



Yellow starthistle invading a grassland off the Cataract Trail

Vegetation Management Report Fiscal Year 2020

August 2020



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Appendix A Mitigation Measures List

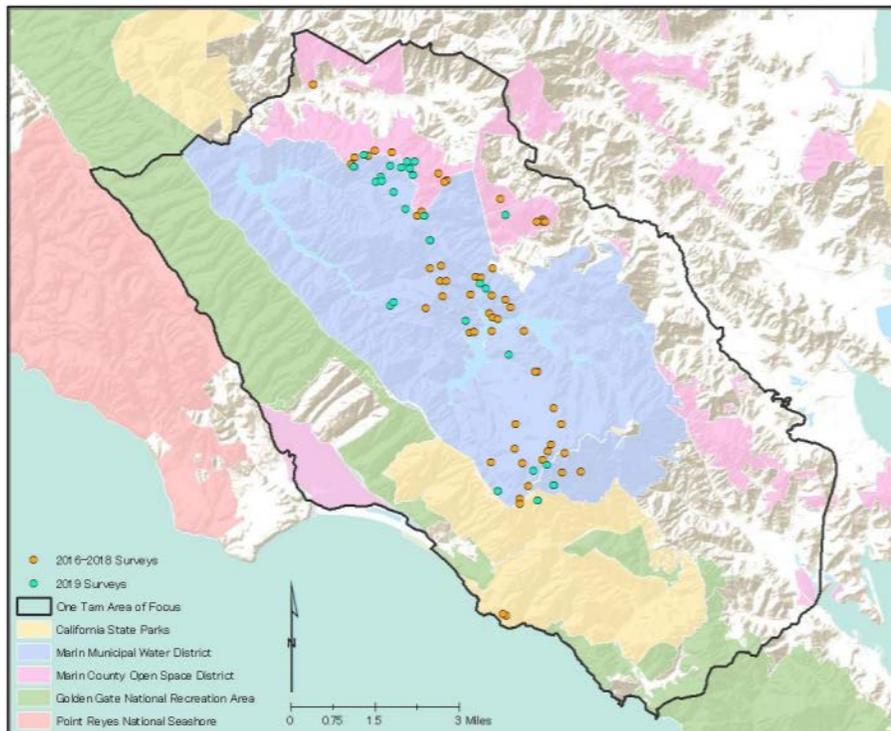
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Executive Summary

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) 2021. Table 1 below provides a summary of the district activities that occurred in FY 2020. Map 2 (Page ES-5) provides a summary showing the locations of vegetation management activities.



Map 1: Map of serpentine endemic species found on barrens within the One Tam focus area being monitored as part of One Tam’s collaborative rare plant monitoring work.

EXECUTIVE SUMMARY

Table 1 Overview of Vegetation Management Activities

Completed Work	Outcome	Approximate Cost ^a	Description
Community Coordination for Fire Risk Reduction		\$ 25,700	
Red Flag Warnings	Watershed Closures	\$2,500	<ul style="list-style-type: none"> Coordinated 13 red flag closures. Purchased two new Wildfire Danger Signs for the Watershed. Increased community outreach for red flag and other critical fire weather events through improved community signage and social media. Aligned protocol for land use restrictions and access for all public lands.
Coordination with PG&E	134 Acres	\$ 11,600	<ul style="list-style-type: none"> Coordinating to ensure cyclical vegetation maintenance around and under transmission lines. PG&E cleared vegetation along 14.5 miles of power lines across the watershed. PG&E repaired/replaced 8 power poles on the watershed, along the Ignacio-Bolinas Transmission Line. Working with PG&E to develop comprehensive plan on Mt. Tam to create better fire safety around all power lines on watershed lands.
Coordination with Lessees and Neighbors on Defensible Space	11 Acres	\$ 11,600	<ul style="list-style-type: none"> Coordinating under existing lease agreement to prioritize maintenance funding for vegetation maintenance around infrastructure. Sent letter to all watershed land neighbors encouraging constructing necessary defensible space, (if not already protected by an MMWD fuel break), an approach consistent with county lands policy.
County Fire Coordination	County and Watershed Wide	\$ 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. Attended monthly FIRESafe Marin Meetings.
Planning and Monitoring		\$268,000	
Biodiversity, Fire, and Fuels Integrated Plan (BFFIP)		\$ 45,000	<ul style="list-style-type: none"> Finalized BFFIP. BFFIP EIR public outreach and adoption in October of 2019.

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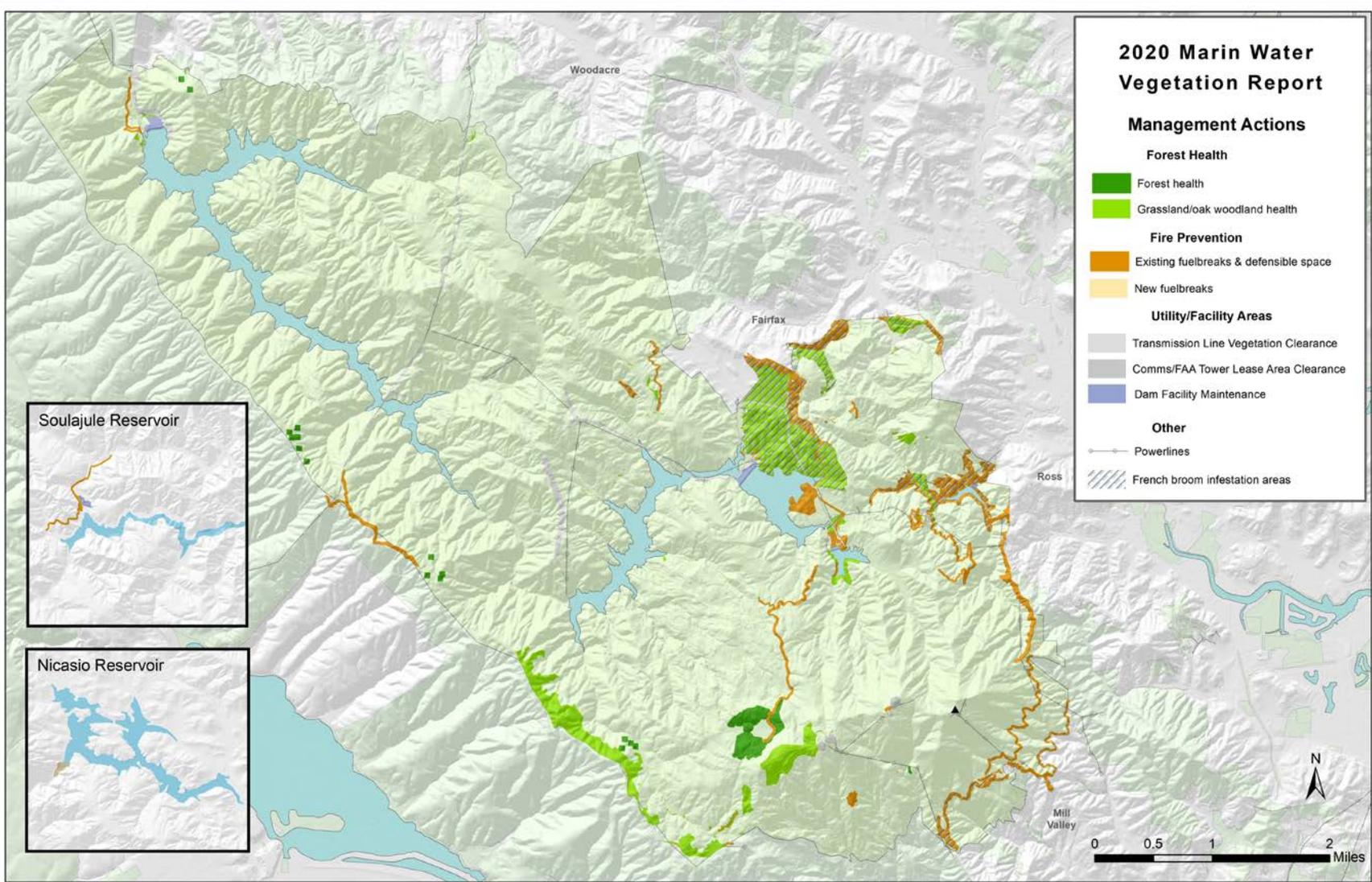
Non-Native Invasive Species Mapping	Updated maps	\$ 9,000	<ul style="list-style-type: none"> Carried out invasive plant surveys on district lands.
Rare Plant Inventory and Monitoring	Rare plants surveyed	\$18,500	<ul style="list-style-type: none"> Completed inventory of rare and special status plants species in 2019. Carried out rare plant surveys in advance of new vegetation work. Surveyed a subset of rare plant populations and worked with One Tam staff on over 75 hours of rare plant monitoring.
Seeps and Springs Inventory	Mapping Seeps and Springs	\$4,900	<ul style="list-style-type: none"> Mapped springs in the vicinity of Potrero Meadows.
Northern Spotted Owl Surveys	Nesting compliance	\$52,400	<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	\$15,200	<ul style="list-style-type: none"> Completed environmental compliance survey work for roosting bat habitat prior to forestry restoration work.
Bird Surveys	Nesting Birds	\$42,000	<ul style="list-style-type: none"> Completed environmental compliance survey work for nesting birds to support vegetation management work.
	Tri-annual land bird monitoring	\$46,300	<ul style="list-style-type: none"> Completed triennial bird surveys to support trend monitoring in relation to vegetation management work.
Osprey Monitoring	Annual Monitoring	\$4,000	<ul style="list-style-type: none"> Completed annual Osprey monitoring at Kent Lake.
Forest Restoration Monitoring and Mapping	120 acres	\$ 20,800	<ul style="list-style-type: none"> Continued monitoring work within Resilient Forest Treatment Plots to evaluate carbon dynamics, water yield, and vegetation response. Completed forest restoration mapping and modeling to inform Cal Fire Grant Application and future forestry restoration work. Collaborating with One Tam on Regional Forest Health Strategy.
Foothill Yellow Legged Frog	Annual Monitoring	\$9,900	<ul style="list-style-type: none"> Completed annual monitoring of foothill yellow legged frogs at select watershed locations.
Vegetation Management	1,220 acres	\$ 1,314,300	
Cyclical Maintenance of Fuelbreaks	446 acres	\$441,800	All fuelbreaks maintained at appropriate intervals
	150 acres	\$312,400	<ul style="list-style-type: none"> Fuelbreak maintenance and cutting of woody vegetation.
	40 acres	\$16,700	<ul style="list-style-type: none"> Mowed fine fuels around structures, along roadsides and parking areas.

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	207 acres	\$86,700	<ul style="list-style-type: none"> • Pulled broom from fuelbreaks.
	12 acres	\$4,400	<ul style="list-style-type: none"> • Mowed non-fuelbreak roadsides.
	37 acres	\$21,600	<ul style="list-style-type: none"> • Managed vegetation on dams and spillways.
New Fuelbreak Construction	3.4 acres	\$47,300	Contractors expanded defensible space at Fern Canyon Fuelbreak
Forest Restoration and Fuel Management	86 acres	\$315,800	Forest and woodland thinning to promote resilience
	70 acres	\$302,500	<ul style="list-style-type: none"> • Initial forest fuel reduction.
	16 acres	\$13,300	<ul style="list-style-type: none"> • Maintenance of forest restoration sites.
Priority Habitat Restoration & Fuel Reduction	684 acres	\$260,400	Removal of target invasive and weeds with forest and woodlands
	36 acres	\$73,800	<ul style="list-style-type: none"> • Douglas fir thinning in oak woodlands and grasslands (OW&G).
	163 acres	\$14,000	<ul style="list-style-type: none"> • Maintenance of Douglas fir.
	37 acres	\$47,100	<ul style="list-style-type: none"> • Broom removal in OW&G.
	310 acres	\$50,200	<ul style="list-style-type: none"> • Broom maintenance in OW&G.
	7 acres	\$6,800	<ul style="list-style-type: none"> • Goatgrass reduction in OW&G.
	103 acres	\$8,800	<ul style="list-style-type: none"> • Yellow Starthistle management in OW&G.
	28 acres	\$59,700	<ul style="list-style-type: none"> • Control of other priority weeds in OW&G.
Early Detection Rapid Response	135 Patches	\$ NA	<ul style="list-style-type: none"> • One Tam EDRR team supported management of non-native invasive plants prioritized as part of EDRR.
Excavator and Forestry Attachment for Vegetation Management	NA	\$249,000	<ul style="list-style-type: none"> • Purchased a new excavator and forestry attachment to support roadside mowing and forestry restoration work.
Contractor Coordinator		\$80,000	<ul style="list-style-type: none"> • Contractor coordinator tracks all vegetation management activities.
Total BFFIP Costs		\$1,688,000	

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Map 2: Locations of Vegetation Management Activities



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.”¹. 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		\$25,700	<ul style="list-style-type: none"> Wildfire risk mitigation
Red Flag Warnings	2 New Signs	\$1,500	<ul style="list-style-type: none"> Closed watershed for 13 days. Installed two wildfire danger signs. Increased community outreach for red flag and other critical fire weather events through improved community signage and social media. Aligned protocol for land use restrictions and access for all public lands. Coordinating county wide signage with Fire Safe Marin and other Fire agencies.
Coordination with PG&E	134 acres/14.5 miles	\$11,600	<ul style="list-style-type: none"> Coordinating to ensure cyclical vegetation maintenance around and under transmission lines. Monitored PG&E Contractors and Maintenance Crews on 134 Acres of land under and 14.5 miles of power lines. Working with PG&E to develop comprehensive plan on Mt. Tam to create better fire safety around all power lines and poles on the watershed lands.
Coordination with Lessees and Neighbors on Defensible Space	11 acres	\$11,600	<ul style="list-style-type: none"> Coordinating under existing lease agreement to prioritize maintenance funding for vegetation maintenance around infrastructure. Sent letter to all watershed land neighbors encouraging constructing necessary defensible space on MMWD lands, (if not already protected by an MMWD fuel break), an approach consistent with county lands policy.

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. • Attending monthly FIREsafe Main Meetings.
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1.1 Red Flag Warnings

Small fire events have occurred on district lands between 2006 and 2015. 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 twelve trained wildland fire fighters with two additional staff in training. 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.

- Increased community outreach for red flag and other critical fire weather events through improved community signage and social media.
- Aligned protocol for land use restrictions and access for all public lands.
- Participated in County wide red-flag sign coordination.
- Purchased two additional wildfire danger signs.

Outcome	Approximate Cost
Watershed Closures	NA
Two Fire Danger Signs	\$1,500

Photo 1: Fire Danger Signs.



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 14.5 miles within 134 Acres of land under and adjacent to power lines.
- Coordinated defensible space work around Middle Peak PG&E facility.

Outcome	Approximate Cost
Coordinated vegetation management within 134 acres along 14.5 miles of distribution and transmission lines	\$ 11,600



Photo 2: PG&E pole replacement near Nicasio Reservoir.

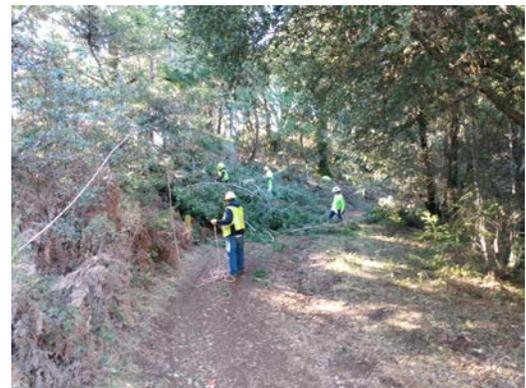


Photo 3: PG&E Vegetation management under power lines on Pine Mt. Fire Rd.

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.

- FAA -- Coordinated West and Middle Peak 3.5 acres of defensible space work on district property, outside leased area.
- PG&E -- Coordinated 2.0 acres of defensible space work around Middle Peak Facility.
- West Point Inn Association – Coordinated 3.0 acres of defensible space work.
- Marin Stables – Coordinated 2.5 acres of defensible space work around facilities.

Outcome	Approximate Cost
11 acres	\$11,600



Photo 4: Before photo of vegetation surrounding American Towers.



Photo 5: After defensible space work around American Towers at Middle Peak.

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.

In 2019, land management agencies and County Fire formed a Vegetation Management working group which meets quarterly to discuss vegetation and wildfire issues. This coordination is helping facilitate cross jurisdictional planning and management. In an effort to scale vegetation management effort the district is 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. Participating in One Tam Forest Health Strategy to develop multi-benefit forest restoration priorities.

Ongoing wildfire coordination efforts:

- MMWD/MCF Mutual Aid Agreement
- Fire Safe Marin Board
- Vegetation Management Working Group
- Community Wildfire Protection Plan
- Defensible space with SMF & RVF
- Ongoing wildland fire trainings with MCF
- County wide fuels vegetation map
- One Tam Forest Health Strategy



Photo 6: Annual district staff wildfire training.

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 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		\$268,000	
Biodiversity, Fire and Fuels Integrated Plan (BFFIP)	Final Plan & EIR	\$ 45,000	<ul style="list-style-type: none"> Finalized BFFIP. BFFIP EIR public outreach and adoption in October of 2019.
Non-Native Invasive Plant Species Mapping	.44	\$ 9,000	<ul style="list-style-type: none"> Invasive mapping during this FY.
Rare Plant Inventory and Monitoring	95 acres	\$18,500	<ul style="list-style-type: none"> Rare plant compliance surveys in advance of new vegetation work. One Tam working with the district completed 75 hours of rare plant surveys in serpentine barrens.
Seeps and Springs Inventory	NA	\$ 4,900	<ul style="list-style-type: none"> Mapped seeps and springs in vicinity of Potrero Meadows.
Northern Spotted Owl Surveys	Compliance	\$52,400	<ul style="list-style-type: none"> Completed environmental compliance survey work for northern spotted owl to support watershed vegetation and construction related projects.
Bird Surveys	Compliance	\$ 42,000	<ul style="list-style-type: none"> Completed environmental compliance survey work for nesting birds to support vegetation management work.
		\$ 46,300	<ul style="list-style-type: none"> Completed triennial bird surveys to support trend monitoring in light of vegetation management work.

Osprey Monitoring	Annual Monitoring	\$4,000	<ul style="list-style-type: none"> Annual Osprey monitoring at Kent Lake.
Bat Surveys	60 acres	\$15,200	<ul style="list-style-type: none"> Completed environmental compliance survey work on roosting bat habitat prior to tree removals.
Forest Restoration Monitoring and Mapping	120 acres	\$ 20,800	<ul style="list-style-type: none"> Continued monitoring work within Resilient Forest Treatment Plots to evaluate carbon dynamics, water yield, and vegetation response.
Foothill Yellow Legged Frog	Annual Monitoring	\$9,900	<ul style="list-style-type: none"> Annual monitoring of foothill yellow legged frog at select watershed locations.

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

Outcome	Approximate Cost
Finalization of BFFIP	\$45,000

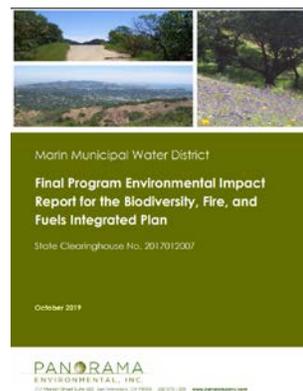


Figure 1: BFFIP EIR adopted in October of 2019.

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.

- District mapped .44 acres of new non-native invasive species.

Outcome	Approximate Cost
.44 Acres	\$9,000

2.3 Rare Plant Inventory and Mapping

To support the district’s goal to preserve existing significant biological resources, including significant plant resource, the district collects field data and updates monitoring reports on an ongoing basis. The objective is to have a complete GIS database with the location and status of all known special status, otherwise rare, and presumed extirpated species of plants. This information helps the district avoid impacts to sensitive species while carrying out vegetation management work on the watershed. This information also helps the district track long-term trends and changes on the watershed and guides restoration planning efforts. It also assist the district with completing rare plant surveys ahead of planned vegetation management to reduce potential impacts.

In FY 2019 the District completed a Rare Plant Inventory which is identified as a Monitoring Management Action in the BFFIP for year one. In FY 2020, the district focused on rare plant compliance surveys to facilitate vegetation management and other watershed projects.

Rare plant compliance surveys conducted in advance of all new vegetation work:

- Fern Canyon fuel break expansion
- Potrero Meadows forestry project
- Azalea Hill trail project
- Phoenix Lake grazing trial
- FAA fuel break expansion



Photo 7: Hairy birds beak (*Cordylanthus pilosus ssp. pilosus*) avoided along Azalea hill.

Outcome	Approximate Cost
95 Acres	\$18,500

2.4 Seeps & Springs Inventory

To support the district’s goal to preserve existing significant biological resources, including wetlands, seeps, and riparian habitat, the district will first need to properly understand the location of wetlands, seeps, and riparian habitat within district lands. The district is working to complete an inventory and GIS database of wetlands, seeps, and riparian habitat. The information will help the district identify projects to preserve and restore wetlands, seeps, and riparian habitat on watershed lands.

The target is to update the map data for wetlands, seeps, and riparian habitat; revise classifications; and complete a list of preservation and restoration projects. Data collection and verification work is ongoing by district staff and consultants. In FY 2020, the district mapped seeps and springs in the vicinity of Potrero Meadows in coordination with this year’s forest restoration work.

Seeps and springs mapped:

- Seeps & springs mapped in the vicinity of Potrero Meadows.

Outcome	Approximate Cost
60 Acres	\$4,900

2.5 Spotted Owl, Osprey, Bats 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 surveys conducted in advance of all new vegetation work.
- Completed tri-annual monitoring of abundance patterns of landbirds.
- Completed annual monitoring of Osprey at Kent Lake.

Outcome	Approximate Cost
Compliance surveys	\$159,900

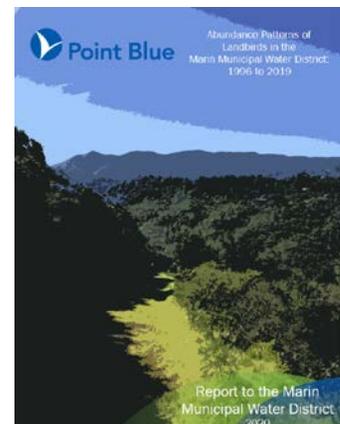


Figure 2: Abundance Patterns of Landbirds on MMWD lands.

2.6 Resilient Forest Monitoring

To better understand the greenhouse gas balance and water yield effects of forest management actions on district lands the district has been working with the U.S. Forest Services, Cal Poly, and UC Davis to monitor greenhouse gas balance and water yield through pre-treatment and post-treatment data collection. A pilot study is currently underway.

- Ongoing data collection and maintenance of existing Resilient Forest sites.
- 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
120 Acres	\$20,800

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.

Outcome	Approximate Cost
Annual Monitoring	\$9,900

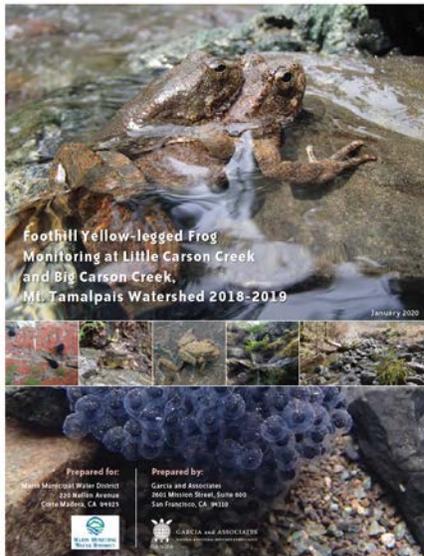


Figure 3: Foothill Yellow-legged Frog Monitoring Report finalized January 2020.



Photo 8: Resilient forest hydrology monitoring at Peters Dam site.

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	1,220 acres	\$1,314,300	
Cyclical Maintenance of Fuelbreaks	446 acres	\$ 441,800	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	3.4 acres	\$47,300	Contractors and staff expanded defensible near Lower Railroad Grade Primary Fuelbreak.
Early Detection Rapid Response	135 Patches	NA	Treatment of 135 patches of priority 1 weeds.
Forest Fuel Management	70 acres	\$302,500	Completed initial forest fuel reduction treatments at Potrero Meadow sites.
	16 acres	\$13,300	Retreated fuels at the Resilient Forest Sites.
Priority Habitat Restoration and Fuel Reduction	684 acres	\$260,400	Improve grassland and oak woodland in the ecosystem restoration zones through Douglas fir thinning, prescribed fire, broom removal, and management of other priority non-natives.
Experiment with New Invasive Species Control Methods	1 Project	\$ NA	Developed plan and initiated contracts to graze Porteous Fuelbreak with Goats & Sheep.
Excavator and Forestry Attachment	NA	\$249,000	Purchased new excavator and forestry attachment to support roadside mowing and forestry restoration work.

3.1 Cyclical Maintenance of Fuelbreaks-MA 20

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.

All existing watershed fuelbreaks maintained:

- Fawn Ridge
- Sky Oaks Road Corridor
- Meerna/Deer Park
- Worn Springs Road
- Indian/Crown Roads
- Old Railroad Grade
- Gravity Car
- Hogback
- Throckmorton
- Double Bow Knot,
- Lagunitas Defensible Space
- Scott Tank Break
- Fern Canyon Break
- Eldridge Grade
- Bill Williams Break
- Lagunitas Rock-Springs Fuelbreak



Photo 9: Lagunitas Rock Springs Fuelbreak maintenance.

Outcome	Approximate Cost
150 acres	\$312,383



Photo 11: Fuelbreak maintenance at Knob II.



Photo 10: Worn Springs Fuelbreak maintenance.

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.

- No grazing was conducted during this FY.
- Completed fine fuel reduction around all watershed facilities.
- Planning initiated on Phoenix Lake grazing broom management trials.

Outcome	Approximate Cost
40 acres	\$16,744



Photo 12: Sky Oaks Residence Defensible Space.



Photo 13: Porteous Fine Fuel Reduction.

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 with 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:

- Fawn Ridge
- Sky Oaks Road Corridor
- Meerna/Deer Park
- Worn Springs Road
- Indian/Crown Road
- Railroad Grade
- Gravity Car/Double Bow Knot
- Bolinas-Fairfax Rd
- Scott Tank Break
- Porteous Break
- Ross Reservoir Break
- Bill Williams Break



Photo 14: French broom removal at Railroad Grade.

Outcome	Approximate Cost
207 acres	\$86,707



Photo 15: French broom removal at Porteous fuelbreak.



Photo 16: French broom removal in Meerna Fuelbreak.

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:

- Shaver Grade
- Concrete Pipe
- Soulajule

Outcome	Approximate Cost
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12 acres

\$4,426



Photo 17: Bon Tempe Filter Plant roadside brushing.



Photo 18: Bon Tempe Filter Plant roadside brushing.

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

Outcome	Approximate Cost
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37 acres

\$4,426



Photo 19: Nicasio Dam vegetation maintenance.



Photo 20: Lagunitas Dam vegetation maintenance.

3.2 New Fuelbreak Construction-MA 21

To reduce fire intensity and spread 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.

New fuelbreak construction along Fern Canyon Fuelbreak.

Outcome	Approximate Cost
3.4 acres	\$47,300



Photo 21: Fern Canyon fuelbreak expansion.

3.3 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 135 patches were managed by the EDRR team which is led by our One Tam Partners.

Outcome	Approximate Cost
135 Patches	NA

3.4 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 restoration site:

- Potrero Meadow Douglas fir thinning and treatment of SOD impacted forest.

Outcome	Approximate Cost
70 acres	\$302,501



Photo 22: Before Potrero Meadow forest restoration.



Photo 23: During Potrero Meadow forest restoration.



Photo 24: After completion of Potrero Meadow forest restoration work.

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 restoration maintenance:

- Bolinas Ridge
- Laurel Dell
- Peters Dam
- Bolinas Summit



Photo 25: Revegetation plant maintenance at Bolinas Summit site.

Outcome	Approximate Cost
16 acres	\$13,270

3.5 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:

- West Ridgecrest Blvd.
- Pine Point

Outcome	Approximate Cost
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36 acres

\$78,831



Photo 26: Ridgecrest Douglas fir stand thinning.

Prescribed Burn in Grasslands & Oak Woodlands

The district is evaluating options for broadcast burning in grasslands and oak woodlands. Prescribed burning will help improve grassland and oak woodland by minimizing the spread of Douglas-fir, coyote brush, and other woody species. To facilitate future prescribe 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 prescribe burning operations.

Prescribed burning:

- No prescribed burns conducted.
- Developed plan for broadcast burns in Lagunitas Meadow.



Figure 2: Lagunitas Meadow and Pumpkin Ridge burn units.

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:

- Deer Park Rd
- Concrete Pipe
- Lower Eldridge Rd

Outcome	Approximate Cost
37 acres	\$47,123



Photo 27: Concrete Pipe broom removal.



Photo 28: Sky Oaks Meadow broom removal.

Goatgrass Reduction

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 while still feasible will benefit watershed biodiversity and reduce 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 off Ridgecrest Boulevard. 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.

Outcome	Approximate Cost
7 acres	\$6,809



Photo 29: Barbed goat grass (*Aegilops triuncialis*) at Pine Mt. Fire Rd.



Photo 30: 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 intends to treat infested areas twice a year to achieve 25 percent reduction in percent cover at existing infested sites and the district will eliminate 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 ParkSky Oaks Meadow,
- Ridgecrest Blvd
- MVAFB

Outcome	Approximate Cost
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103 acres	\$8,787
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Control of Other Priority Weeds

Invasions of other high priority weeds are limited and generally are scattered throughout the watersheds. Two types of weeds are considered priorities: species the district would like removed across district lands (species targets) and species that are controlled because of the priority of the site (site targets).

Priority weeds manually removed at:

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

Outcome	Approximate Cost
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28 acres	\$59,725
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Photo 31: Cheat grass (*Bromus Tectorum*) at Yolanda Trail.



Photo 32: Panic veldtgrass (*Ehrharta erecta*) at Cataract Trail.

4 Compliance Verification and Monitoring in FY2020

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, partway through fiscal year 2020. This section summarizes the district's fiscal year 2020 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 2020 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 (150 acres) • Fine fuel mowing (40 acres) • Broom removal in fuelbreaks (207 acres) • Roadside mowing (12 acres) • Dam maintenance (37 acres) 	<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 (3.4 acres) 	<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 (70 acres) • Forest fuel maintenance (16 acres) 	<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 (36 acres) • Maintenance of Douglas fir (163 acres) • Broom removal in OW&G (37 acres) • Broom maintenance in OW&G (310 acres) • Goatgrass reduction in OW&G (7 acres) • Yellow star thistle management in OW&G (25 acres) • Control of other priority weeds in OW&G (28 acres) 	<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

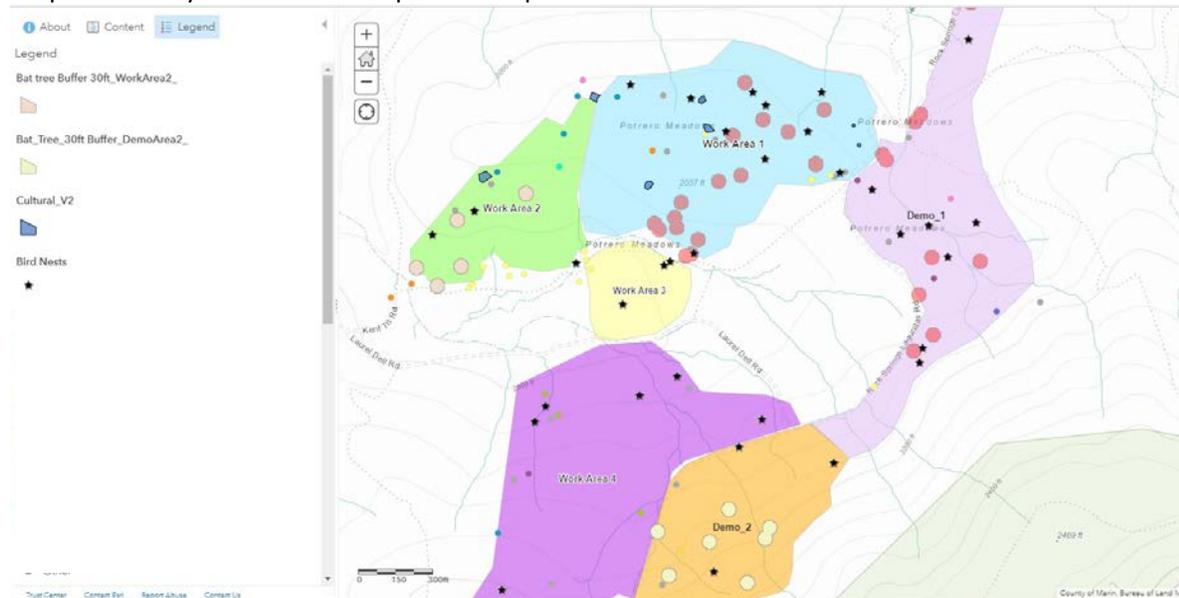
4.2 Notable Compliance and Monitoring Considerations and Findings

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 consultance. 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 Potrero Meadows and allowed district staff and contractors to use gps enable devices to avoid sensitive resources within the work areas.

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 during FY 2021.

For FY 2021 the district will be working to develop an inventory of forest pathogens and pests. As part of this process the district will develop a request for proposals and contract with a consulting or research entity to assist with the development of the inventory. It is likely that the inventory will take multiple years to fully complete but work will begin in 2021. The district will implement a trial grazing project and as part of the trial will be conducting pre and post vegetation surveys to evaluate the efficacy of grazing for fuelbreak maintenance. The district will also be entering into another contract with the U.S Forest Service to continue long-term monitoring of the Resilient Forest Pilot study.

Map 2: Forestry restoration compliance map



5 BFFIP Review & Work Plan

5.1 Review of BFFIP Management Actions

The district will continue to reduce the risk of wildfire, preserve and enhance important biological resources and ecosystem functions, and review and revise its work in response to changing conditions.

The below table compares BFFIP Year 1 Targets to actual completed work for FY 2020 and outlines BFFIP Targets for Year 2.

Management Actions	Year 1 Targets	Year 1 Completed	Year 2 Targets
MA-20.1 Maintain existing fuel breaks	150 acres	150 acres	170 acres
MA-20.2 Mow fine fuels	20 acres	40 acres	25 acres
MA-20.3 Broom removal in fuelbreaks	240 acres	207 acres	260 acres
MA-20.4 Roadside mowing	10 acres	12 acres	30 acres
MA-20.5 Dam maintenance	30 acres	37 acres	30 acres
MA-21 New fuelbreak construction	5 acres	3.4 acres	10 acres
MA22.1 EDRR surveys	150 miles	150 miles	150 miles
MA22.2 EDRR weed treatments	100 patches	135 patches	100 patches
MA23.1 Forest fuel reductions	60 acres	70 acres	60 acres
MA23.2 Forest maintenance	8 acres	16 acres	28 acres
MA23.3 Forest broadcast burn	0 Rx units	0 Rx unit	1 Rx unit
MA24.1 Douglas fir thinning	30 acres	36 acres	100 acres
MA24.2 Oak & grassland broadcast burn	1 units	0 units	2 units
MA24.3 Initial broom removal	100	37	150
MA24.4 Broom maintenance	205	310	205
MA24.5 Goatgrass removal	32	7	35
MA24.6 Yellow star removal	100	103	100
MA 24.7 Priority weeds	-- acres	28 acres	-- acres
MA 25.1 Planting	1 project	1 project	2 projects
MA25.2 Habitat restoration	0 projects	0 projects	2 projects
MA27 Weed control trials	1 project	1 planning project	2 projects

Overall the district achieved the BFFIP Year 1 vegetation management targets. The district was under for total acres of broom removed from fuelbreaks MA 20.3 by 33 acres and was under initial broom MA 24.3 removed by 63 acres. However, the district was over the total acres for broom maintenance MA 24.4 by 105 acres. This was a result of the vegetation type within the fuelbreaks scheduled for cyclical maintenance this FY and the district's focus on maintaining previously treated broom sites. The district was short on total acres of goat grass MA 24.5 treated, which was a result of work delays during COVID 19. The district was over the total acres for forest fuel reduction MA 23.1 by 10 acres and was over total acres for forest maintenance Ma 23.2 by 8 acres. The district was also over for total acres of fine fuel managed.

The below table summaries cost per acre for vegetation management activities completed during FY 2020.

Cost per Acre by Management Action		
Management Action	Description	Cost/Acre
MA-20.1	Maintain fuelbreaks	\$2,082
MA-20.2	Mow fine fuels	\$418
MA-20.3	Remove broom from fuelbreaks	\$419
MA-20.4	Roadside mowing (non-break)	\$367
MA-20.5	Dam maintenance	\$584
MA-21	Construct new fuelbreak	\$13,912
MA-23.1	Reduce fuels in forests, new work	\$4,321
MA23.2	Maintenance of forest fuels	\$831
MA-24.1	Reduce fir encroachment in grasslands and oak woodlands	\$2,050
MA-24.3	Remove broom in grasslands and oak woodlands	\$1,273
MA-24.4	Broom maintenance in grasslands and oak woodlands	\$162
MA-24.5	Reduce goatgrass	\$971
MA-24.6	Reduce yellow starthistle*	\$85
MA-24.7	Control Other Priority Weeds	\$2,133

5.2 Work Plan for FY2021

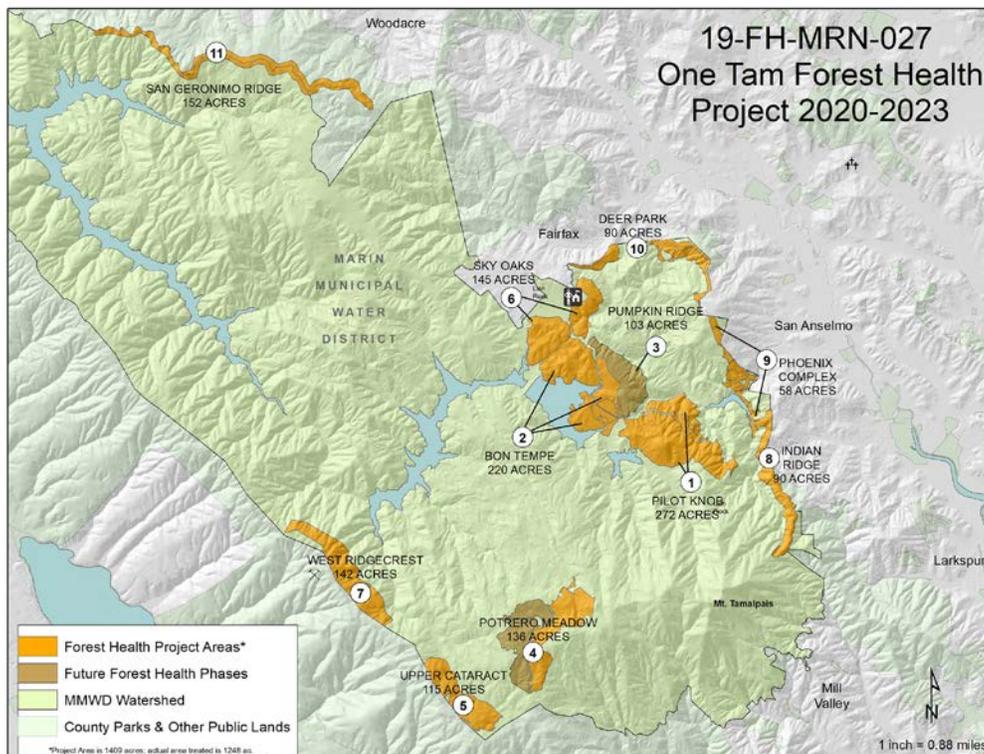
Planning and Monitoring

- Begin forest pest and pathogen inventory.
- Continue collaborating with One Tam on Regional Forest Health Strategy.
- Evaluate suitability of using drones to assist with vegetation management survey and monitoring work.
- Continue mapping of rare plants.
- Continue mapping of non-native invasive plants.
- Develop forestry restoration outreach materials to educate watershed users of the multi-benefit forestry restoration work underway.

Vegetation Management

- Complete BFFIP Year 2 vegetation management plan.
- Implement goat grazing trial within Porteous Fuelbreak.
- Continue fuelbreak expansion at BTTP and Fern Canyon.
- Widen fuelbreak along Lagunitas-Rock Spring Road.
- Reduce encroachment/pull broom outside of fuelbreaks.
- Implement prescribed burn at Lagunitas Meadow.
- Scale up forestry restoration work in accordance with BFFIP.

Map 3: Planned forestry and fuelbreak maintenance work areas for 2021-2023.



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)	