MARIN COUNTY PARKS
OPEN SPACE DISTRICT

VEGETATION & BIODIVERSITY MANAGEMENT

ANNUAL REPORT AND PROJECT LIST

2020 - 2021

Mission

Marin County Parks is dedicated to educating, inspiring, and engaging the people of Marin in the shared commitment of preserving, protecting, and enriching the natural beauty of Marin's parks and open spaces, and providing recreational opportunities for the enjoyment of all generations.

Cover photo: Parks staff removes tree limbs from a fallen tree near homes at Old St. Hilary's.

Overview

Marin County Parks manages 16,000 open space acres. We work to control invasive species, reduce fire risk, and restore native habitat.

Marin County is a regional and national leader in ecologically sound open space vegetation management. Throughout Marin County are 34 open space preserves that harbor unique species and ecosystems and provide visitors a chance to experience some of the most treasured landscapes in northern California. Our goals are to manage invasive plants, protect sensitive habitats, reduce fire fuel hazards, and provide safe and sustainable recreation opportunities for the surrounding community and future generations. Our work follows the principles set forth in the Vegetation and Biodiversity Management Plan with guidance and oversight from the seven-member Parks and Open Space Commission.

Adaptive stewardship adjusts to changing natural conditions, while working toward multiple goals. We work to control invasive species, reduce fire risk, and restore native habitat. We adjust tactics and plans based on science, research, and observations from the field. We aim to encourage the positive natural processes that support diversity throughout open space ecosystems, from healthy soil and wildfire resilience to thriving plant and wildlife communities. In partnership with local and regional fire agencies, we pursue wildfire prevention and risk reduction in the wildland interface as part of the Marin Community Wildfire Protection Plan.

We use a wide array of techniques and tools, from goats to weed wrenches and flaming devices, but most of our work is done with just our hands and a sturdy pair of gloves. Our staff focuses their time and energy on non-chemical solutions. After careful consideration, we occasionally apply limited and targeted herbicide only in critical use situations, as a means for bringing infestations under control so we can effectively manage the site organically over the long term. Our goal regarding herbicide use is “getting to zero” at each project site.

Nature doesn’t draw lines at property boundaries. Marin County Parks works closely with other regional land managers, County and regional fire agencies, community leaders, local organizations, and residents. In collaboration with One Tam we are part of the inter-agency effort to map vegetation county-wide so that we can assess fire risk, the impacts of climate change, and the spread of diseases like Sudden Oak Death. Ongoing consultation with fire agencies helps us develop strategies and tactics to reduce wildfire risk across thousands of acres.

Goats graze 120 acres behind homes and in fuelbreaks at Terra Linda / Sleepy Hollow Preserve.

Goats graze above homes to improve wildfire preparedness in Terra Linda.

Second year of regional partnership brings 1200 goats and sheep to the region...and presents new challenges.

Coordination is key. Sleepy Hollow Fire Protection District and FIRESafe Marin joined forces with Marin County Parks and adjacent private property owners to share herds across boundaries. Working together, the partners can maximize benefits for the region and explore cost-sharing opportunities.

Grazing focuses on defensible space zones near homes and strategic fuel reduction areas along fire roads and ridgelines. The goats also helped prevent the spread of one of our worst weeds, barbed goatgrass, by eating the grass before seeds could form.

Goats helped prevent the spread of barbed goatgrass, a priority invasive species within the county. We time grazing so that animals are not picking up and spreading goatgrass seeds. Early spring grazing reduces the risk of spreading seeds, and it clears out other grasses so that hand crews can easily find and remove goatgrass later in the year. Unfortunately, grazing does not directly reduce goatgrass; it only delays flowering and must be combined with additional treatments later in the year.

New challenges arise. Early spring grazing encourages invasive species like thistles because they sprout later and escape getting grazed while their competitors have been mowed down around them. We see a marked increase in yellowstar thistle within grazed or mowed areas. A second round of grazing or a controlled burn could help achieve a balance of fuel reduction and invasive species management in these areas.

The Students and Teachers Restoring a Watershed (STRAW) program digs in at Ring Mountain's freshwater marsh.

The Ring Mountain Stewardship Coordinator, a position made possible through partnership with The Nature Conservancy, engages volunteers and other work groups in ecologically important fieldwork.

Volunteer efforts focus on areas of ecological importance.

The Tiburon Peninsula has habitats and rare species that occur nowhere else in the world. From the Broom Busters to STRAW's restoration efforts, volunteers regularly work to preserve the unique serpentine ecology of Ring Mountain and Old St. Hilary's Preserve.

Community members come together to protect wetlands in the face of climate change. Volunteer efforts at Creekside Marsh, Bolinas Lagoon, Bothin Marsh, and Arambaru Island promote resiliant marshes and wetlands that can adapt and provide critical ecosystem functions in changing conditions.

Volunteers of all ages and abilities contribute through community volunteer opportunities, special events, and programs. In 2019, we collaborated on restoration and site stewardship projects with individuals, school and corporate groups, partner organizations, government agencies, and non-profit organizations. These efforts are critical in helping us restore natural habitats and engaging the community in a shared commitment to protecting Open Space lands.

2019 Volunteer Stats

1,893
VOLUNTEERS

7,337
HOURS

The Tamalpais fire crew manages fuels at the interface between residential communities and open space.

Before and after photos show a forest understory that is more resistant and resilient to fire.

In partnership with Marin County Fire...

Marin County Parks works with local communities to improve wildfire preparedness. In coordination with fire management personnel and community leaders, we identify priority areas where fuel reduction efforts will benefit the region. Labor forces such as the Tamalpais fire crew, conservation corps, contractors, and Marin County Parks staff complete fuel reduction work annually.

For the first time, a fire crew was dedicated to vegetation management on Marin County Parks land when they were not fighting fires. Over the season, this 14-person crew tackled 28 acres of fuel reduction across 15 project sites in 12 open space preserves, plus additional projets at park sites outside the open space. Projects ranged from 0.2 to 8 acres and focused on understory fuels, dead woody debris, and invasive species within the priority 100-foot defensible space zone around homes.

Contractors, conservation corps crews, and Marin County Parks staff also manage vegetation to maintain critical access routes and reduce wildfire risk. Crews prune fire roads and mow grass in areas with higher ignition risk, such as roadsides and preserve entries. Shaded fuelbreak areas are re-visited each year to keep the understory clear of tenacious invasive species that could transfer fire up into oak canopies.

2019 Fire Crew Stats

14
PEOPLE

28
ACRES TREATED

15
OPEN SPACE PROJECT SITES

Invasive Plant Inventory: Early Detection & Rapid Response (EDRR)

Early detection and rapid response (EDRR) is a management approach that capitalizes on our ability to most effectively eradicate invasive plant populations when they are small. By detecting a new invasive plant before it has a chance to spread or build a large seed bank, managers can respond early enough in the invasion process to fully eradicate the species from a given area. Through EDRR, well-informed surveillance can avoid costly long-term control efforts.
- California Invasive Plant Council

The Marin County Parks EDRR Program began in 2014 with the support of Measure A funds.
Since then, we have conducted comprehensive surveys for invasive plants throughout the 34 open space preserves. Surveys focus on the areas most likely to have new weed introductions - roads, trails, and preserve edges - as well as sensitive areas that are most critical to protect.

During surveys, we determine if a potentially invasive plant is well-established in an area. If not, survey crews will treat high-priority, small populations when manageable by one person with hand tools; otherwise, the location and data are recorded so that future treatments can be planned and prioritized.

2019 EDRR Stats

100
MILES SURVEYED (2x)

263
NEW DETECTIONS

102
RAPID RESPONSE TREATMENTS

4
RARE PLANT POPULATIONS DISCOVERED



Marin County Parks is a leader in ecologically sound Integrated Pest Management.

Treatment Methods

Hand pull. This frequently-used is simple and often most effective. It is used alone or with other methods. Even when mature plants are impossible to pull by hand (as with invasive trees), hand pulling can be used on new seedlings. Weed wrenches help to remove difficult, woody plants.

Mow. Strategically timed mowing reduces the seeds of many weeds, such as invasive annual grasses, but the window for effective control is short. Mowing can also be used to temporarily reduce fuels or to make some weeds easier to see and remove. Mowing early tends to favor plants that develop later.

Animal grazing. Cattle, sheep, goats, and horses, can help reduce fuels and weeds. They are able to cover large areas that are difficult for people to maneuver. Like all methods, they may have negative impacts that should be weighed against the positive ones so that a net benefit is obtained. Like mowing, the time of grazing will imact or favor certain species. Grazing is one of very few methods that can be applied at a landscape scale to address widespread challenges.

Flaming and prescribed burns. Environmental conditions must be perfect, and this tool is best combined with active follow-up. Safety of staff, visitors, and nearby residential areas must be the top priority. Often fire is used to burn small piles for fuel reduction projects. Prescribed burning is one of very few methods that can be applied at a landscape scale to address widespread challenges.

Insect predators and pathogens. New helpful organisms are being developed and released by qualified scientists. While they usually target agricultural weeds, some support our fight against wildland weeds.

Mulch or Tarp. Covering an area with tarps, straw, chips, and/or cardboard to prevent plant growth or seedling establishment is a good tool in some locations. However, it does not allow for preserving desirable plants in the area. Tarps are often difficult to install and maintain, and they must be removed so they don't become trash on the landscape.

Organic herbicides. Organic chemicals typically cause the top of a plant to wither. Existing products don't impact large rooted plants, so they aren't effective at managing priority wildland species, although they might provide assistance in special cases. These products should be considered over conventional herbicides when tackling annual weeds within smaller areas in residential landscaping or urban areas.

Conventional herbicides. This method, used sparingly, can help us manage some of the toughest invasive species threats. Some conventional herbicides have the ability to target the roots of a plant, which is important when it is not feasible to remove roots by hand (as with invasive trees).

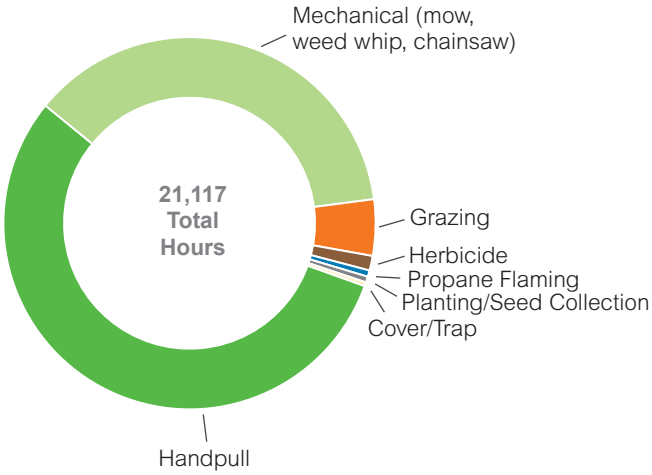
Herbicides that may be used for open space projects include:

- Garlon 4 Ultra (Tryclopyr)
- Habitat (Imazapyr)
- Fusilade II (Fluazifop)
- Milestone (Aminopyralid)
- Aquamaster (Glyphosate)
- Weed Slayer (Eugenol) - OMRI Organic
- Suppress (Caprylic/Capric acid) - OMRI Organic

Work crews spent over 21,000 hours managing vegetation in open space preserves.

We use Integrated Pest Management (IPM) practices to reduce the use of herbicide wherever possible. Only a small fraction of our work requires herbicide; when we do use it, our process is transparent. We engage our community and incorporate feedback into project plans each year, and we post notices on site and online in advance of work. We post monthly treatment reports on our website showing the different types of management we conduct throughout the year. To view treatment reports, including herbicide use data, visit *http://bit.ly/vegmonthlyreports*.

The majority of herbicide is applied under the critical use of maintaining fuelbreaks for safer communities. In other project areas small amounts of herbicide are used to manage the most tenacious weeds. Our goal is to reduce these problem species before they expand and require greater amounts of treatment with lower chances of success. With consistent follow-up, we can reduce herbicide use to zero at each project site. For example, careful herbicide use and follow-up work brought three large fuelbreak projects to the point where no herbicide was needed in 2018 or 2019.



Fuelbreak with reduced ladder fuels (left) and adjacent area with re-sprouting Eucalyptus trees in the understory (right).

5-year Report: Declining herbicide use in Eucalyptus fuelbreak

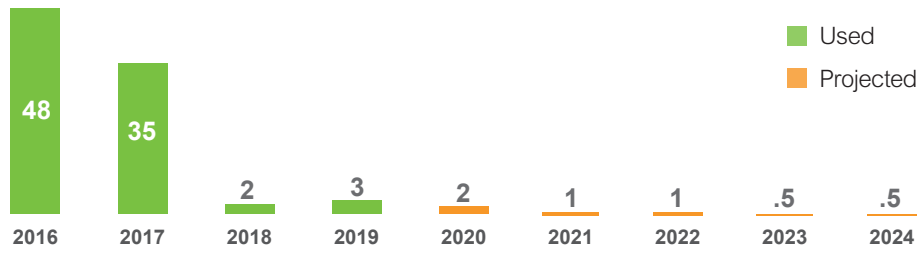
In 2015, Marin County Parks partnered with fire agencies and crews to remove small, understory Eucalyptus trees that posed a fire risk along Ridgewood Fire Road in the Terra Linda/Sleepy Hollow Preserve. The understory "ladder fuels" catch fire easily, carrying fire up into the larger tree canopy where winds could blow embers long distances from the ridgetop location.

For 4 years, trained staff carefully applied herbicide to stump sprouts in order to prevent regrowth of ladder fuel material. The amount of herbicide started at 48 ounces in 2016 and declined to only 3 ounces in 2019. With fewer trees sprouting back each year, herbicide use is projected to decline, and resprouting stumps will eventually be manageable without herbicide. To prevent Eucalyptus saplings from re-establishing in the understory, hand crews pull small saplings out by the roots using weed wrenches.

In an adjacent area, trees removed in 2015 were not treated with herbicide. Instead, a crew cut dense regrowth by hand in 2018. Goats helped to clear poison oak ahead of the crew but they did not eat Eucalyptus. The resources needed for this integrated approach are not expected to decline, whereas areas with herbicide follow-up require fewer resources over time, thereby enabling risk reduction to expand into new areas.

Based on results from the first five years, a small amount of herbicide helps achieve long-term success with both fuels and invasive species management goals. Similar techniques may be used in the future to reduce fuels in the adjacent fuelbreak area where trees continue to sprout dense regrowth.

Ridgewood Fuelbreak Eucalyptus Ladder Fuels: Herbicide Used (ounces)



Approximate Eucalyptus Fuelbreak Maintenance Cost

$1,355

WITH HERBICIDE, PER ACRE OVER 4 YEARS

$5,493

WITHOUT HERBICIDE, PER ACRE OVER 4 YEARS

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
680 Trail Mitigation	Purple star thistle, yellow star thistle	Prevent purple and yellow star thistles from spreading along trail corridor.
Alto Bowl Fire Protection	Broom (Cytisus and Genista spp.)	Keep understory fuels low by managing broom north of Bob Middagh Trail and east of fire road in wide area fuelbreaks; work with neighboring lands toward additional fuel reduction and broom control.
Baltimore Canyon: Crown to Coronet Fire Protection	Broom (Cytisus and Genista spp.)	Keep understory fuels low by managing broom in fuelbreak areas.
Baltimore Canyon: Pinchpoint Emergency Access	Broom (Cytisus and Genista spp.)	Keep emergency access clear.
Baltimore Canyon: Kent Woodlands Fire Protection	Broom (Cytisus and Genista spp.), Acacia, Mayten, pines	Create shaded fuelbreak within 100-200 feet of homes; expand understory fuel reduction by managing broom beyond 200 feet to create a wide area fuelbreak.
Big Rock Ridge Broom Control (Preserves: Pacheco Valle, Loma Verde, Ignacio Valley, Lucas Valley)	*French broom*	Prevent pioneer broom from spreading into disturbed fuelbreak areas; extirpate isolated populations from central portions of the complex. (Well-established populations may remain at preserve perimeters.)
Blithedale Summit: Blithedale Ridge Access and Fuelbreak	*Broom (Cytisus and Genista spp.)*	Keep emergency access clear; transition to annual mowing after broom is absent.
Blithedale Summit: Corte Madera Ridge Access and Fuelbreak	*Broom (Cytisus and Genista spp.)*	Keep emergency access clear; reduce understory fuels.

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
Hand pull			
		Hand pull broom plants >6" in fuelbreak areas.	
		Hand pull broom plants >6" in fuelbreak areas.	
Tryclopyr (Garlon) selectively applied over a 2-day period Note: Hand pulling in January 2018 was not effective; roots could not be extracted due to previous cutting which led to large roots in hard rocky soil.			
	Mechanically limb-up trees, thin trees/shrubs, remove dead/down woody vegetation, chip cut material back onto site or haul off site; cut and pile broom. Tryclopyr (Garlon) selectively applied to cut stumps of Acacia and Mayten		Tryclopyr (Garlon) selectively applied to seedlings and resprouting broom
Tryclopyr (Garlon) selectively applied over 1-day in fuelbreak areas Note: Only if broom is too dense to hand pull earlier in the year.		Hand pull	Hand pull
		Hand pull broom plants >6" in within 75 ft of the road.	
		Weed whip broom for at least 50 ft on each side of the road. (Complete before Feb. 1.)	

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Blithedale Summit: Hillside Fire Protection	Broom (Cytisus and Genista spp.)	Keep understory fuels low by managing broom in wide area fuelbreak.
Blithedale Summit: Middle Summit Access and Fuelbreak	Broom (Cytisus and Genista spp.)	Keep emergency access clear; reduce broom cover and fine fuels annually in the fuelbreak understory; maintain horizontal and vertical spacing; partnership with Mill Valley Fire to maintain access/fuelbreak.
Blithedale Summit: Ryder Ridge Access and Fuelbreak	Broom (Cytisus and Genista spp.)	Keep emergency access clear; reduce fine fuels in the fuelbreak understory; partnership with Mill Valley Fire to maintain access/fuelbreak.
Blithedale Summit: Two Tanks Emergency Access	Broom (Cytisus and Genista spp.) Acacia	Keep emergency access clear; reduce understory fuels
Bolinas Lagoon Invasive Cordgrass Control	Invasive cordgrass	Extirpate this species in partnership with regional goals and efforts. Note: No individuals were found in 2018 or 2019; if there are still no plants by 2023, extirpation will be achieved and we will continue to conduct early detection surveys for new introductions.
Bothin Marsh Alkalai Russian Thistle Control	Alkalai russian thistle	Protect marsh habitat.
Bothin Marsh Invasive Sea Lavender Control	Invasive sea lavender	Extirpate this early detection species that threatens intact marsh habitat.

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
		Hand pull broom plants >6" in fuelbreak areas. Note: Assessed grazing as alternate treatment in 2017, but herd logistics were too difficult for the grazing contractor to implement in this location.	
Weed whip broom and fine fuels for at least 60' on each side of the road (except south/east end where ownership is private on downhill side); prune/thin for horizontal and vertical spacing (focus thinning on common/ abundant shrub species).			
Weed whip fine fuels for at least 50' on each side of the road.			
Power tools to cut large broom and acacia; chip cut material back onto site or haul off site. Tryclopyr (Garlon) selectively applied to cut acacia stumps over a 2-day period	Trial: Pull large broom plants in section of roadside using stems left behind after high cut.		Imazapyr (Habitat) selectively applied over a 2-day period to resprouting broom stems and new seedlings
			Only if new plants are found: Imazapyr (Habitat) selectively applied once annually over a 1-day period in summer/fall.
			Hand pull
Hand pull; flame small, dense areas.		Hand pull; flame small, dense areas.	Hand pull; flame small, dense areas.

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Camino Alto Fire Protection	Broom (Cytisus and Genista spp.)	Keep understory fuels low by managing broom in wide area fuelbreaks
Cascade Canyon Broom Control	French broom	Contain broom to eastern portion of preserve by removing all broom within San Anselmo Creek subwatershed.
Cascade Canyon: Toyon Fuelbreak	Broom (Cytisus and Genista spp.)	Keep understory fuels low by managing broom within 50' of the fire road, or more where previously managed.
Deer Island Goatgrass Control	Goatgrass	Extirpate early detection populations.
Deer Island Pepperweed Control	Pepperweed	Extirpate from preserve.
Districtwide Distaff Thistle Control (Preserves: Indian Tree, Lucas Valley)	Distaff thistle	Extirpate all populations on MCP lands (early detection priority).
Districtwide Defensible Space Clearance	Invasive annual grasses (e.g. wild oat, Italian wild rye, false brome)	Remove flashy fuels near homes.
Districtwide Emergency Access	Woody species encroaching on access routes	Keep road clear for emergency vehicles
Districtwide Purple Star Thistle Control (Preserves: Little Mountain, Loma Alta, Lucas Valley, Mount Burdell, Ring Mountain, 680 Trail)	Purple star thistle	Extirpate all populations on MCP lands (early detection priority).
Districtwide Stinkwort Control	Stinkwort	Extirpate this early detection species in all priority habitats (early detection priority).

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
		Hand pull broom plants >6" in fuelbreak areas.	
		Hand pull	
		Hand pull broom plants >6" in fuelbreak areas.	
			Weed-whip in early May; hand pull in early-mid June as a follow-up to mowing.
			Imazapyr (Habitat) selectively applied once over a 2-day period
Hand pull			
Trial: Graze a second time in Cedar Hill/Cherry Hill area of Terra Linda to reduce (or prevent increase) in starthistle after goatgrass has been surveyed for and removed.			Mow; graze (Terra Linda/Sleepy Hollow)
Mow; prune			
Hand pull May-July with a second round before August to get all plants.			Hand pull May-July with a second round before August to get all plants.
Hand pull			

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Districtwide Thoroughwort Control (Preserves: Blithedale Summit, Old St. Hilary's)	Thoroughwort	Extirpate from MCP lands; protect waterways (early detection priority).
French Ranch Broom Control	Broom (Cytisus and Genista spp.)	Control broom in eastern portion of preserve to complement neighbor's control efforts; expand resources westward as resources allow.
Gary Giacomini Broom Control	Broom (Cytisus and Genista spp.)	Extirpate isolated early detection populations.
Horse Hill Fire Protection	Broom (Cytisus and Genista spp.)	Keep fuels low by managing broom; partnership with Alto Bowl Horseowners Association to manage invasives.
Kent Island Restoration & Stewardship	Broom (Cytisus and Genista spp.) Acacia Beachgrass Bird's foot trefoil European sea rocket Fennel Iceplant Invasive sea lavender Monterey pine Rosy iceplant Tall fescue	Invasive sea lavender: Eradicate from all lands in the county. (regional goal) Acacia, beachgrass, broom, fennel, iceplant, rosy iceplant, tall fescue: Extirpate from the island. Bird's foot trefoil: Reduce cover and maintain control at maintenance levels to increase habitat for a diversity of native species. European sea rocket: Reduce to maintenance levels to prevent stabilization of mobile sand processes and protect habitat for pink sand verbena. Monterey pine: Prevent spread on Kent Island while retaining mature trees as wildlife habitat.
King Mountain Fire Protection	Broom (Cytisus and Genista spp.), Acacia	Keep woody fuels low by managing broom and acacia in wide area fuelbreaks
Loma Alta Broom Control	French broom	Map broom, as time allows; assess priorities for removal.

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
		Hand pull all sites.	Hand pull all sites as a follow-up to first round of treatment.
	Cut large plants in new project areas.	Flame small seedlings in recently treated areas (initial cut/pull in 2020); hand pull in treated areas.	
		Hand pull	Hand pull
		Propane flame or hand pull especially in areas of mechanical removal and pile burning in 2018. (Volunteers needed!)	Hand pull especially in areas of mechanical removal and pile burning in 2018. (Volunteers needed!)
Hand pull all species; cut small Acacia and pine trees if too large to pull.	Hand pull all species; cut small Acacia and pine trees if too large to pull.		Hand pull all invasive sea lavender in spring before seed is produced. Hand pull all other species; cut small Acacia and pine trees if too large to pull.
Grazing and associated mechanical or hand cutting/ thinning within fuelbreak downslope of Citron Fire Road.			Tryclopyr (Garlon) selectively applied to resprouting Acacia within fuelbreak upslope of Citron Fire Road.
			Map broom.

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Lucas Valley Vernal Pool Restoration & Stewardship	Pennyroyal	Preserve rare plant habitat (Lobb's buttercup) and frog breeding habitat in roadside vernal pool
Mount Burdell Fuel Reduction and Medusahead Control	Invasive annual grasses (e.g. medusahead, wild oat, Italian wild rye, false brome)	Promote native biodiversity.
Mount Burdell Goatgrass Control	Goatgrass	Reduce seed bank for eventual extirpation.
Mount Burdell: Hidden Lake Restoration & Stewardship	Pennyroyal	Preserve rare plant habitat (Baker's navarretia) and frog breeding grounds in natural vernal pool
Mount Burdell Yellow Star Thistle Control	Yellow star thistle	Eliminate from northern and western regions of preserve.
Old Saint Hilary's Acacia Control	Acacia	Protect rare serpentine habitat and stream water flow; control Acacia to maintain low fuels in project area below homes.
Old Saint Hilary's Broom Control	Broom (Cytisus and Genista spp.)	Protect rare serpentine habitat.
Old Saint Hilary's Endangered Jewelflower Protection	Italian rye grass, wild oat	Protect federally endangered jewelflower population.
Old Saint Hilary's Pampas Grass Control	Pampas/jubata grass	Protect rare serpentine habitat and stream waterflow

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
Hand pull pennyroyal; survey for other priority targets and consider additional stewardship actions.			
Map medusahead extent; monitor residual dry matter to determine whether grazing is sufficient to help control medusahead.		Cattle grazing	Cattle grazing
Revisit sites to find missed plants; hand pull.		Propane flame seeds on ground surface before germination.	Hand pull all sites.
Hand pull pennyroyal; survey for other priority targets and consider additional stewardship actions.			
Hand pull in early July and again in early August to get all plants.	Seed or plant disturbed areas to increase competition.	Seed or plant disturbed areas to increase competition.	
	Tryclopyr (Garlon) selectively applied to newly cut stumps once annually over a 2-day period in Fall as retreatment in initial project areas or as initial treatment in adjacent areas.	Hand pull small seedlings.	Hand pull small seedlings.
		Hand pull	
			Hand pull
Hand pull			

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Ring Mountain Broom Control	Broom (Cytisus and Genista spp.)	Protect rare serpentine habitat.
Ring Mountain Bull Thistle Control	Bull thistle	Reduce density to maintenance level to protect seeps, springs, and marsh areas.
Ring Mountain: Endeavor Fire Road Repair and Restoration	Wild oat, fennel	Prevent weeds from dominating recently disturbed road edges.
Ring Mountain Fennel Control	Fennel	Protect native grasslands
Ring Mountain Harding Grass Control	Harding grass	Prevent spread into serpentine.
Ring Mountain Invasive Annual Grass Control	Invasive annual grasses (e.g. wild oat, Italian wild rye)	Reduce density in higest priority rare plant habitats and/or within test plots
Ring Mountain Mayten Control	Mayten	Protect native grasslands
Ring Mountain Monterey Pine Control	Monterey pine	
Ring Mountain Pampas Grass Control	Pampas/jubata grass	Extirpate from preserve to protect rare serpentine habitat and stream water flow; eradication not possible due to outside seed sources surrounding the preserve; annual seedling surveys in all wetland habitat to detect new plants.

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
		Hand pull Seeding/planting	
			Hand pull
			Hand pull or weed whip
Hand pulll			
			Hand pull; Fluazifop (Fusilade) or Imazapyr (Habitat) selectively applied up to twice annually over a 2-day period in spring/summer (only if hand pulling is not effective over time).
			Hand pull or weed whip
	Imazapyr (Habitat) or Tryclopyr (Garlon) selectively applied to cut in bark once annually over a 2-day period in summer/fall		
Hand pull or cut	Hand pull or cut	Hand pull or cut	Hand pull or cut
Hand pull new plants prior to flowering. (Can be done earlier, but easiest to detect green plants and flower stalks in dry/summer conditions.)			

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Ring Mountain Rosy Sandcrocus Control	Rosy sandcrocus	Prevent spread into serpentine.
Ring Mountain Tall Fescue Control	Tall fescue	Control to prevent spread in wetlands.
Ring Mountain: Taylor Road Fire Protection	Broom (Cytisus and Genista spp.) Monterey pine Harding grass Pampas grass	Keep fuels low by managing woody species (broom, pine trees); promote native and rare species (Oakland star tulip) habitat by controlling invasive species.
Ring Mountain Tocalote Thistle Control	Tocalote	Extirpate from preserve.
Ring Mountain Wild Mustard Control	Wild mustard	Prevent spread into serpentine areas.
Roy's Redwoods Broom Control	Broom (Cytisus and Genista spp.)	Extirpate isolated early detection populations.
Roy's Redwoods Harding Grass Control	Harding grass	Extirpate isolated early detection populations
Rush Creek Broom Control	French broom	Extirpate early detection populations.
Santa Venetia Marsh Restoration & Stewardship	Pepperweed, Fennel, Broom, Harding grass, Palms, Plum trees, Iceplant, Puncture vine, Salsify	Protect marsh habitat and maintain native marsh restoration site; extirpate pepperweed; prioritize species targets for overall site benefit.

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
			Hand pull
			Cover (fabric or plastic); hand pull; Imazapyr (Habitat) selectively applied once annually over a 1-day period in spring/summer.
Hand pull pampas prior to flowering.		Hand pull broom, pampas, and small pines; hand pull additional invasives, as time allows.	
			Hand pull
			Hand pull
		Hand pull	Hand pull
			Hand pull
		Hand pull	
Hand pull priority species.		Check and maintain tarps on pepperweed.	Imazapyr (Habitat) selectively applied to pepperweed over 1-day; hand pull other priority target species; hand pull other priority species

Proposed Vegetation Management Projects

PROJECT NAME	INVASIVE SPECIES TARGETS	OBJECTIVES
Terra Linda / Sleepy Hollow Goatgrass Control	Goatgrass	Containment; prevent from impacting grazing lands elsewhere in Marin County while preserving native seed bank in portions of infested serpentine habitat.
Terra Linda / Sleepy Hollow Broom Control	Broom (Cytisus and Genista spp.)	Extirpate isolated populations with large volunteer engagement.
Terra Linda / Sleepy Hollow Pampas Grass Control	Pampas/jubata grass	Extirpate isolated populations
Terra Linda / Sleepy Hollow: Ridgewood Fire Protection	Blue gum eucalyptus	Control ladder fuels within fuelbreak.

FY 2020–21 Project List

PROPOSED METHODS SUMMER (Jul–Sept '20)	FALL (Oct–Dec '20)	WINTER (Jan–Mar '21)	SPRING (Apr–Jun '21)
Burn in Luiz Fire Road area before goatgrass seed heads drop and after starthistle plants bolt (treat both species). Continue to hand pull in mowed sites or as a follow-up to previously pulled sites, as time allows.		Notes: Previous trial of OMRI product (Suppress) on goatgrass yielded poor results. Applications of grass-specific herbicide (Fusilade) in grass-dominated areas near rare plants and recent grazing in those same areas reduced goatgrass but promoted starthistle. Trial of Suppress on yellowstar seedlings (within goatgrass control areas) to reduce or eliminate need for Milestone in spring did not visibly reduce starthistle; however, spring Milestone treatment was not attempted.	Mow dense grass sites; follow-up with hand pulling in late spring or early summer. Hand pull all sparse grass sites. Selectively apply herbicide (Aquamaster) once over a 2-day period as a follow-up treatment to mowing.
		Hand pull	Hand pull
Hand pull			
	Tryclopyr (Garlon) selectively applied to newly cut stumps over a 2-day period in fuelbreak area	Hand pull small plants if feasible to remove root.	

Vegetation and Biodiversity Team

Mischon Martin
Chief of Natural Resources and Science

Mischon has worked professionally in Natural Resources and Science for over 20 years. In addition to her current role, she has served in a number of positions with Marin County Parks, including Resource Ecologist and Natural Resources Program Manager. Mischon oversees the planning and implementation of a variety of landscape-level restoration and vegetation management projects throughout Marin County parks and open space preserves. Her work focuses on improving habitat for endangered species, as well as reducing fire fuels and managing the spread of invasive species. Mischon holds a Bachelor of Science in Biology.

Julian Geoghegan
Resource Specialist

Julian has worked for a variety of conservation agencies over the last decade, and began working for Marin County Parks in 2017. His work focuses on invasive plant management, habitat restoration, and vegetation mapping, with a particular interest in rare native plants. Julian holds a Bachelor of Science in Biology.

Sarah Minnick
Vegetation and Fire Ecologist

Sarah has over ten years of experience in land conservation and vegetation management, including six years working for the National Park Service. In her current position at Marin County Parks, she focuses on vegetation and biodiversity management, including habitat restoration and monitoring, fire protection, invasive weed control, rare species mapping, monitoring and preservation, and community engagement. She holds an undergraduate degree in Mathematics/Biology and a graduate degree in Conservation Ecology.

Greg Reza
Volunteer Program Coordinator

Greg has organized volunteer projects at Marin County parks and open spaces for over 20 years. He builds community with local schools, groups, businesses, and non-profit organizations, coordinating the many thousands of volunteers each year needed to support ecologically sound vegetation management and habitat restoration. Greg holds a Bachelor's degree in Environmental Studies and Planning with a concentration in Conservation and Restoration.

Vegetation and Biodiversity Team

Seasonal Field Technicians and Assistants

Early Detection/Rapid Response Technician – Practices and promotes weed prevention and biosecurity within our organization; engages our neighbors about invasive plants.

Biological Monitor Technician – Oversees bird habitat and compliance surveys (e.g. preconstruction surveys and worker awareness trainings).

Wildlife Technician – Oversees the Marin Wildlife Picture Index Project and assists with the Bat Monitoring Project.

Nursery Technician – Oversees daily operations in our new native plant nursery, working with volunteers to provide material support for ongoing restoration projects.

Vegetation Mapping Technician – Survey for and map rare plant populations and fuel break vegetation.

Trail Technician – Oversees trail maintenance crews, regulatory permitting compliance, trail revegetation projects, analyzes visitor use data, assists the Open Space Planner in the project management of the road and trail system.

Field Assistants – Work alongside technicians and full-time staff providing capacity to achieve vegetation and biodiversity goals including weed management, project implementation, and data collection.