EAGLE RIM TRAIL PROJECT DESCRIPTION

Prepared by
Marin County Open Space District
February 2018

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Project Title

Eagle Rim Trail Project

Lead Agency Name and Address

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Project Location

Mount Burdell Open Space Preserve, Novato

Project Sponsor's Name and Address

Marin County Open Space District
3501 Civic Center Drive, Suite 260
San Rafael, California 94903

General Plan Designation

Open Space (OS)

Zoning

APN: 125-180-58
Zoning: Restricted Open Space (OS)

DESCRIPTION OF THE RTMP

On December 16, 2014, the Marin County Open Space District (MCOSD) Board of Directors approved the Road and Trail Management Plan (RTMP)[1] and certified its program environmental impact report (EIR) (State Clearinghouse Number 2011012080) (MCOSD, 2014a and 2014b). The RTMP is a science-based comprehensive management plan to guide the MCOSD in the: 1) establishment and maintenance of a sustainable system of roads and trails; 2) reduction of environmental impact from roads and trails on natural resources; and 3) improvements to visitor experience and safety.

The RTMP covers six regions (Figure 1) within Marin County, and 34 open space preserves. Region 4, which includes the project site, covers the following open space preserves:

- Deer Island
- Indian Tree
- Little Mountain
- Mount Burdell
- Rush Creek
- Verissimo Hills

The MCOSD developed the RTMP over the course of four years based on extensive outreach and public input. After adoption of the plan and consistent with the RTMP's *Policy SW.2: System Roads and Trails*, the MCOSD initiated a process to designate a system of roads and trails in all existing open space preserves. The roads and trails eligible for consideration must have existed as of November 2011, which is when the MCOSD completed a report on the condition of the existing roads and trails. The designation of a formal road and trail system is proceeding on a regional basis. The road and trail designation for Region 4 occurred in 2017. The MCOSD held the Region 4 Designation Workshop on May 13, 2017. Following the workshop, the public had an opportunity to view and comment on the proposed road and trail system for Region 4 (Figure 2).

The RTMP incorporates existing policies from the Countywide Plan and the MCOSD's Policy Review Initiative. Additionally, it identifies 34 new policies that govern the MCOSD's road and trail system. The intent of these policies is to reduce the environmental impacts from the road and trail system and to improve the recreational experience. In addition to these policies, the RTMP included best management practices (BMPs) that will reduce resource effects from any road and trail projects.

[1] For a copy of the RTMP, go to http://www.marincountyparks.org/~/media/files/departments/pk/projects/open-space/rtmp-eir/rtmp_lowres_3615_bookmarks.pdf?la=en. Printed copies are available from Marin County Parks for a small fee.

Figure 1: MCOSD Preserves by Region

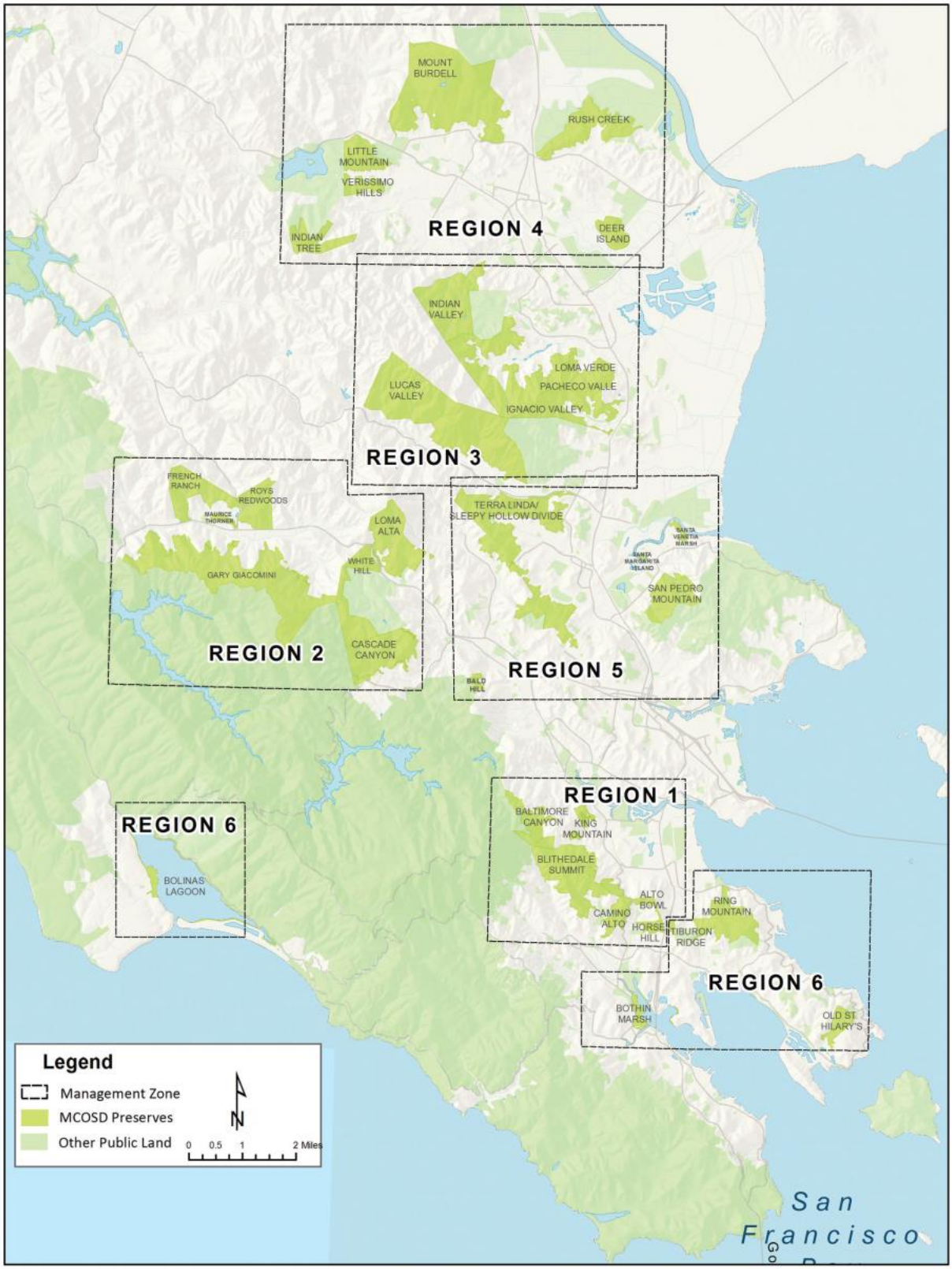
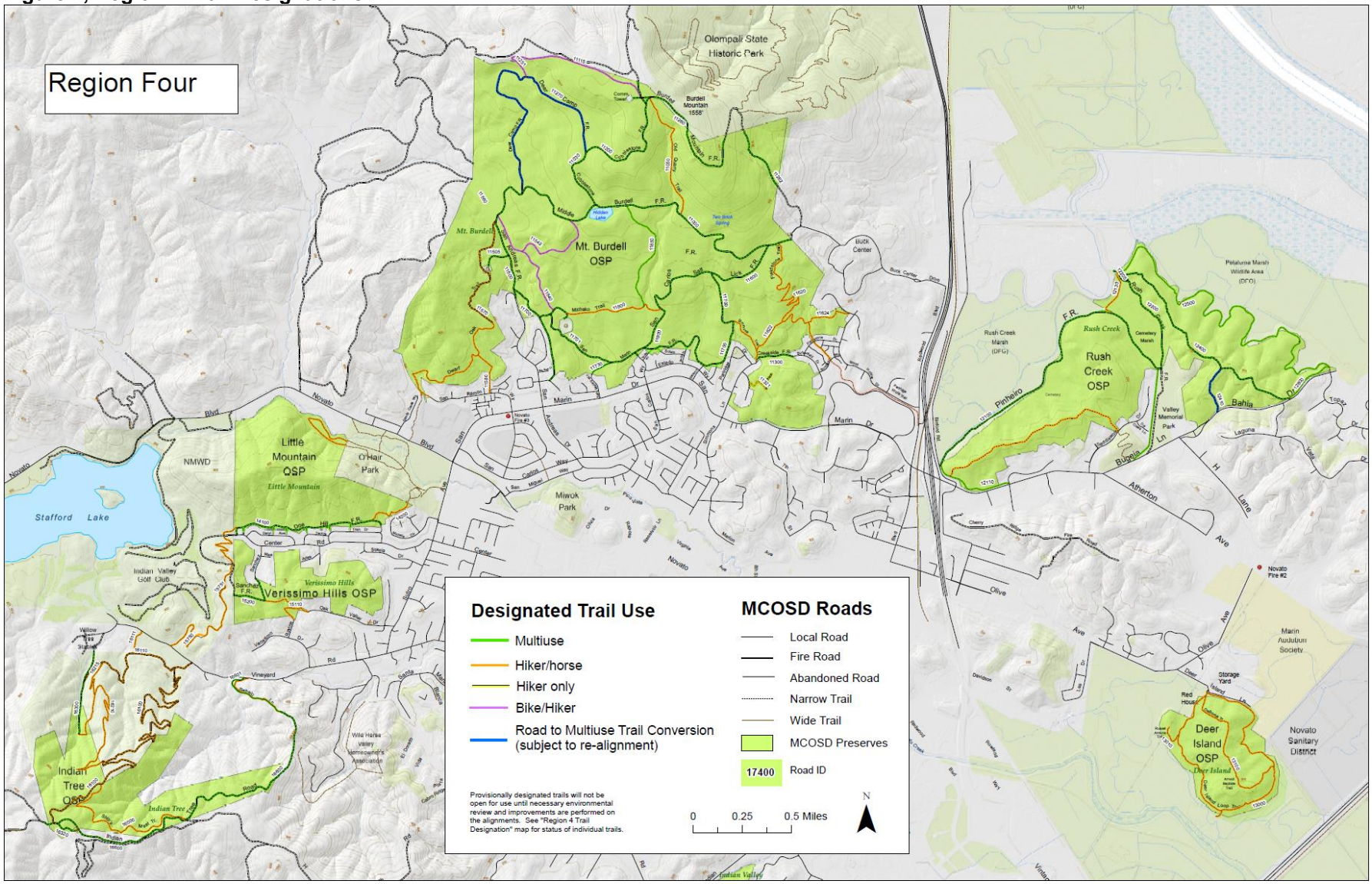


Figure 2, Region 4 Trail Designations



PROJECT LOCATION

The project is in Region 4, located toward the northern end of Marin County near the City of Novato. It is the northernmost of the six regions. The region consists of six preserves totaling 2,874 acres. It includes the Mount Burdell, Little Mountain, Verissimo Hills, Indian Tree, Rush Creek, and Deer Island Preserves. Mount Burdell is the largest preserve in Region 4 (1,627 acres), followed by Rush Creek (522 acres), Indian Tree (242 acres), and Little Mountain (214 acres). Region 4 contains 59 miles of roads and trails, second only to Region 1. Olompali State Historic Park is located to the north of Mount Burdell Preserve, and U.S. 101 is located east of Mount Burdell Preserve. The Rush Creek Marsh and Petaluma Marsh Wildlife Refuges, managed by the California Department of Fish and Wildlife, are located north of the Rush Creek Preserve. Region 4 is the only region where roads and trails are located near “very rural” residential lands as designated by the Marin Countywide Plan (Figure 1).

PROJECT SITE

The project site is in the Mount Burdell Open Space Preserve, in Novato, CA (Figure 2). Mount Burdell was previously part of C Ranch and MCOSD purchased most of it in 1978. The preserve is surrounded by Olompali State Park to the northeast, private agricultural land to the northwest and west, and residential development in the City of Novato to the south and east. Cattle have grazed on the preserve for decades and currently cattle are grazing on the preserve through a lease to a private party. Mount Burdell currently contains 24.06 miles of roads and trails, water tanks and pipelines owned and operated by the North Marin Water District, PG&E lines, and telecommunication facilities.

The project site includes the Eagle Rim Trail, which is a well-established two-foot wide unsanctioned trail. The trail originates next to the communication tower at the summit, and descends along the north ridge, until it intersects with the Deer Camp Fire Road. The existing trail is approximately 4,530 feet long and has an elevation change of 495 feet for an average gradient of 10.9 percent.

Figure 3: Existing Eagle Rim Trail

Figure 4: Existing Eagle Rim Trail

Figure 5: Existing Eagle Rim Trail

Figure 6: Trail 11251

Figure 7. Region 4 Map

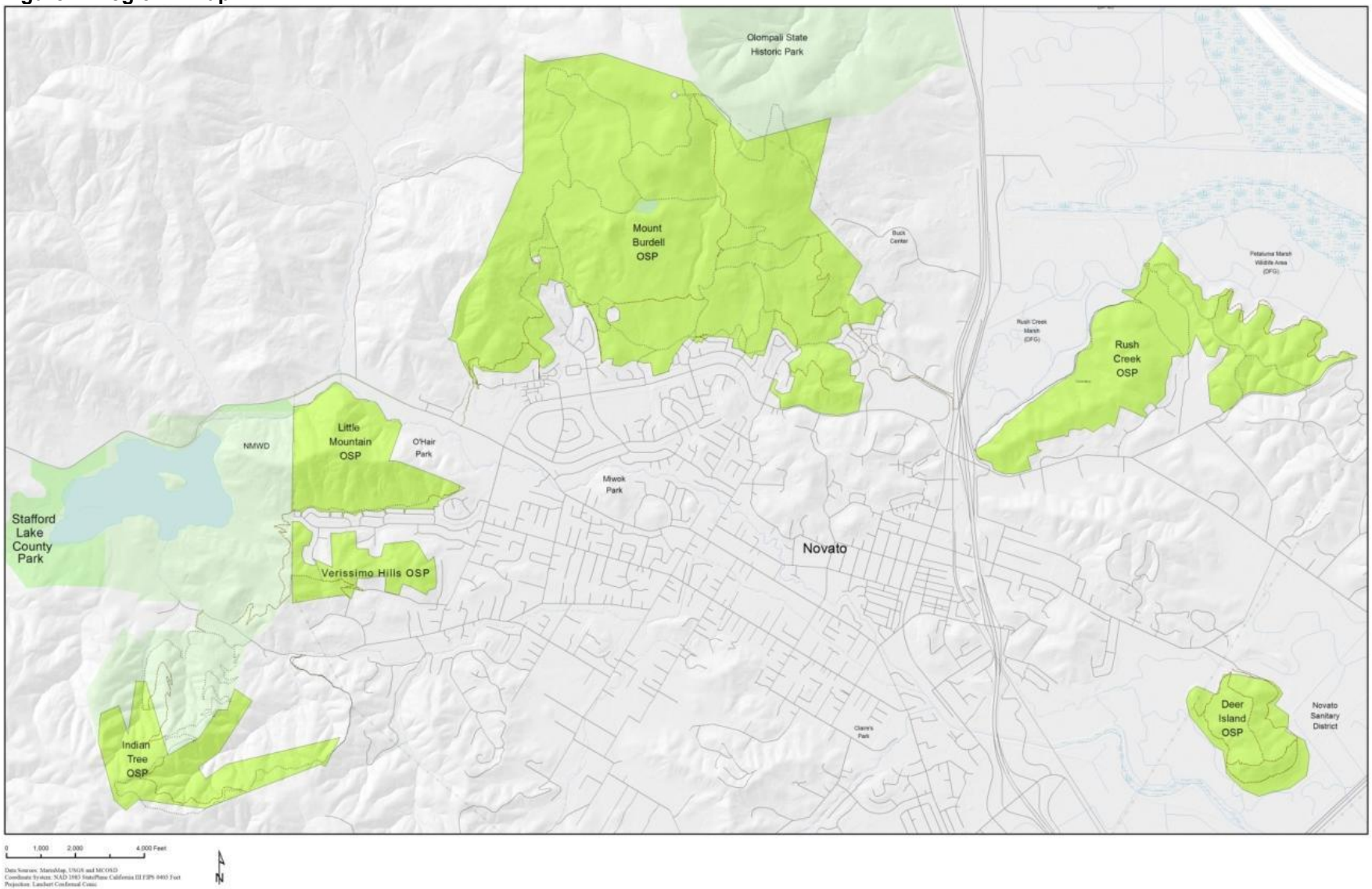
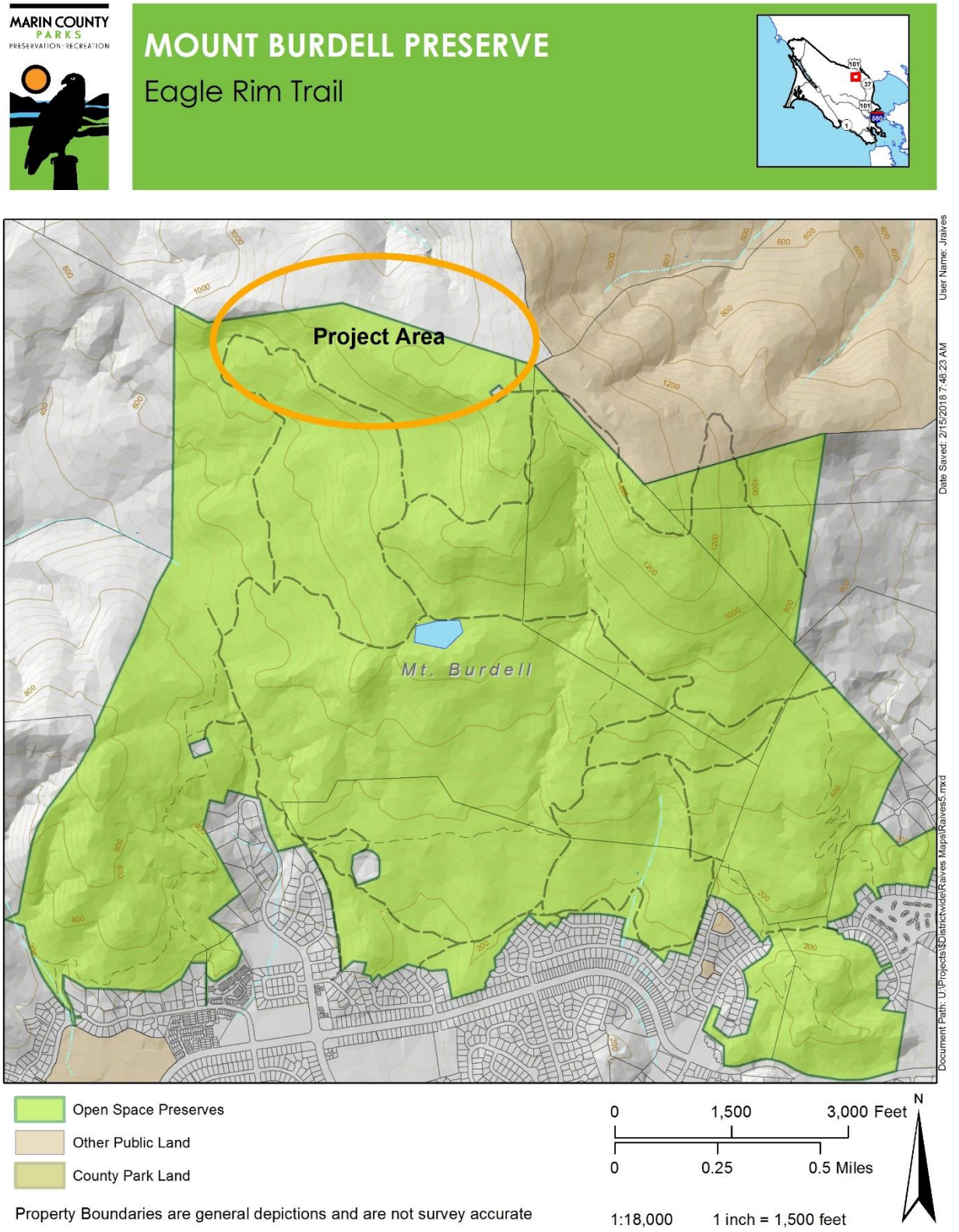


Figure 8: Project Site

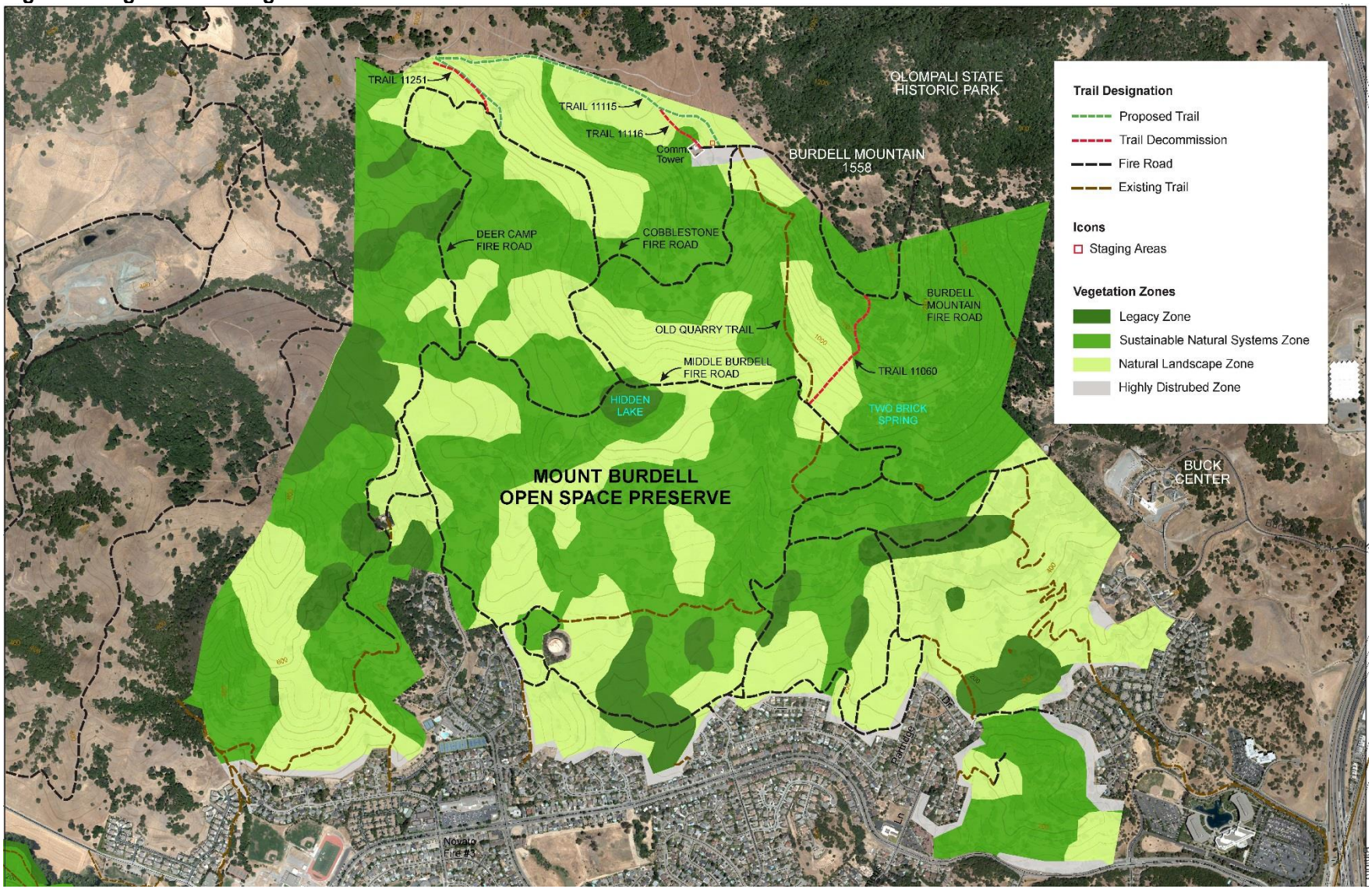


VEGETATION

The MCOSD classified vegetation within the preserves into four management zones, based on the ecological and/or cultural importance of distinctive vegetation types, the condition of resources in particular locations, and the proximity of particular locations to urban or suburban areas. This process is described in great detail in the MCOSD's Vegetation and Biodiversity Management Plan. MCOSD's preserves contain at least one of the following four zones: Legacy Zone, Sustainable Natural Systems Zone, Natural Landscape Zone, and Highly Disturbed Zone. The Mt. Burdell Open Space Preserve is a rich mosaic of grassland, forest, and riparian habitats with rich native flora. The project site occupies an area of the preserve that is primarily in the Natural Landscape Zone, as identified in Vegetation and Biodiversity Management Plan (MCOSD, 2016).

The Natural Landscape Zone includes lands that support native plants and natural vegetation types that are typical of Marin County landscapes. These common vegetation types, while not legally protected or recognized as rare, provide valuable habitat for a diversity of local native species. They contribute to the beauty of Marin County landscapes and add to the ecologically rich natural communities and scenic vistas that define the MCOSD preserves. Vegetation within the natural landscape zone often provides important buffers between the wildland-urban interface and other zones and contains large tracts of grasslands, common oak and other woodland vegetation types, and coastal scrub. While this zone is more infested with invasive plants than the legacy and sustainable natural systems zones, it still provides valuable connectivity and important habitat for common wildlife and plants (MCOSD, 2016). Field observations indicate that the trail primarily traverses the ridgeline, and then continues off the ridgeline through a grassy bowl. Oak and Bay trees boarder the trail and occasionally provide canopy shade. No trees or shrubs would need to be removed for the proposed trail adoption and improvements to be made; however, some trimming would occur.

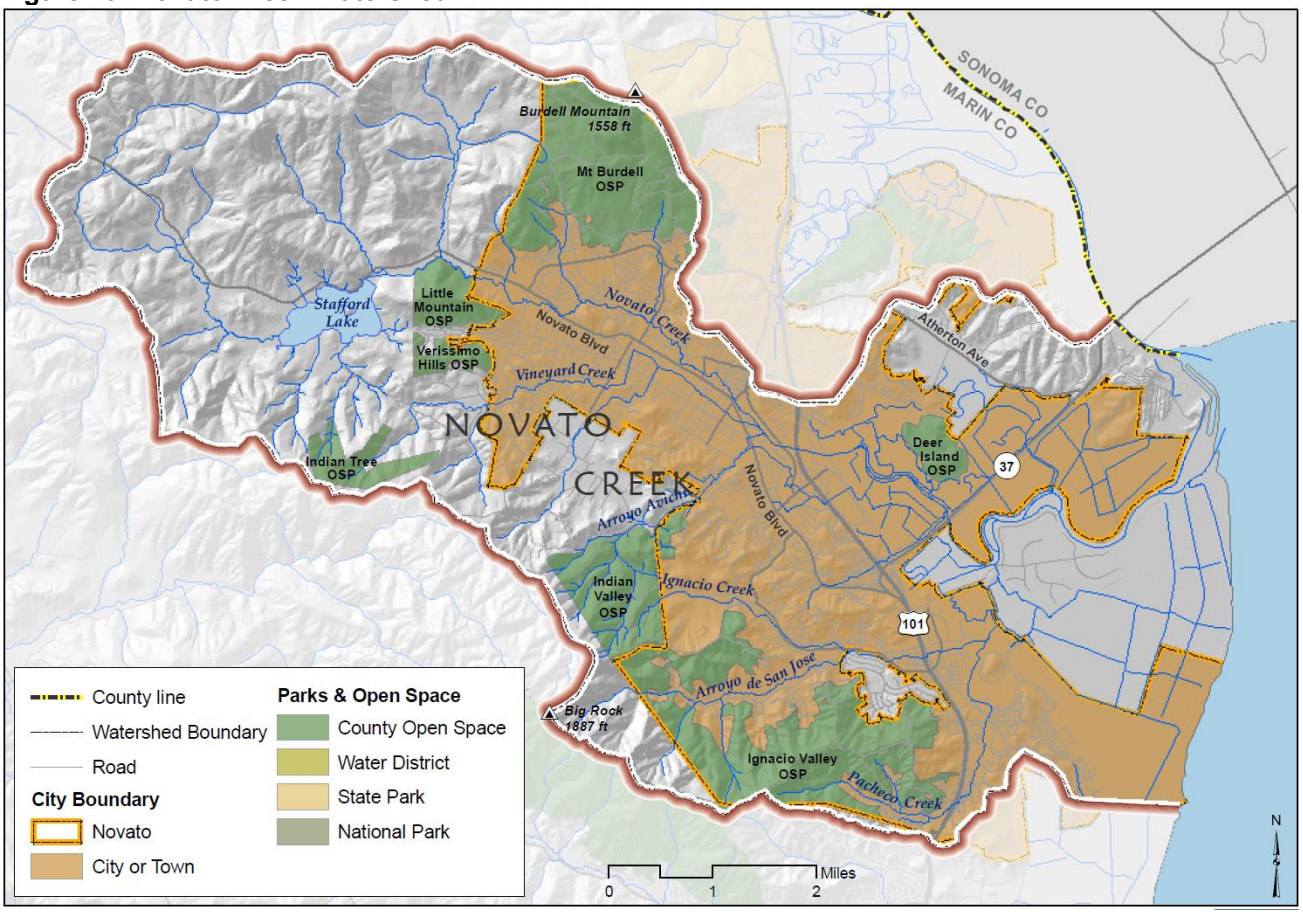
Figure 9: Vegetation Management Zones



HYDROLOGY

Mount Burdell is mostly located in the Novato Creek watershed, with the eastern edge of preserve in the Rush Creek watershed. Novato Creek is the largest watershed in eastern Marin County and flows eastward through oak and bay forests, grasslands, the City of Novato, and into San Pablo Bay near the mouth of the Petaluma River and encompasses 45 square miles (Marin County, 2017; Figure 10). Hydrologic features in Mount Burdell Open Space Preserve include two small, unnamed creeks run through the preserve and Hidden Lake, one of Marin County's few vernal pools. Large proportion of preserve trails exhibit erosion and gullying (MCOSD, 2014b).

Figure 10: Novato Creek Watershed



PROJECT PURPOSE AND NEED

The purpose of the proposed project is to implement road and trail improvements based on the 2014 Road and Trail Management Plan (RTMP) in the Mount Burdell Open Space Preserve. The primary goals of the RTMP are to:

- Establish and maintain a sustainable system of roads and trails that meet design and management standards.
- Reduce the environmental impact of roads and trails on sensitive resources, habitats, riparian areas, native and special-status plant and animal species.
- Improve the visitor experience and visitor safety for all users, including hikers, mountain bikers, and equestrians.

During the Region 4 designation process in 2017, MCOSD provisionally designated the Eagle Rim Trail for hikers and bicycle use, pending the implementation of needed improvements and environmental review. The map for Region 4 (Figure 1) includes Eagle Rim Trail as part of the system. The primary purpose of the proposed project is to officially designate the trail as part of the system in a sustainable manner that reduces its ecological footprint. Specific objectives include:

- Improve and adopt the Eagle Rim Trail;
- Improve trail stability;
- Reduce trail gradient;
- Reduce trail density;
- Reduce habitat fragmentation; and
- Improve the visitor experience for hikers and cyclists.

TRAIL ASSESSMENT

The design process for the project began field reconnaissance by MCOSD staff, literature review of available data, and site-specific data, including:

- MCOSD, 2014a. Road and Trail Management Plan Recirculated Final Tiered Program Environmental Impact Report, November;
- MCOSD, 2014b. Road and Trail Management Plan, December;
- MCOSD, 2016. Vegetation and Biodiversity Management Plan, October;
- Benson, S, 2017. Grassland Assessment and Rare Plant Survey of Mount Burdell Preserve's Upper Slope. Oct 2, 2017;
- Benson, S, 2015a. Grassland Community Assessment of the Lower Slope of Mount Burdell Preserve, Marin County Parks. Marin County Parks, October 27, 2015, unpublished report.
- Benson, S, 2015b. Survey of Special Status Plants on the Lower Slope of Mount Burdell Preserve, Marin County Parks. Marin County Parks, October 27, 2015, unpublished report.
- United States Department of Agriculture (USDA), 1985. Soil Survey of Marin County; and
- USDA, 2017. Natural Resources Conservation Services.

Site reconnaissance took place in October and December 2017 by Carl Szawarzenski (Equipment Operator Supervisor) and David Frazier (Maintenance Equipment Operator), and included site investigation of topography of project site, soil conditions, trail gradients, and drainage issues. Additionally, MCOSD engaged the community through a series of stakeholder meetings to further facilitate the opportunity for feedback about the proposed project.

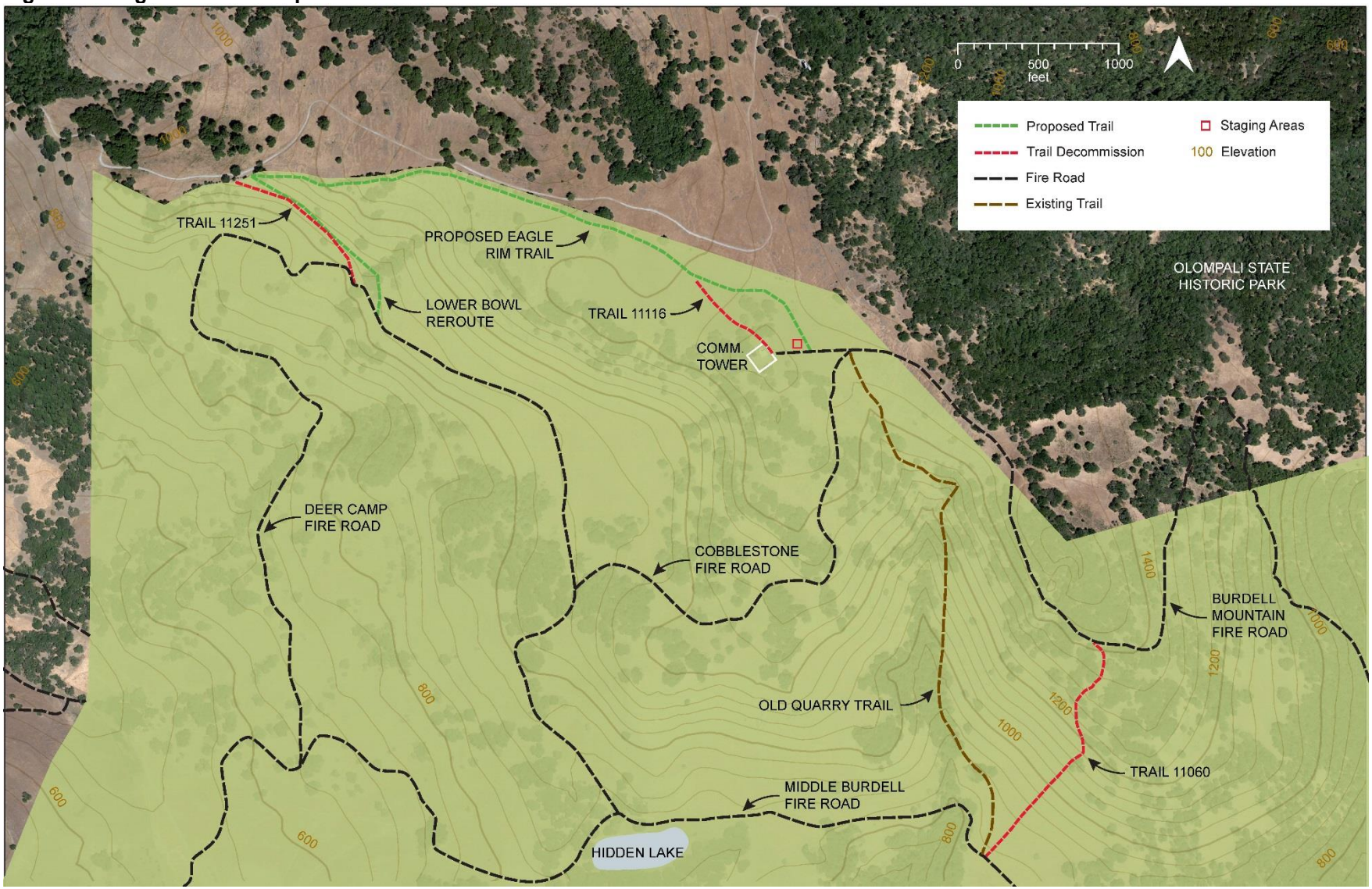
PROPOSED PROJECT

The project would improve the existing Eagle Rim Trail to support incorporation of the trail into the MCOSD trail system as a hiker/biker trail. The proposed Eagle Rim Trail would be a 4,815-foot long single-track trail, with an average grade of 9.34 percent, that predominately meanders along the northwestern corner of the Mount Burdell Open Space Preserve. Proposed improvements would ensure the trail is properly drained, minimize future maintenance, improve sustainability, and improve user safety. To meet the RTMP Policy SW.4: Overall Reduction of Road, Trail and Visitor Impacts, the proposed project includes the decommissioning of three unsanctioned trails: Trail 11251, 1116, and 11060. Trails 11251 and 1116 are two segments of the existing Eagle Rim Trail totaling 1,401 linear feet. Trail 11060 is a 1,621-linear foot unnamed fall line social trail connecting Burdell Mountain Fire Road to Middle Fire Road. These decommissionings would reduce erosion and habitat fragmentation.

The proposed realignments, drainage features, and other actions to protect the environment and improve the user experience would improve the sustainability of the trail consistent with the RTMP policies, applicable BMPs, and trail design standards. These measures would substantially reduce impacts from erosion and runoff into nearby drainages, thereby reducing sedimentation into the Novato Creek Watershed. These improvements would reduce the trail's physical impacts to the preserve and watershed. Based on the recommendations of the feasibility study, adoption, and construction of the 4,815-foot Eagle Rim Trail would require the following (Figure 11):

- Improve existing Eagle Rim Trail to meet trail standards;
- Construct lower bowl reroute;
- Install drainage improvements to produce a more sustainable and hydraulically stable trail;
- Decommission trails 11251, 11116, and 11060, totaling 3,022 linear feet;
- Install fencing and signage, as needed; and
- Designate Eagle Rim Trail as hiker/biker.

Figure 11: Eagle Rim Trail Map



EAGLE RIM TRAIL

The project would enhance the existing Eagle Rim Trail reducing trail slope to meet standards, constructing more sustainable routes, hardening the tread, and decreasing erosion rates. The MCOSD would adopt in place 3,846 linear feet of the existing Eagle Rim Trail along the ridgeline. The existing trail would be improved to meet district standards as described in the RTMP. Approximately 2,400 feet of trail tread would be hardened through the importation of 38 – 48 tons of base rock mix. The base rock would be placed in areas where the trail tread is incised to raise the trail, prevent erosion, reduce long term maintenance, and thereby improve the trail's sustainability. To improve drainage, reduce sedimentation, and make the trail hydrologically invisible, the project includes the construction of rolling dips the tread would be outsloped to let water sheet across the trail naturally. The tread would be outsloped at approximately five percent. The project includes some tree limbing along the trail corridor to improve sightlines and minor modifications of four existing rock outcroppings.

LOWER BOWL REROUTE

The existing Trail 11251 is a 675-linear foot trail alignment with an average grade of 18.4 percent and a maximum grade of 26 percent. The project proposes to construct a new alignment that would include a sustainable tread, reduce steep grades, maintain good sightlines, and improve passing zones. The rerouted alignment would total 955 linear feet and have a 10 percent average trail grade. Due to the steep cross slope, the trail would be approximately 30 inches wide, except at designated pull outs on the trail. The new alignment would include dewatering features, reverse grade dips, and knicks[2], at a maximum of 100-foot intervals to ensure stability and longevity.

Figure 12: Lower Bowl Trail Looking Downhill

Figure 13: Lower Bowl Trail Looking Uphill

DRAINAGE IMPROVEMENTS

Drainage improvements to the trails would include installation of rolling dips and outsloping of the trail. Rolling dips are drainage dips excavated into the trail to convey water off the trail. This is the preferred technique to get water off an existing trail. Outsloped tread is a technique that alters the trail to be lower on the outside or downhill side of the trail than it is on the inside or bank side. Outsloping lets water sheet across the trail naturally. The tread would be outsloped at

[2] Knick- Outsloped drain constructed into existing trails to move water off the trail.

approximately five percent. The project would entail the construction of approximately 30 rolling dips at various locations, to be determined in the field during construction.

TRAIL DECOMMISSIONING

To meet a critical goal of the RTMP, the proposed project includes the reduction of environmental impacts through the closure and decommissioning of unsanctioned trails to reduce habitat fragmentation. Trail decommissioning is proposed for three segments of unsanctioned trails, identified as trails 11251, 11116, and 11060. These unsanctioned trails were identified for decommissioning because they are either redundant, fragment high value habitat or excessively steep and erosive. Each proposed decommission is described below.

Trail 11251

This trail extends approximately 726 linear feet from the ridgeline to Deer Camp Fire Road. The trail traverses an open grassland on a steep side slope and is approximately two to three feet wide and well worn. The MCOSD would decommission the entire length of trail with the following techniques:

- Scarification;
- Installing dewatering features;
- Straw application;
- Split rail fencing if needed; and
- Trail closure signage at top and bottom of both segments.

Trail 11116

This trail extends from its eastern trailhead at the communication tower to its intersection with the proposed Eagle Rim Trail. The unsanctioned trail is approximately 675 linear feet and traverses open grassland and is approximately two to three feet wide and well worn. The MCOSD would decommission the entire length of trail with the following techniques:

- Scarification;
- Installing dewatering features;
- Straw application;
- Split rail fencing if needed; and
- Trail closure signage at top and bottom of both segments.

Trail 11060

This trail is approximately 1,621 linear feet and extends from its northern connection with Burdell Mountain Fire Road to its intersection with the Middle Burdell Fire Road. The trail traverses scattered oak trees and an open grassland on an extremely steep side slope and is approximately two to four feet wide and well worn. The MCOSD would decommission the entire length of trail with the following techniques:

- Scarification;
- Installing dewatering features;
- Straw application;
- Split rail fencing, if needed; and
- Trail closure signage at top and bottom of both segments.

FENCING AND SIGNAGE

Fencing and signage would be installed after completion of trail improvements. Signs would be used to specify allowed users on the trail and to identify the trail from both Deer Camp Fire Road and from the communication tower. Signage would also promote the use of the designated trail, rather than social trails. Split rail fencing would be installed as needed to prevent use of decommissioned trails and to direct users to appropriate locations. The success of the fencing and signage would be monitored by the MCOSD staff.

DESIGNATION

After trail improvements have been implemented, the Eagle Rim Trail would be added to MCOSD maps of the Mount Burdell Open Space Preserve as a hiker/biker trail. The trail would be open to use consistent with MCOSD rules and regulations pertaining to the hiker/biker designation.

CONSTRUCTION

Construction of the project would adhere to the Road and Trail Plan's standards and BMPs outlined in Chapter 6 of the RTMP. Construction would include the following phases:

- Preconstruction biological surveys
- Demarcation and establishment of the final trail alignment
- Equipment mobilization and staging
- Construction
- Restoration
- Long-term monitoring

The construction stage would commence with the completion of preconstruction surveys (BMP Wildlife-2, 3, and 4 and BMP Special-Status Plants-2). After all sensitive plants have been identified in the field and the site has been cleared for nesting birds, bats, and other wildlife, the trail alignment would be finalized to avoid all sensitive resources and would be marked clearly for construction staff. After the alignment is marked and finalized, equipment staging areas would be established and equipment would be brought to the project site. Construction staging areas would be restricted to existing MCOSD roads and trails or other disturbed areas that would avoid any significant impacts on sensitive natural resources as required by BMPs described in the MCOSD's Road and Trail Management Plan. Access to the project site for construction vehicles and equipment would be from San Marin Drive. During construction, the MCOSD would limit trail access for safety purposes and would install signs at preserve entrances to warn trail users.

Construction would begin in spring/summer of 2018 and would require up five MCOSD staff members and volunteers for approximately four weeks. Equipment would include a mini excavator, carriers, generators, ATVs, a jackhammer, skillsaw, sawzall, drum roller, plate compactor, and hand tools (hedge trimmers, chainsaws, etc.). Earthwork involving heavy equipment would end by October 15, 2018 (BMP Water -6) to prevent erosion during the rainy season. Construction would largely take place four days a week, Monday through Thursday, from 7:00 a.m. to 6:00 p.m.

After completion of the project, the MCOSD would continue to monitor the trail for resource protection as well as visitor use. The MCOSD Natural Resource staff would conducted a field assessment of the Eagle Rim Trail in the pre-planning phases to investigate the presence of invasive plant species. The Early Detection, Rapid Response Team would continue to monitor the

trail for the presence of invasive species. Additionally, the MCOSD may install visitor use counters to determine the type and frequency of recreational use of the trail.

OPERATION AND MAINTENANCE

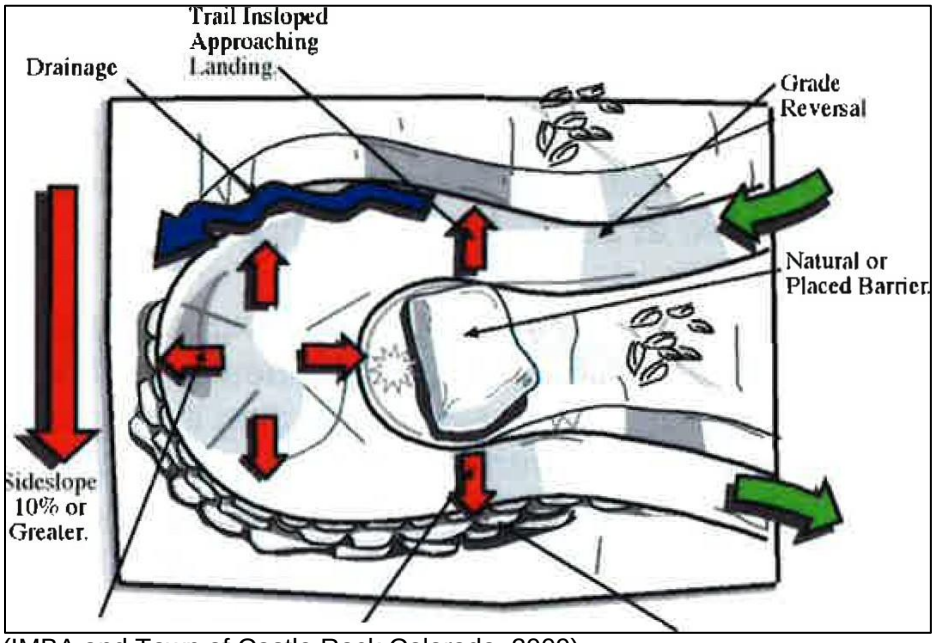
After project construction, use of the trail for public recreation would continue similar to existing conditions. The trails would be used largely by locals for hiking, biking, dog walking, and other allowable recreational purposes. The project would be integrated into the Region 4 trail system and would be published on all maps, which would increase public knowledge of the Eagle Rim Trail. However, as the project does not include any parking or other amenities to improve access to the trail system, increases in trail use are anticipated to be minor and largely proportional with regional population growth.

Once the MCOSD incorporates the trails into its system, the trails would be maintained by MCOSD staff. As the trails are designed to improve existing trail sustainability, this level of maintenance is expected to be manageable. Regular maintenance includes, brushing of the trail corridor, maintaining drainage structures, and clearing fallen trees and trail obstructions and would occur as needed. As part of the project, the decommissioned trail segments would be monitored to ensure revegetation is successful and to prevent continued use of the decommissioned trails. Minor work may occur as needed to prevent access to the decommissioned trails.

PROJECT DESIGN FEATURES

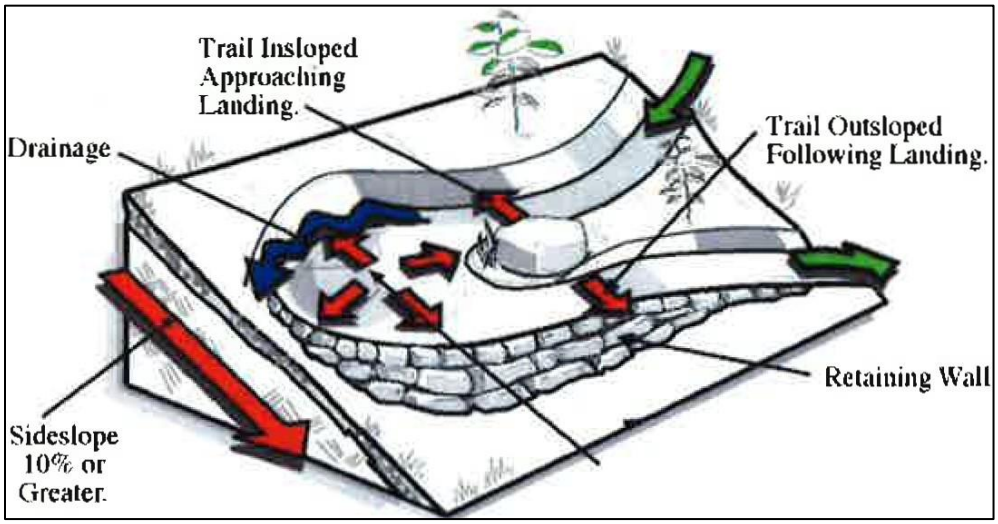
The project would be designed and constructed in compliance with the RTMP. See Appendix A for a list of all applicable BMPS that are incorporated into the project. The figures below show typical drawings for some of the proposed project features.

Figure 14: Climbing Turn, Plan View



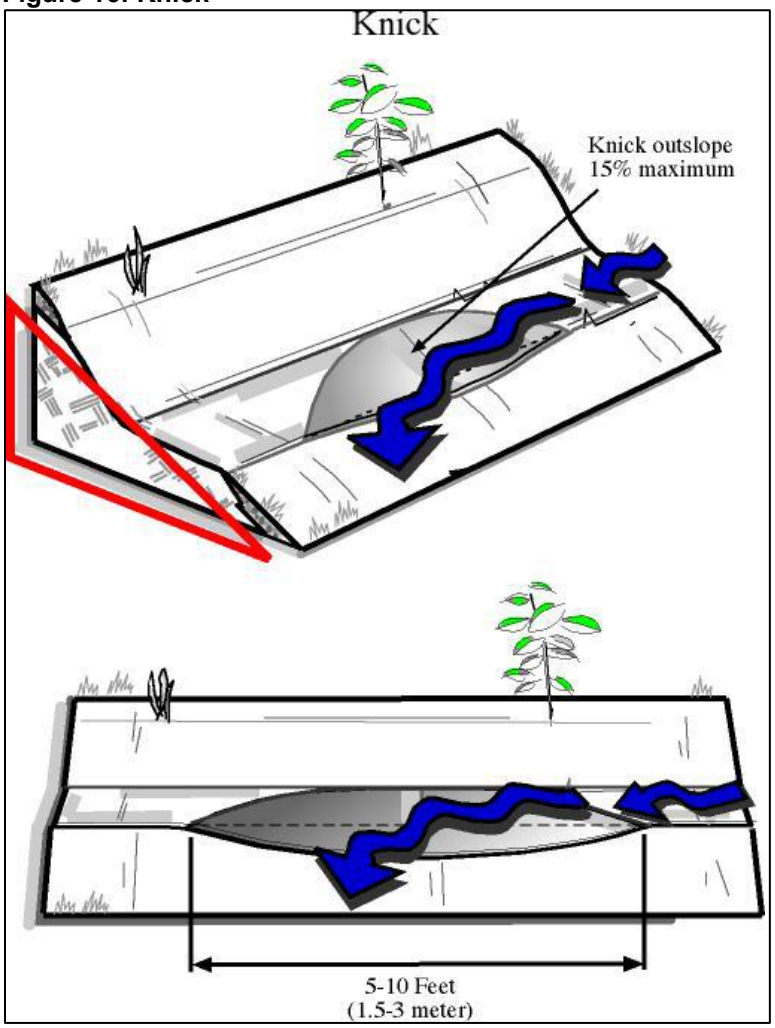
(IMBA and Town of Castle Rock Colorado, 2009)

Figure 15, Climbing Turn, side view



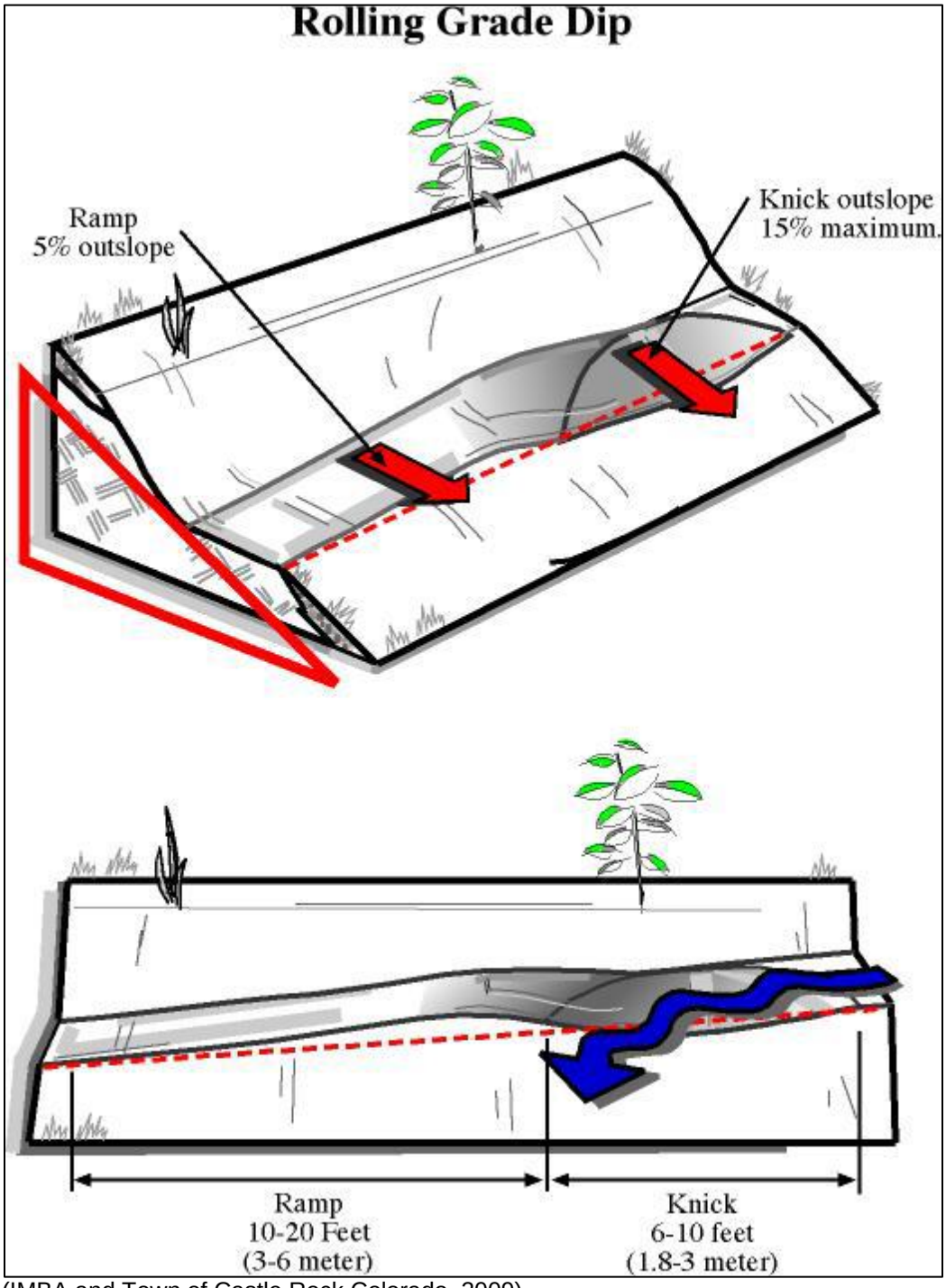
(IMBA and Town of Castle Rock Colorado, 2009)

Figure 16: Knick



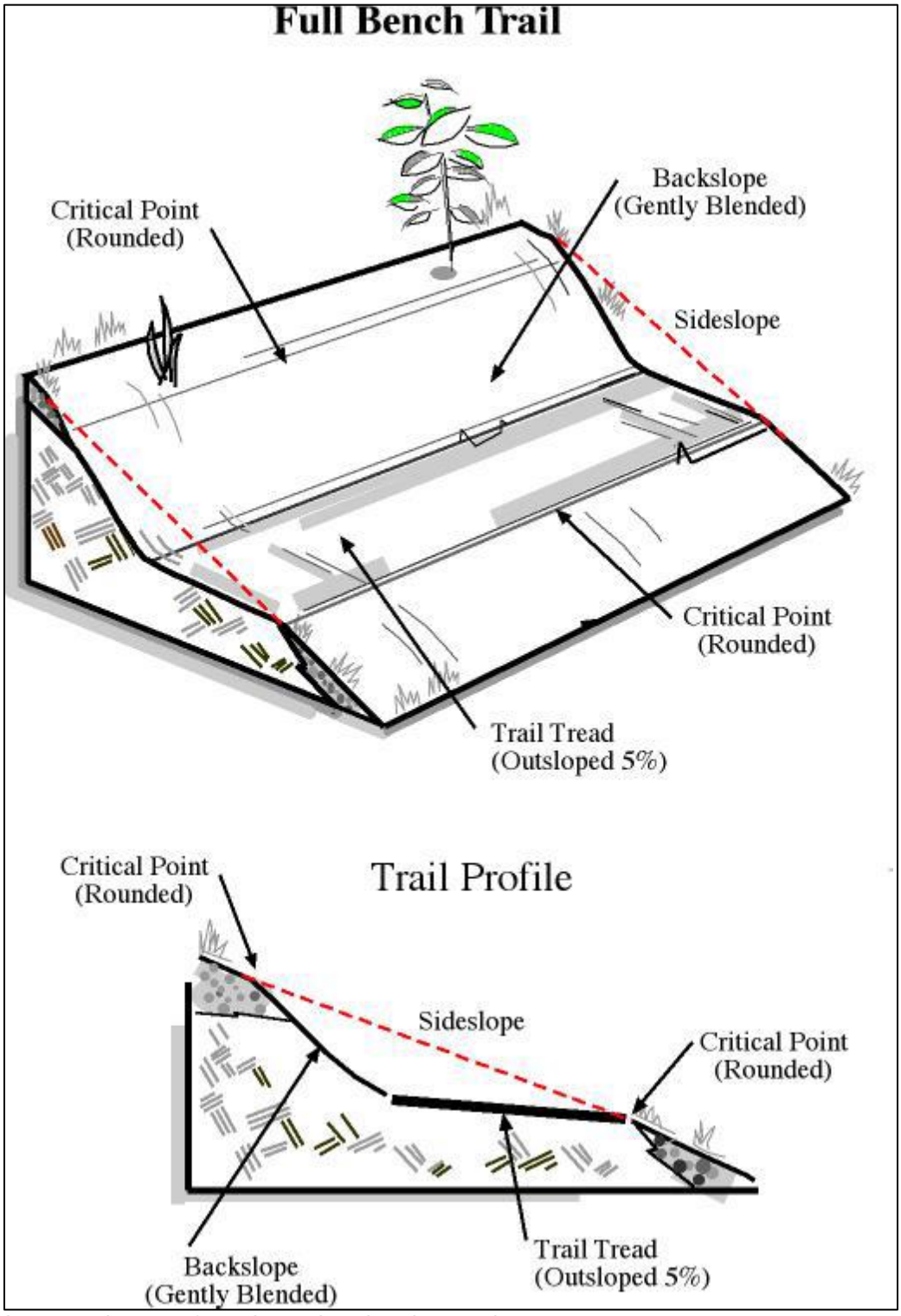
(IMBA and Town of Castle Rock Colorado, 2009)

Figure 17: Rolling Grade Dip



(IMBA and Town of Castle Rock Colorado, 2009)

Figure 21: Full Bench Trail



(IMBA and Town of Castle Rock Colorado, 2009)

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