

Vegetation and Biodiversity Management Work Plan

[Draft]

This document summarizes vegetation and biodiversity management projects for Marin County open space preserves for July 2017 to June 2018. Our mission is to preserve, protect, and enrich the natural beauty of Marin's parks and open spaces, and provide recreational opportunities for the enjoyment of all generations.

Vegetation must be actively managed to reduce fire hazards and protect biodiversity. Infestations of invasive weeds are found within the majority of our preserves. Unchecked, these aggressive weeds can increase the possibility of wildfire near residential developments, damage wildland ecosystems, and endanger protected species. If we don't eradicate, control, and contain invasive vegetation, it will irreversibly alter Marin's iconic landscape.

MCOSD is committed to reducing herbicide use. This year we expect to spend \$1.7 million on herbicide-free vegetation work, with volunteers contributing an additional 10,000+ hours of labor. Last year we treated 1,780 acres of vegetation. Less than 1% required a small amount of herbicide as part of a treatment plan. We apply limited and targeted herbicide in carefully considered critical use situations, where we must protect communities from the threat of a wildfire, protect endangered species, or preserve local agriculture from invasive weeds.

Effective invasive plant management requires integrating multiple methods into a site-specific, multi-year treatment program. MCOSD develops an individual treatment plan for each site. In many cases, multiple types of treatments are required over the span of years. Treatments are timed, based on season and conditions, to optimize effectiveness. Effectiveness is monitored and treatment plans modified based on how the area responds. The goal may be to eradicate, control, or contain, depending on the potential harm of the infestation.

For each site, MCOSD may make use of any of the following organic methods.

- Manual: hand pulling, weed wrenching, weed whacking, mulching, tarping, reseeding
- Mechanical: flail or rotary mowing, excavator chassis equipment, equipment pulled behind a farm tractor, hydro-mechanical obliteration
- Cultural: animal grazing, prescribed burns, physical barriers, early detection with rapid response, preventing seed spread, avoiding unnecessary land disturbances
- Biological: insect predators or pathogens that prohibit invasive weed growth
- Organic Products: naturally occurring compounds like salt or clove oil that inhibit or prevent invasive weed growth

Conventional chemical compounds that inhibit or prevent the growth of plants are only used as a last resort.

Marin County Parks encourages participation in our decision making processes. We share knowledge with other regional land managers. We engage with Marin residents who are passionate about supporting open spaces. We gather data from the field and monitor scientific research. Collaborative conversations about supporting healthy ecosystems while reducing fire risk help us continuously innovate and improve.

Biodiversity strengthens Marin County wildlands so they can endure environmental changes. Biodiverse ecosystems provide food and shelter for a wider range of species, create wildlife corridors across populated areas, purify natural waters, and store excess carbon in plants and soils. Biodiversity will help our preserves adapt to global warming, climate change, and other environmental challenges. Vegetation management is a necessary component in ensuring Marin County open spaces remain healthy and thrive for future generations.

Region 1

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Alto Bowl Fire Protection	Alto Bowl	Broom (Cytisus and Genista spp.)	Hand pull (volunteers) Power tools	Tryclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer in fuelbreak areas north of Bob Midaugh Trail and east of fire road	Fire protection	Engage community Promote biodiversity Reduce fire fuel Transition to zero herbicide
Crown to Coronet Fire Protection	Baltimore Canyon	Broom (Cytisus and Genista spp.)	Power tools	Tryclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer in fuelbreak areas	Fire protection	Promote biodiversity Reduce fire fuel Transition to zero herbicide
Blithedale Summit Thoroughwort Control	Blithedale Summit	Thoroughwort	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Corte Madera Ridge Access and Fuelbreak	Blithedale Summit	Broom (Cytisus and Genista spp.)	Mow			Maintain emergency access Reduce fire fuel
Ryder Ridge Access and Fuelbreak	Blithedale Summit	Broom (Cytisus and Genista spp.)	Mow			Maintain emergency access Reduce fire fuel
Two Tanks Emergency Access	Blithedale Summit	Broom (Cytisus and Genista spp.)	Power tools	Tryclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer in fuelbreak areas	Fire protection	Maintain emergency access Promote biodiversity Transition to zero herbicide
Hillside Fire Protection	Blithedale Summit	Broom (Cytisus and Genista spp.)	Power tools	Tryclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer in fuelbreak areas	Fire protection	Promote biodiversity Reduce fire fuel Transition to zero herbicide
Blithedale Ridge Access and Fuelbreak	Blithedale Summit	Broom (Cytisus and Genista spp.)	Hand pull (contractors)			Promote biodiversity Reduce fire fuel
Middle Summit Access and Fuelbreak	Blithedale Summit					Maintain emergency access Reduce fire fuel
Camino Alto Fire Protection	Camino Alto	Broom (Cytisus and Genista spp.)	Hand pull Power tools	Tryclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer in fuelbreak areas except hand pull area east of Camino Alto Fire Road	Fire protection	Promote biodiversity Reduce fire fuel Transition to zero herbicide
Horse Hill French Broom Control	Horse Hill	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide

Region 1 *(continued)*

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Horse Hill Fire Protection	Horse Hill	Broom (Cytisus and Genista spp.)	Hand pull (volunteers) Power tools Flaming			Engage community Promote biodiversity Reduce fire fuel
King Mountain Fire Protection	King Mountain	Acacia, Broom (Cytisus and Genista spp.)	Goat grazing	Triclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer in fuelbreak areas north of fire road	Fire protection	Promote biodiversity Reduce fire fuel Test alternative methods Transition to zero herbicide

Region 2

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Toyon Fuelbreak	Cascade Canyon	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Reduce fire fuel
Cascade Canyon Broom Control	Cascade Canyon	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
French Ranch Pampas Grass Control	French Ranch	Pampas/Jubata Grass	Hand pull			Promote biodiversity Prevent spread and need for herbicide
French Ranch Broom Control	French Ranch	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Gary Giacomini Broom Control	Gary Giacomini	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Maurice Thorner Broom Control	Maurice Thorner	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Roys Redwoods Broom Control	Roys Redwoods	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide

Region 2 *(continued)*

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Roys Redwoods Harding Grass Control	Roys Redwoods	Harding Grass	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Loma Alta Star Thistle Control	Loma Alta	Star Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Loma Alta Broom Control	Loma Alta	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide

Region 3

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Ignacio Valley Broom Control	Ignacio Valley	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Indian Valley Broom Control	Indian Valley	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Loma Verde Star Thistle Control	Loma Verde	Star Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Loma Verde Broom Control	Loma Verde	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Lucas Valley Distaff Thistle Control	Lucas Valley	Distaff Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Lucas Valley Star Thistle Control	Lucas Valley	Star Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Pacheco Valle Broom Control	Pacheco Valle	Broom (Cytisus and Genista spp.)	Hand pull	Triclopyr (Garlon) selectively applied once annually over a 1-day period in spring/summer in fuelbreak areas	Fire protection	Promote biodiversity Prevent spread and need for additional herbicide Reduce fire fuel Transition to zero herbicide

Region 4

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Deer Island Goatgrass Control	Deer Island	Goatgrass	Hand pull Power tools	Glyphosate (Aquamaster) selectively applied to plants as a follow-up treatment once in spring/summer following a spring mowing	Agricultural threat Species protection	Promote biodiversity Prevent spread and need for herbicide
Deer Island Pepperweed Control	Deer Island	Pepperweed		Imazapyr (Habitat) selectively applied once annually over a 2-day period in spring/summer	Species protection	Promote biodiversity Prevent spread and need for additional herbicide Transition to zero herbicide
Indian Tree Star Thistle Control	Indian Tree	Star Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Little Mountain Distaff Thistle Control	Little Mountain	Distaff Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Little Mountain Star Thistle Control	Little Mountain	Star Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Mt. Burdell Goatgrass Control	Mt. Burdell	Goatgrass	Hand pull	Glyphosate (Aquamaster) selectively applied to plants as a follow-up treatment once in spring/summer following a spring mowing	Agricultural threat Species protection	Promote biodiversity Prevent spread and need for herbicide
Mt. Burdell Fuel Reduction and Medusahead Control	Mt. Burdell	Invasive annual grasses (e.g. Medusahead, Avena spp., Festuca Perennis, Brachypodium Distachyon)	Cattle grazing			Promote biodiversity Prevent spread and need for herbicide Reduce fire fuel
Hidden Lake Rare Navarretia Protection	Mt. Burdell	Pennyroyal	Hand pull			Promote biodiversity
Mt. Burdell Star Thistle Control	Mt. Burdell	Star Thistle	Hand pull Seed/Planting			Promote biodiversity Prevent spread and need for herbicide
Rush Creek Broom Control	Rush Creek	Broom (Cytisus and Genista spp.)	Hand pull Seed/Planting			Promote biodiversity Prevent spread and need for herbicide

Region 5

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Bald Hill Fuel Reduction	Bald Hill	Broom (Cytisus and Genista spp.)	Grazing Hand pull			Promote biodiversity Prevent spread and need for herbicide Reduce fire fuel
Santa Venetia Marsh Broom Control	Santa Venetia Marsh	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Santa Venetia Marsh Fennel Control	Santa Venetia Marsh	Fennel	Hand pull Flower and seed removal			Promote biodiversity Prevent spread and need for herbicide
Santa Venetia Marsh Harding Grass Control	Santa Venetia Marsh	Harding Grass	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Santa Venetia Marsh Pepperweed Control	Santa Venetia Marsh	Pepperweed	Cover (fabric or plastic)	Imazapyr (Habitat) selectively applied once annually over a 1-day period in spring/summer	Species protection	Promote biodiversity Prevent spread and need for herbicide
Terra Linda/Sleepy Hollow Goatgrass Control	Terra Linda/Sleepy Hollow	Goatgrass	Hand pull Mow Propane flaming Seed/Planting	Fluazifop (Fusilade) applied to select areas over 1 day in winter/spring; Glyphosate (Aquamaster) selectively applied as a follow-up treatment once annually over a 2-day period in spring/summer following a spring mowing	Agricultural threat Species protection	Promote biodiversity Prevent spread and need for additional herbicide Transition to zero herbicide
Terra Linda/Sleepy Hollow Star Thistle Control	Terra Linda/Sleepy Hollow	Star Thistle	Hand pull Propane flaming			Promote biodiversity Prevent spread and need for herbicide
Terra Linda/Sleepy Hollow Pampas Grass Control	Terra Linda/Sleepy Hollow	Pampas/Jubata Grass	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Ridgewood Fire Protection	Terra Linda/Sleepy Hollow	Blue Gum	Power tools	Triclopyr (Garlon) selectively applied to cut stumps once annually over a 2-day period in summer/fall in fuelbreak area	Fire protection	Promote biodiversity Reduce fire fuel Transition to zero herbicide
Terra Linda/Sleepy Hollow Broom Control	Terra Linda/Sleepy Hollow	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Lucas Valley Road Rare Buttercup Protection	Terra Linda/Sleepy Hollow	Pennyroyal	Hand pull			Promote biodiversity

Region 6

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Bolinas Lagoon Acacia Control	Bolinas Lagoon	Acacia	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon Beachgrass Control	Bolinas Lagoon	Beachgrass	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon Broom Control	Bolinas Lagoon	Broom (Cytisus and Genista spp.)	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon Fennel Control	Bolinas Lagoon	Fennel	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon Iceplant Control	Bolinas Lagoon	Iceplant	Hand pull Cover with fabric or plastic			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon Invasive Cordgrass Control	Bolinas Lagoon	Invasive Cordgrass		Imazapyr (Habitat) selectively applied once annually over a 1-day period in summer/fall	Species protection	Promote biodiversity Prevent spread and need for additional herbicide Transition to zero herbicide
Bolinas Lagoon Invasive Sea Lavender Control	Bolinas Lagoon	Invasive Sea Lavender	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon Tall Fescue Control	Bolinas Lagoon	Tall Fescue	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bolinas Lagoon European Sea Rocket Control	Bolinas Lagoon	European Sea Rocket	Hand pull			Promote biodiversity
Bolinas Lagoon Rosy Iceplant Control	Bolinas Lagoon	Rosy Iceplant	Hand pull			Promote biodiversity
Bolinas Lagoon Bird's Foot Trefoil Control	Bolinas Lagoon	Bird's Foot Trefoil	Hand pull			Promote biodiversity
Bolinas Lagoon Monterey Pine Control	Bolinas Lagoon	Monterey Pine	Hand pull			Promote biodiversity

Region 6 *(continued)*

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Bothin Marsh Invasive Sea Lavender Control	Bothin Marsh	Invasive Sea Lavender	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Bothin Marsh Alkalai Russian Thistle Control	Bothin Marsh	Alkalai Russian Thistle	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Old St. Hilary's Broom Control	Old St. Hilary's	Broom (Cytisus and Genista spp.)	Hand pull Seeding/planting Propane flaming	Tryclopyr (Garlon) selectively applied once annually over a 1-day period in spring/summer	Species protection	Community engagement Promote biodiversity Prevent spread and need for additional herbicide Transition to zero herbicide
Old St. Hilary's Fennel Control	Old St. Hilary's	Fennel	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Old St. Hilary's Endangered Jewelflower Protection	Old St. Hilary's	Italian Rye Grass, invasive annual grasses	Hand pull			Promote biodiversity
Old St. Hilary's Pampas Grass Control	Old St. Hilary's	Pampas/Jubata Grass	Hand pull Power tools			Promote biodiversity Prevent spread and need for herbicide
Old St. Hilary's Thoroughwort Control	Old St. Hilary's	Thoroughwort	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Taylor Road Fire Protection	Ring Mountain	Broom (Cytisus and Genista spp.)	Hand pull	Tryclopyr (Garlon) selectively applied once annually over a 2-day period in spring/summer	Fire protection Species protection	Promote biodiversity Reduce fire fuel Transition to zero herbicide
Ring Mountain Broom Control	Ring Mountain	Broom (Cytisus and Genista spp.)	Hand pull Seeding/planting			Community Engagement Promote biodiversity Prevent spread and need for herbicide
Ring Mountain Fennel Control	Ring Mountain	Fennel	Hand pull Flower and seed removal			Community Engagement Promote biodiversity Prevent spread and need for herbicide
Ring Mountain Harding Grass Control	Ring Mountain	Harding Grass	Hand pull	Fluazifop (Fusilade) or Imazapyr (Habitat) selectively applied to cut in bark once annually over a 2-day period in summer/fall	Species protection	Promote biodiversity Prevent spread and need for herbicide

Region 6 *(continued)*

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Ring Mountain Mayten Control	Ring Mountain	Mayten		Imazapyr (Habitat) or Tryclopypyr (Garlon) selectively applied to cut in bark once annually over a 2-day period in summer/fall	Species protection	Promote biodiversity Prevent spread and need for additional herbicide Transition to zero herbicide
Ring Mountain Pampas Grass Control	Ring Mountain	Pampas/Jubata Grass	Hand pull Power tools			Promote biodiversity Prevent spread and need for herbicide
Ring Mountain Star Thistle Control	Ring Mountain	Star Thistle	Hand pull			Community Engagement Promote biodiversity Prevent spread and need for herbicide
Ring Mountain Tall Fescue Control	Ring Mountain	Tall Fescue	Hand pull	Imazapyr (Habitat) selectively applied once annually over a 1-day period in spring/summer	Species protection	Promote biodiversity Prevent spread and need for additional herbicide Transition to zero herbicide
Endeavor Fire Road Repair and Restoration	Ring Mountain	Wild Oat, Fennel	Power tools Propane flaming Planting			Promote biodiversity
Ring Mountain Invasive Annual Grass Control	Ring Mountain	Invasive annual grasses (e.g. Avena spp., Festuca Perennis, Brachypodium Distachyon)	Hand pull			Promote biodiversity Test alternative methods
Ring Mountain Bull Thistle Control	Ring Mountain	Bull Thistle	Hand pull			Community Engagement Promote biodiversity Prevent spread and need for herbicide
Ring Mountain Wild Mustard Control	Ring Mountain	Wild Mustard	Hand pull			Promote biodiversity Prevent spread and need for herbicide
Ring Mountain Monterey Pine Control	Ring Mountain	Monterey Pine	Hand pull			Promote biodiversity
Ring Mountain Rosy Sandcrocus Control	Ring Mountain	Rosy Sandcrocus	Hand pull			Promote biodiversity Prevent spread and need for herbicide

Districtwide

PROJECT NAME	PRESERVE	INVASIVE SPECIES TARGETS	PROPOSED ORGANIC METHODS	PROPOSED CONVENTIONAL METHODS	CRITICAL USE	OBJECTIVES
Emergency Access	Districtwide	Invasive annual grasses	Mow			Allow access in case of emergency
Defensible Space	Districtwide	Woody species encroaching on access routes	Prune			Allow access in case of emergency