary project documentation where possible, this could involve a short summary of what activities occurred, dates, observed outcomes, photographs, and observations of previous projects.				X		X	X	X	X	X	X	X	X
All	N/A	Work cooperatively with City and other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.).The City will organize, lead and in some instances delegate the task of partnering with other organizations to collect seeds and propagate these species.		X	X	X		X	X	M.	M.	M.	M.	M.	M.
A	1	Limited planting in areas with sparse native coverage					X	X	X						
A	1	Complete ivy removal on ground and in trees, maintain ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)				X	X	X							
A	1	Adopt a plot (work with City on a possible adopt a plot program)	X		X	X		X	X						
A	1	Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X	M.	M.	M.	M.	M.	M.	M.	M.	M.
F	2	Work with City and other organizations (Oregon Department of Agriculture, etc.) to protect sensitive species (Madrone, Trillium and Larkspur).				X	X	X							
F	2	Work with neighbors to address private property invasive species.				X		X							
F	2	Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X		X	M.	M.	M.	M.	M.	M.	M.
B	2	Ground ivy removal within designated area (not in volunteer restricted area)							X	X					
B	2	Priority invasive removal, Scotch Broom, Shining start geranium, blackberry. (See Invasive Maps)							X						
B	2	Free the trees, ivy removal from trees within designated area (not in volunteer restricted area)			X	X			X	X					
B	2	Protect Trillium Patch, (develop protection/propagation project, acquire city approval)		X		X			X	X					
B	2	Plant native species in recently cleared areas	X					X	X						
B	2	Free the trees with neighbors (work with private property owners to free the trees on the boundary of the park)				X			X						
B	2	Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X			X	X	M.	M.	M.	M.	M.
C	3	Remove invasive species in non restricted areas – target areas with higher concentration of native species (use these areas as a "beachhead")									X				
C	3	Free the Trees within non restricted areas.			X					X	X	X			
C	3	Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X					X	M.	M.	M.	M.
E	4	Free the trees of Clematis and Ivy within designated area (not in volunteer restricted area)										X	X		
E	4	Remove invasive species in non restricted areas – target areas with higher concentration of native species (use these areas as a "beachhead")										X	X		
E	4	Utilize this area as an experimental/example of low chemical or chemical free restoration (Excludes City projects).										X	X		
E	4	Plant native species where needed.										X	X		
E	4	Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)										X	X		
E	4	Provide heightened restoration efforts around the unique boulders within this area.		X								X	X		
E	4	Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X							X	M.	M.
H	5	Free the trees from ivy and clematis											X	X	
H	5	Invasive removal within non restricted space											X	X	
H	5	Maintain Restored Areas (Develop Maintenance program with the City)	X		X	X								X	M.

M. = This indicates an area is restored and at a state of continual maintenance.

Master Project Implementation Plan
City of Lake Oswego, Parks and Recreation Department

Sub-area	Priority Level	Projects Friends/Volunteer Projects	Priorities Met GL1	GL2	GL3	GL4	Proposed Implementation Schedule 2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
All	N/A	Develop a buffering strategy to use along road ways and areas where infestation of low tolerance invasives is likely. In the interim try ivy buffer along roadways. (City)				X	X	X	X						
All	N/A	Investigate adopt a plot program (City, Friends Group)	X		X	X		X	X	X					
All	N/A	Complete a master planning process for the park (City)							X	X					
All	N/A	Study park natural systems (City)							X	X					
All	N/A	Work with neighbors to address private property invasive species. (Friends Group, City)			X	X			X	X					
All	N/A	Voluntary project documentation where possible, this could involve a short summary of what activities occurred, dates, observed outcomes, photographs, and observations of previous projects.				X		X	X	X	X	X	X	X	X
All	N/A	Survey boundaries (City)						X	X	X	X	X	X		
All	N/A	Work cooperatively with other organizations (Oregon Department of Agriculture, Scientific Organizations etc.) to track, protect and propagate sensitive/endangered species (Madrone, Trillium, Larkspur and Etc.). City will develop guidelines for protection, tracking and propagation utilizing thoughtful approaches and Integrated Pest Management tools. The City will organize, lead and in some instances delegate the task of partnering with other organizations to collect seeds and propagate these species (City, Friends Group, State)		X	X	X		X	X	X	M.	M.	M.	M.	M.
A	Support	Survey Boundaries						X							
A	Support	Spot treat any invasives restricted to City/Contractor only removal (see invasive matrix)							X						
A	Support	Develop Guidelines for stabilizing and protecting sensitive species (Western Wahoo, Madrone, Larkspur)		X	X		X	X	X						
A	Support	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X			X	X	X	S.	S.	S.	S.
F	1	Survey boundaries					X	X	X	X	X	X			
F	1	Work with neighbors to address private property invasive species.		X	X	X	X	X							
F	1	Remove invasive species according to threat in area (ivy, blackberry, scotch broom, refer to invasive species matrix for guidance)						X							
F	1	Address poison oak infestation, (consider keeping poison oak or limited amounts of the plant throughout the area, incentive to protect White Oak Upland from trespass.)		X				X	X						
F	1	Plant native species appropriate for the terrain (licorice fern)						X	X						
F	1	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X		X	M.	M.	M.	M.	M.	M.	M.
B	2	Holly removal								X	X				
B	2	Ivy removal in volunteer restricted areas								X	X				
B	2	Plant native species in recently cleared areas							X	X					
B	2	Eastside of Area B is restricted for friends groups and volunteers, only the City will be concentrating on this area.							X	X					
B	2	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X				X	M.	M.	M.	M.	M.
D	2	Stabilize the area from further degradation								X	X				
D	2	Work with the LOIS and LOTWP projects to provide stabilization and possibly some restoration of the area.			X	X		X	X	X					
D	2	Develop a stream stabilization and restoration plan after the master planning process								X	X				
D	2	Stabilize and Restore the stream resources		X							X	X			
D	2	Implement Master Plan restoration recommendations									X	X	X	X	X
D	2	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X						X	M.	M.	M.
C	3	When extra funding is available treat restricted area for all invasives including Poison Oak		X						X					
C	3	Remove invasive trees Holly, Hawthorne and Cherry. (Utilize Invasive Matrix for priority removal guidance)								X	X				
C	3	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X				X	M.	M.	M.	M.	M.
E	4	Invasive removal where volunteers are restricted (poison oak, ivy, clematis)										X	X		
E	4	Remove Holly trees										X	X		
E	4	Investigate and develop a ground cover strategy to provide invasive buffer along roads		X	X	X						X	X		
E	4	Work with street department and railroad to address re-infestations of low tolerance invasives (see invasive species matrix)										X	X		

M. = This indicates an area is restored and at a state of continual maintenance.

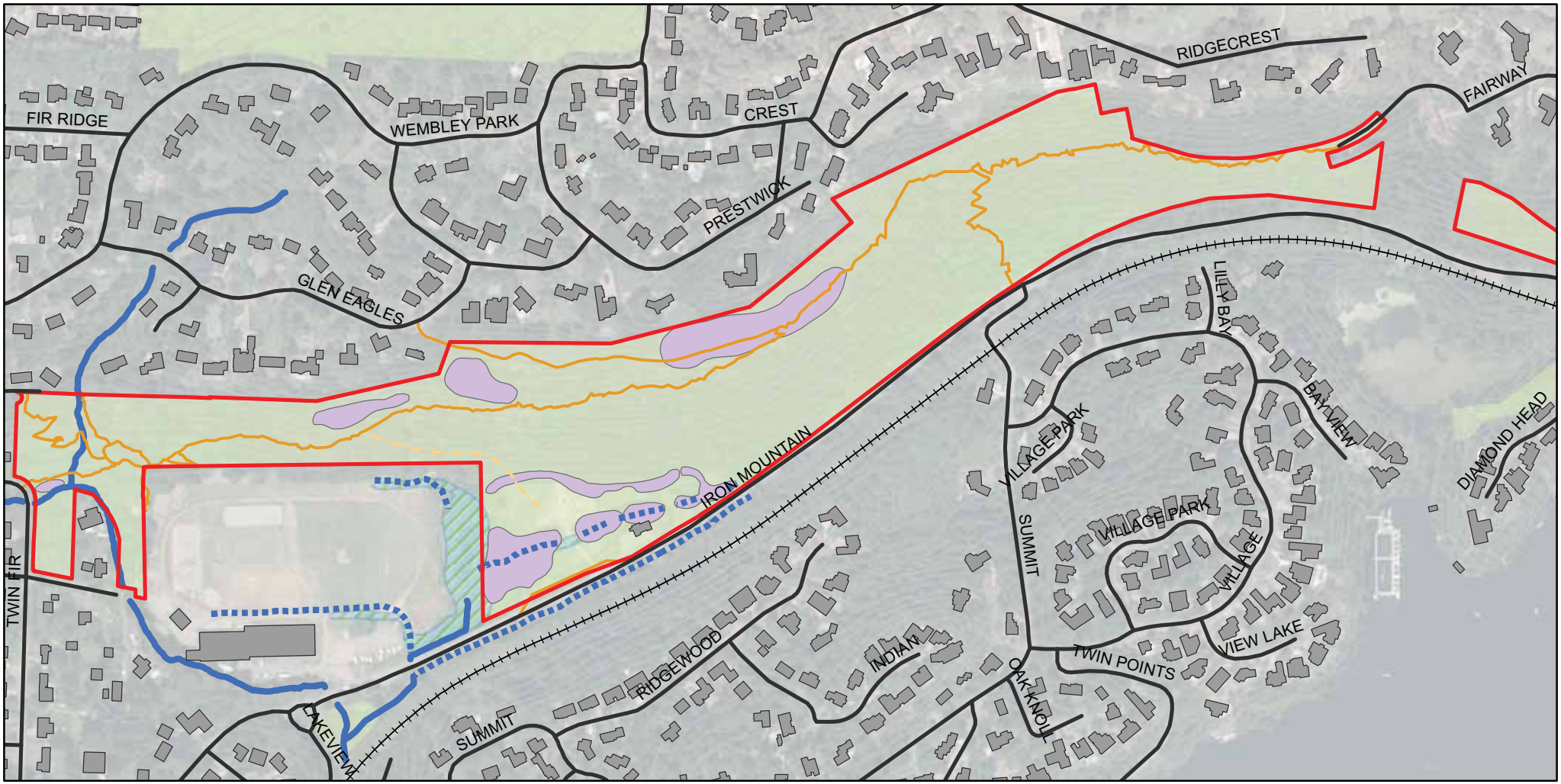
S. = This indicates a supportive role by the City.

Sub-area	Priority Level	Projects Friends/Volunteer Projects	Priorities Met GL1	GL2	GL3	GL4	Proposed Implementation Schedule 2014	2015	2016	2017	2018	2019	2020 - 25	2025 - 30	2031 - 35
E	4	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X						X	X	M.	M.
G	5	Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)				X							X		
G	5	Remove all invasive species from ground and trees. If limited removal is the only option choose areas that have high concentration of native species and areas that will protect existing restoration efforts.											X		
G	5	Plant native species appropriate for site and location											X		
G	5	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X							X	M.	M.
H	6	Survey boundaries											X	X	
H	6	Work with neighbors to address private property invasive species.		X		X							X	X	
H	6	Invasive removal											X	X	
H	6	Consider an ivy buffer along streets to prevent spread of lower tolerance invasives (until alternate buffers can be discovered)											X	X	
H	6	Develop a maintenance plan and maintain restored areas (Coordinate with Friends Group)	X		X	X								X	M.

M. = This indicates an area is restored and at a state of continual maintenance.

APPENDIX A – INVASIVE SPECIES MAPS

INVASIVE SPECIES - BLACKBERRY

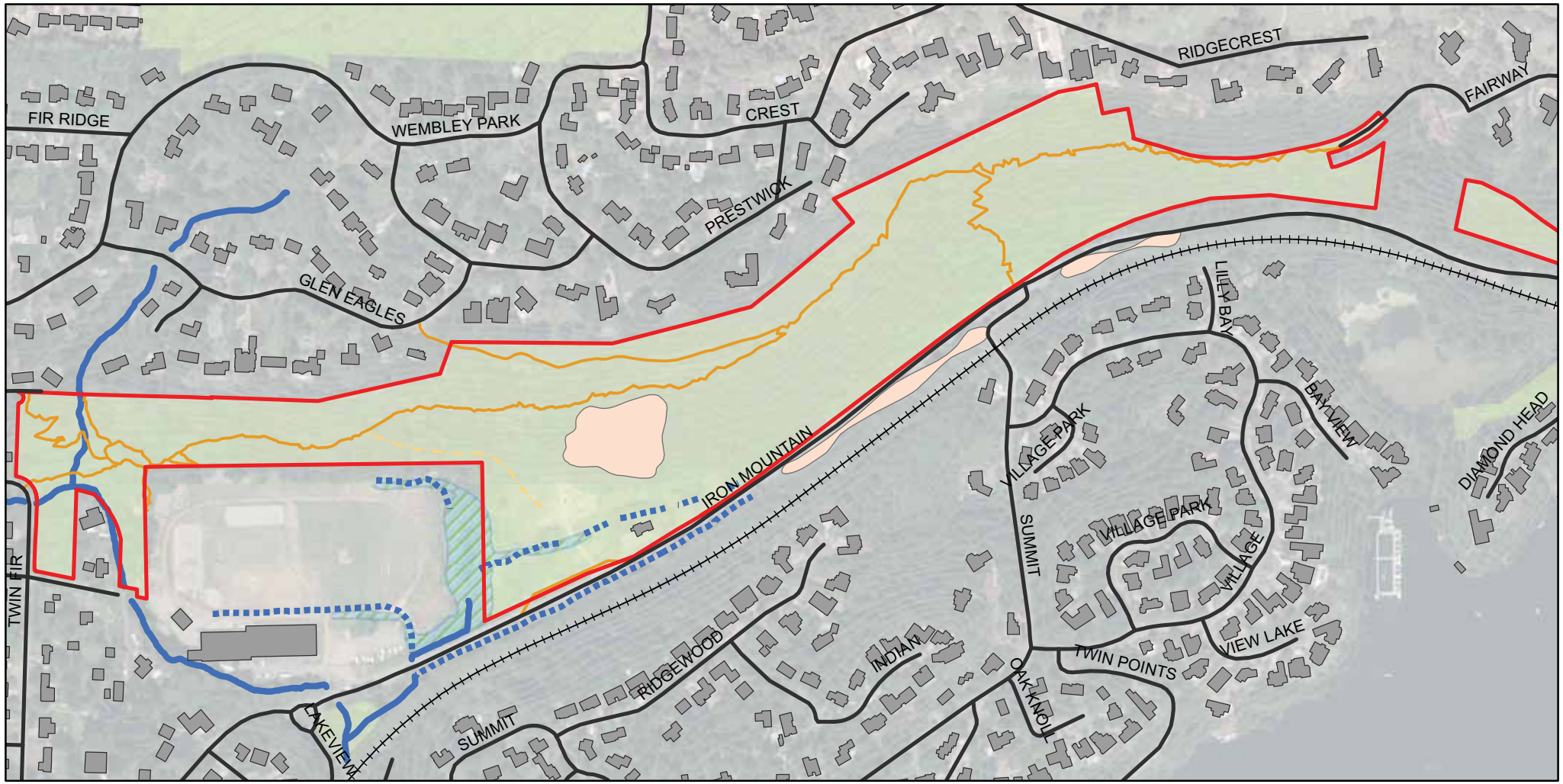


Legend

- Blackberry
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - CLEMATIS

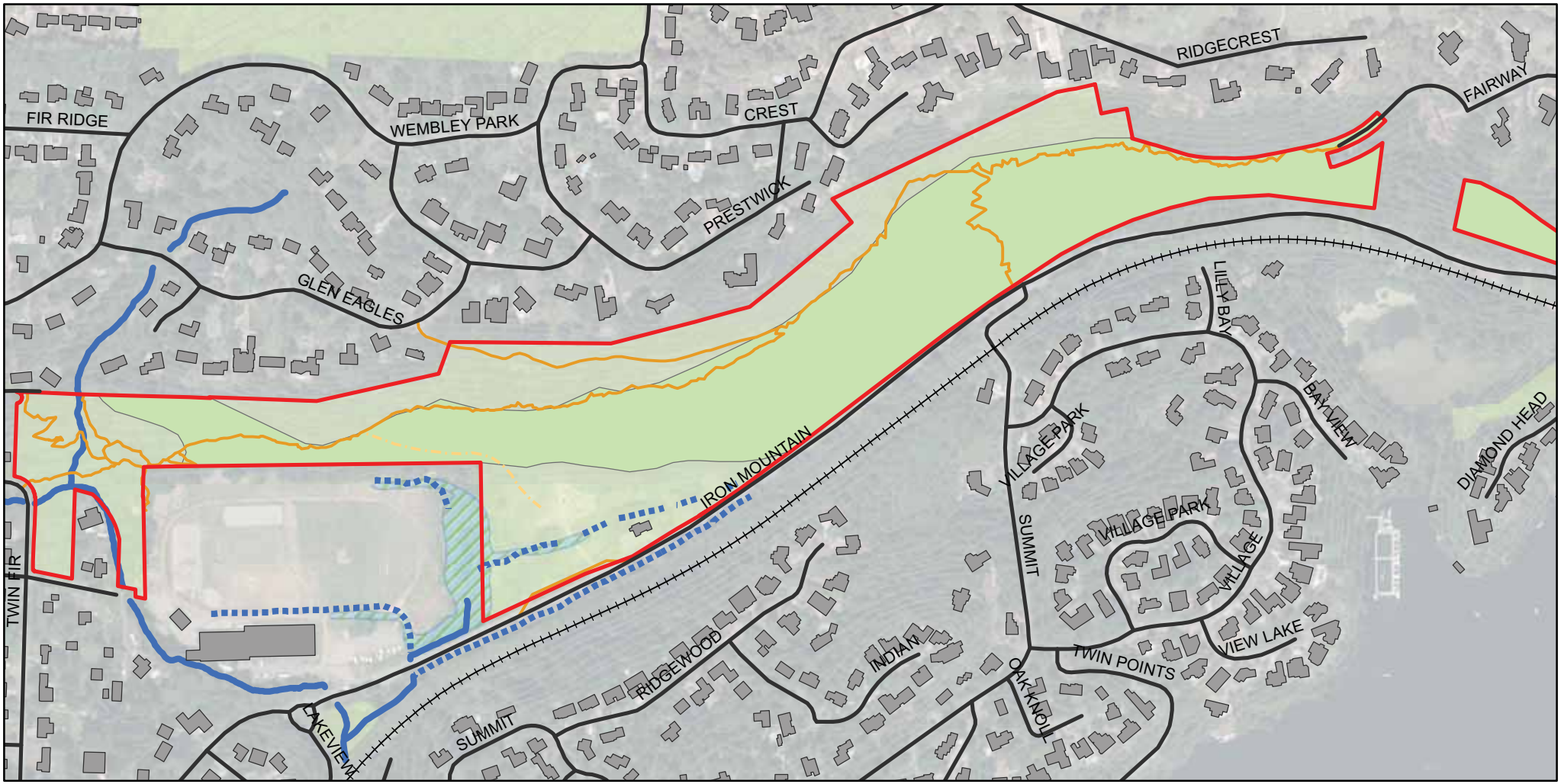


Legend

- Clematis
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - ENGLISH IVY

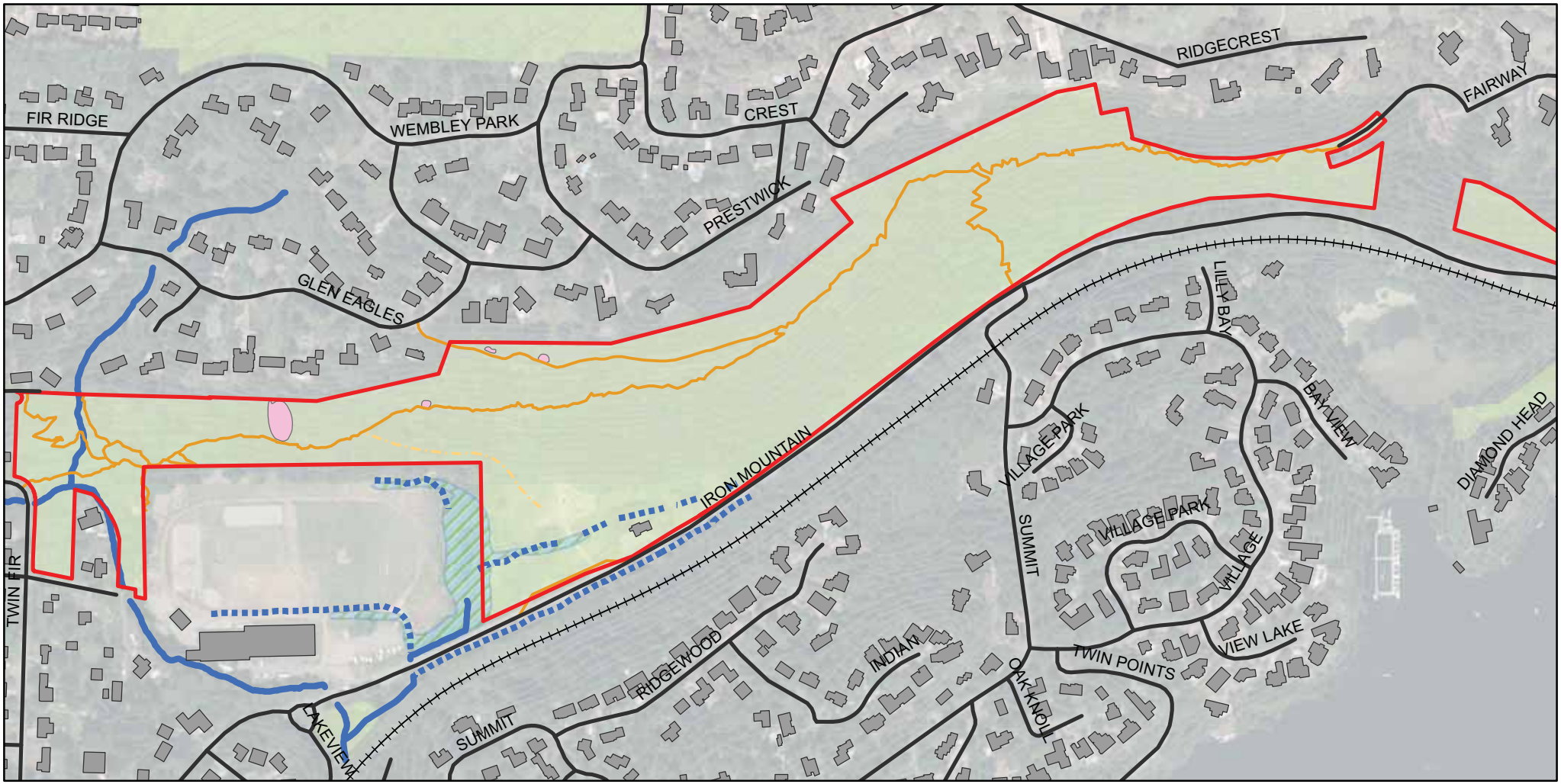


Legend

- English Ivy
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - VINCA MINOR

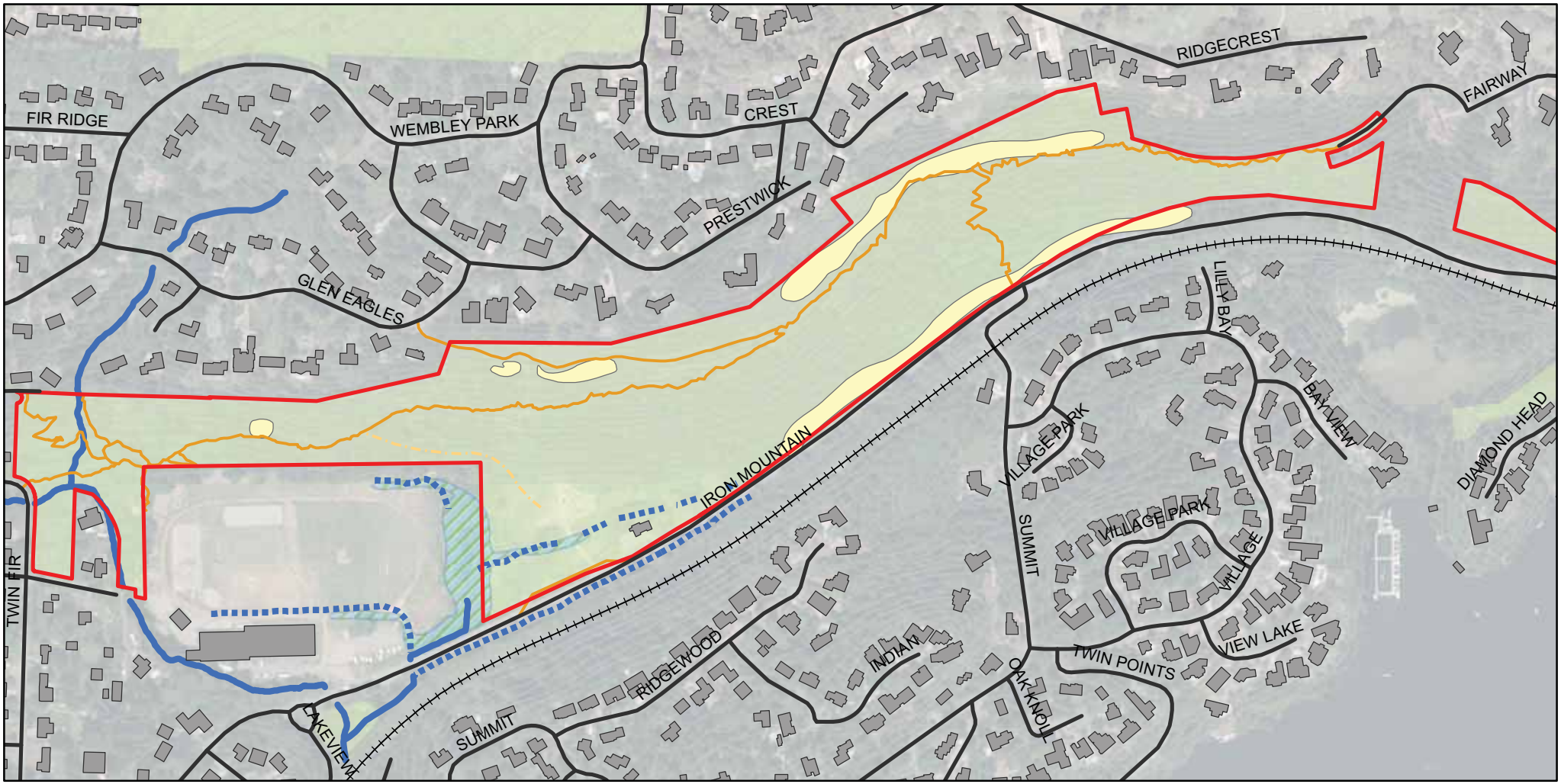


Legend

- Vinca Minor
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - SCOTCH BROOM

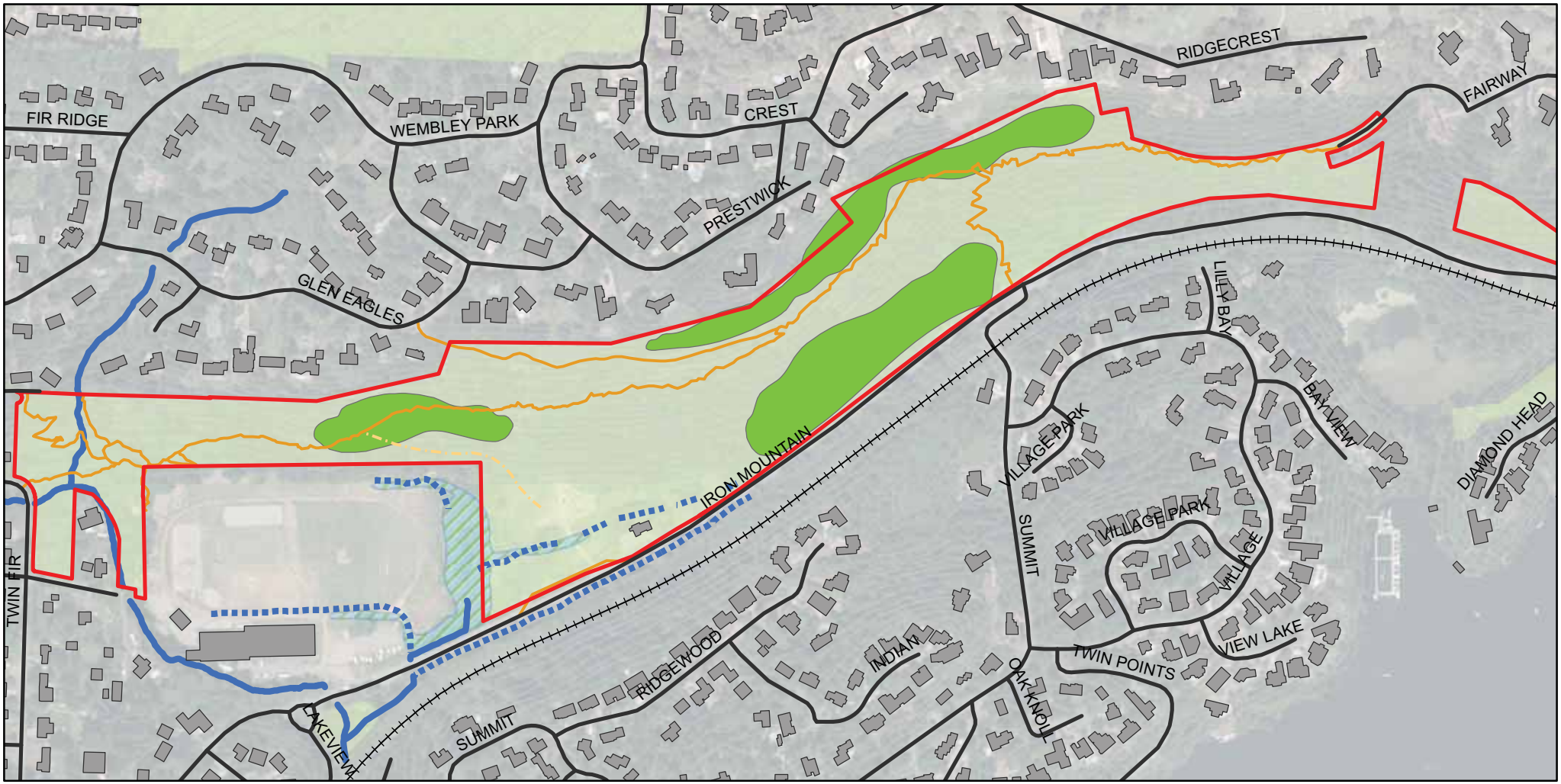


Legend

- Scotch Broom
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - POISON OAK

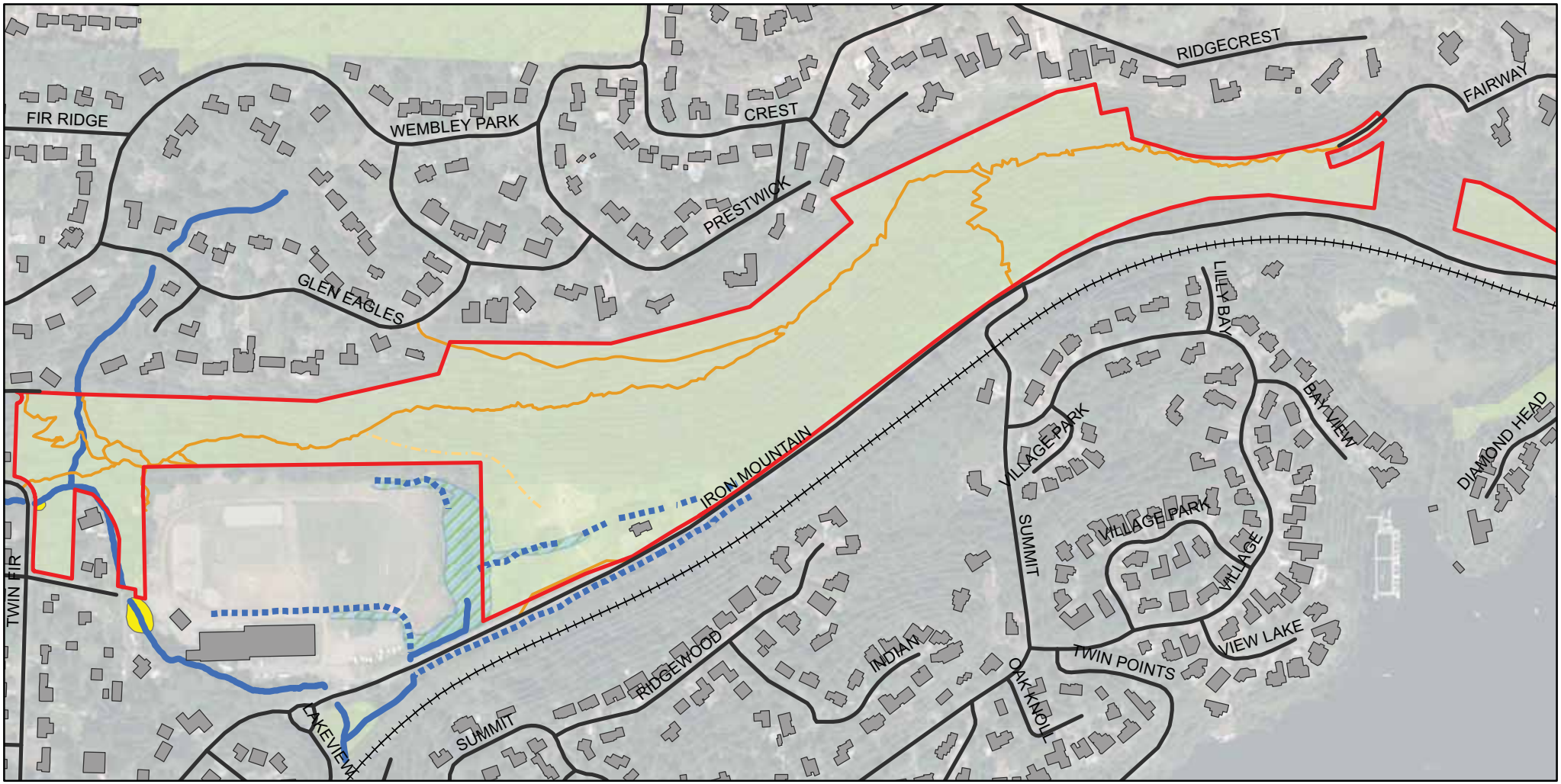


Legend

- Poison Oak
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - LESSER CELANDINE

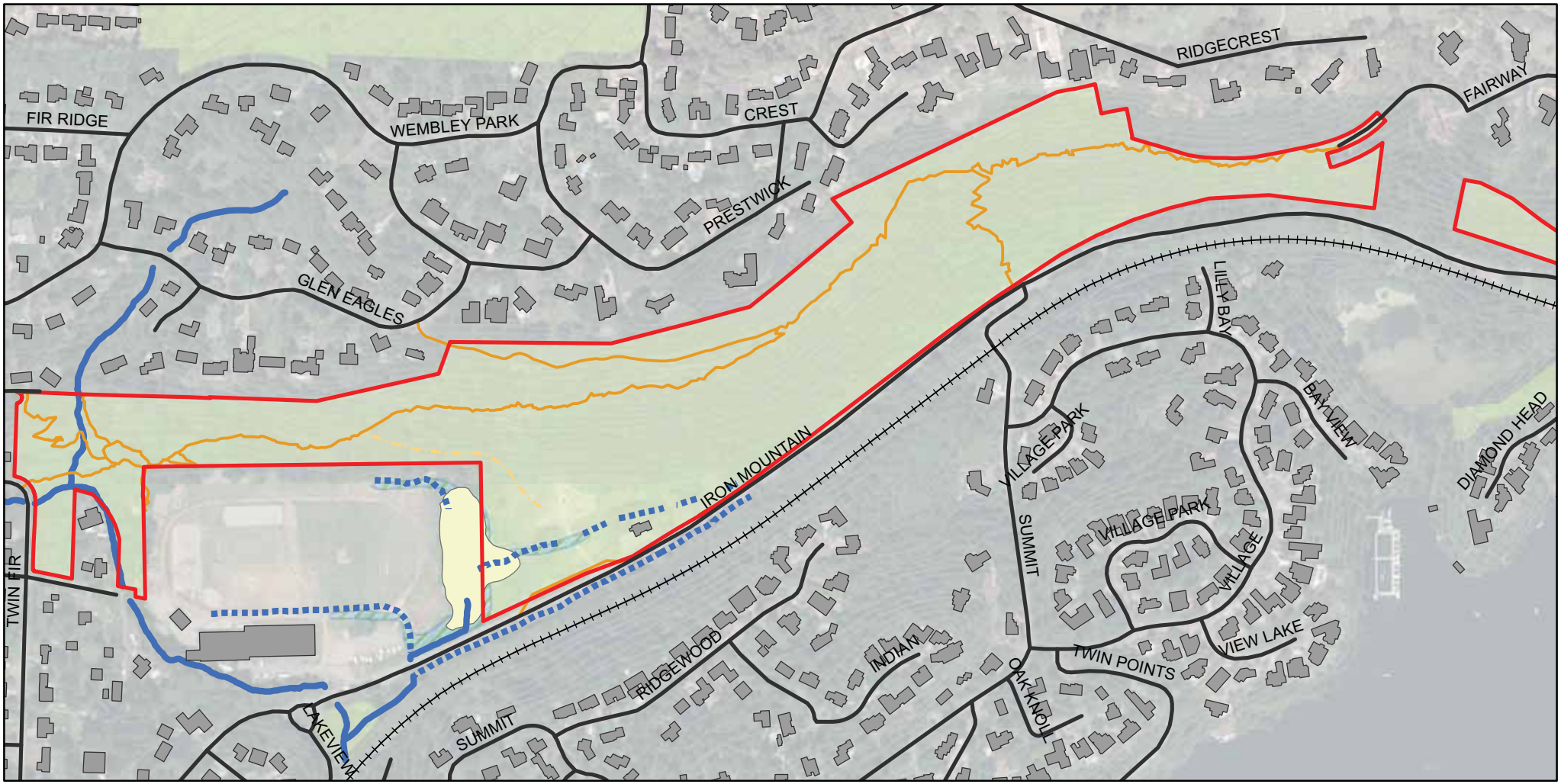


Legend

- Lesser Celandine
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - HYDROCOTYLE

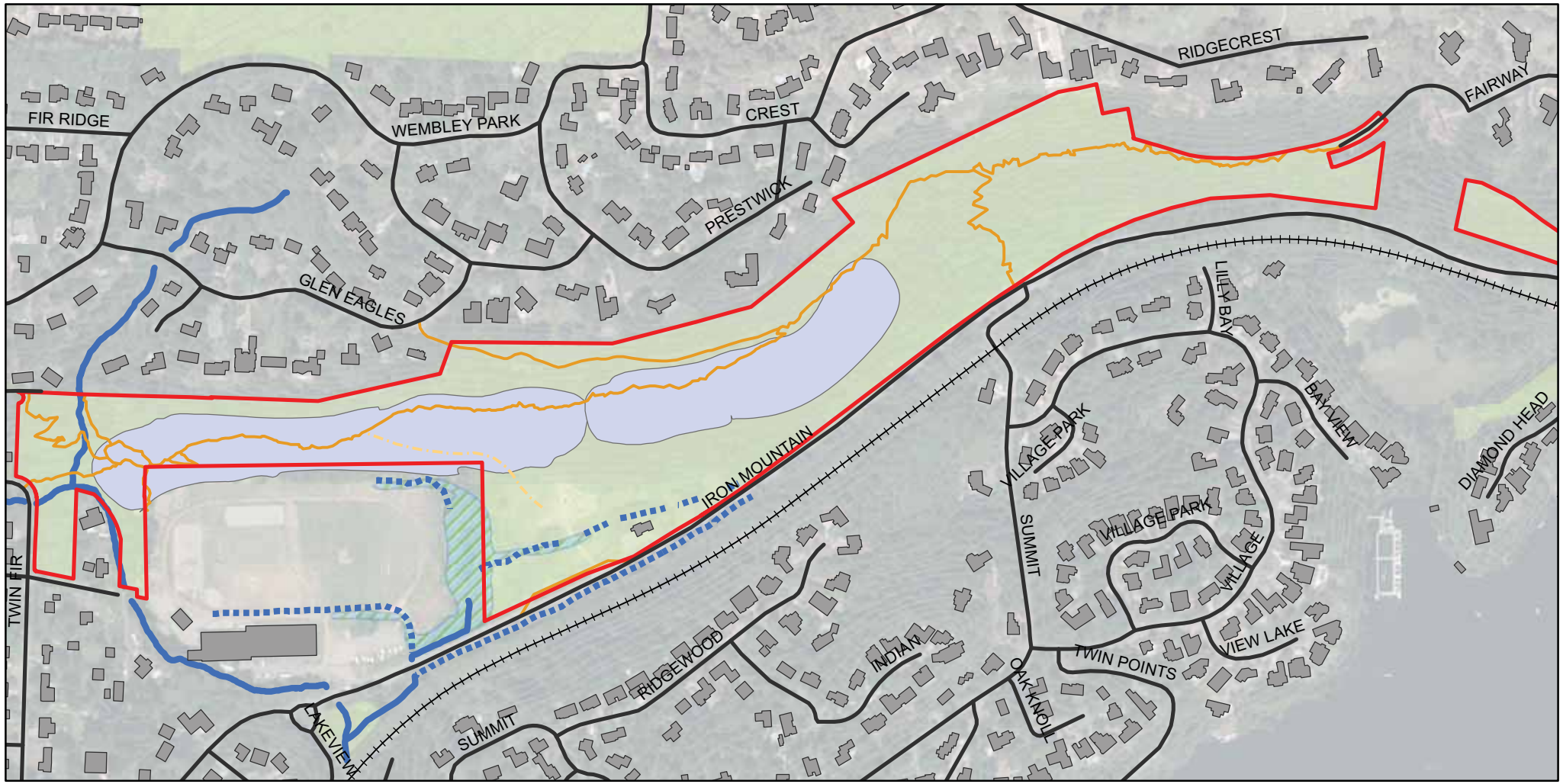


Legend

- Hydrocotyle
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - HOLLY

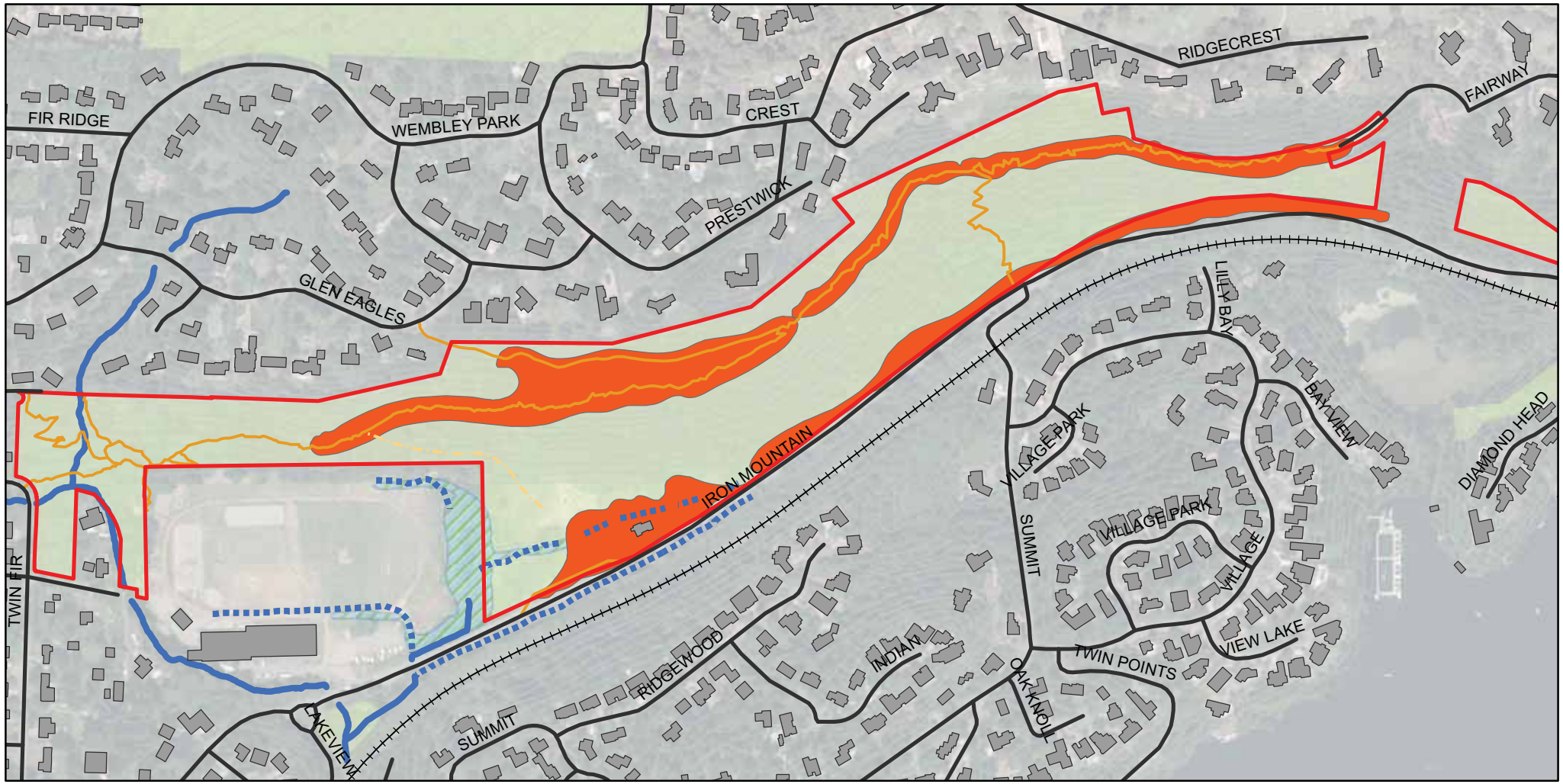


Legend

- Holly
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

INVASIVE SPECIES - GERANIUM



Legend

- Geranium
- Building footprints
- Existing Trail
- Master Planned Trail
- All Streets
- Railroads
- 10 Foot Contours
- Iron Mountain Park
- Park Property

1 in = 500 ft

APPENDIX B – HABITAT INVENTORY

IRON MOUNTAIN NATURAL AREA

Habitat Assessment and Enhancement Recommendations

DRAFT

Prepared for
City of Lake Oswego, Parks & Recreation

November 2012

Prepared by
Sarah Hartung, Senior Biologist, M.S. Avian Ecology

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1. Introduction

Iron Mountain is a 51-acre park and natural area located just north of Lake Oswego. The park consists of 18 parcels owned by the City of Lake Oswego (City) and managed by the Parks & Recreation Department (Parks). Approximately 8 of the acres are located on flat terrain, while a majority of the park is on a forested, rocky, south-facing slope. A Master Plan was prepared in 1984 for the parcel just east of the Lake Oswego Hunt Club, an equestrian training center. A few trail systems are in place and future trail development is desired. ESA was retained by Parks to prepare this habitat assessment of Iron Mountain to help inform future development plans and identify compatible enhancement projects.

This report includes the following elements;

- Wildlife species observed, detected, or expected based on habitat features and surrounding landscape,
- Ground-level photographs,
- A map showing major deer trails, wildlife use areas, and habitat features, and
- Recommendations for enhancing or improving wildlife habitat on-site.

2. Assessment Methods and Site Description

2.1. Methodology

ESA visited the site on September 15 and 18, 2012 to assess existing habitat conditions and evaluate potential enhancement opportunities. Many wildlife species are nocturnal, wary of humans, and/or inconspicuous; therefore field methods relied on observable evidence of wildlife use (scat, presence of trails, etc) and habitat features (downed wood, snags, perches, etc). Park users encountered during the site visits were questioned about their wildlife experiences on the site. Binoculars were used to aid in field identification of birds. Habitat features were recorded using a hand-held Global Positioning System (GPS) where feasible; however, the dense canopy cover of the forested areas hindered GPS capabilities in many areas. In lieu of GPS, locations of deer trails were noted by pacing off distances from reference features (benches, trail connections) and added to the habitat map. Signs of deer use in the park including major travel corridors were recorded as were observations of other mammals and birds.

The following resources were reviewed to aid in the assessment of existing habitat conditions:

- Plant Inventory for Iron Mountain, Ash Creek Management, 2012
- Aerial imagery (Google Maps, 2012)
- Federally Listed, Proposed, Candidate Species and Species of Concern for Clackamas County, U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office. Last updated September 8, 2012. USFWS, 2012
- Data system search for rare, threatened and endangered plants and animals for the Iron Mountain Natural Area, Oregon Biodiversity Information Center, 2012.

2.2. Landscape Setting and Site Use

The study area is situated on a south-facing slope along Iron Mountain Boulevard. Approximately 8 acres of the site are on flat terrain just east of the Lake Oswego Hunt Club, but a majority of the site has very steep, forested slopes that exceed 25 percent in many areas. The existing trail system is used for dog-walking, hiking, running, and wildlife viewing. The park was mined for iron ore in the late 1800s and the main trail at the top of the slope is a remnant of mining access. Interpretative signs related to site history are located at the northwest trail entrance off of Glen Eagles Road. Park users can also access the trail system from the northeast end off of Fairway Road or from Brookside Road and Twin Fir Road at the southwest end. A short trail segment, approximately 500 feet long, parallels Iron Mountain Boulevard at the base of the hill. This trail segment is adjacent to a small parking lot and crosses an access road that extends north to a construction staging site. In the absence of a complete trail loop, people walk or run along the shoulder of Iron Mountain Boulevard which is a major arterial (Photo 1).

Photo 1. Iron Mountain Boulevard and adjacent shoulder.

Photo 2. Looking northeast at the Lake Oswego Hunt Club with Iron Mountain Park in the background.

Surrounding land use includes residential, open space (Photo 2 - Hunt Club, and the Oswego Lake Country Club); and the Burlington Northern Railroad corridor south of Iron Mountain Boulevard. Single-family residences abut the park boundary at the top of the slope where oak forest is located. Single-family residences are also located west of the park and south of the railroad corridor. Oswego Lake is not visible from the park, but is located 0.2 to 0.3 mile to the south. The Hunt Club, located at the southwest end of the study area, is used for equestrian training and consists primarily of turf grass and a wood chip track. The hunt club property contains a few buildings including a large historic wooden barn and stable.

Two stream corridors are located on-site: Spring Brook Creek and an unnamed stream. Spring Brook Creek is a tributary of Oswego Lake that originates from a residential area west of the site and flows along the extreme southwest end of the study area. The stream flows through a culvert under Iron Mountain Boulevard and through a box culvert under the railroad berm to the south, eventually draining to the lake. No special status fish species are mapped for Spring Brook Creek (StreamNet, 2012). The unnamed stream originates as seepage from the hillside and consists of a series of impoundments located

east of the Hunt Club and just north of Iron Mountain Boulevard. The unnamed stream is not included in the StreamNet database, indicating that it does not support special status fish species.

3. Habitat Assessment

Five habitat types were observed on-site: wetland, riparian, scrub-shrub, Douglas fir forest, and Oregon white oak forest. Refer to Figure 1, Appendix A for a depiction of the habitat types. Habitat assessment forms for each habitat type are located in Appendix B and the USFWS county species list is located in Appendix C. Characteristics of the habitat types and wildlife species observed are described below.

Rare or special status plants and animals recorded for the project site or vicinity include white rock larkspur (*Delphinium leucophaeum*; OBIC, 2012), Peacock larkspur (*Delphinium pavonaceum*; Ash Creek Management, 2012), and bald eagle (OBIC, 2012). White rock larkspur is a federal species of concern and state endangered plant documented as occurring in the oak forest habitat on-site (OBIC, 2012). This rare plant grows in oak woodlands, rocky bluffs, moist slopes and lowland meadows. White rock larkspur is similar in appearance to Peacock larkspur, but is not as tall and has smaller flowers. . Peacock larkspur is also a federal species of concern (USFWS, 2012) but is not state listed. Ash Creek Management reported an observation of peacock larkspur in the oak forest but recommended confirming species identification in the spring when the plant is in bloom. ESA did not observed either of the Delphinium species during the September field visit. The bald eagle is a state endangered species documented as nesting along the shoreline of Lake Oswego about ¼ to ½ mile away. No bald eagle nests were observed on the Iron Mountain project site, but potential suitable habitat (i.e. large swath of tall trees) is present on-site.

3.1. Wetlands

A wetland covering approximately 1 acre is located in a depression at the southeast end of the site. Only a small portion of the wetland occurs in the study area and the majority of the wetland is located on the adjacent Hunt Club property. Characteristics of the wetland are summarized on Habitat Assessment Form 1, Appendix C. Standing water covers a large portion of the wetland, with average depths estimated between 2 to 3 feet. Open water is present at the center of the wetland where depths are estimated to reach up to 5 feet. A few pockets of soft rush (*Juncus effusus*) and cattail (*Typha latifolia*) are located along the edge of the wetland, but the dominant plant in the wetland is marsh pennywort (*Hydrocotyle ranunculoides*), a floating aquatic plant that has forms almost a complete monoculture (Photo 3). Willows (*Salix* spp.) fringe the wetland and have an estimated canopy cover of 20 percent (Photo 4). Downed wood is limited in the wetland; only a few logs and several small branches were observed at the east end of the wetland on saturated ground.

Photo 3. Marsh pennywort has formed a monoculture around the open water portion of the wetland. Non-native nutria were seen in the wetland and have made extensive trails through the pennywort.

Photo 4. Willows along the edge of the wetland provide foraging habitat for songbirds including the ruby-crowned kinglet. Some downed wood is present, but more could be added.

Wildlife observed in the wetland includes several nutria, a great blue heron, and ruby-crowned kinglets foraging in the willows. The willows are also expected to provide foraging and limited nesting habitat for other native songbirds including the spotted towhee, western wood pewee, song sparrow, chickadees, and yellow warbler. No waterfowl were observed in the wetland, and only small numbers of ducks or geese are anticipated to use the wetland based on the wooded surroundings and limited amount of open water (about 0.5 acre). Waterfowl generally prefer larger expanses of open water with low surrounding vegetation that allows the detection of predators. No amphibians or turtles were observed, but the native chorus frog was heard in the adjacent stream corridor and likely inhabits the wetland. No American bullfrogs were detected on-site, despite their widespread distribution of these non-native frogs across Oregon in permanent bodies of freshwater. Bullfrogs typically squeak and plunge into water for safety when disturbed. No squeaks or splashes were detected after walking along the eastern shoreline.

Nutria have made several trails through the wetland vegetation and two individuals were seen foraging in the pennywort. Nutria are a non-native, semi-aquatic mammal that were introduced from South America for the fur trade several decades ago. Nutria are well-established in Oregon's streams, rivers, ponds, and wetlands where they eat a variety of vegetation and dig extensive burrows in banks. The native muskrat has been replaced by the more aggressive nutria in many aquatic habitats (ODFW, 2012).

3.2. Riparian Corridors

Two riparian corridors are present on-site: one along Spring Brook Creek at the west end of the project area, and the other associated with an unnamed stream east of the wetland. Characteristics of the riparian corridor of the unnamed stream are summarized in Habitat Assessment Form 2, Appendix C. The stream corridor east of the wetland consists of a series of impoundments due to clogged or failing culverts. Each stream segment contained standing water with depths ranging from 2 to 4 feet. No flow was observed and duckweed (*Lemna sp*.) covered the water surface in each stream segment. The eastern most culvert at Iron Mountain Boulevard appears plugged because no standing water was observed in the swale on

the south side of the road (off-site). Streambanks are relatively steep (2:1 and 3:1 slopes) and the top of bank varied from 1-3 feet above the surface water. The stream flows through an old settlement, as evidenced by a buried bathtub at the east end (Photo 5).

The stream contained limited downed wood that would provide habitat for macro-invertebrates, fish, and amphibians. The vegetation along the corridor consisted of patches of trees with an estimated canopy cover of 50 percent and a mix of Armenian blackberry,and native shrubs with 50 to 70 percent cover. Dominant trees were black cottonwood and red alder. Native shrubs included California hazelnut (*Corylus cornuta*). Groundcover was sparse due to dominance by Armenian blackberry and consisted generally of non-native grasses and forbs. The riparian zone of the unnamed stream is relatively narrow (25 to 30 feet wide) and could be enhanced with additional tree and shrub plantings. No snags or standing dead trees were observed in the riparian habitat or in the adjacent wetlands.

Photo 5. The eastern segment of the unnamed creek (on left side) and a buried bathtub from past settlement.

Photo 6. Spring Brook Creek runs dry south of the Hunt Club property and north of Iron Mountain Boulevard.

The riparian corridor of Spring Brook Creek is approximately 30 to 40 feet wide on either side and consists of big-leaf maple as well as Douglas fir trees. The banks of Spring Brook Creek are high and steep with evidence of erosion, apparently from flashy stormwater flows. Water was flowing in Spring Brook Creek at the western end of the study area, but the creek was dry along the southern boundary of the Hunt Club property (Photo 6, off-site).

Wildlife observed in the riparian habitat on-site includes several American goldfinches foraging on red alder cones; as well as American robin, Stellar's jay, and spotted towhee. According to information from Parks, rough-skinned newts inhabit the unnamed stream. Newts and chorus frogs are native pond-breeding amphibians, and both species likely breed in the impounded stream sections and/or the permanent wetland. The Pacific chorus frog is the most common native amphibian in Oregon found in a variety of habitats including marshes, woodlands, shrubland and disturbed areas. The chorus frog prefers shallow pools (1.5 feet deep or less) with some aquatic vegetation to which they attach egg masses (Corkran and Thoms, 1996).

3.3. Scrub-Shrub

Scrub-shrub habitat includes the flat, open areas that are dominated by shrubs, saplings, and herbaceous plants located adjacent to the unnamed stream riparian zone. This habitat type includes the construction staging area and the graveled parking lot, which contribute to the openness of the area and have the potential to provide habitat for the killdeer which prefers open sparsely vegetated ground for nesting. Scrub-shrub habitat is summarized in Habitat Assessment Plot 3, Appendix C. This area has been disturbed from past land clearing and most plant species are non-native and/or invasive. The dominant shrub in the scrub-shrub habitat is Armenian blackberry and dominant herbaceous plants are weedy grasses and forbs such as the common chicory (Photo 7).

Photo 7. Bees on the common chicory, an attractive but non-native weedy plant often seen along roadsides.

Photo 8. Black-tailed deer have adapted to urban and suburban habitats where hunting is restricted and food is often abundant.

The scrub-shrub area provides edge habitat that is used by several native species. According to one of the construction workers encountered in the staging area, coyote and black-tailed deer reportedly move through the area early in the morning on a regular basis. The tall grasses and herbaceous plants provide suitable cover for wildlife including an area for deer to bed down in at night. Deer scat was also observed in the tall grass. Other species observed in the scrub-shrub include downy woodpecker, Stellar's jay, American goldfinches, and Cedar waxwings. Common wildlife species not observed, but expected to occur on-site based on habitat requirements and distribution include raccoon, garter snakes, opossum, voles, moles and other small rodents.

Deer are common in suburban areas in the Willamette Valley including the residential and open spaces of the City of Lake Oswego (Photo 8). Restrictions on hunting near cities and the abundance of food (parks, gardens, ornamental landscaping) have created suitable conditions in which deer populations thrive. Deer require large quantities of vegetation in their diet and they browse on the new growth of shrubs, trees, and herbaceous plants. In response to landowners who report extensive damage to gardens and landscaping, the Oregon Department of Fish and Wildlife (ODFW) provides details on how to install fencing to effectively exclude deer (ODFW, 2012).

Deer are most active at dawn and dusk and are relatively habitual in their activities. Deer will travel along human-made trails, roads, and through dense cover on the way to feeding grounds. Once they encounter a favorable feeding area, deer will often return to the location. Despite being well-adapted to living in relatively urban areas, deer are generally wary of people. Deer population controls in urban and suburban areas include domestic dogs, coyotes, cars, lack of food (starvation), and disease. Dogs and coyotes primarily prey on fawns, which are most vulnerable in the first few weeks of their life.

3.4. Douglas Fir Forest

The Douglas fir forest is the largest habitat type on-site with approximately 32 acres covering the steep slopes along Iron Mountain Boulevard. Habitat characteristics are summarized on Assessment Form 4, Appendix C. The forest consists of a relatively even-aged stand of trees dominated by Douglas fir. Sub-dominant mature trees include big-leaf maple, Pacific madrone, and western red cedar. Black cottonwood, Oregon ash, and Pacific willows are located at the base of the slope just east of the wetland. The forest consists of three main vegetation layers: canopy, shrubs/saplings, and groundcover (Photo 9). The forest canopy cover is estimated between 80 to 90 percent, which provides a substantial amount of shade for the understory. The shrub layer is approximately 5 to 15 feet high and is relatively sparse, with an estimated cover of 40 to 50 percent.

Photo 9. Three main vegetation layers are present: high canopy, shrub layer, and groundcover. Note sword fern in foreground.

Photo 10. English ivy forms a dense carpet in some areas of the forest, out-competing native species.

The shrub species consist of California hazelnut, vine maple, Indian plum, poison oak, common snowberry, thimbleberry, and serviceberry. The groundcover is dominated by English ivy with an estimated 70 percent cover (Photo 10) (Ash Creek Management, 2012). Ivy reduces the biodiversity of the forest floor and threatens the long-term health of the forest. Native groundcover species present among the ivy includes fringecup (*Tellima grandiflora*), sword fern (*Polystichum munitum*), slender-footed sedge (*Carex leptopoda*), inside-out flower (*Vancouveria hexandra*), and wood strawberry (*Fragaria vesca*).

The Douglas fir forest provides extensive foraging and nesting habitat for several common native songbird and woodpecker species including the American robin, Stellar's jay, downy woodpecker

(Photo 11), black-capped chickadee, red-breasted nuthatch, and brown creeper. All of these species were observed during the field visit and are anticipated to be breeding on-site. Neotropical migratory species such as Wilson's warbler and the orange crowned warbler are expected to use the forest as stop-over habitat and/or breeding habitat. A few cup nests in tall shrubs were observed and were likely constructed by American robins (Photo 12). Very few snags and limited downed wood was observed throughout the forested habitat.

Photo 11. Downy woodpecker foraging on the bark of a big-leaf maple sapling. The downy woodpecker nests in cavities in standing dead trees or snags.

Photo 12. Shrubs and saplings in the forest understory provide nesting sites for native songbirds; this cup nest is about 8 feet high in a hazelnut shrub and was likely constructed by an American robin earlier in the year.

Deer tracks were observed at the lower west trail and several trails intersect with the trails on-site. These trails are shown as red arrows on Figure 2, Appendix A. A hiker indicated that he periodically sees deer using the main trail and that a decade ago an elk was in his backyard which is located near the park. The elk would have likely travelled along the railroad corridor.

Raptors including the red-tailed hawk, cooper's hawks, great horned owl or western screech owl are expected to use the forest for nesting or roosting. No large raptor nests were observed but the high, dense canopy made detection difficult.

3.5. Oregon White Oak Forest

The Oregon white oak forest covers approximately 11 acres and is located along the top of the hillside. Characteristics of the white oak forest are summarized on Habitat Assessment Form 5, Appendix C. The main historic trail is a rough dividing line between the oak forest and Douglas fir forest. The oaks are short in stature (20 to 30 feet high) with diameters of 8 to 10 inches (Photo 13). Other trees growing among the oaks include Pacific madrone, big-leaf maple and a few Douglas firs. The dominant shrub species was common snowberry and Poison oak with English ivy as a dominant groundcover species. A small patch of Scot's broom was observed off the trail; this species should be targeted for eradication to prevent it from spreading further. Oaks are considered a rare and important habitat in Oregon (ODFW,

2008) because of the high number of endemic species or species found in association with oaks, such as the acorn woodpecker and the white rock larkspur.

Wildlife species observed in the white oak habitat were similar to those observed in the Douglas fir forest and include red-breasted nuthatch, black-capped chickadee, song sparrow, and black-tailed deer trails (Photo 14). A few raptors, including the American kestrel, turkey vulture, and red-tailed hawk were observed soaring above the oak bluffs..

Photo 13. Short statured oaks growing with Pacific madrone and big-leaf maple. A small population of Scot's broom, a non-native invasive species has established in the shrub layer off the trail.

Photo 14. Deer trail up the steep, rocky slope through oak forest habitat.

3.6. Overall Habitat Assessment

Overall, the Iron Mountain Park is in relatively good condition and provides habitat for a variety of year-round and migratory species. The natural area provides extensive foraging and breeding habitat for native songbirds, woodpeckers, and raptors. Neotropical migratory songbirds are also expected to use the habitat on-site for breeding or stopover habitat. The Oregon white oak forest is a rare and important habitat that should be conserved and protected. A state endangered species, the white rock larkspur, is documented as occurring on-site (ORBIC, 2012) and potential suitable habitat is present for the peacock larkspur. Habitat opportunities in the wetland are limited by the monoculture of marsh pennywort, but the willows along the edge provide some foraging and nesting opportunities. Native pond-breeding amphibians including the rough-skinned newt and Pacific chorus frog are expected to breed in either the wetland or adjacent standing water in the unnamed stream.

The biggest threat to long-term forest health is non-native, invasive species, especially English ivy which is the dominant groundcover and vine in the Douglas fir and Oregon white oak forests. Invasive plant management will require annual efforts over the long-term to control and reduce the extent of undesirable species.

4. Enhancement Recommendations

While a majority of the site is in relatively good condition with abundant native shrub and tree cover, several habitat enhancement opportunities are available. Proposed habitat enhancement and recreational opportunities are shown on Figure 2, Appendix A, and are summarized in Table 1. A more detailed description of recommended habitat enhancements is provided in the following section.

Table 1: Proposed Enhancement Actions and Recommended Timeline

Enhancement Action	Recommended Timeline
A. Install large wood along perimeter of wetland and unnamed stream corridor for amphibians and reptiles	In coordination with trail development which may require limited tree removal along Iron Mountain Blvd.; or as part of other tree removal activities in the project vicinity.
B. Install live cuttings (willow, cottonwood, dogwood) in wetland to improve habitat diversity	Fall or winter during the dormant season; 2013 to 2014
C. Enhance the riparian habitat by replacing invasive species with native plantings	Fall or winter, 2013 to 2014
D. Create a pollinator garden with a succession of blooming native plants	During first planting season following demobilization of the construction staging area
E. Install a snag, kestrel nest box, or bat roosting box to enhance wildlife habitat	Following demobilization of the construction staging area
F. Continue English ivy removal (currently being done by friends group) throughout the forested portions of the study area	On-going, all seasons
G. Construct a multi-use trail at the base of the slope to connect to the main historic trail	After securing grant-funding or other funding; 2015
H. Formalize the north/south mountain bike paths	After securing grant-funding or other funding; 2015
I. Enhance habitat along proposed trails – remove English ivy, replace non-native invasive shrubs/trees (Armenian blackberry, English hawthorne, English holly) with native shrubs	In coordination with possible future trail development at the base of the slope.
J. Conserve and protect large fir trees	Avoid removal of large trees during planning of a future trail at the base of the slope.
K. Spot control Scot's broom in oak forest habitat	2012-2014, fall or early winter

Large Wood Installation. Downed large woody debris is an important component of wildlife habitat that benefits terrestrial and aquatic insects, amphibians, reptiles and small mammals. The wetland is severely lacking in downed wood of any size, therefore a recommended habitat enhancement measure is to add large wood around the perimeter, including logs that extend into the open water for potential basking sites. While no turtles (native or non-native) were observed in the pond, it is possible that turtles are present or could be present in the future. One method of confirming turtle presence is to provide basking sites and over time monitor the logs to see if turtles are present. Large wood typically consists

of logs that are 20 feet long with a minimum diameter of 15 inches, however smaller pieces could also be used, including dimensions of 8 to 10 feet in length and 8 to 10 inches in diameter. Sources of large wood might be from tree cutting activities on-site or at other natural areas in Lake Oswego or from hazard tree removal projects undertaken by the Oregon Department of Transportation (ODOT) or the Portland Department of Transportation (PDOT).

Live Cuttings. Installing live cuttings of native shrubs and trees is a relatively inexpensive method of enhancing wetland habitat. Live cuttings of native willows, black cottonwood, and red-osier dogwood could be planted in the wetland to increase habitat structure and diversity. Live stakes should be a minimum of 3 feet long and consist of at least three different species. Willow species could include Pacific willow, Scouler's willow and sitka willow. Cuttings could be obtained from the willows on-site during the dormant season or from a local nursery.

Enhance Riparian Habitat. The riparian corridor along the unnamed stream has been disturbed in the past and contains an abundance of Armenian blackberry. While blackberry provides feeding, cover and nesting habitat for some species, it could be replaced with native shrubs that are thicket-forming and berry-producing such as thimbleberry and salmonberry. Other suitable native shrubs that would provide wildlife habitat include elderberry, serviceberry, hazelnut, and vine maple.

Create a Pollinator Garden. Creating one or more pollinator gardens in the scrub-shrub habitat would provide a food source for hummingbirds, butterflies, bees, and other pollinators. Several bees were observed on the common chicory, a blue-flowered roadside weed, and other native species could be planted instead, including blue blossom (*Ceanothus thyrsiflorus*), tall Oregon grape (*Mahonia aquifolium*), red-flowering currant (*Ribes sanguineum*), pink honeysuckle (*Lonicera hispidula*), yarrow (*Achillea millefolium*), red columbine (*Aquilegia formosa*), and nodding onion (*Allium cernuum*). These species are somewhat drought-tolerant (once established) and thrive in sun or part sun. Installing a variety of species with different bloom periods will support pollinators from early winter to late fall. For example, red-flowering currant and tall Oregon grape bloom in the early spring, while pink honeysuckle and nodding onion bloom in the summer, and blue blossom blooms in the fall (as well as spring).

Install a Snag or Habitat Boxes. In addition to managing native vegetation, installing artificial structures is one method of enhancing wildlife habitat. Suitable nesting sites are in limited supply for several cavity-nesting birds like the American kestrel. The American kestrel is the smallest falcon native to the United States and hunts in open grassland and pastures. Depending on the long-term use of the Hunt Club, a kestrel box near the wetland would provide suitable nesting near potential foraging grounds (Photo 15). Kestrel boxes are relatively inexpensive but require monitoring to ensure that undesirable species, like the European starling, does not take up residence in the box. Annual monitoring would be required to clean out old nests and to prevent starlings from evicting kestrels or other native species (western screech owl) that might use the box.

A bat box could also be installed to provide roosting habitat for Oregon's several native bat species (Photos 16 and 17). Unlike the kestrel box, the bat box would not need to be monitored on an annual basis.

Very few snags, or standing dead trees were observed on-site. Snags provide foraging and nesting opportunities for many woodpeckers and other species. In coordination with tree removal activities on-

site or at other natural areas in Lake Oswego, a snag could be installed near the wetland to provide perching and potential nesting habitat.

Photo 15. A nest box for the American kestrel could be placed near open habitat and should monitored annually to prevent undesirable birds like starlings from occupying the box.

Photo 16. A roosting box for bats on a long pole in Oaks Bottom natural area. A similar box could be installed near the wetland to improve wildlife habitat.

Photo 17: Bats access the box from the narrow opening at the base.

Continue English Ivy Removal. Probably the biggest threat to biodiversity on-site is English ivy which is the dominant groundcover plant in the Douglas fir and Oregon white oak forest. English ivy control can be done throughout the year and is a long-term habitat enhancement recommendation. Removal can build on the progress that has been accomplished to date at the west trail by a neighborhood friends group. Continuous vigilance in controlling English ivy will be required because birds eat the ivy berries and distribute the seeds as they forage across the landscape.

Trail Construction and Habitat Improvement. Trail construction along Iron Mountain Boulevard is a park improvement option that would create a continuous trail system on-site. Currently, runners and walkers use the shoulder of Iron Mountain Boulevard which is less than ideal from a safety standpoint. The steep terrain of the park poses challenges for trail construction and construction at the base of the slope near the edge of the forest would preserve the central habitat areas while providing recreational opportunities. Wildlife species including black-tailed deer use human-made trails and would be expected to adapt to new trail construction at the base of the slope. A possible connection route would be along a natural ridgeline at the east end of the site which would tie in with the upper historic trail.

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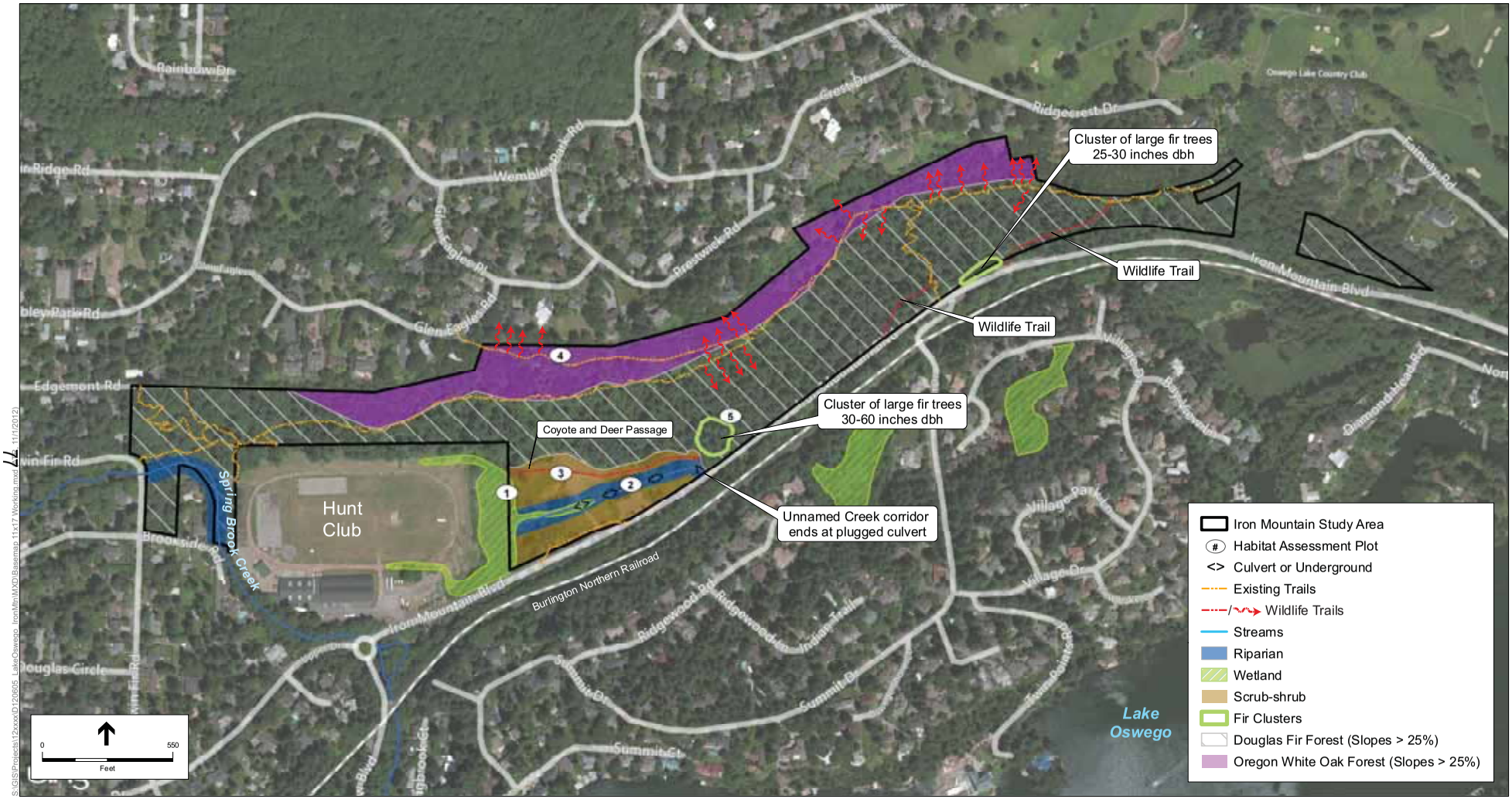
DRAFT

APPENDIX A: FIGURES

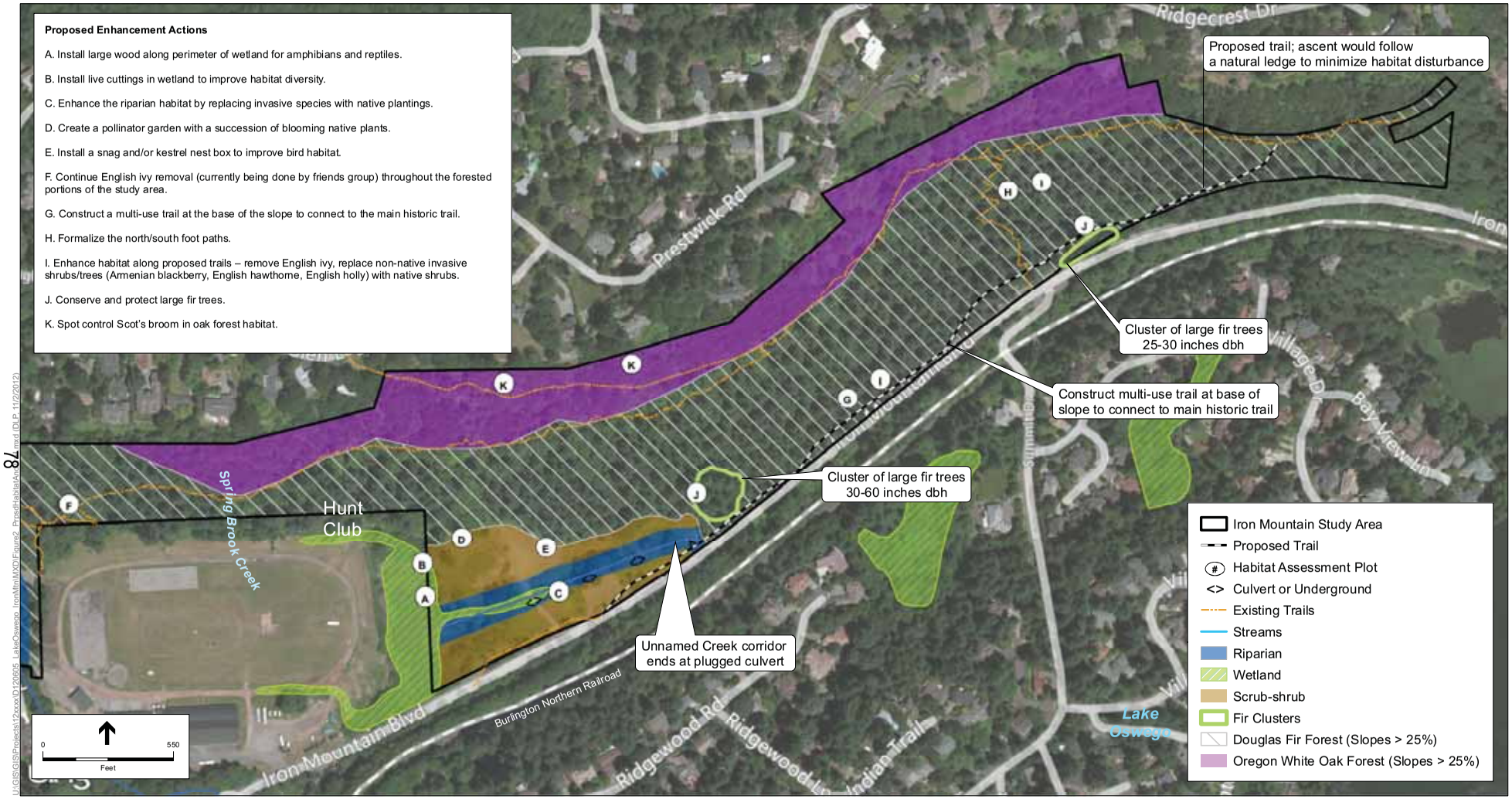


SOURCE: ESA, 2012; Lake Oswego, 2012

Lake Oswego - Iron Mountain Habitat Assessment .120605

Figure 1

Existing Habitat Features



U:\GIS\GIS\Projects\12xxx\120605_LakeOswego_IronMtn\MXD\Figure2_PriestHabitatAndTrail.mxd (DLP 11/2/2012)

SOURCE: ESA, 2012; Lake Oswego, 2012

Lake Oswego - Iron Mountain Habitat Assessment .120605

Figure 2

Proposed Habitat Enhancement and Trail Development

APPENDIX B: HABITAT ASSESSMENT FORMS

Wildlife Habitat Assessment Form

Project: Iron Mountain Habitat Assessment **Dates:** 9/18/2012

Assessment Form # 1 **Field Investigator:** S. Hartung

Habitat Area Type and Size: Wetland, just under 1 acre; **Location:** Southwest portion of the property near Iron Mountain Blvd.

Structural Conditions (% tree/shrub canopy; canopy layers, tree size, land cover conditions, etc.):

Minimal shrub cover – about 20% of wetland area; shrubs (mainly willows) are located on the perimeter of the wetland , which transitions to wooded riparian fringe to the east where historic fill has been placed. There is an abrupt shift from the wetland elevation to the upland, approximately 2 – 3 feet higher in elevation.

Dominant Plants:
The open water portion of the wetland is fringed with a non-native invasive weed called marsh pennyroyal. Towards the shoreline there are a few pockets of soft rush (native, Juncus effusus), and a few patches of cattail (native, but considered aggressive). Willows are the dominant species on the outer perimeter.

Habitat Elements (snags, perches, downed logs, constructed features):

A few willow saplings have dead branches which provide perch habitat for flycatchers, but no significant snags were noted. Downed wood is limited and small in size, many small pieces of downed wood. No constructed features are on-site.

Caption: Wetland with open water and marsh pennywort around the edge, looking northeast. Iron Mountain forested slope in the background. 9/18/12

Wildlife Observations:
Great blue heron foraging in the marsh pennyroyal, Several nutria (non-native) were seen in the pennywort. Ruby crowned kinglet (songbird) in the willows and a spotted towhee was heard in the adjacent riparian habitat.
No ducks or geese were observed, open water area likely too small for significant numbers of waterfowl.

Special Status Species or Other Notes:

None observed and none recorded for the area.

Habitat Continuity/Use as a Corridor:

Wetland receives hydrology from subsurface drainage on the hillslope; water is also ditched at the base of the slope and conveyed to the east into the wetland.

Adjacent Land Uses and Conditions:

Equestrian training / Hunt Club property to the east has open space, and mowed turf grass. The main buidling at the Hunt Club large, wooden structure that may provide roosting habitat for bats and owls.

Threats to Habitat Integrity:
Nitrogen input from horse manure on adjacent property; invasive plant marsh pennywort reduces biodiversity and foraging opportunities.

Opportunities:
Add large wood to the perimeter for amphibian habitat; install live cuttings of willows, cottonwood, dogwood to increase habitat complexity.

Wildlife Habitat Assessment Form

Project: Iron Mountain Habitat Assessment **Dates:** 9/18/2012

Assessment Form # 2 **Field Investigator:** S. Hartung

Habitat Area Type and Size: Stream corridor and adjacent riparian habitat (~ 2 ac) **Location:** East of wetland; around the staging area and parking lot; west end along Spring Brook Creek

Structural Conditions (% tree/shrub canopy; canopy layers, tree size, land cover conditions, etc.):
Tree canopy = 50% canopy cover
Shrubs = 50-70% cover
Understory = grasses, herbaceous plants; native sedges and rushes at the east end of the corridor: small-fruited bulrush

Dominant Plants:
Trees: Red alder (native); black cottonwood (native); Douglas fir (native); a few non-native trees: locust, weeping willow
Shrubs: Himalayan blackberry (non-native) – considered a "shrub"
Aquatic plant: Duckweed (native)

Habitat Elements (snags, perches, downed logs, constructed features):

No snags (standing dead trees) and limited downed logs observed.

Year-round ponded water provides breeding habitat for native frogs and the rough-skinned newt. No bull frogs were seen or heard (they typically squeak when approached and dive into the water for cover).

Caption: A section of the unnamed stream covered with duck weed. 9/18/12

Wildlife Observations:
Chorus frogs (native) were heard in the riparian zone and likely breed in the impounded stream sections; Rough-skinned newt reportedly occur in the stream as well.
No native fish are expected to inhabit the stream sections.

Special Status Species or Other Notes:

None observed and none recorded for the area; however, red-legged frogs, a state sensitive-critical species, may breed in the ponded water.

Habitat Continuity/Use as a Corridor:
Coyote and deer move through the adjacent open, scrub-shrub habitat early in the morning (info from construction worker).

The stream is piped through 2-3 different culverts on-site, but no flow was observed during the site visit. The culverts are submerged and likely clogged with debris. The stream is functioning more as a wetland due to lack of conveyance.

Adjacent Land Uses and Conditions:

Equestrian training, hunt club property to the east has open space, and mowed turf grass.

Forested land, parking areas, staging, and Iron Mountain Boulevard are also adjacent to the unnamed stream corridor.

Threats to Habitat Integrity:
Invasive plants: English hawthorne; common teasel, Himalayan blackberry; clematis

Opportunities:
Replace non-native Armenian blackberry with native shrubs in dense plantings.
Add large wood in the riparian zone for amphibians.

Wildlife Habitat Assessment Form

Project: Iron Mountain Habitat Assessment **Dates:** 9/18/2012

Assessment Form # 3 **Field Investigator:** S. Hartung

Habitat Area Type and Size: Upland scrub-shrub, ~ 2-3 acres **Location:** East of wetland; around the staging area and parking lot

Structural Conditions (% tree/shrub canopy; canopy layers, tree size, land cover conditions, etc.):
Open canopy with patches of trees and young shrubs on the perimeter. Tree canopy approximately 20%; shrub canopy approximately 30% (includes Armenian blackberry as a shrub – thicket). Tree sizes range from 8" to 15" dbh. Land cover includes construction staging area and adjacent disturbed areas overgrown with weeds.

Dominant Plants:
Armenian blackberry (non-native)
Pasture grasses – orchard grass, tall fescue, etc.
Common chicory (non-native, blue flowers)

Habitat Elements (snags, perches, downed logs, constructed features):

Open habitat surrounded by good vegetation cover for large mammal movement (coyote, deer). Edge habitat attracts several songbird species. Boulders and rubble provide hiding places for garter snakes and small mammals. No snags or large downed wood observed.

Caption: Scrub-shrub habitat looking west from the construction staging area with chicory and weedy grasses in the foreground and blackberry in the background. 9/18/12

Wildlife Observations:
Stellar's jay; many American goldfinches foraging on red alder cones; Spotted towhee; Downy woodpecker; Coyote reportedly moves through (info from construction worker); deer scat observed;

Special Status Species or Other Notes:

None observed and none recorded for the area.

Habitat Continuity/Use as a Corridor:

Coyote and deer move through the open, scrub-shrub habitat early in the morning (info from construction worker).

Adjacent Land Uses and Conditions:

Equestrian training / Hunt Club property to the east has open space, and mowed turf grass.

Threats to Habitat Integrity:
Invasive plants. Off-leash dogs.

Opportunities:
Replace common chicory (weedy blue flower) with native flowering plants (e.g. *Ceanothus thyrsiflorus, Ribes sanguineum*) to improve pollinator habitat (hummingbirds, butterflies, bees, etc.); Opportunity for public education and signage.

Wildlife Habitat Assessment Form

Project: Iron Mountain Habitat Assessment **Dates:** 9/18/2012

Assessment Form # 4 **Field Investigator:** S. Hartung

Habitat Area Type and Size: Oak forest (~ 11 ac) **Location:** Top of slope along ridgeline

Structural Conditions (% tree/shrub canopy; canopy layers, tree size, land cover conditions, etc.):
Tree canopy = > 70% canopy cover; Multi-layered canopy with low shrubs (snowberry) and tall shrubs (vine maple)
Shrubs = 70-80% cover
Understory = grasses, herbaceous plants

Dominant Plants:
Trees: Oregon white oak (native); Sub-dominant plants = Pacific madrone; big-leaf maple; Douglas fir
Shrubs: Common snowberry (native) is the dominant shrub, with a few Indian plum, Poison oak, western serviceberry and California hazelnut
Herbaceous layer: English ivy (non-native) is a dominant plant throughout the habitat

Habitat Elements (snags, perches, downed logs, constructed features):

Only a few snags observed from the trail and the ones observed were generally short (less than 10' tall) and small in diameter (less than 10"). No significant downed wood was observed. No constructed features are located in this habitat area.

Caption: Oregon white oaks growing on the steep rocky hillside along with madrone and big-leaf maple. 9/18/12

Wildlife Observations:
Several red-breasted nuthatches and black-capped chickadees foraging in the oaks (bark and branches); Song sparrow; American kestrel soaring above the canopy – migrating through.
Many wildlife trails (deer likely)

Special Status Species or Other Notes:
Oregon white oak forests are considered a rare habitat in the Willamette Valley. White rock larkspur, state endangered (ORBIC, 2012). Possible peacock larkspur (federal species of concern – but not protected by either the federal or state endangered species acts). Need to confirm identification during the bloom period (spring).

Habitat Continuity/Use as a Corridor:
Deer move through the steep oak habitat (north to south primarily) and access it from residential areas on top of the slope. A golf course is located to the north and likely provides a connection to Tryon Creek natural areas.

Adjacent Land Uses and Conditions:

Residential properties abut the northern boundary of the oak forest.

Threats to Habitat Integrity:
Invasive plants: English ivy, small population of Scot's broom; English hawthorne; Long-term replacement issues with oak – Douglas fir and big-leaf maple will ultimately succeed.

Opportunities:
Eradicate Scot's broom; control non-native groundcover; Increase public awareness of rare oak habitat; cultivate and protect rare plant populations (*Delphinium spp*.).

Wildlife Habitat Assessment Form

Project: Iron Mountain Habitat Assessment **Dates:** 9/18/2012

Assessment Form # 5 **Field Investigator:** S. Hartung

Habitat Area Type and Size: Douglas fir forest (~ 32 ac) **Location:** Mid to lower portion of hillside

Structural Conditions (% tree/shrub canopy; canopy layers, tree size, land cover conditions, etc.):
Tree canopy = > 80-90% canopy cover; Three main vegetation layers: Canopy, shrubs, and herbaceous layer.
Shrubs = ~ 50% cover – not dense, can readily walk through forest and see through the understory
Understory = English ivy covers rocky, cobbley soils, a few native herbaceous plants are present.

Dominant Plants:
Trees: Douglas fir (native); sub-dominants: big-leaf maple, western red cedar, Pacific madrone
Shrubs: California hazelnut, vine maple, and dull Oregon grape
Herbaceous layer: English ivy (non-native); with areas of sword fern (native) and fringe-cup (native)

Habitat Elements (snags, perches, downed logs, constructed features):

Few snags; limited downed wood; no constructed features are located in this habitat area.

Caption: View of 60-inch dbh Douglas fir. 9/18/12

Wildlife Observations:
Several Stellar's jays (native) foraging, likely nesting on-site; two old nests observed – likely American robin; black-tailed deer trails observed; Anna's hummingbird; black-capped chickadees; red-breasted nuthatch; red-tail hawk and turkey vulture above canopy

Special Status Species or Other Notes:
Pocket of large fir trees located at base of slope east of the stream corridor. Large is defined as > 30 inches in diameter at breast height (dbh).

Habitat Continuity/Use as a Corridor:
Deer move through the habitat and use the formal trails as well as informal trails. Coyote are also expected to move through the forest; A trail user reported an elk in his backyard about 10 years ago – it likely travelled along the railroad corridor.

Adjacent Land Uses and Conditions:

Iron Mountain Boulevard to the south, at base of slope; Railroad corridor south of Iron Mnt. Blvd.

Threats to Habitat Integrity:
Invasive plants: English ivy is the main threat to forest regeneration.

Opportunities:
Enhance the understory in selected areas with dense, native shrub plantings to promote songbird habitat; Install large wood for wildlife habitat.

APPENDIX C: USFWS SPECIES LIST

FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN CLACKAMAS COUNTY, OREGON

LISTED SPECIES

Birds

Northern spotted owl	*Strix occidentalis caurina*	CH T

Plants

Willamette daisy	*Erigeron decumbens var. decumbens*	CH E
Nelson's checker-mallow	*Sidalcea nelsoniana*	T

PROPOSED SPECIES

None

No Proposed Endangered Species	PE
No Proposed Threatened Species	PT

CANDIDATE SPECIES

Mammals

North American wolverine	*Gulo gulo luscus*

Birds

Streaked horned lark	*Eremophila alpestris strigata*

Plants

Whitebark Pine	*Pinus albicaulis*

SPECIES OF CONCERN

Mammals

Townsend's western big-eared bat	*Corynorhinus townsendii townsendii*
Silver-haired bat	*Lasionycteris noctivagans*
Long-eared myotis bat	*Myotis evotis*
Fringed myotis bat	*Myotis thysanodes*
Long-legged myotis bat	*Myotis volans*
Yuma myotis bat	*Myotis yumanensis*
Camas pocket gopher	*Thomomys bulbivorus*

Birds

Northern goshawk	*Accipiter gentilis*
Olive-sided flycatcher	*Contopus cooperi*
Harlequin duck	*Histrionicus histrionicus*
Yellow-breasted chat	*Icteria virens*
Acorn woodpecker	*Melanerpes formicivorus*
Lewis' woodpecker	*Melanerpes lewis*
Mountain quail	*Oreortyx pictus*

Band-tailed pigeon	*Patagioenas fasciata*
Oregon vesper sparrow	*Pooecetes gramineus affinis*
Purple martin	*Progne subis*

Reptiles and Amphibians

Northern Pacific pond turtle	*Actinemys marmorata marmorata*
Coastal tailed frog	*Ascaphus truei*
Oregon slender salamander	*Batrachoseps wrighti*
Larch Mountain salamander	*Plethodon larselli*
Northern red-legged frog	*Rana aurora aurora*
Cascades frog	*Rana cascadae*

Fish

Pacific lamprey	*Lampetra tridentata*
Coastal cutthroat trout	*Oncorhynchus clarki ssp*

Invertebrates

Insects:

Beller's ground beetle	*Agonum belleri*
Scott's apatanian caddisfly	*Allomyia scotti*
Cascades apatanian caddisfly	*Apatania tavala*
Mt. Hood primitive brachycentrid caddisfly	*Eobrachycentrus gelidae*
Mt. Hood farulan caddisfly	*Farula jewetti*

Annelid Worms:

Oregon giant earthworm	*Megascolides macelfreshi*

Plants

Cliff paintbrush	*Castilleja rupicola*
Cold-water corydalis	*Corydalis aquae-gelidae*
Pale larkspur	*Delphinium leucophaeum*
Willamette Valley larkspur	*Delphinium oreganum*
Peacock larkspur	*Delphinium pavonaceum*
Howell's daisy	*Erigeron howellii*
Thin-leaved peavine	*Lathyrus holochlorus*
Whitetop aster	*Sericocarpus rigidus*
Henderson's checker-mallow	*Sidalcea hendersonii*
Pale blue-eyed grass	*Sisyrinchium sarmentosum*
Oregon sullivantia	*Sullivantia oregana*

DELISTED SPECIES

Birds

American Peregrine falcon	*Falco peregrinus anatum*
Bald eagle	*Haliaeetus leucocephalus*

Definitions:

Listed Species: An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

APPENDIX C – PLANT INVENTORY

Iron Mountain Plant Inventory Report

Prepared by: Ash Creek Forest Management, LLC
Contact: John Goetz III

Iron Mountain is divided into two relatively distinct forest stand cover types. One that is dominated by a mixed species Douglas fir forest and the other is dominated by primarily Oregon white oaks (Figure 1). The habitats overlap minimally and are generally separated by the trail crossing Iron Mountain within the upper third of the slope.

For each of the forest stand types transects were installed 300' apart (Figure 2), perpendicular to the slope, and the number of plots was calculated to ensure that one plot represented approximately two acres in the Douglas fir dominated stands and one plot represented approximately each acre of the white oak dominated stands (Figure 3). In addition to the installation of transects, multiple wandering transects were installed.

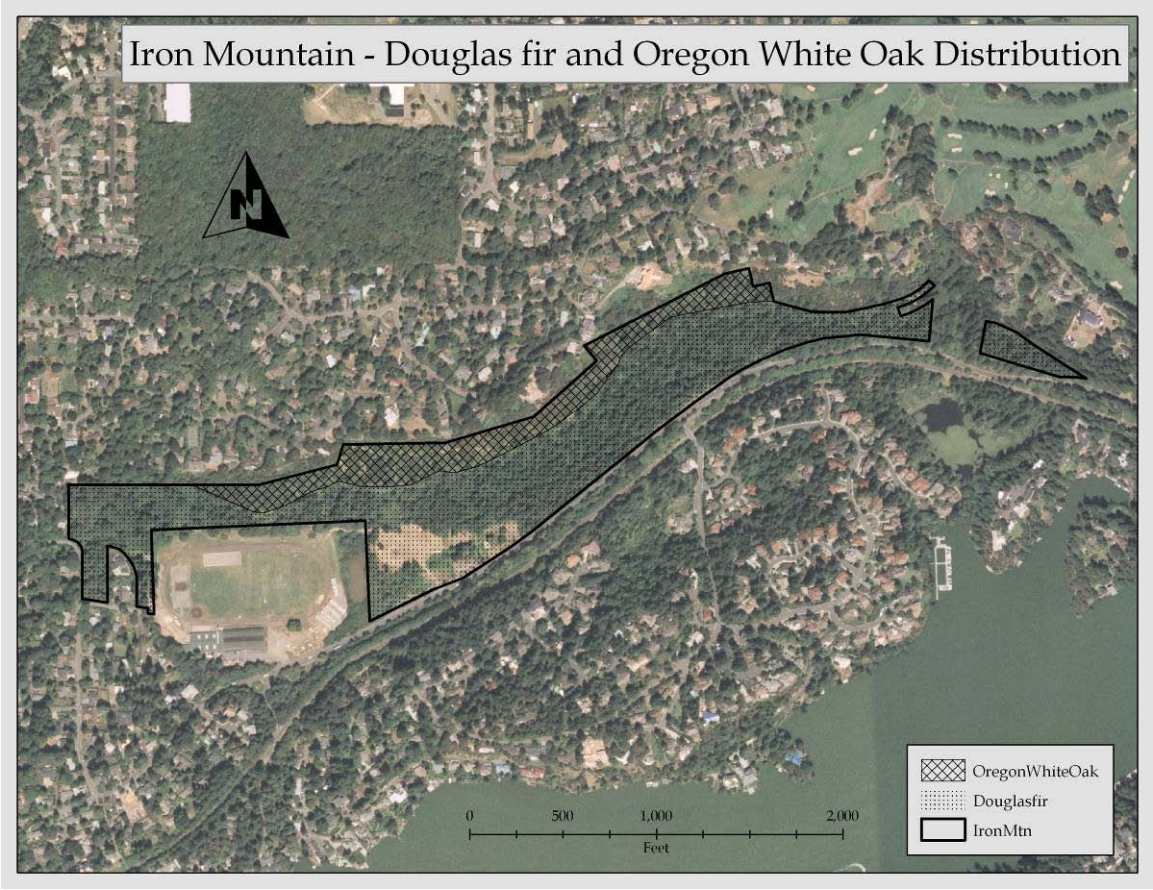


Figure 1. Relative locations of Douglas fir/big leaf maple and Oregon white oak dominated stands on Iron Mountain.

For the purposes of sampling the Douglas fir dominated stands, which is relatively uniform in species composition, distribution and cover and equals approximately 40.26 acres, plots were measured and installed every 300' along each transect using a Fieldranger hip chain. Sampling at an intensity of one plot per acre was not needed as the uniformity of cover and diversity lends itself well to a less intense sampling method but ensures adequate sampling and representation of the species on site.

When sampling the white oak dominated stands, which had a calculated area of 10.71 acres, plots were also measured using the Fieldranger hip chain, but were installed every 100’ along each transect. Given the relatively smaller habitat dominated by the oaks necessitated a more intense sampling protocol to ensure adequate representation of the species within the oak dominated stands.

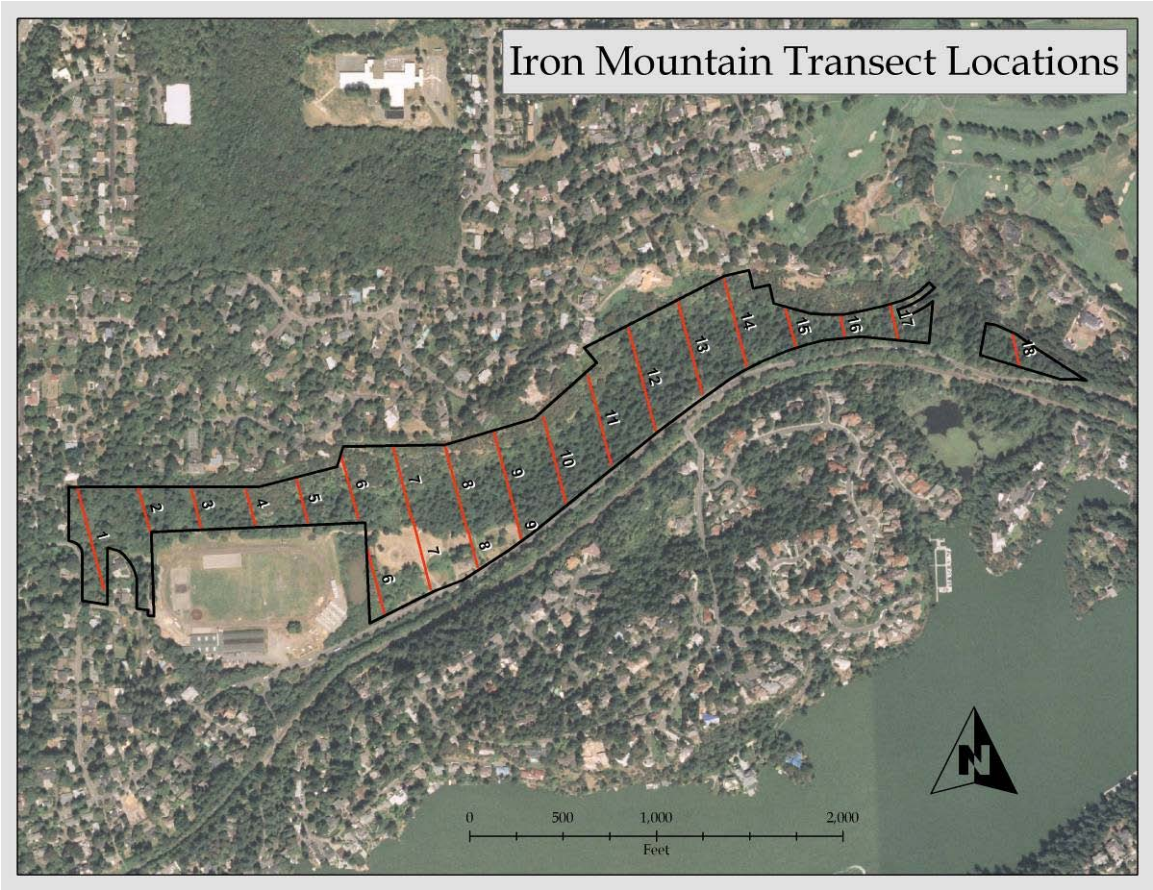


Figure 2. Location of plant inventory transects on Iron Mountain.

Following is a break down of how plots were organized in each of the habitats present on Iron Mountain:

1. Douglas fir dominated stands
    Stand size: 40.26 acres
    Plot size: 11.8’ radius
    Distance between transects: 300’
    Distance between plots: 300’
    Number of plots: Approximately 20, 1 plot for approximately every 2 acres

2. Oregon white oak dominated stands
    Stand size: 10.71 acres
    Plot size: 11.8’ radius
    Distance between transects: 300’
    Distance between plots: 100’
    Number of plots: 10, 1 plot for approximately each acre

The methodology for installing and gather plot data is as follows:

Circular plots, 11.8’ in radius measured with a Spencer tape, were installed along transects aligned perpendicular to the predominant topography of Iron Mountain. Plots were marked with pink and blue flagging.

Plots were spaced as indicated above and all vegetation within each plot was identified and percent cover estimated according to the Braun-Blanquet cover-abundance scale. Diameter at breast height (DBH, which is approximately 4.5' from the ground) of all trees was measured and recorded by species (see attached plot data).

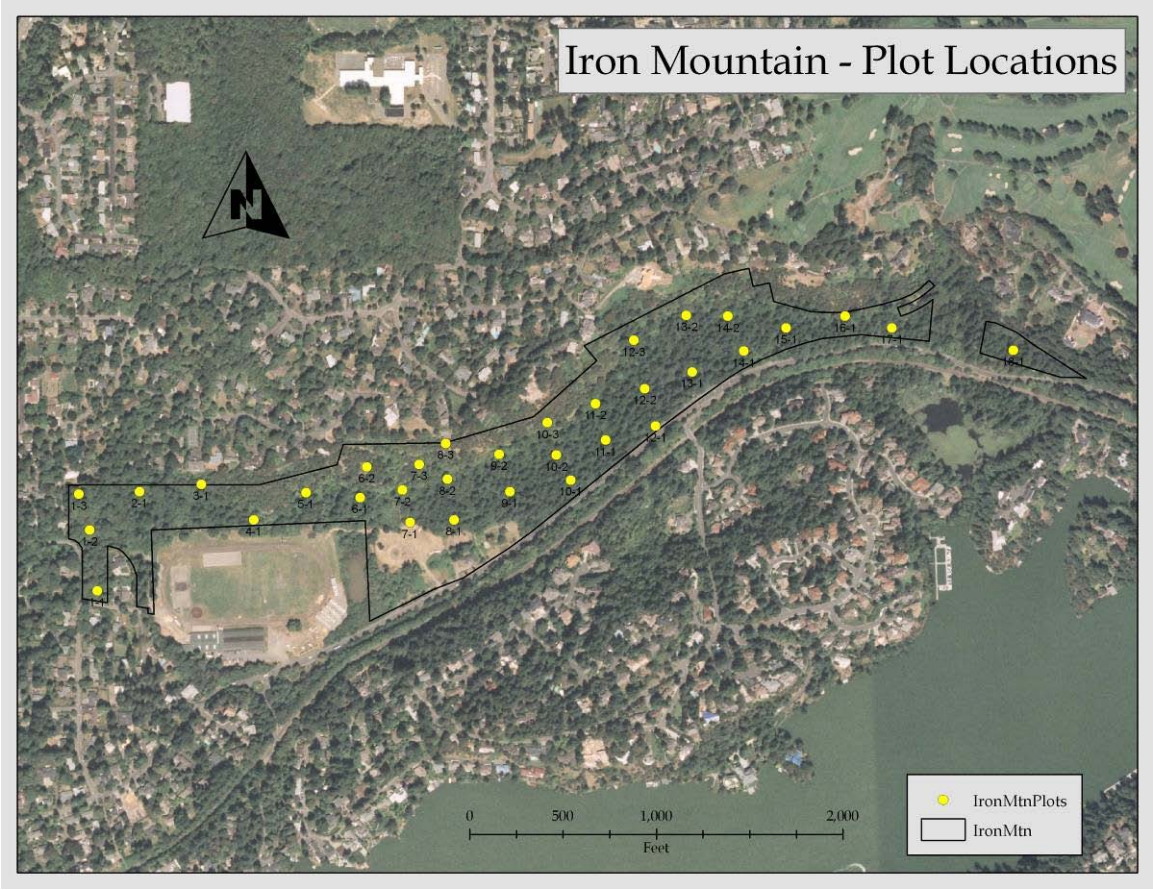


Figure 3. Numbered plot locations on Iron Mountain. Plots are numbered first by associated transect and secondly by the number of plots per transect.

Below details the methodology for installing and completing the wandering transects:

These are transects designed to capture plant species present at Iron Mountain but that may not fall within the plots installed as conducted above. When combined with the formally measured and installed plots, the wandering transect technique enabled the compilation of a relatively comprehensive plant list. Wandering transects will follow the same layout as the plots and transects but differ in that all species observed are recorded and no formally measured plots are installed.

Summary – Data analysis

For analysis plots have been separated by the main two dominant forest stands (i.e. Douglas fir or Oregon white oaks) and briefly discussed below. As previously stated, Iron Mountain is dominated by Douglas fir and Oregon white oak stands the understories of which are primarily a mix of native shrubs and herbaceous plants competing with dense and threating populations of establishing non-native woody and herbaceous species.

Douglas fir dominated stand

Iron Mountain is primarily dominated by a Douglas fir/big leaf maple association compromising approximately 40 acres which, for a visual representation, is similar to the southwest portion of Cook's Butte (see attached survey list of observed species). Observed tree species in the Douglas fir stands range in diameter from 4 to 40 inches when measure at 4.5' from the ground.

The Douglas fir dominated stands are represented by dense, nearly single canopy populations of Douglas fir and interspersed big leaf maple. Other tree species that occurred in the understory of the Douglas fir dominated stands include Pacific madrone, western red cedar, English hawthorn, English holly, Pacific yew, cascara, non-native cherries and one species of non-native plum. Other tree species that occur in the lower third of the slope, as well the southern edge environment include black cottonwood, pacific willow, scouler willow, Oregon ash, black locust, horse chestnut and red alder.

Shrubs that occurred most frequently in the Douglas fir dominated stands include, vine maple, serviceberry, western wahoo, ocean spray, orange trumpet honeysuckle, poison oak, indian plum, mock orange, thimbleberry, tall Oregon grape, low Oregon grape, baldhip rose, snowberry and hazelnut.

The most frequently occurring native herbaceous plants in the understory include sword fern, fringe cup, lady fern, Dewey sedge, Oregon drops of gold, inside out flower, wood strawberry, pacific waterleaf, false lily of the valley, sweetcicley, Pacific trillium and wood violet.

Non-native species are present throughout the understory and were observed on every installed plot and along every wandering transect. English ivy is the most dominant non-native species, having an observed cover of 75-100% on most plots, and is evenly distributed throughout the Douglas fir dominated stands (Figure 1). Other non-native

species less dominant in cover, when compared to English ivy, but observed throughout the understory within the Douglas fir dominated stands, and especially present along the southern edge as well as along Iron Mountain Road (Figure 1) include English holly, English laurel, clematis, Armenian blackberry, English hawthorn, garlic mustard, herb robert and nipplewort. One satellite population of garlic mustard was found between plots 7-3 and 8-3 (Figure 3).

Non-native herbaceous species, such as Canada and bull thistles, annual sow thistle, Queen Anne's lace, common mullen, meadow foxtail, burdock, chickory, Scot's broom, bindweed, poison hemlock, teasel and clover are ubiquitous in presence throughout the Douglas fir dominated stands but are highest in cover where wandering transects intersected the southern edge of Iron Mountain as well as boarding nearly all of the existing trails.

Oregon white oak dominated stand

The upper approximately 10 acres of Iron Mountain is steep and covered by relatively loose and rocky soils, dominated by Oregon white oaks. The understory of the oak dominated stands are primarily herbaceous being represented by many native and non-native graminoid and forb species, with multiple dense clusters of native shrub species as well (see survey list of observed species). Oaks were relatively short, with an open grown habit and ranged in diameter from 4 to 16 inches measured at 4.5' from the ground

Dominant shrubs species, occupied dense, interspersed clusters often beyond the drip line of the oaks, primarily consisted of poison oak, tall Oregon grape, snowberry, ocean spray, orange trumpet honeysuckle and serviceberry.

Several understory herbaceous species present on Iron Mountain have been rarely documented in the Portland metro area (*Cynoglossum grande* and *Lomatium* sp.) and at least one herbaceous species observed (*Delphinium pavonaceum*), that should be monitored and keyed for identification verification during the flowering period of 2013, is listed federally as endangered and might be the first report of this species in the Portland metro area. The most dominant understory herbaceous species observed was shiny leaf geranium, which is a common non-native species that is particularly threatening to those species typically found in the understory of Oregon white oaks. Shiny leaf geranium is highly competitive and a prolific seed producer which is able to displace most oak associated herbaceous species, including those that are rare and endangered. This habit often results in an overall loss of species diversity and a dense, non-native monoculture, which can fundamentally change the functional properties of oak woodlands.

Management recommendations

As the majority of the site is in relatively good condition, the following recommendations are for the general control of non-native species throughout the entire acreage of Iron Mountain and can be used as a starting point for reducing the overall dominance of non-native species and shifting dominance towards the native species in the park. A

comprehensive plan will be necessary prior to the initiation of control efforts, however, the information below may be of assistance.

Prior to initiating any control efforts a surveyor should be employed to mark the entire Iron Mountain boundary within Lake Oswego ownership. Marking the boundary will ensure the avoidance of trespassing onto private property and will expedite the work of city employees, volunteers or contract crews during non-native species control efforts and subsequent replanting and maintenance.

Notify park users and stakeholders well in advance of starting any control efforts and reach out to neighboring landowners where populations of non-native species may persist so that they may be controlled as well.

Seek to control all non-native species balanced with seasonality of sensitive and native woody and herbaceous plants. Many non-native species are found both in the Douglas-fir stands as well as the Oregon oak stands and as the seasonal cycles of the native species must be considered when developing a non-native species management plan so to must the seasonal cycles of the non-native target species. This can prove to be a difficult task, however, a suitable non-native species management plan for Iron Mountain may appear as outlined in Table 1.

Site	Treatment	Season	Notes
Douglas fir stands	Spot spray ivy and blackberries. Stump treat hawthorn, holly and laurels.	Year 1 - Late fall/early winter	Time treatment to occur after most native plants have entered dormancy. Leave stumps 6-10” high for re-treatment as needed.
Douglas fir stands	Hand cutting	Year 2- Early summer	Mechanically reduce all dead and live blackberries to facilitate future treatments. Time cutting with active flowering of blackberries.
Douglas fir stands	Spot spray ivy, blackberries and clematis. Stump treat skipped or resprouting hawthorn, holly and laurels.	Year 2 - Early summer	Target those areas free of native herbaceous plants, exercise caution around native vegetation. Cut and treat clematis vines.

Douglas fir stands	Spot spray ivy and blackberries. Stump treat non-native trees	Year 2- Late fall/early winter	Treat ivy and blackberries. Treat non-native trees.
Douglas fir stands	Planting	Year 3-Late winter/early spring	Install woody and herbaceous plants in areas free of non-native species.
Douglas fir stands	Spot spraying and Planting	Years 4 and beyond	Spot spray ivy and other non-natives as encountered and as seasonally effective, introduce additional native species with volunteers or crews.
Oak Woodland	Spot spray all non-native species	Year 1- Early fall	Target all non-natives, including non-native trees, as most herbaceous native species will be dormant at this time. Avoid chemicals with soil residual effects.
Oak Woodland	Survey and study	Year 2- Spring/Summer	Study plant species present, note timing of growth and flowering to plan follow up spring and summer treatments
Oak Woodland	Spot spray all non-native species	Year 2- Early Fall	Spot spray all non-native species after native herbaceous species have entered dormancy.
Oak Woodland	Spot spray all non-native species	Year 3- Spring/summer	Time treatments to target shiny leaf geranium and other non-native herbaceous species.
Oak Woodland	Planting	Year 3- Fall/Winter	Sow native grass. Use of native grasses allows the continued use of broadleaf

			selective herbicides while building a native grass seed bank.
Oak Woodland	Survey and study, as well as Spot spray all non-native species	Year 4- Spring/summer	Time treatments to target shiny leaf geranium and other non-native herbaceous species as encountered. Survey for native herbaceous plants of interest and work with Metro, or other partners, to propagate plugs and bulbs to increase frequency and diversity of native herbaceous wild flowers in this area.

Table 1. Conceptual non-native species control and native plant reestablishment prescription for Iron Mountain.