

NOTICE OF MEETING

WATERSHED COMMITTEE/BOARD OF DIRECTORS (WATERSHED)

(Per paragraph 3 on page 10 under subsection *Committee Meetings* of the Board Handbook: The Board, as a practice, generally does not take final action on items during committee meetings, unless District staff determines the urgency of the item requires immediate action that cannot be delayed until a subsequent regular bi-monthly Board meeting.)

MEETING DATE: September 21, 2023

TIME: 1:30 p.m.

LOCATIONS: This meeting will be held remotely and in-person.

Open Session	Virtually
Marin Water Board Room 220 Nellen Avenue Corte Madera, CA 94925	URL: https://us06web.zoom.us/j/89367727671 Webinar ID: 893 6772 7671 Phone Call: 1-669-444-9171

EMAILED PUBLIC COMMENTS: Submit your comments in advance of the meeting to BoardComment@MarinWater.org. All emailed comments received by 11:30 a.m. on the day of the meeting will be provided to the Board of Directors prior to the meeting. Please do not include personal information in your comment that you do not want published on our website such as phone numbers and home addresses.

PARTICIPATION DURING THE MEETING:

In-person Attendee: Fill out a speaker card prior and place it next to the Board Secretary. List the number of the agenda item(s), for which you would like to provide a comment. Once you’re called, proceed to the lectern to make your comment.

Remote Attendee: Click on the “raise hand” button on the bottom of the Zoom screen. If you are joining by phone and would like to comment, press *9 and staff will call on you by the last four digits of your phone number.

(Note: The board president may shorten the amount of time for public comment due to large numbers of both in-person and virtual attendees.)

AGENDA ITEMS	RECOMMENDATIONS
Call to Order and Roll Call*	
Adoption of Agenda	<i>Approve</i>
Public Comment - Items Not on the Agenda	
<p>Members of the public may comment on any items not listed on the agenda during this time. Comments will be limited to three (3) minutes per speaker, and time limits may be reduced by the board president to accommodate the number of speakers and ensure that the meeting is conducted in an efficient manner.</p>	
Calendar (1:40 p.m. – Time Approximate)	
1. Minutes of the Watershed Committee Meeting/Special Meeting of the Board of Directors (Watershed) of June 15, 2023 (Approximate Time 1 Minute)	<i>Approve</i>
2. Annual Vegetation and Management Report (Approximate Time 20 Minutes)	<i>Information</i>
3. Lagunitas Creek Stewardship Plan Update (Approximate Time 15 Minutes)	<i>Information</i>
Adjournment (2:16 p.m. – Time Approximate)	

ADA NOTICE AND HEARING IMPAIRED PROVISIONS:

In accordance with the Americans with Disabilities Act (ADA) and California Law, it is Marin Water’s policy to offer its public programs, services, and meetings in a manner that is readily accessible to everyone, including those with disabilities. If you are an individual with a disability and require a copy of a public hearing notice, an agenda, and/or agenda packet in an appropriate alternative format, or if you require other accommodations, please contact Board Secretary Terrie Gillen at 415.945.1448, at least two days in advance of the meeting. Advance notification will enable Marin Water to make reasonable arrangements to ensure accessibility.

INFORMATION AGENDAS ARE AVAILABLE FOR REVIEW AT THE CIVIC CENTER LIBRARY, CORTE MADERA LIBRARY, FAIRFAX LIBRARY, MILL VALLEY LIBRARY, MARIN WATER OFFICE, AND ON THE MARIN WATER WEBSITE (MARINWATER.ORG)

*MARIN WATER BOARD OF DIRECTORS ORDER OF ROLL CALL: RANJIV KHUSH, LARRY RUSSELL, JED SMITH, MONTY SCHMITT, AND MATT SAMSON

FUTURE BOARD AND COMMITTEE MEETINGS AND UPCOMING AGENDA ITEMS:

Dates	Meetings
Thursday, September 28, 2023 9:30 a.m.	<ul style="list-style-type: none">• Finance & Administration Committee Meeting/Special Meeting of the Board of Directors (Finance & Administration)
Tuesday, October 10, 2023 6:30 p.m.	<ul style="list-style-type: none">• Board of Directors Regular Bi-Monthly Meeting

Upcoming Key Items for future Watershed Committee Meeting

- At December 12, 2023 Board Meeting
 - Watershed Recreation Management Plan Progress Update


Board Secretary



Item Number: 01
 Meeting Date: 09-21-2023
 Meeting: Watershed
 Committee/Board of Directors
 (Watershed)

Approval Item

TITLE

Minutes of the Watershed Committee Meeting/Special Meeting of the Board of Directors (Watershed) of June 15, 2023

RECOMMENDATION

Approve the minutes

SUMMARY

On June 15, 2023, the Watershed Committee/Board of Directors (Watershed) held a meeting. The minutes of that meeting are attached.

DISCUSSION

None

FISCAL IMPACT

None

ATTACHMENT(S)

1. Minutes of the Watershed Committee Meeting/Special Meeting of the Board of Directors (Watershed) of June 15, 2023

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Communications & Public Affairs Department	 Terrie Gillen Board Secretary	 Ben Horenstein General Manager

**MARIN MUNICIPAL WATER DISTRICT
WATERSHED COMMITTEE MEETING/SPECIAL MEETING OF THE
BOARD OF DIRECTORS (WATERSHED)**

MINUTES

Thursday, June 15, 2023

Meeting Remotely and In-Person

In-Person Locations: Marin Water Board Room, 220 Nellen Avenue, Corte Madera, CA 94925;
and, 103 Herring Pond Road, Plymouth, MA 02360

CALL TO ORDER AND ROLL CALL

Chair Matt Samson called the meeting to order at 1:30 p.m.

Directors Present: Larry Russell, Monty Schmitt, Jed Smith, and Matt Samson
(*Director Russell arrived at 1:34 p.m.*)

Directors Absent: Ranjiv Khush

ADOPT AGENDA:

On motion made by Director Smith and seconded by Director Schmitt, the board approved the adoption of the agenda by the following roll call vote:

Ayes: Directors Schmitt, Smith, and Samson
Noes: None
Absent: Directors Khush and Russell

PUBLIC COMMENT:

There were no public comments.

CALENDAR ITEMS:

Item 1 Minutes of the Watershed Committee Meeting/Special Meeting of the Board of Directors (Watershed) Meeting of March 16, 2023

On motion made by Director Smith and seconded by Director Schmitt, the board approved the minutes by the following roll call vote:

Ayes: Directors Schmitt, Smith, and Samson
Noes: None

Absent: Directors Khush and Russell

Item 2 Watershed Recreation Management Planning Update

Watershed Resources Manager Shaun Horne provided highlights of what occurred at previous Watershed Recreation Management Plan workshops, as well as provide summaries of the Watershed Visitor's Census Survey. Discussion followed.

There were 12 public comments.

This was an informational item. The Board did not take any formal action.

Item 3 Recruitment and Hiring of Two (2) Watershed Protection Park Ranger Trainees for a Limited Duration of Up to Three Years

Chief Watershed Ranger Don Wick and Watershed Resources Manager Horne presented this item. Discussion ensued.

There was one (1) public comment.

By motion made by Director Schmitt and seconded by Director Russell, they referred this item to the Board for approval at a future Board meeting.

Item 4 Biodiversity, Fire & Fuels Integrated Plan (BFFIP) Updates and Addendum to BFFIP Program Environmental Impact Report

Natural Resources Program Manager Carl Sanders and Watershed Resources Manager Horne presented this item. Discussion followed.

There were two (2) public comments.

Although this item was inadvertently listed as an information item on the agenda, General Counsel Molly MacLean stated that this item would go the full Board at a future Board meeting for approval.

Item 5 Lagunitas Creek Fisheries Monitoring and Tagging Update

Watershed Resources Manager Horne introduced Fisheries Program Manager Jonathon Koehler, who presented this item. Discussion followed.

There was one (1) public comment.

This was an informational item. The Board did not take any formal action.

ADJOURNMENT

There being no further business, the Watershed Committee Meeting/Special Meeting of the Board of Directors (Watershed) adjourned at 3:35 p.m.



Board Secretary




Item Number: 02
Meeting Date: 09-21-2023
Meeting: Watershed
Committee/Board of Directors
(Watershed)

Informational Item

TO: Watershed Committee/Board of Directors Watershed

FROM: Shaun Horne, Watershed Manager 
Carl Sanders, Natural Resources Program Manager 

THROUGH: Ben Horenstein, General Manager 

DIVISION NAME: Watershed

ITEM: 2023 Annual Vegetation Management Report

SUMMARY

The District conducts vegetation management work on watershed lands throughout the year under the Biodiversity, Fire, and Fuels Integrated Plan (BFFIP), which was adopted in October of 2019. Staff has prepared a BFFIP Annual Vegetation Report detailing work completed in FY 2022/2023. Staff will provide a presentation with an overview of work completed to address wildfire hazards and to enhance biodiversity on the District's watershed lands.

DISCUSSION

As outlined in the BFFIP and associated Environmental Impact Report, "The District will evaluate the effectiveness of annual management actions based on the findings from monitoring results. An annual board report will include the findings from monitoring and any recommendations made by District staff for modifications to methods and/or the schedule of preservations and restoration actions." The attached BFFIP Annual Report summarizes the District's vegetation management work, wildfire coordination, biological monitoring, and planning activities.

The District adopted its first vegetation management plan in 1995. The District's principal management concern at the time was reducing wildfire hazards on its lands, while minimizing impacts on natural resources. The plan included the creation of a series of fuelbreaks and access roads along major ridges, and the maintenance of the fuelbreak infrastructure. In October of 2019, the District adopted the BFFIP which described the actions the District would implement to reduce wildfire hazards and to maintain and enhance ecosystem function. Under the BFFIP there are 27 management actions that are being implemented to fulfill the goals and approached described in the plan. To implement the inventorying, planning, and monitoring management actions, the District conducts surveys, manages data, and creates maps. To implement the vegetation management actions, the District uses a combination of manual and mechanical techniques to achieve the BFFIP management actions targets. On a regular basis,

the District evaluates the effectiveness of its various techniques and progress towards meeting the BFFIP targets, and annually it reports its findings to the Board and public.

Vegetation management under the BFFIP aims to reduce fuel loads, maintain fuelbreak infrastructure, preserve defensible space, and reduce invasive weed species. Vegetation management is conducted continuously throughout the year with the chief goal of reducing fuel loads and maintaining the watershed’s biological diversity. To document the District’s annual vegetation management work, staff has prepared the BFFIP Annual Report for the fourth year of implementation. The report summarizes the District’s implementation activities carried out from July 1, 2022 through June 30, 2023. It includes information on vegetation treatment types, total acres managed, and vegetation management costs. Also, included in the report is an overview of the District’s environmental compliance and biological monitoring activities. The final section reviews progress towards meeting the BFFIP year IV targets and priorities for the upcoming year.

For FY 2023, the District treated 1,528 acres at a cost of \$3,270,328 for an average cost of \$2,149/acre. Environmental compliance cost were \$467,787 bringing the total costs for BFFIP FY 2023 implementation to \$3,752,495, for a per acre cost of \$2,455/acre. As a percentage of total costs, compliance costs were 12.5% of the total.

In FY 2023, total BFFIP expenses were funded, in part, with \$1,603,048 in grants provided by the California Coastal Conservancy and the Cal Fire Forest Health Program. This funding represents 43% of the total FY 2023 BFFIP expenses. The table below summarizes the costs and outcomes for wildfire coordination, planning, monitoring, and vegetation management work implemented during FY 2022/2023:

Table 1 Overview of Vegetation Management Activities

Completed Work	Outcome	Approximate Cost ^a	Description
Community Coordination for Fire Risk Reduction		\$14,380	
Red Flag Warnings	Watershed Closures	N/A	<ul style="list-style-type: none"> Closed Watershed for 0 days due to Red Flag Warnings. Community outreach for red flag and other critical fire weather events through signage and social media.
Coordination with PG&E	12.5 Acres	\$950	<ul style="list-style-type: none"> Managed PG&E access through permits to support cyclical vegetation maintenance around and under transmission lines. PG&E cleared vegetation along 12.5 miles of access roads across the watershed. PG&E repaired/replaced 47 pieces of hardware maintenance along the Distribution system throughout the watershed. See section 1.2 for detail.

Coordination with Lessees and Neighbors on Defensible Space	10 Acres	\$13,430	<ul style="list-style-type: none"> Coordinating under existing lease agreement to prioritize maintenance funding for vegetation maintenance around infrastructure. Coordinated with Marin Wildfire Prevention Authority around fuels treatment along the Greater Ross Valley Shaded Fuelbreak
County Fire Coordination	County and Watershed Wide	N/A	<ul style="list-style-type: none"> Provided direction and support for development of Marin’s Community Wildfire Protection Plan in collaboration with Marin County Fire and FIRESafe Marin. Attended monthly FIRESafe Marin Meetings. Submitted two cross jurisdictional grant applications to NOAA Climate Resiliency Program and California’s Office of Planning and Research ICARP for forestry restoration and vegetation management work.
Planning, Compliance and Monitoring		\$467,787	
Biodiversity, Fire, and Fuels Integrated Plan (BFFIP)		\$79,761	<ul style="list-style-type: none"> Implemented BFFIP Year 4 Targets. Completed Addendum to be implemented in Year 5 to increase the acres of watershed vegetation management work.
Non-Native Invasive Species Mapping	Updated Records	N/A	<ul style="list-style-type: none"> 1,349 invasive plant records updated.
Rare Plant Surveys	Rare plant compliance surveyed	\$88,246	<ul style="list-style-type: none"> 411 acres surveyed for Rare plants ahead of vegetation management projects. 210 Rare Plant Records Created.
Northern Spotted Owl Surveys	Nesting compliance	\$75,821	<ul style="list-style-type: none"> Completed environmental compliance survey work for northern spotted owl to support watershed vegetation and construction related projects.
Bat Surveys	Roosting bat habitat surveys	\$4,578	<ul style="list-style-type: none"> Completed environmental compliance survey work for roosting bat habitat prior to Douglas fir thinning work and excavation at the Concrete Pipe Tank Replacement Project.
Bird Surveys	Nesting Birds	\$83,208	<ul style="list-style-type: none"> Completed environmental compliance survey work for nesting birds to support vegetation management work.
Tri-Annual Land Bird Survey	Nesting Birds	\$35,189	<ul style="list-style-type: none"> Completed tri-annual nesting bird monitoring on the watershed.
Osprey Monitoring	Annual Monitoring	\$8,670	<ul style="list-style-type: none"> Completed annual Osprey monitoring at Kent Lake. Note, FY23 expenses include two years of survey work due to the timing and receipt of the FY22 invoice.

Forest Restoration Monitoring and Mapping	Maintenance of Existing Areas	NA	<ul style="list-style-type: none"> Routine Maintenance of 16 acres of Forest Habitat in the Resilient Forest Project Area. Costs for this activity are contained in the Vegetation Management section.
Foothill Yellow Legged Frog	Annual Monitoring	\$39,480	<ul style="list-style-type: none"> Completed annual monitoring of foothill yellow legged frogs at select watershed locations with known occurrences.
Prescribed Burning Report	Prescribed Burning Plan	\$13,753	<ul style="list-style-type: none"> Received reports for 6 burn plans across the watershed.
Watershed Fuel Modeling	Final Report	\$39,080	<ul style="list-style-type: none"> Evaluated BFFIP treatments and developed Report to inform future treatments.
Compliance Supplies	Rx Burn Signage	\$1,308	<ul style="list-style-type: none"> Purchased Rx burn signs to inform visitors and improve burn safety.
Vegetation Management	FY23 BFFIP Implementation	\$3,270,328	
Cyclical Maintenance of Fuelbreaks	578 acres	\$782,070	<ul style="list-style-type: none"> All fuelbreaks maintained at appropriate intervals
	189 acres	\$500,012	<ul style="list-style-type: none"> Fuelbreak maintenance, cutting of woody vegetation & pile burns.
	45 acres	\$37,260	<ul style="list-style-type: none"> Mowed fine fuels around structures, roadsides and parking areas.
	253 acres	\$140,460	<ul style="list-style-type: none"> Pulled/mowed broom from fuelbreaks.
	47 acres	\$54,598	<ul style="list-style-type: none"> Mowed non-fuelbreak roadsides.
	43 acres	\$49,740	<ul style="list-style-type: none"> Managed vegetation on dams and spillways.
New Fuelbreak Construction	10 acres	\$76,198	<ul style="list-style-type: none"> Contractors expanded defensible space at Taylor Trail Fuelbreak
Forest Restoration and Fuel Management	130 acres	\$829,957	<ul style="list-style-type: none"> Forest and woodland thinning to promote resilience
	62 acres	\$765,170	<ul style="list-style-type: none"> Initial forest fuel reduction.
	68 acres	\$64,787	<ul style="list-style-type: none"> Maintenance of forest restoration sites.
Priority Habitat Restoration & Fuel Reduction	797 acres	\$1,554,177	<ul style="list-style-type: none"> Removal of target invasive weeds within forest and woodlands
	150 acres	\$908,368	<ul style="list-style-type: none"> Douglas fir thinning in oak woodlands and grasslands (OW&G).
	260 acres	\$442,258	<ul style="list-style-type: none"> Broom removal in OW&G.
	198 acres	\$111,342	<ul style="list-style-type: none"> Broom maintenance in OW&G.
	10 acres	\$16,770	<ul style="list-style-type: none"> Goatgrass reduction in OW&G.
	143 acres	\$33,128	<ul style="list-style-type: none"> Yellow Starthistle management in OW&G.

	36 acres	\$42,312	<ul style="list-style-type: none"> Control of other priority weeds in OW&G.
Early Detection Rapid Response	N/A	One Tam Contribution	<ul style="list-style-type: none"> 66 miles of roads and trails surveyed. 186 patches of invasive weeds treated in FY23.
Experiment with New Invasive Species Control Methods	2 Trials 31.4 Acres	\$27,080	<ul style="list-style-type: none"> Implemented Goat Grazing Projects at Deer Park and Ross Reservoir.
Implementation Supplies	Weed Pullers	\$847	<ul style="list-style-type: none"> Purchased 6 Weed Pullers.

FISCAL IMPACT

For FY 2022/2023 Marin Water budgeted BFFIP implementation costs in the Capital Program AE107 and from Operation Budgets 2044 and 2045. Additionally, Marin Water received implementation grants from the California Coastal Conservancy and CalFIRE Forest Health Programs for forestry restoration work.

ATTACHMENT(S)

1. Annual FY 2022/2023 BFFIP Vegetation Management Report



Photo 1: Bon Tempe Lake & Mt Tam Summit.

Vegetation Management Report

Fiscal Year 2023



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TABLE OF CONTENTS

Table of Contents

Executive Summary	1
1 Coordination to Reduce Wildfire Risk	1-1
1.1 Red Flag Warnings.....	1-2
1.2 Coordination with PG&E	1-3
1.3 Coordination with Lessees	1-4
1.4 Wildfire Coordination.....	1-5
2 Planning, Monitoring and Environmental Compliance	2-6
2.1 Biodiversity, Fire and Fuels Integrated Plan.....	2-7
2.2 Non-Native Invasive Species Mapping.....	2-7
2.3 Rare Plant Complinance	2-8
2.4 Seeps & Springs Inventory	Error! Bookmark not defined.
2.5 Spotted Owl, Osprey, Wildlife and Migratory Bird Surveys	2-9
2.6 Resilient Forest Monitoring & Forest Restoration Planning	2-10
2.7 Foothill Yellow Legged Frog Monitoring	2-11
2.8 Prescribed Burning Report	2-12
2.9 Forest Pests & Pathogens.....	2-13
3 Vegetation Management	3-17
3.1 Cyclical Maintenance of Fuelbreaks.....	3-18
3.2 New Fuelbreak Construction-MA 21.....	3-23
3.3 Early Detection Rapid Response (EDRR)-MA 22	3-23
3.4 Initial Forest Fuel Reduction-MA 23.....	3-24
3.5 Improve Grassland and Oak Woodlands-MA 23.....	3-25
4 Compliance Verification and Monitoring in FY2023	3-31
4.1 Requirements Implemented by Management Action	4-33
4.2 Notable Compliance and Monitoring Considerations and Findings	4-36
5 BFFIP Review & Work Plan	4-33
5.1 Review of BFFIP Management Actions	5-1
5.2 Work Plan for FY2024.....	5-3
6 Appendices	6-5

TABLE OF CONTENTS

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Executive Summary

Each year, the Marin Municipal Water District (district) plans, monitors, and performs actions to reduce the risk of wildfire and improve the resiliency and biodiversity of its lands. Vegetation management activities are tracked and monitored so the district may adapt its actions and adjust to new information. This report is part of that adaptive management cycle. The Biodiversity, Fire, and Fuels Integrated Plan (BFFIP) is being implemented under an adaptive management framework. Per the BFFIP and Environmental Impact Report “The district will evaluate the effectiveness of annual management actions based on the findings from monitoring results. An annual board report will include the findings from monitoring and any recommendations made by District staff for modifications to methods and/or the schedule of preservations and restoration actions”.

The first section covers coordination and planning to reduce wildfire risk, such as watershed closures during Red Flag Warnings; working with PG&E, lessees, and neighbors on defensible space; and coordinating with County Fire. The second section details planning, inventorying, monitoring and compliance work to support vegetation management. The third section shows the results of on-the-ground actions taken for fuel reduction and biodiversity and habitat enhancement. The fourth section describes the district’s verification and monitoring of compliance with mitigation measure requirements. The fifth section lays out the work planning and recommendations for fiscal year (FY) 2024. Table 1 below provides a summary of the district activities that occurred in FY 2023. Map 1 (Page ES-5) provides a summary showing the locations of vegetation management activities.

EXECUTIVE SUMMARY

Table 1 Overview of Vegetation Management Activities

Completed Work	Outcome	Approximate Cost ^a	Description
Community Coordination for Fire Risk Reduction		\$14,380	
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Planning, Compliance and Monitoring		\$467,787	
Biodiversity, Fire, and Fuels Integrated Plan (BFFIP)		\$79,761	<ul style="list-style-type: none"> Implemented BFFIP Year 4 Targets. Completed Addendum to be implemented in Year 5 to increase the acres of watershed vegetation management work.

EXECUTIVE SUMMARY

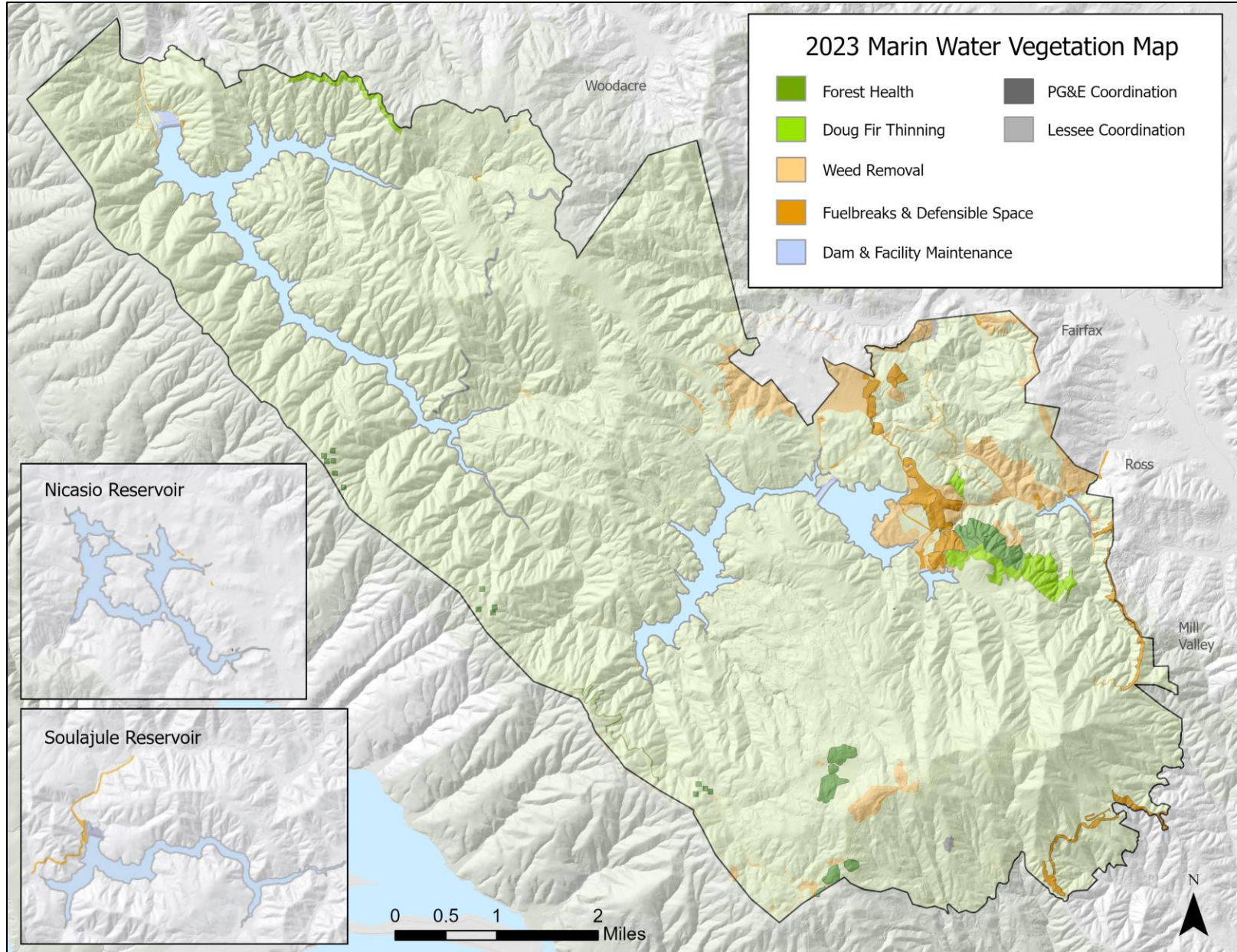
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EXECUTIVE SUMMARY

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Early Detection Rapid Response	N/A	One Tam Contribution	<ul style="list-style-type: none"> 66 miles of roads and trails surveyed. 186 patches of invasive weeds treated in FY23.
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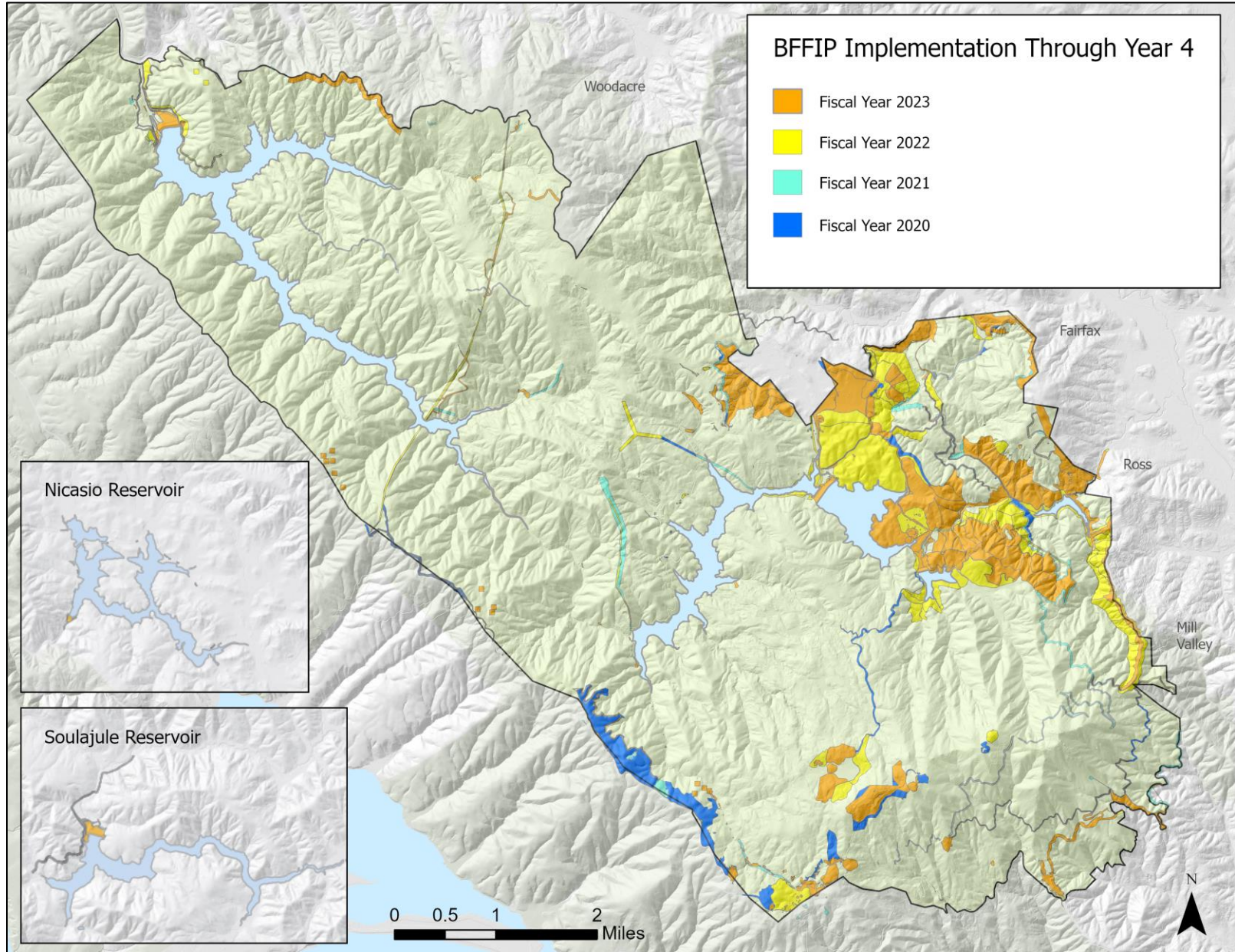
EXECUTIVE SUMMARY

Map 1: FY23 Vegetation



EXECUTIVE SUMMARY

Map 2: BFFIP Implementation Years 1 - 4



1 Coordination to Reduce Wildfire Risk

The district is responsible for managing its watershed lands, which includes minimizing the risk of wildfires. Over 25,000 structures housing approximately 45,000 residents are within two miles of district lands along a WUI that has a CalFire Fire Hazard rating of “High” to “Very High.” Wildfire also poses a threat to water quality and distribution, and to the ecosystem functions and values provided by watershed lands. Climate change, forest diseases, and the proliferation of weeds increase the potential for large wildfires.

This section details approaches to reduce the potential for fire ignitions and hazards through coordination with other agencies and landowners, as well as continuing best management practices to minimize ignition potential particularly during high-risk events. Adjacent to the watershed there are approximately 300 private properties, the remainder of the district’s lands are surrounded by State, Federal and other local agencies lands. Vegetation management actions are summarized in Section 3 Vegetation Management.

Work	Outcome	Approximate Cost	Description
Community Coordination for Fire Risk Reduction		\$14,380	<ul style="list-style-type: none"> Wildfire risk mitigation
Red Flag Warnings		N/A	<ul style="list-style-type: none"> Zero Red Flag Warning Closures in FY23. Continued community outreach for red flag and other critical fire weather events through signage and social media. Coordinating county wide signage with Fire Safe Marin and other Fire agencies.
Coordination with PG&E	2.5 Miles of Access Roads (12.5 Acres)	\$950	<ul style="list-style-type: none"> Coordinating to ensure cyclical vegetation maintenance around and under transmission & distribution lines. Maintained Vegetation along 2.5 miles of PG&E Access Roads, totaling 12.5 acres. PG&E repaired/replaced 47 pieces of hardware along the Distribution system through out the watershed. See section 1.2 for detail. Worked with PG&E to ensure that pre-project environmental surveys are completed before vegetation management work is conducted.
Coordination with Lessees and Neighbors on Defensible Space	10 acres	\$13,430	<ul style="list-style-type: none"> Coordinating under existing lease agreement to prioritize maintenance funding for vegetation maintenance around infrastructure. Conducted assessments of fuelbreak infrastructure and defensible space to inform annual maintenance activities.

County Fire Coordination	NA	NA	<ul style="list-style-type: none"> • Provided direction and support for development of Marin’s Community Wildfire Protection Plan in collaboration with Marin County Fire and FIREsafe Marin. • Collaborated on Watershed Prescribed Fire Report • Attended monthly FIREsafe Marin Meetings. • Submitted two cross jurisdictional grant applications to NOAA Climate Resiliency Program and California’s Office of Planning and Research ICARP for forestry restoration and vegetation management work.
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1.1 Red Flag Warnings

Small fire events have occurred on district lands between 2006 and 2023. To reduce the potential for ignition during severe weather events the district coordinates with County Fire, and California State Parks to close sections of the watershed to automotive traffic during red-flag warnings. It is, therefore, imperative that the district be prepared to respond to fire events that occur on district lands. As such the district maintains operational readiness for initial attack and wildfire support services. The district currently has 11 trained wildland fire fighters. Ranger and Watershed Maintenance staff conduct monthly trainings.

The target is to regularly (annually or more frequently, as needed) train staff in Red-Flag Day protocols, ignition prevention BMPs, wildland firefighting techniques, and firefighting equipment maintenance.

- Continued community outreach for red flag and other critical fire weather events through community signage and social media.
- Participated in County wide red-flag sign coordination.
- Installed and operating additional wildfire danger signs.

Outcome	Total Closures
Watershed Closures	0



Photo 2: Fire Danger Signs at Main Entrance.



Photo 3: Fire Danger Signs posted in picnic areas.

1.2 Coordination with PG&E

PG&E-owned transmission lines and transformers are located within district lands. PG&E is responsible for maintaining clearance around transmission lines to minimize the potential for wildfires. The district will facilitate PG&E access for the purpose of vegetation management associated with their distribution and transmission lines and transformers. The target is to coordinate annually (or more frequently, as needed) with PG&E to ensure cyclical and emergency vegetation management occurs as needed under power lines and transformers.

- Coordinated vegetation management treatments along 2.5 miles of PG&E access roads totaling 12.5 acres.
- PG&E performed 47 hardware maintenance activities on Distribution Lines throughout the Watershed: See Table.

Activity	Sum
Install	4
Anchor	1
Pole	3
Remove	1
Tree/Vine	1
Repair	5
Conductor	3
Recloser	2
Replace	33
Anchor	1
Conductor	2
Connector	2
Crossarm	5
Cutout	1
Cutouts	7
Jumper	1
Pole	10
Switch	1
Switch/J-Box	1
Transformer	2
Trim	4
Tree/Vine	4
Grand Total	47



Photo 4: PG&E Coordination under line on Eldridge Grade.

Outcome	Approximate Cost
Coordinated vegetation management along 2.5 miles of access roads totaling 12.5 acres.	\$950

1.3 Coordination with Lessees

The district has entered into leases or easements with other parties that own facilities that are located within district lands. It is the responsibility of these other parties to conduct vegetation management activities around those facilities. The district performs annual inspections of leased areas and works with lessees to ensure vegetation management work is completed. The target is to coordinate annually (or more frequently as needed) with other parties that have entered into a lease or easement with the district, to ensure cyclical maintenance of fuelbreaks and other vegetation management activities occur around these facilities on district lands.

- West Point Inn: Fine Fuel Reduction work.
- Marin Stables: Fuelbreak Maintenance & chipping around stable perimeter.

Outcome	Approximate Cost
10 acres	\$13,430



Photo 5: Fine Fuel Maintenance at West Point Inn

1.4 Wildfire Coordination

The district is located adjacent to lands that are managed by other agencies, including private, county, state, and federal agencies. The district partners with these agencies and local fire departments to encourage the adequate management of fuels along common borders. District personnel attend monthly FIRESafe Marin meetings and participate in countywide Community Wildfire Protection Plan annual work plans and plan updates. Through the year district staff are coordinating with local fire departments to improve community education regarding defensible space, ongoing vegetation maintenance, and ongoing emergency response. Additionally, the districts Ranger staff and Watershed Maintenance staff carry out regular trainings relating to wildfire preparedness. The District is continuing to coordinate fuels management work with Marin Wildfire Prevention Authority (MWPA) agency through ongoing involvement in the Technical Advisory committee. This coordination is helping facilitate cross jurisdictional planning and management. In an effort to scale vegetation management effort the district is also working with the One Tam collaborative and County Fire to leverage the County Wide Vegetation Map to create an updated fuels profile for vegetated lands across Marin County, which will help to inform and prioritize fuel reduction efforts. In FY 2023 agency partners collaborated on the One Tam Forest Health Strategy to develop multi-benefit forest restoration priorities.

Ongoing wildfire coordination efforts:

- Marin Wildfire Prevention Authority (MWPA)
- Prescribed fire planning with MCF and NPS
- MMWD/MCF Mutual Aid Agreement
- Fire Safe Marin Board
- Defensible space with SMF & RVF
- Ongoing wildland fire trainings with MCF
- One Tam Forest Health Strategy
- Working with OneTam partners to coordinate Resource Advisor readiness and standards for post-wildfire rehabilitation



Photo 6: California Conservation Corps Member tending pile burns.

2 Planning, Monitoring and Environmental Compliance

Another charge of the district is to protect important biological resources and ecosystem functions on the district's lands. Enhancing ecosystem resiliency is a key strategy for the district to pursue. Resiliency is defined as an ecosystem's ability to absorb shocks or perturbations and still retain desirable ecological functions, such as the ability to provide breeding and foraging habitat for wildlife; the ability to support significant biological resources such as rare, threatened, or endangered species; the ability to regenerate desired plant communities following a disturbance such as wildfire; the ability to cycle nutrients; and the ability to protect water quality. As part of the district's vegetation management actions environmental compliance surveys are completed to ensure the district's work doesn't negatively impact sensitive resources.

The work in this section focuses on planning for vegetation management actions, inventorying and monitoring key natural resources, and performing actions related to environmental compliance.

Completed Work	Outcome	Approximate Cost	Description
Planning and Monitoring		\$467,787	
BFFIP Implementation		\$79,761	<ul style="list-style-type: none"> Implemented BFFIP Year 4 Targets. Approved Addendum
Non-Native Invasive Plant Species Mapping	Updated Records	N/A	<ul style="list-style-type: none"> 1,349 Invasive Plant observations this FY.
Rare Plant Compliance	411 Acres Surveyed	\$88,246	<ul style="list-style-type: none"> MMWD Contractors and staff conducted 411 acres of rare plant surveys in potential project areas.
Northern Spotted Owl Surveys	Compliance	\$75,821	<ul style="list-style-type: none"> Completed environmental compliance survey work for northern spotted owl to support watershed vegetation and construction related projects.
Bat Surveys	Roosting Bat Habitat Surveys	\$4,578	Completed environmental compliance survey work for roosting bat habitat prior to Doug Fir Thinning.
Bird Surveys	Nesting Birds	\$83,208	<ul style="list-style-type: none"> Completed environmental compliance survey work for nesting birds to support vegetation management work.
Tri-Annual Land Bird Survey	Nesting Birds	\$35,189	<ul style="list-style-type: none"> Completed triennial bird surveys to support trend monitoring in light of vegetation management work.
Osprey Monitoring	Annual Monitoring	\$8,670	<ul style="list-style-type: none"> Annual Osprey monitoring at Kent Lake.

Forest Restoration Monitoring and Mapping	Maintenance of Existing Areas	NA	<ul style="list-style-type: none"> Routine Maintenance of 14 acres of Forest Habitat in the Resilient Forest Project Area. See Vegetation Management Section for Costs.
Foothill Yellow Legged Frog	Annual Monitoring	\$39,480	<ul style="list-style-type: none"> Annual monitoring of foothill yellow legged frog at select watershed locations.
Perscribed Burn Report	Perscribed Burn Plan	\$13,753	<ul style="list-style-type: none"> Received reports for 6 burn plans across the watershed.
Watershed Fuel Modeling	Final Report	\$39,080	<ul style="list-style-type: none"> Received completed report detailing effectiveness of Fuel Treatments.
Cultural Resource Study	Prep for Rx Burn	N/A	<ul style="list-style-type: none"> Continued to coordinate with FIGR and SSU in preparation for Rx burns at Rock Springs & Cataract Trail areas.
Compliance Supplies	Rx Burn Signs	\$1,308	<ul style="list-style-type: none"> District purchased 22 Rx Burn Signs.

2.1 Biodiversity, Fire and Fuels Integrated Plan

In an effort to expand vegetation management work to reduce fuel loads and wildfire hazards on watershed lands the district has developed the Biodiversity, Fire and Fuels Integrated Plan (BFFIP). The BFFIP supersedes the 1995 Vegetation Management Plan (VMP), which the District operates under from 1995-2019. The BFFIP was approved by the District’s Board of Directors and as such, is considered a discretionary action and subject to the California Environmental Quality Act (CEQA). As part of the CEQA process the district held a public meeting to inform the community and circulated the Draft Environmental Impact Report for public review from March 21, 2019 through June 19, 2019. The Plan and EIR were adopted on October 16, 2019.

- BFFIP adopted in October of 2019
- Addendum adopted in 2023.

Outcome	Approximate Cost
Addendum detailing work in Year 5 and beyond approved.	\$79,761

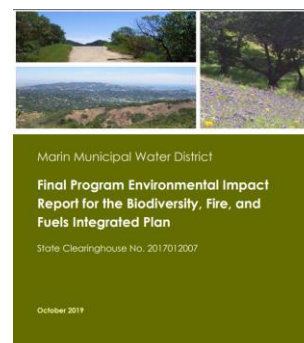


Figure 1: BFFIP EIR adopted in October of 2019.

2.2 Non-Native Invasive Species Mapping

To support the vegetation management actions that will be conducted by the district, the district needs to properly understand the location of invasive species and the extent that invasive species have spread on district lands. The district will continue to regularly update invasive species map. The target is to

annually update the maps of invasive species. This information helps to inform vegetation management priorities and annual work plans.

The District completed a French Broom mapping update in FY 2018/2019 and is continuing with watershed wide Early Detection Rapid Response surveying as well as management of priority weeds.

Outcome	Approximate Cost
1,349 Records Updated	One Tam Contribution & MMWD Staff

2.3 Early Detection & Rapid Response (EDRR)

In FY23 Marin Water coordinated with an experienced EDRR team at Golden Gate National Parks Conservancy to conduct surveys on 66 miles the Marin Watershed’s roads and trails. Results as follows:

- 135 New Detections of Invasive Weeds in FY23.
 - 8 of the new records are listed as Priority 1, including Medusa Head, Barbed Goatgrass, Purple Starthistle, etc.
- 15.8 Acres of Serpentine Barrens monitored for rare plants.
- 1 Acre of Marin Dwarf Flax monitoring
- 55 Acres of supplemental searching for Thoroughwort (*Ageratina adenophora*)

Vegetation management and construction projects have the potential to introduce, spread, or create conditions for the spread of invasive plant species. Experience has shown that proactive efforts to catch these plant infestations early are key to protecting the integrity of the habitat. The District plans to follow up with EDRR work in FY24 following the repair work on the Worn Springs and Bolinas Ridge slides, as well as the excavation at the Concrete Pipe Tank Replacement project.

2.4 Rare Plant Complince

To support the district’s goal to preserve existing significant biological resources, including rare plants and sensitive natural communities, the district collects field data and updates watershed data on an ongoing basis. The objective is to ensure that all management actions taken on the Watershed have no significant negative impact on rare plants or sensitive natural communities. This information also helps the district track long-term trends and changes on the watershed and guides restoration planning efforts.

In FY19 the District completed a Rare Plant Inventory which is identified as a Monitoring Management Action in the BFFIP for year one. Since that time the district focused on rare plant complince surveys to facilitate vegetation management and other watershed projects over the next 5 years.

In FY23 411 acres were surveyed for Rare plant compliance across the following locations:

- Sky Oaks Broom
- Yolanda Trail to Shaver (YOSH)
- Fish Grade to Shaver (FISH)
- Middle Cataract
- Shadey Side Trail to Rocky Ridge
- San Geronimo Ridge Expansion

Outcome	Approximate Cost
411 Acres	\$88,246



Photo 7: Yellow Mariposa
(*Calochortus luteus*) at Azalea Hill.
Sherry Adams

2.5 Spotted Owl, Osprey, Wildlife and Migratory Bird Surveys

To facilitate vegetation management activities on the watershed the district carries out a number of pre-project biological surveys to minimize potential impacts. The survey results determine the mitigation or avoidance measures the district applies while carrying out vegetation management work. It's also a good way for the district to collect valuable biological data to monitor the long-term trends associated with biological resources on watershed lands. Surveys and monitoring work ensures that the district is complying with the regulations lined out in the Endangered Species Act and the Migratory Bird Treaty Act.

- Comprehensive district-wide northern spotted owl nesting surveys conducted.
- Nesting bird project surveys conducted in advance of all new vegetation work.
- Completed annual monitoring of Osprey at Kent Lake.
- Roosting bat compliance surveys conducted.

Outcome	Approximate Cost
Compliance surveys (combined)	\$207,467



Photo 8: Compliance Photo showing location of Downey Woodpecker Nest.

-Mark McCaustland, Kleinfelder, 2023.

2.6 Resilient Forest Monitoring & Forest Restoration Planning

The District is collaborating with with the U.S. Forest Service, Cal Poly, and UC Davis to monitor greenhouse gas balance and water yield in Forest Restoration sites through pre-treatment and post-treatment data collection within a pilot treatment area. Monitoring was paused in FY21 due to COVID, but maintenance of the sites continues. The District is also working with One Tam Partners to develop a regional Forest Health Strategy through leveraging data from the recently complete County Wide Vegetation Map to identify opportunities for future forest restoration efforts. One Tam recently published the Forest Health Strategy here: <https://www.onetam.org/forest-health#Forests-Are-Vital>.

- Mapping of forestry restoration projects to support Cal Fire Forest Health Grant and future work areas.
- Working with One Tam on Forest Health Strategy to guide multi-benefit forestry restoration work.

Outcome	Approximate Cost
Colaborated with One Tam to publish <u>Marin Regional Forest Health Strategy</u>	NA

2.7 Foothill Yellow Legged Frog Monitoring

Since 2004, MMWD has conducted annual population monitoring of foothill yellow legged frogs (FYLF) on the Mt. Tamalpais Watershed. The FYLF is designated as a Federal and Species of Concern. The California Department of Fish and Wildlife also designates the FYLF as a California Species of Special Concern. Monitoring sites for FYLF are conducted at two known breeding sites within the Mt. Tamalpais Watershed, Little Carson Creek and Big Carson Creek, both of which flow into Kent Lake. The annual monitoring of FYLF populations informs district vegetation work within their known habitats.

Additionally in FY23 the Discript thinned the vegetation around the intersection of Carson Creek and Pine Mt Rd to allow additional daylight into the creek bed and improve FYLF habitat.

Outcome	Approximate Cost
Annual Monitoring & Veg Maintenance	\$39,480



Photo 9: Foothill Yellow-legged Frog

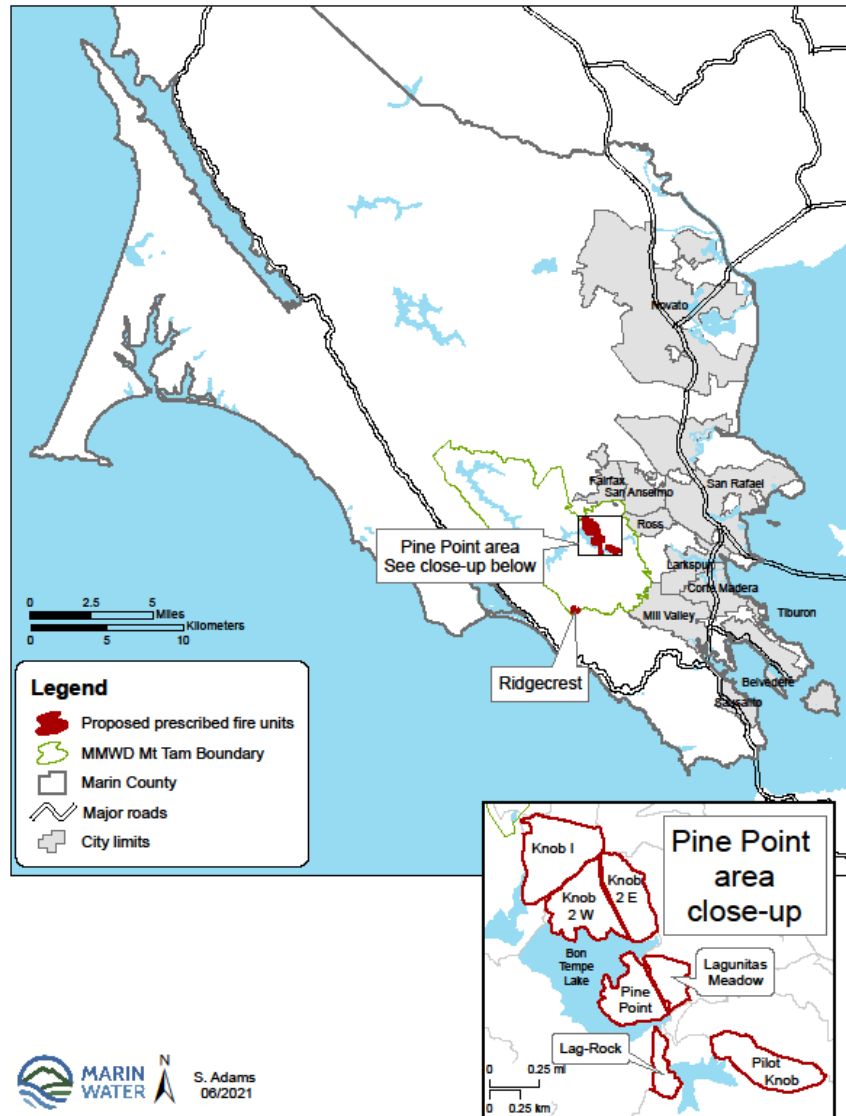


Photos 10 & 11: Foothill Yellow-legged Frog site vegetation maintenance. Before / After

2.8 Prescribed Burning Report

The district is continuing to prepare to conduct prescribed fires and is focused on developing a process for implementation with County Fire. The District worked with a consulting Burn Boss to plan activities and prepare burn plans for 6 proposed units.

Map 3: locations reviewed as possible prescribed fire locations. A subset was selected as most suitable.



Prescribed burning:

- No prescribed burns were conducted this year.
- Ongoing coordination with Marin County Fire and BAAQMD continued.
- Prescribed Burn Plans were drafted for six forested units.

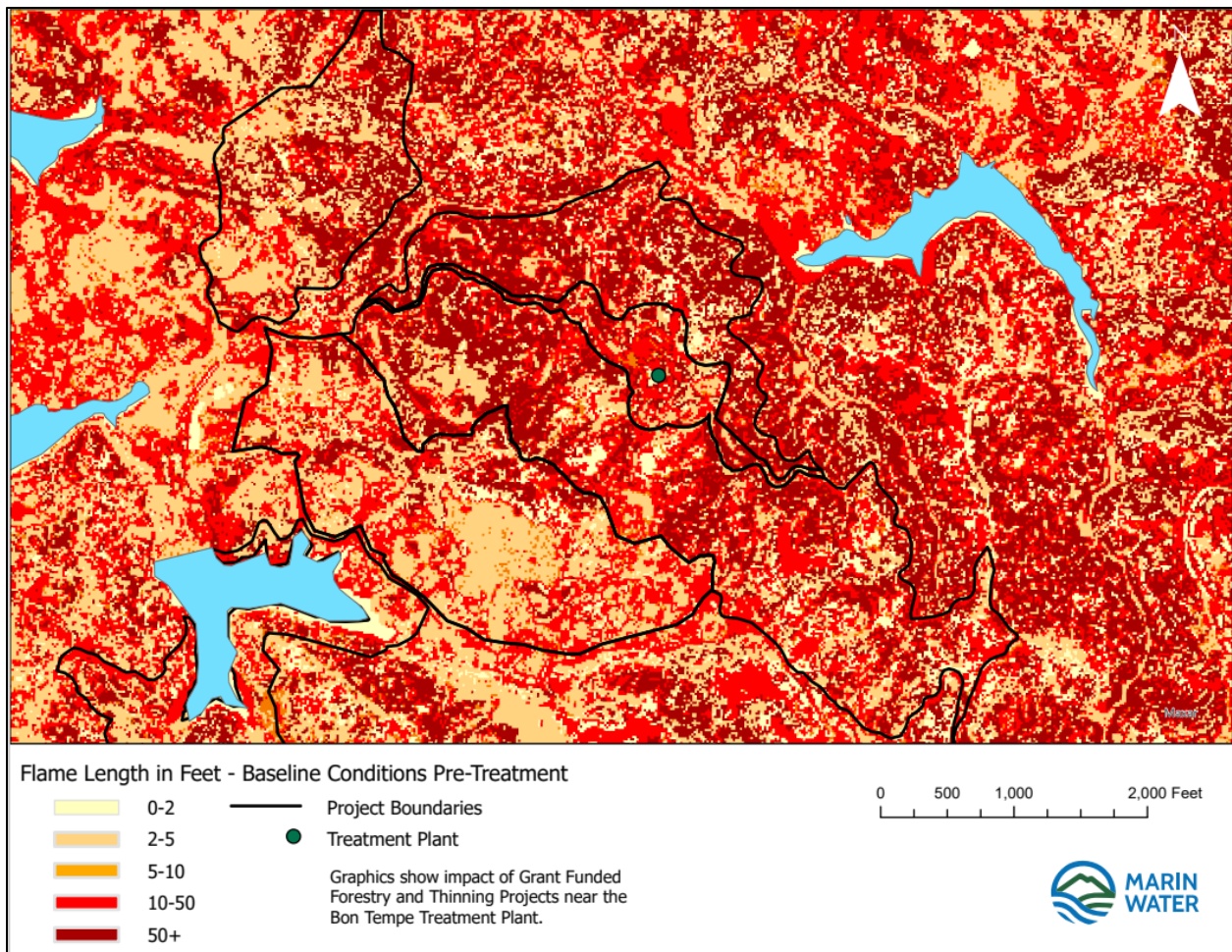
Outcome	Approximate Cost
Six Burn Plans	N/A

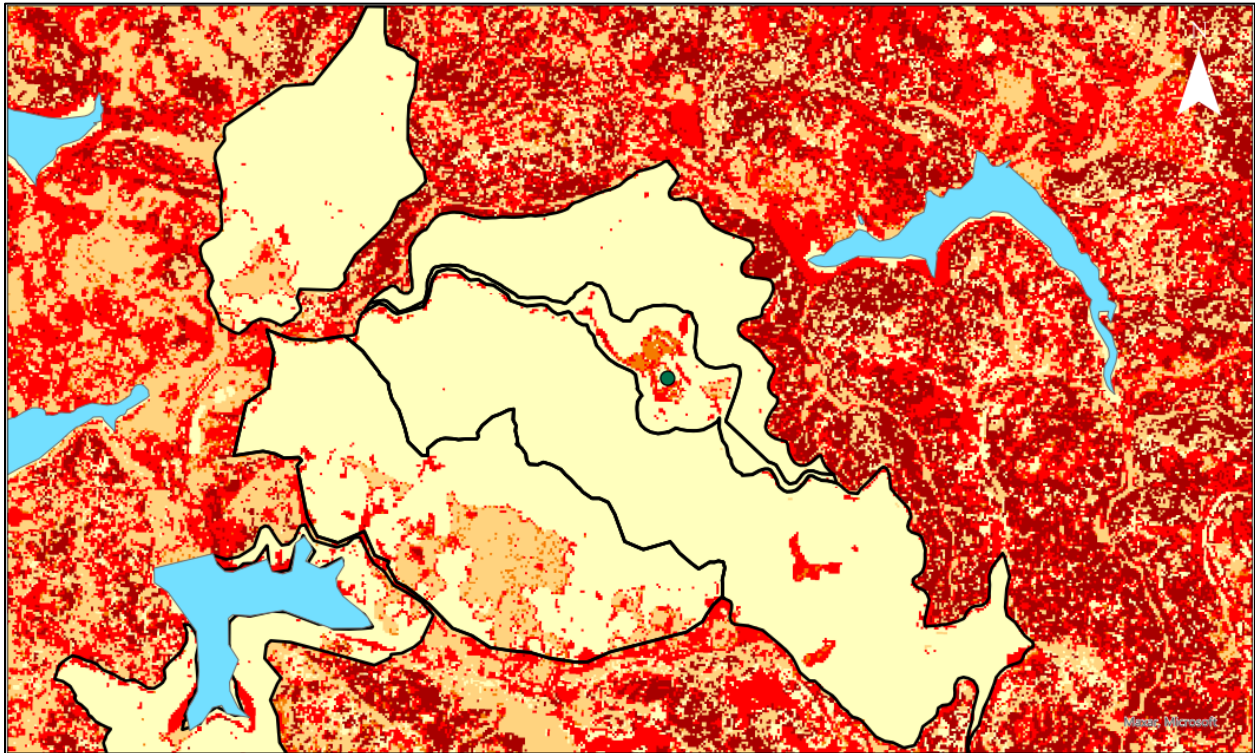
2.9 Watershed Fuel Modeling

Marin Water contracted with Tukemean Geospatial to perform watershed-wide fuel modeling to evaluate the efficacy of existing and proposed fuel treatments. This wildland fire behavior modeling informs effective methods and locations for watershed fuel treatments needed to protect critical infrastructure and communities, as well as reduce severity and improve suppression response efforts.

Outcome	Approximate Cost
Finalized Report	\$39,080

Maps 3 & 4 (Below): Examples of Flame Length models before and after fuels treatments around Bon Tempe Treatment Plant. Models below reflect conditions if entire mapped area were burning in a wildfire.



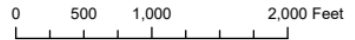


Flame Length in Feet - Future Conditions 6/30/24

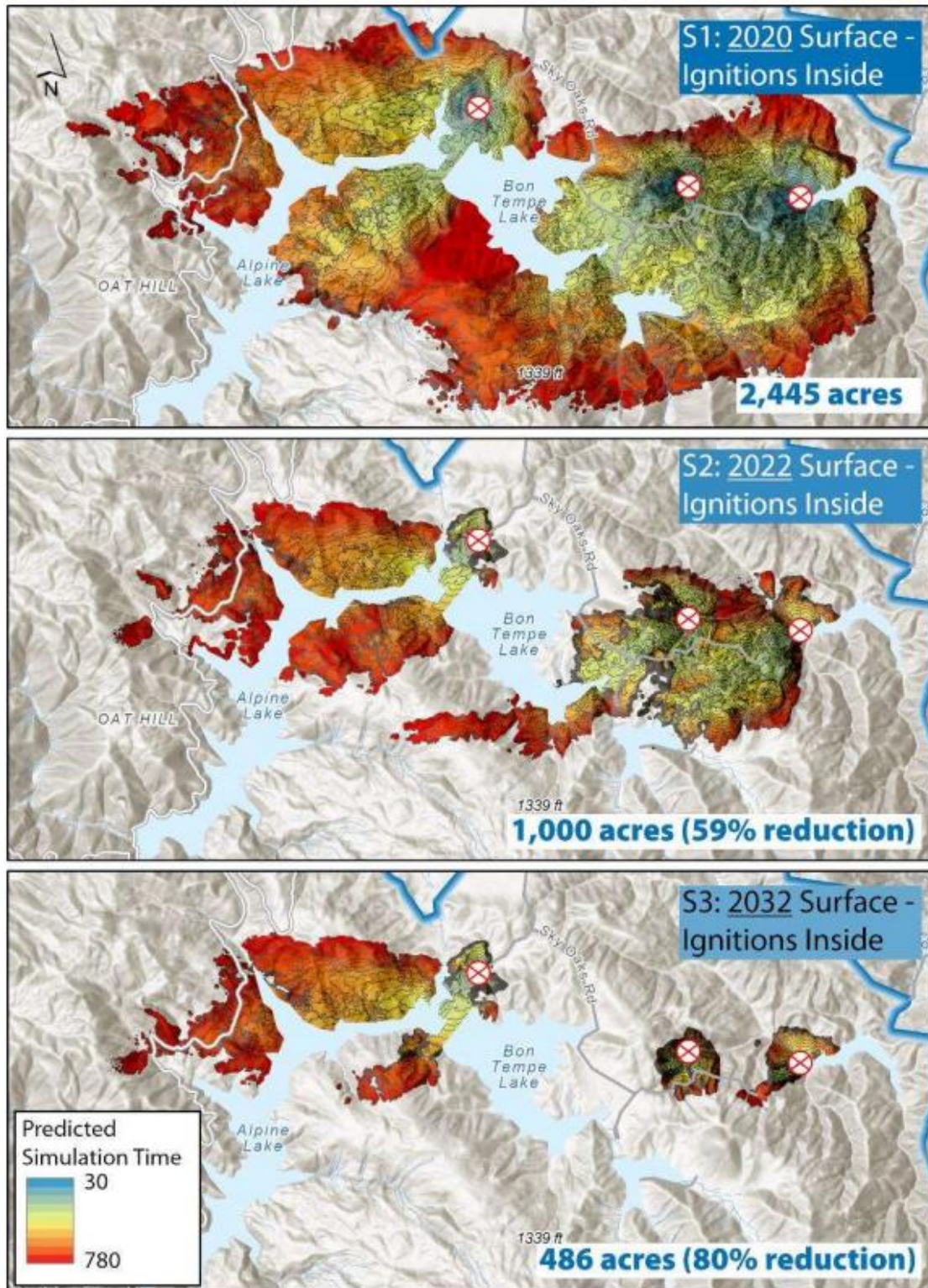
- 0-2
- 2-5
- 5-10
- 10-50
- 50+

- Project Boundaries
- Treatment Plant

Graphics show impact of Grant Funded Forestry and Thinning Projects near the Bon Tempe Treatment Plant.



Maps 5, 6, & 7 (Below): Examples of wildfire spread / coverage in the event of ignition based on pre-treatment (2020), BFFIP Year 3 (2022), and expected future conditions as of 2032.



2.10 Cultural Resource Study

Marin Water contracted with Sonoma State University, in consultation with the Federated Indians of Granton Rancheria, to conduct a cultural resources study for proposed prescribed burns in the vicinity of Rock Spring. As part of the One Tam Forest Health Strategy agency partners integrated FIGR’s input into the final document to help guide work on public lands. No additional BFFIP cultural resource studies were required for project work during FY23.

Outcome	Approximate Cost
Continued Coordination on Ridgecrest Rx Burn Units	N/A

2.11 Forest Pests & Pathogens

To limit the spread of forest pathogens as described in MA-14, Marin Water continues to implement Best Management Practices, as previously drafted by Phytosphere Research. No additional forest pest and pathogen studies were conducted during FY23. However, BMP’s were integrated into ongoing BFFIP project work.

Outcome	Approximate Cost
Implemented Forest Pest & Pathogen BMPs	N/A

2.12 Compliance Supplies

The District purchased 22 bilingual prescribed fire signs to inform visitors and improve safety on the day of the burn.

Outcome	Approximate Cost
Signage	\$1,308



Photo 12: Rx Burn Sign

3 Vegetation Management

The district has been proactively managing vegetation to reduce wildfire hazards and preserve and enhance significant biological resources by implementing measures that were recommended in the 1995 VMP, as well as actions suggested by research and monitoring over the past decades. This section details actions undertaken to reduce wildfire risk, improve forest health, increase ecosystem resiliency and the status and function of other key natural systems and species. These actions primarily involve fuelbreak maintenance and construction, resilient forest projects, invasive plant management and restoration of native plant communities through reducing woody species encroachment.

Completed Work	Outcome	Approximate Cost	Description
Vegetation Management	1,528 acres	\$3,284,708	
Cyclical Maintenance of Fuelbreaks	578 acres	\$782,070	<ul style="list-style-type: none"> All fuelbreaks maintained at appropriate intervals. Cut woody vegetation in established fuelbreaks. Mowed fine fuels around structures, along roadsides and parking areas. Pulled broom from fuelbreaks. Mowed non-fuelbreak roadsides. Managed vegetation on dams and spillways.
New Fuelbreak Construction	10 acres	\$76,198	<ul style="list-style-type: none"> Contractors and staff expanded defensible near Sky Oaks Headquarters.
Early Detection Rapid Response	66 Miles & 186 Patches Treated.	One Tam Contribution	<ul style="list-style-type: none"> 66 miles of roads and trails surveyed. 135 new weed populations identified. 186 populations of new and recurring weeds treated.
Forest Fuel Management	62 acres	\$765,170	<ul style="list-style-type: none"> Completed 62 acres of initial forest fuel reduction treatments around the Bon Tempe Treatment Plant.
	68 acres	\$64,787	<ul style="list-style-type: none"> Retreated 68 acres of fuels at Potrero Meadow, Rock Springs, and the Resilient Forest Research Sites.
Priority Habitat Restoration and Fuel Reduction	797 acres	\$1,554,177	<ul style="list-style-type: none"> Improved grassland and oak woodland in the ecosystem restoration zones through Douglas fir thinning, broom removal, and management of other priority non-natives.
Experiment with New Invasive Species Control Methods	Goat Grazing	\$27,080	<ul style="list-style-type: none"> Implemented Goat Grazing Projects at Deer Park Fire Rd, and Shaver Grade Fuelbreak.
Implementation Supplies	Broom Pullers	\$845	<ul style="list-style-type: none"> Purchased 6 Broom Pullers.

3.1 Cyclical Maintenance of Fuelbreaks

Fuelbreak Maintenance & Cutting of Woody Vegetation

A fuelbreak is a built asset requiring periodic maintenance to operate as intended. Fuelbreaks are strategically located blocks or strips of land where vegetation has been altered so that it has a low fuel volume and/or reduced flammability. Maintenance work is intended to maintain reduced fuel loads and stand structure that will slow fire spread and reduce flame lengths. Fuel reduction areas are maintained by re-cutting vegetation as warranted.

The target is for each fuelbreak to be re-treated on a cyclical basis, as needed to maintain desired fuel characteristics; each fuelbreak will be re-treated at least once every five years. Fuelbreaks remain effective only if they are continually maintained.

Fuelbreaks maintained in FY22 include:

- Sky Oaks Headquarters
- Gravity Car /Double Bow Knot
- Throckmorton Fire Station
- Pumpkin Ridge
- Indian Crown
- Keys Creek
- Upper Fern Canyon
- Fawn Ridge
- Marin Stables
- Lagunitas Residence



Photo 13: Fuelbreak Maintenance at Throckmorton Fuelbreak.

Outcome	Approximate Cost
189 Acres	\$500,012



Photo 14: Fuelbreak Maintenance at Indian Crown Fuelbreak.

In FY23 acres and costs for pile burning were included in Fuelbreak Maintenance. Pile Burn Statistics as follows:

- 38 Burn Days between November 2022 and May 2023.
- 1,400 Piles Burned.
- \$154,867 spend on Contractor and MMWD staff specifically for Pile Burning.
- Approximately \$110 to burn each pile.



Photo 15: Pile Burn at Pilot Knob

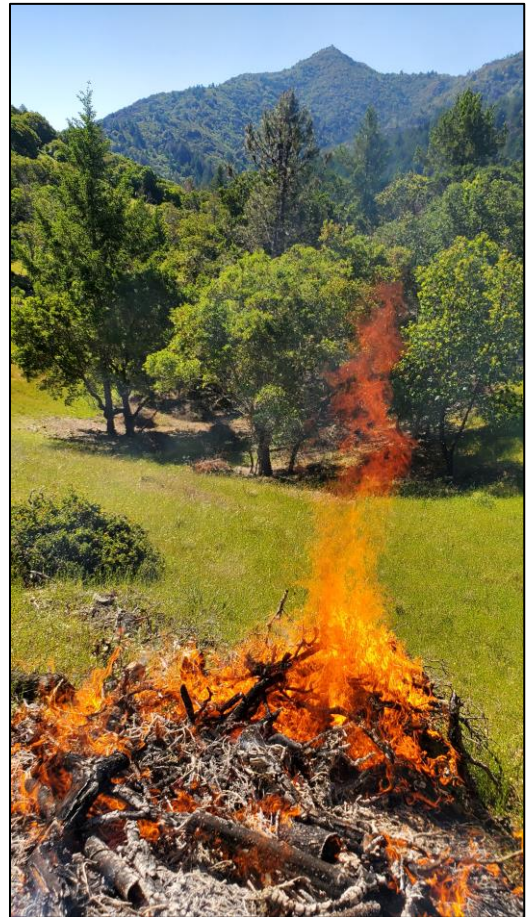


Photo 16: Pile Burn at Pilot Knob

Fine Fuel Reduction

Managing vegetation in the most risk-prone area, including parking lots, picnic areas, and defensible space around structure is a top priority. These areas, which are most risk-prone, are maintained by re-cutting vegetation, as warranted to keep grasses at 4 inches or less in height. The work is performed primarily with power tools such as string cutters, the district also uses heavy equipment with mowers. The vegetation is shredded and scattered on site as part of the cutting process with no additional treatment required. Soils are not disturbed.

All annual grass (fine fuel) defensible space maintained around Watershed facilities.

- Completed fine fuel reduction around all watershed facilities.

Outcome	Approximate Cost
45 acres	\$37,260



Photo 17: Nicasio Reservoir Before



Photo 18: Nicasio Reservoir After

Broom Removal in Fuelbreaks

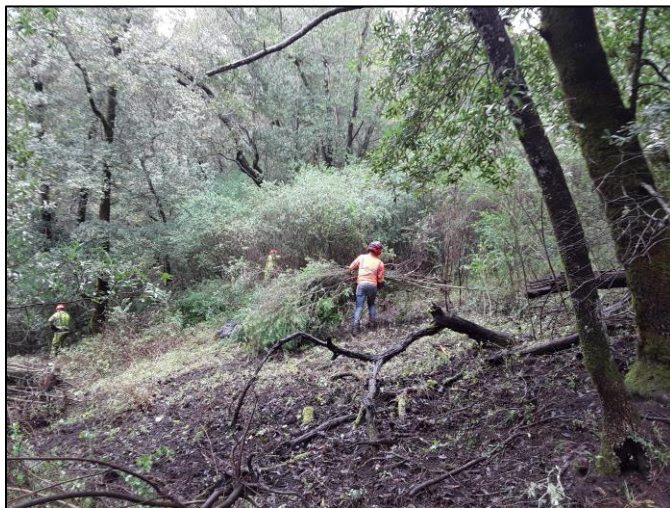
On-going management and elimination of broom within fuelbreaks significantly reduces the amount of cyclical maintenance needed, which frees up resources to implement other vegetation management actions. The elimination of broom, however, is difficult to achieve in fuelbreaks that are characterized by the presence of large and persistent broom populations and thus are classified as Compromised Fuelbreaks. Implementation of this management action is restricted to fuelbreaks that are not bounded by extensive broom stands. The fuelbreaks that meet this criterion are Optimized Fuelbreaks and Transitional Fuelbreaks. Annual broom management within fuelbreaks is informed by ongoing invasive plant mapping and surveys.

The ultimate intent is to eliminate broom in the Optimized Fuelbreaks and Transitional Fuelbreaks. To do this, broom plants must be removed annually before any are mature enough to produce seed pods and replenish the seedbank (i.e., reproductive broom).

Broom was manually removed and/or cut within existing fuel breaks:

- Meerna
- Pine Point
- Porteous
- Ross Reservoir
- Dibblee
- Worn Springs
- Bill Williams
- Shaver Entrance
- Bon Tempe Treatment Plant

Outcome	Approximate Cost
253 acres	\$140,460



Photos 19 - 22: Broom Pulling near Shaver Grade

Roadside Mowing (Non-Fuelbreak)

Vegetation management around roadsides is necessary to ensure the integrity of the infrastructure. The district continues to conduct roadside mowing on an as-needed basis to maintain unobstructed access for district vehicles and a clear line of sight for both district staff and recreationists. The work is performed with a combination of heavy equipment with cutting or masticating heads mounted on articulating arms and with power tools including chainsaws and brushcutters.

Roadside mowing sites:

- Indian Fire Rd
- Pine Mt Tunnel Rd.
- Phoenix Lake Entrance (collaboration with Town of Ross)
- Sky Oaks Rd / Bon Tempe Dam Rd / Bull Frog Rd
- Soulajule & Peters Dam Roads
- 5 Corners Intersection

Outcome	Approximate Cost
47 acres	\$54,598



Photo 23: Indian Fire Rd (before).



Photo 24: Indian Fire Rd (after).

Dam Maintenance

Per CA Department of Water Resources – Division of Safety of Dams (DSOD), all woody vegetation was removed from district earthen dams. Cutting and disposing of any woody shrubs or trees on earthen dams protects the structural integrity, facilitates annual DSOD inspections and compliance with State regulations.

Dam maintenance sites:

- Phoenix Dam
- Lagunitas Dam
- Bon Tempe Dam
- Peters Dam
- Nicasio Dam
- Soulajule Dam
- Alpine Dam

Outcome	Approximate Cost
43 acres	\$49,740

Alpine Dam was added to the cycle of Dam Maintenance sites in FY23. While constructed of concrete, contractors reduced encroaching vegetation and mosses at the groins to improve visibility and monitoring of dam deflection.

3.2 New Fuelbreak Construction-MA 21

To facilitate firefighter access in the event of an ignition, the district has removed dead material, thinned canopies, and cleared brush along areas designated as fuelbreaks. Fuelbreaks infrastructure has been strategically designed based on detailed analyses of existing vegetation, fuel loads, slopes, slope aspect, and local climate data. The vast majority of proposed future construction is the widening or expansion of existing fuelbreaks to maximize their utility. Fuelbreak widening will be performed as crews are in the area performing cyclical maintenance in the existing system.

For FY23 new Fuelbreak construction took place in the Taylor Trail Fuelbreak, just north of the Sky Oaks Office.

Outcome	Approximate Cost
10 acres	\$76,198



Photo 25: Fuelbreak Construction at Taylor Trail Before



Photo 26: Fuelbreak Construction at Taylor Trial After

3.2 Early Detection Rapid Response (EDRR)-MA 22

Eliminating new colonies of weeds is the most effective action aside from prevention that the district can take to preserve biodiversity (as well as reduce fuelbreak maintenance). EDRR includes regular surveys of parts of the watershed where weed invasion is most likely, and periodic surveys in remote areas where new weed invasions are likely to be less frequent. EDRR staff pull, cut, or dig out newly discovered invasions that area less than 100 square meters (0.02) in size; larger populations are flagged for later treatment by the district using watershed aides or contractors.

This fiscal year 66 miles of Roads & Trails were surveyed and 186 patches were managed by the EDRR team which is led by our One Tam Partners. 135 new invasive weed populations were identified.

Outcome	Approximate Cost
186 Populations & 66 Miles	One Tam Contribution

3.3 Initial Forest Fuel Reduction-MA 23

Reduce Accumulated Fuels and Brush Density

The district will reduce accumulated fuels and brush density in conifer and mixed hardwood forest to reduce wildfire risk and improve overall forest function. Thinning brush is an established means of promoting the growth of retained native trees by reducing the competition for light, nutrients, and water. The district is carrying out this work because over 10,000 acres of forests on district lands have been impacted by Sudden Oak Death (SOD) this has increased the fuel loads within the forest. Tanoak-dominated forest types have been the most heavily impacted: as the disease progresses, tanoaks drop out of the canopy resulting in fuel load build up, large openings in the canopy and an overall simplification in forest diversity and structures.

Forestry Fuel Reduction Sites in FY23 were situated in the Above Filter Plant Project Area.

Outcome	Approximate Cost
62 Acres	\$765,170

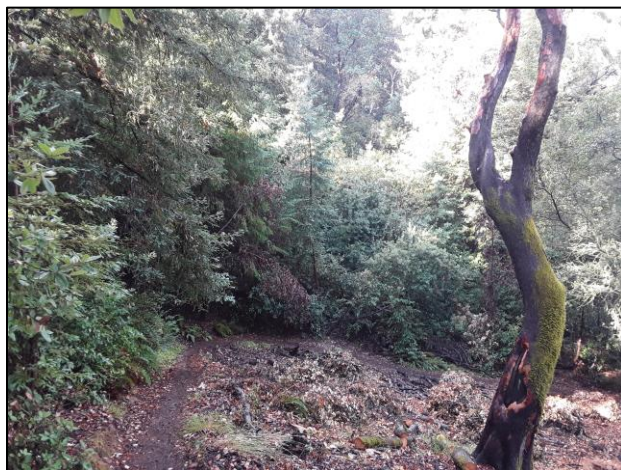


Photo 27: Pilot Knob Forestry Project Before



Photo 28: Pilot Knob Forestry Project After

Forest Fuel Maintenance

Ongoing maintenance of areas where fuels and brush density were reduced and where trees were planted is necessary to improve overall forest stand structure. Maintenance of existing Resilient Forest sites promotes long-term ecosystem resilience and function.

Forest Fuel Maintenance:

- Potrero Meadow
- Resilient Forest Sites
- Rock Springs

Outcome	Approximate Cost
68 Acres	\$64,787



Photo 29: Potrero Meadow Project Maintenance.

3.4 Improve Grassland and Oak Woodlands-MA 23

Reduce Encroachment in Oak Woodlands & Grasslands

In the absence of wildland fires, native Douglas fir trees invade oak woodland and grassland habitat on Mt. Tamalpais. On the watershed, both woodland and grassland habitats have significantly declined in area due to the encroachment of Douglas fir trees. Using a combination of hand crews and heavy equipment to remove young fir trees growing within grasslands and mixed hardwoods slows the rate that these plant communities are lost and retains the unique habitat and biodiversity that each provides.

Oak woodland and grassland preservation:

- W. Ridgecrest
- Above Filter Plant
- New Pumpkin Ridge
- Pilot Knob
- San Geronimo Ridge

Outcome	Approximate Cost
150 Acres	\$908,368



Photos 30 - 33: Pilot Knob Doug Fir Thinning Projects Area Before / After

Prescribed Burn in Grasslands & Oak Woodlands

The district is evaluating options for broadcast burning in mixed conifer, grasslands and oak woodland communities. Prescribed burning will help improve grassland and oak woodland by minimizing the spread of Douglas-fir, coyote brush, and other woody species. Additionally, prescribed fire can reduce the fuel loading at these sites, so that future wildfires will burn at a lower intensity and result in lower tree mortality. To facilitate future prescribed burning projects the district is contracting with County Fire to assist with the development of prescribed burn plans. Additionally, County Fire is assisting with pre-project vegetation management and would participate in future prescribed burning operations.

Prescribed burning:

- No prescribed burns conducted.
- Ridgecrest Rx Burn Site Prepped
- Burn plans for forested six units on file (See Planning Section).

Outcome	Approximate Cost
Six Burn Plans	N/A

Broom Removal in Oak Woodlands & Grasslands

The district takes a site-based approach when eliminating broom. Broom removal projects may be done simultaneously with fuelbreak maintenance in a specific area or as part of a restoration project. Broom removal requires the complete uprooting of the plant. Because soil disturbance stimulates germination of broom seeds lying dormant in the soil, initial clearing usually leads to a flush of new broom plants and the need to perform repeat clearing annual at a level of effort commensurate with the initial clearing. The period of high frequency, high intensity pulling typically lasts between 5 and 7 years. Eventually, the level of effort needed to prevent seed production decreases exponentially, and there is a corresponding decrease in soil disturbance. Broom sites are considered in a long-term maintenance phase when there is a zero seed set for seven consecutive years and when the effort needed to maintain zero seed set is reduced by 90 percent from the point of initial clearing. Site-based broom management is informed by the districts mapping and monitoring of areas with broom.

French broom manually removed from Oak woodland and grasslands:

- Yolanda to Shaver (YOSH Project)
- New Pumpkin Ridge
- Azalea Hill to Meadow Club (AMC Project)

Outcome	Approximate Cost
260 acres	\$442,258



Photo 34: Ross Reservoir Before



Photo 35: Ross Reservoir After

Broom Maintenance in Oak Woodlands & Grasslands

The District tracks maintenance of broom in Oak Woodlands & Grasslands separately from initial removal. Areas maintained by cutting are treated on an annual basis, while areas maintained by pulling

are treated every two years. Additionally the District has found that Broom populations require an elevated level of maintenance for roughly six years after an initial pulling treatment before stabilization at a minimal level of maintenance. Areas such as the original Indian Crown Fuelbreak and Sky Oaks Meadow are examples that require minimal broom maintenance. The District acknowledges that the initial pulling work in FY22 will initially require a significant effort to maintain every two years.

Outcome	Approximate Cost
198 acres	\$111,342



Photo 36: Broom Maintenance at Fish Grade Site.

Goatgrass Reduction

This species is targeted because of its ability to invade serpentine habitat – one of the least-invaded and rare plant-rich habitats on the Watershed. At present, barbed goatgrass is restricted to three known locations, and though one is large, it remains discrete enough to fully manage. Extirpating these populations benefits watershed biodiversity and reduces future management costs. The goatgrass infestation on district lands is centered on the intersection of Bolinas-Fairfax Road and Pine

Mountain Road, though two additional populations were found within the last five years: one near Bullfrog Quarry and the other on San Geronimo Ridge. The target is to treat all infestation annually with a long-term target of extirpation of this species from the watershed.

Goat grass manually removed at priority sites:

- Azalea Hill
- Pine Mt. Fire Rd.
- Bullfrog Rd

Outcome	Approximate Cost
10.4 acres	\$16,770



Photo 37: Barbed goat grass (*Aegilops triuncialis*) at Pine Mt. Fire Rd. Leah Lord



Photo 38: Yellow starthistle (*Centaurea solstitialis*) at West Ridgecrest.

Yellow Starthistle Reduction

Yellow starthistle is second only to broom in the amount of the watershed that it has invaded. Eliminating this weed before it spreads further will benefit biodiversity and reduce future management costs. The district treats infested areas multiple times each year to achieve 25 percent reduction in percent cover at existing infested sites and the district will initiate treatment of incipient populations as detected. The target is to achieve containment at the 2015 extent of yellow starthistle and a 10% reduction in the level of effort needed to prevent seed set.

Yellow star thistle removed at priority sites:

- Deer Park
- Sky Oaks Meadow,
- Ridgecrest Blvd
- MVAFB

- Peters Dam
- Fawn Ridge
- Cataract Trail

Outcome	Approximate Cost
143 Acres	\$33,128

Control of Other Priority Weeds

Invasions of other high priority weeds are limited and generally are scattered throughout the watersheds. The species targeted are known or suspected to negatively impact rare plants or sensitive natural communities.

Priority weeds manually removed across the watershed with priority placed at:

- Yolanda Trail
- West Peak / Mill Valley Air Force Base
- Peters Dam
- Ridgecrest
- Rock Springs
- Cataract Trail

Outcome	Approximate Cost
36 Acres	\$42,312



Photo 39: Stinkwort at Kent Lake. Angie Notari



Photo 40: Ehrharta erecta at Cataract Trail. Angie Notari

Experimental Weed Treatment

The District implemented two new weed grazing trials in FY23 near Deer Park and Ross Reservoir. The focus in FY23 was to determine effectiveness of grazing at sites where the district typically mows broom on an annual basis. Results showed a reduction in time required to mow the broom later in the winter. For example contractors saved two days or approximately \$4K worth of mowing time at the Deer Park

site as a result of the broom and surrounding grasses having been grazed earlier in the year. When considering the cost of grazing however it remains clear that grazing of Broom is not a cost effective treatment. Furthermore grazing of Broom does not kill the plant, rather it simply prevents some of the plants from seeding that year. The District acknowledges there were some benefits from reduction of fine fuels in the grazing units, and an increase in positive comments and engagement from visiting community members.

Outcome	Approximate Cost
Goat Grazing Trial	\$27,080



Photo 41: Grazing Trial at Deer Park



Photo 42: Grazing Trial at Meerna Fuelbreak

4 Compliance Verification and Monitoring in FY23

The district developed the BFFIP to plan the management of district lands to minimize fire hazards and maximize ecological health. The district prepared a Program EIR for the BFFIP in accordance with CEQA, which requires the implementation of mitigation measures to avoid or lessen the significant environmental impacts of the district's vegetation management activities. The Final Program EIR for the BFFIP was adopted in October of 2019. This section summarizes the district's fiscal year 2023 verification and monitoring activities conducted in compliance with the BFFIP EIR mitigation measure.

4.1 Requirements Implemented by Management Action

Mitigation compliance is tracked on a project-by-project basis. Projects fall within several Management Actions or MAs. The MAs with environmental compliance components include:

- MA-20: Perform cyclical maintenance throughout the infrastructure zone with sufficient frequency to maintain design standards.
- MA-21: Construct the remainder of the fuelbreak system
- MA-22: Expand EDRR to identify, report, and treat new populations of invasive species
- MA-23: Improve conifer and mixed hardwood forest stand structure and function in the ecosystem restoration zone
- MA-24: Improve grasslands and oak woodlands in the ecosystem restoration zone
- MA-25: Reintroduce or enhance historic populations of special-status plant species
- MA-26: Develop and implement 10-year restoration plans for Potrero Meadow, Sky Oaks Meadow, and Nicasio Island
- MA-27: Conduct experiments and trials to identify suitable methods for control of invasive species

The projects that were implemented under each management action and the mitigation measures that were implemented in fiscal year 2023 are summarized in Table 2.

Table 2 Management Actions, Projects, and Mitigation Measure Compliance

Management Action	Projects Completed under Management Action	Mitigation Measures Implemented	
All MAs with environmental compliance components		See Appendix A	
MA-20 Perform cyclical maintenance throughout the infrastructure zone with sufficient frequency to maintain design standards	<ul style="list-style-type: none"> • Fuelbreak maintenance and cutting of woody vegetation • Fine fuel mowing • Broom removal in fuelbreaks • Roadside mowing • Dam maintenance 	<ul style="list-style-type: none"> • MM Air-3 • MM Air-4 • BMP-1 	<ul style="list-style-type: none"> • MM Hazards-3 • MM Hydrology-1 • MM Noise-1
MA-21 Construct the remainder of the fuelbreak system	<ul style="list-style-type: none"> • New fuelbreak construction 	<ul style="list-style-type: none"> • MM Air-3 • MM Air-4 • BMP-1 • BMP-5 • MM Biology-2 • MM Biology-11 • MM Biology-12 • MM Cultural-3 	<ul style="list-style-type: none"> • MM Cultural-4 • MM Hazards-1 • MM Hazards-2 • MM Hazards-7 • MM Hydrology-1 • MM Noise-1 • MM Recreation-1 • MM Transportation-1
MA-22 Expand EDRR to identify, report, and treat new populations of invasive species	<ul style="list-style-type: none"> • Road, disturbed areas, and trail surveys • Control of small weed patches 	<ul style="list-style-type: none"> • BMP-7 • MM Biology-2 • MM Biology-11 • MM Biology-12 • MM Biology-17 • MM Cultural-1 • MM Hazards-1 	<ul style="list-style-type: none"> • MM Hazards-6 • MM Hazards-7 • MM Hydrology-1 • MM Noise-1 • MM Recreation-1 • MM Transportation-1

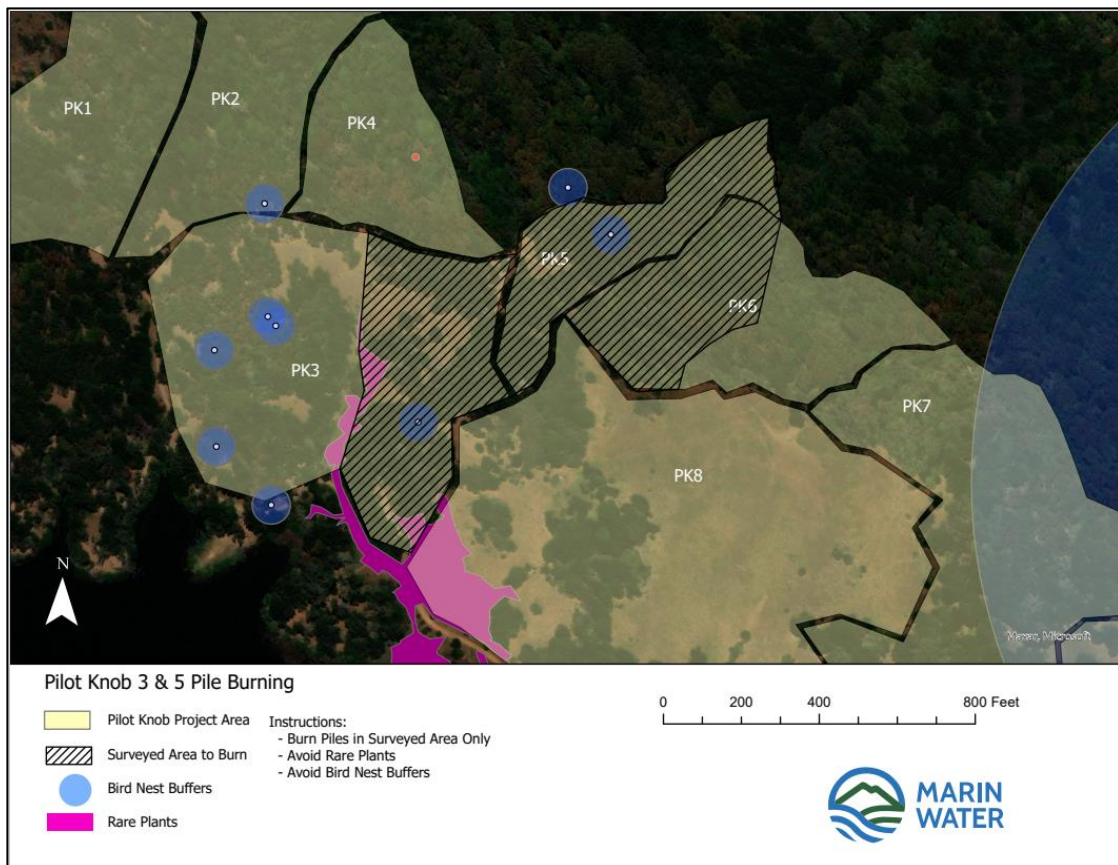
<p>MA-23 Improve conifer and mixed hardwood forest stand structure and function in the ecosystem restoration zone</p>	<ul style="list-style-type: none"> • Initial forest fuel reduction • Forest fuel maintenance 	<ul style="list-style-type: none"> • MM Air-1 • MM Air-3 • MM Air-4 • BMP-1 • BMP-4 • BMP-5 • BMP-6 • BMP-7 • MM Biology-2 • MM Biology-17 • MM Cultural-1 • MM Cultural-3 	<ul style="list-style-type: none"> • MM Cultural-4 • MM Geology-2 • MM Hazards-1 • MM Hazards-2 • MM Hazards-3 • MM Hazards-4 • MM Hazards-5 • MM Hazards-7 • MM Hydrology-1 • MM Noise-1 • MM Recreation-1 • MM Transportation-1
<p>MA-24 Improve oak woodlands and grasslands (OW&G) in the ecosystem restoration zone</p>	<ul style="list-style-type: none"> • Douglas fir thinning in OW&G • Maintenance of Douglas fir • Broom removal in OW&G • Broom maintenance in OW&G • Goatgrass reduction in OW&G • Yellow star thistle management in OW&G • Control of other priority weeds in OW&G 	<ul style="list-style-type: none"> • MM Air-1 • MM Air-3 • MM Air-4 • BMP-1 • BMP-4 • BMP-5 • BMP-6 • BMP-7 • MM Biology-2 • MM Biology-11 • MM Biology-12 • MM Biology-17 • MM Cultural-1 	<ul style="list-style-type: none"> • MM Cultural-3 • MM Cultural-4 • MM Geology-2 • MM Hazards-1 • MM Hazards-2 • MM Hazards-3 • MM Hazards-4 • MM Hazards-5 • MM Hazards-7 • MM Hydrology-1 • MM Noise-1 • MM Recreation-1 • MM Transportation-1

4.2 Compliance and Monitoring Considerations and Findings

The district was able to effectively carry out the BFFIP mitigation measures for all Management Actions completed through the use of technical staff, partner agencies and professional environmental consultants. The district integrated new mapping technologies to help identify avoidance zones within project sites which helped guide field activities. This was especially effective for the district's forestry restoration work in the vicinity of Pilot Knob and Above Filter Plant, which allowed district staff and contractors to use gps enabled devices to avoid sensitive resources within the work areas. The Pilot Knob Compliance Map shown below was used to avoid disturbance to Rare Plants and Bird Nest Locations during a Pile Burn Treatment.

The overall level of effort to carry out BFFIP compliance is significant and requires professionals with specific technical expertise. As the district scales up implementation of vegetation management under the BFFIP compliance costs will increase due to the need for additional compliance surveys. The compliance work is critical to ensuring that the district can effectively avoid sensitive resources and protects the biodiversity of the district's watershed lands while reducing wildfire hazards. The number of total hours spent completing pre project surveys will increase in subsequent years as the acres of implementation increase.

The district carries out compliance trainings with contractors working on the watershed before work is initiated.



Map 8:
Compliance
Map of Pilot
Knob Proj.

5 BFFIP Review & Work Plan

5.1 Review of BFFIP Management Actions

As part of implementing the BFFIP the district conducts an annual review of project activities. As the district continues to scale up work to reduce the risk of wildfire, preserve and enhance important biological resources and ecosystem functions, the district will review and revise its work in response to changing conditions.

The below table compares BFFIP Year 4 Targets to actual completed work for FY 2023, and outlines BFFIP Targets for Year 5.

Management Actions	Year 4 Targets	Year 4 Completed	Year 5 Thresholds
MA-20.1 Maintain existing fuel breaks	190 acres	189 Acres	200 acres
MA-20.2 Mow fine fuels	40 acres	45 Acres	50 acres
MA-20.3 Broom removal in fuelbreaks*	260 acres	253 Acres	756 acres
MA-20.4 Roadside mowing	50 acres	47 Acres	50 acres
MA-20.5 Dam maintenance	45 acres	43 Acres	45 acres
MA-21 New fuelbreak construction	10 acres	10 Acres	10 acres
MA 22.1 EDRR surveys	150 miles	66 Miles	150 miles
MA 22.2 EDRR weed treatments	100 patches	186 patches	100 patches
MA 23.1 Forest fuel reductions**	60 acres	62 Acres	100 acres
MA 23.2 Forest maintenance**	70 acres	68 Acres	300 acres
MA 23.3 Forest Rx burn	1 Rx units	0 Units	1 Rx unit
MA 24.1 Douglas fir thinning	150 acres	150 Acres	200 acres
MA 24.2 Oak & grassland Rx burn	3 units	0 Units	3 units
MA 24.3 Initial broom removal	260 Acres	260 Acres	0 Acres
MA 24.4 Broom maintenance	205 Acres	198 Acres	0 Acres
MA 24.5 Goatgrass removal	35 Acres	10.4 Acres	35
MA 24.6 Yellow star removal	120 Acres	143 Acres	120
MA 24.7 Priority weeds	-- acres	31 acres	-- acres
MA 25.1 Planting	2 projects	0 project	3 projects
MA 25.2 Habitat restoration	2 projects	3 projects	3 projects
MA 27 Weed control trials	2 project	2 projects	3 projects

*In Year 5 (FY24) the three Broom related MAs 20.3, 24.3, & 24.4 will be combined as a single Management Action.

**In Year 5 MAs 23.1 & 23.2 were increased above originally approved thresholds as part of the BFFIP Addendum.

For FY23 the district met the majority of BFFIP year four targets.

The District now has multiple Rx Burn Plans in place, and given the correct conditions for weather, staffing, and compliance, will conduct Rx Burns in accordance with BFFIP guidelines. The District did not conduct any Rx Burns in FY23 because the above factors did not align in a way to allow for a safe and effective burn.

The actual treated acres of Goatgrass will vary from year to year based on the efficacy of ongoing treatments. Annual variations in Yellow Starthistle treatments MA 24.6 are directly related to seasonality of the plant and whether the treatment window falls in June or July (i.e. Prior vs Current FY) of each season.

In FY 2023 the district treated 1,528 acres for \$3,284,709 for an average cost of \$2,149/acre. Including \$467,787 in Compliance costs, the total cost increases to \$3,752,496, with a per acre cost of \$2,455/acre. As a percentage of total costs, compliance costs were 12.5% of the total. Costs referenced in this report reflect direct costs for vegetation work only, and do not include administrative support, planning, contract negotiation, etc.

FY23 Total BFFIP expenses were funded with \$1,603,048 in grants provided by the California Coastal Conservancy, and the Cal Fire Forest Health Project. This funding represents 43% of the total FY23 expense.

The District completed all remaining acres and grant obligations for the Coastal Conservancy Grant in FY23. See map below.

The below table summaries cost per acre for vegetation management activities completed during FY 2023.

Cost per Acre by Management Action		
Management Action	Description	Cost/Acre
MA-20.1	Maintain fuelbreaks	\$2,641
MA-20.2	Mow fine fuels	\$824
MA-20.3	Remove broom from fuelbreaks*	\$556
MA-20.4	Roadside mowing (non-break)	\$1,151
MA-20.5	Dam maintenance	\$1,151
MA-21	Construct new fuelbreak	\$7,663
MA-23.1	Initial Forest Fuel Reduction	\$12,249
MA-23.2	Maintenance of forest fuels	\$953
MA-24.1	Reduce fir encroachment in grasslands and oak woodlands	\$6,060
MA-24.3	Remove broom in grasslands and oak woodlands	\$1,704
MA-24.4	Broom maintenance in grasslands and oak woodlands	\$563
MA-24.5	Reduce goatgrass	\$1,611
MA-24.6	Reduce yellow starthistle	\$231
MA-24.7	Control Other Priority Weeds	\$1,181

MA-27	Experimental Weed Treatment (Grazing)*	\$862
Total Vegetation Treatment Costs / Acre		\$2,149
Total Compliance Costs		\$467.787
Combined Veg & Compliance Cost / Acre		\$2,455

* Experimental Weed Treatment is typically measured based on number of projects for BFFIP compliance rather than acres, but for comparison purposes in the table above the two grazing sites totaling 31.4 Acres have been backed out of Broom in Fuelbreaks and isolated in MA27.

Initial Forest Fuel Reduction work in FY23 was particularly costly on a unit basis due to the challenging steep terrain and vegetation density in the Above Filter Plant Project area. The Above Filter Plant Project was financed primarily with Coastal Conservancy and Cal Fire grant funds.

5.2 Work Plan for FY2024

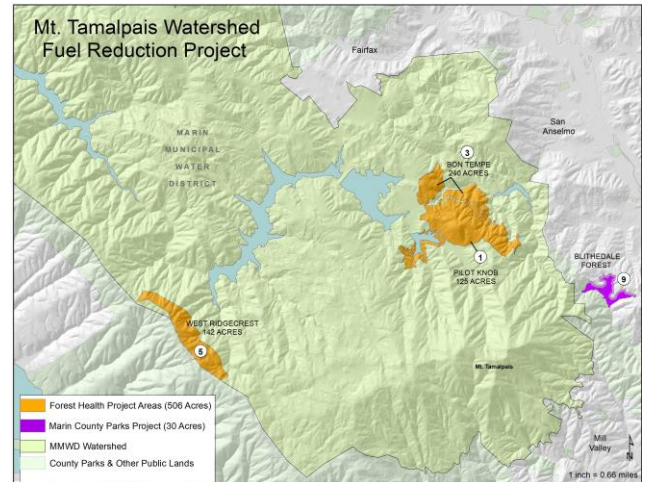
The district conducts year end reviews of BFFIP activities to inform project planning for the following year. For year five of BFFIP implementation the district will continue to rely on grant funds received from the Cal Fire Forest Health grant. These funds have been allocated over a 3 year period to help meet the BFFIP targets and goals of reducing wildfire fuels while enhancing biodiversity and ecosystem function. FY24 is the final year of the grant and the District is on schedule to complete all remaining obligations of the grant by 6/30/24. Below is a brief summary of BFFIP priorities for year five.

Planning and Monitoring

- Continue forest pest and pathogen inventory.
- Continue collaborating with One Tam on Regional Forest Health Strategy.
- Collaborate with Marin Wildfire Prevention Authority on the Technical Advisory Committee.
- Continue mapping and treating non-native invasive plants.
- Continue to develop forestry restoration outreach materials to educate watershed users of the multi-benefit forestry restoration work underway.
- Continue Prescribed fire planning with MCF and BAAQMD, as well as with FIGR for additional cultural resource surveys.

Vegetation Management

- Complete BFFIP Year 5 vegetation management plan. Per the BFFIP Addendum approved in FY23, Year 5 acre thresholds were modified as follows:
 - Forest Fuel Reduction increased from 60 to 100 acres.
 - Forest Fuel Maintenance increased from 100 to 300 acres.
 - All 3 Broom related Management Actions were combined for a total of 765 acres.
- Collaborate directly with MWPA Vegetation crews to treat portions of the Greater Ross Valley Shaded Fuelbreak that extend into the Marin Watershed.
- Continue fuelbreak expansion at Sky Oaks / Taylor Trail areas.
- Complete remaining acres of forest restoration work around Potrero Meadow and San Geronimo Ridge for the Cal Fire Forest Health Grant.
- Focus new Broom work around Ross Reservoir and Shaver Grade.
- Implement one or more prescribed burns.
- Scale up forestry restoration work in accordance with BFFIP.
- Continue removal of invasive weeds.



Map 10: Completed forestry and fuel reduction work areas funded by California Coastal Conservancy between 2021-2023.

New Grant Updates:

- The District is currently in the process of submitting two grants to support BFFIP implementation as follows:
 - \$5M over 5 years through the NOAA Climate Resiliency Program
 - \$1.3M over 3 years through the California Government Office of Planning & Research ICARP Program.

6 Appendices

Appendix A – Mitigation Measures List

The following mitigation measures were implemented for all Management Actions (MAs) with environmental compliance components (MA-20 to MA-27):

MM Air-2 (Asbestos)	MM Biology-8 (Northern Spotted Owl; nesting season)
MM Air-3 (Air Pollutants)	MM Biology-9 (Western Pond Turtles)
MM Air-4 (Smoke)	MM Biology-10 (CA Red-Legged Frog)
BMP-1 (Operations)	MM Biology-12 (Foot-Hill Yellow Legged Frog)
BMP-2 (Pre-work Assessment/Planning)	MM Biology-13 (Mollusks)
BMP-3 (Import fills, rock & plants)	MM Biology-14 (Northern Spotted Owl, avoidance buffer)
MM Hazards-1 (Spills)	MM Biology-15 (Wetlands)
MM Hazards-3 (Fire Risk)	MM Biology-16 (Native Grasslands)
MM Hazards-4 (Prescribed Burn Plan)	MM Cultural-2 (Cultural Resources)
MM Hazards-7 (Fire Ignition)	MM Geology-1 (Erosion Control)
MM Hydrology-1 (Water Quality)	
MM Noise-1 (Noise Reduction)	
MM Recreation-1 (Roads & Trails)	
MM Transportation-1 (Emergency Access)	
MM Biology-1 (Worker Training)	
MM Biology-2 (Special-Status Plants)	
MM Biology-3 (Invasive Species)	
MM Biology-4 (Forest Diseases)	
MM Biology-5 (Roosting Bats)	
MM Biology-6 (Badgers)	
MM Biology-7 (Nesting Birds)	

Appendix B – Watershed Burn Plan Reports



Item Number: 03
Meeting Date: 09-21-2023
Meeting: Watershed
Committee/Board of Directors
(Watershed)

Informational Item

TO: Watershed Committee/Board of Directors (Watershed)

FROM: Shaun Horne, Watershed Recreation Manager 

THROUGH: Ben Horenstein, General Manager 

DIVISION NAME: Watershed

ITEM: Lagunitas Creek Stewardship Plan Update

SUMMARY

The Lagunitas Creek Stewardship Plan (Stewardship Plan) was developed through a collaborative process with watershed stakeholders, culminating in June of 2011. The Stewardship Plan represents a cooperative approach to identifying and implementing priority actions to benefit Coho Salmon, steelhead, and California freshwater shrimp, as required by State Water Board Order WR95-17. The Stewardship Plan is comprised of ten main elements. Of these elements, the District's fisheries monitoring obligations get particular focus because the resulting data inform all of the other actions and serve as the basis of restoration prioritization efforts. The Stewardship Plan was envisioned with an implementation timeline of approximately ten years, and the District is now in the process of updating it with current priorities and new information. Staff will provide an overview of the current Stewardship Plan, the proposed approach and timeline for updating it, and a discussion of recent monitoring trends.

DISCUSSION

The Lagunitas Creek Stewardship Plan, adopted by the District in 2011, guides the District's stewardship, habitat enhancement, and monitoring actions in Lagunitas Creek. In accordance with the Stewardship Plan, the District conducts continuous monitoring of streamflow and stream temperature, as well as regular surveys of habitat conditions (i.e. large wood loading, gravel quality, etc.). A large component of the Stewardship Plan is dedicated to the District's population monitoring obligations for Coho Salmon (endangered), steelhead (threatened), and California freshwater shrimp (endangered). The Lagunitas Creek watershed is considered one of the highest priority areas in the state for recovery of these species.

During the past 20 years, the District’s monitoring has shown a long-term upward trend in abundance of Coho Salmon juveniles and smolts in the Lagunitas Creek watershed. In fact, the 2022 juvenile and 2023 smolt counts were the highest on record. However, during that same 20-year period, we have observed a long-term decline in the number of adults returning to spawn. Given the complex life histories of these species, and all of the environmental variables outside of the District’s control (rainfall patterns, ocean conditions, etc.), it is difficult to attribute such population trends to specific restoration actions. However, the recent record-high numbers of young Coho Salmon in Lagunitas Creek are encouraging, and the data underscore the value of consistent ongoing monitoring. These trends are helping to inform how best to continue and update the District’s ongoing fisheries monitoring approach in the future.

The District is in the process of updating the Stewardship Plan with new information and priorities gained during the past decade. The update is being conducted in close collaboration with the Lagunitas Technical Advisory Committee (Lagunitas TAC), which includes representatives from resource agencies and other watershed stakeholder groups. The Stewardship Plan update will include a series of monitoring, enhancement, and compliance tasks for the next approximately ten-year period. These include design and implementation of habitat restoration/enhancement projects, continued collaboration and outreach, and refinements to monitoring methods. Several meetings with the Lagunitas TAC and District Board are anticipated throughout this process to garner input. The District anticipates completing a draft update by early 2024 and finalizing the new Plan by summer 2024.

FISCAL IMPACT

None

ATTACHMENT(S)

None