

**ATTACHMENT B. Informal Alternatives Assessment of Systemic Herbicides**

10/28/15 Version, San Francisco Department of the Environment

Based on a series of meetings with Bay Area public agency pest managers, Summer, 2015.

Uses	Est. Need for Herbicides (solid=greater)	Chemical Exposure Potential <sup>2</sup>	Impacts of No Control			Impacts of Alternatives	
			Public	Workers	Environment	Alternatives Available	Potential Impacts
<b>General types of use</b>							
High fire risk areas	◐	Variable depending on closure policy and total area treated	Fire risk from dry weeds, dense trees & shrubs	None	Fire risk to ecosystems	Mowing, mechanical removal, replacement with more suitable species	Fire risk from mechanical/mowing, cost of relandscaping
Fenced Renovations	◐	Low for public; variable for environment depending on slope and area	Loss of intended use	None	None	Sheet mulching, solarization	Not effective in some circumstances. Requires large time window. Higher costs.
Areas with mandated controls (airports, utility rights of way)	●	Very low for public (inaccessible); medium-high for environment due to runoff from paved surfaces & large areas	N/A	N/A	N/A	Repeated use of reduced-risk herbicides, flaming, mechanical removal	Need for repeated treatment makes these unfeasible for some situations (airports); fire hazards, eye hazards for workers, costs
Poison oak near pathways/use areas	●	Variable for public depending on closure policy; variable for environment	Allergic dermatitis from poison oak	Allergic dermatitis from poison oak	None	Repeated use of reduced risk herbicides, goats	Burndown herbicides ineffective due to rapid resprouting & eye hazards for workers. Goats will eat all foliage. Mechanical removal not feasible due to worker hazard.
Deep-rooted invasive plants or trees	●	Low-medium for public depending on closure policy; variable for environment depending on area treated	Loss of intended use, decrease in habitat and scenic value	None	Risk to rare plants and animals from invasive plants.	Repeated mechanical removal, repeated goat grazing	Disruption from physical removal, higher costs, bare soil may worsen weed problems. Goats will eat all foliage.
Traffic visibility risk areas	◐	Low for public due to inaccessibility; low-medium for environment	Increase in traffic accidents from high weeds	None	None	Repeated mechanical removal, reduced-risk herbicides, replanting with lower-growing plants	Traffic hazards to workers. More frequent treatments and higher costs.
<b>Specific areas of use</b>							
Natural areas	●	Low for public due to inaccessibility, dispersal of treatments; low for environment due to dispersed treatments	Decrease in habitat and scenic value, possible fire hazards	None	Risk to rare plants and animals from invasive plants.	Manual removal, repeated use of reduced risk herbicides	Damage to sensitive environments by manual removal, damage to nontarget plants by burndown herbicides
Tree wells	○	Low-medium for public depending on accessibility; low for environment based on area treated	Decrease in scenic value	None	None	Mulching, hand removal, weed barriers, ground cover	Strain injuries from hand removal. Tree damage from improper mulching or weed barriers
Fence lines	○	Low-medium (see above)	Decrease in scenic value	None	None	Concrete or recycled rubber mow strips, hand weeding, reduced-risk herbicides.	Strain injuries from hand removal. Burndown herbicides require repeated treatments & pose eye hazards. Cost of mow strips.
Unpaved paths	○	Low-medium (see above)	Decrease in scenic value	None	None	Mechanical removal, surface sealants	Nutrient runoff from some surface sealants
Golf courses	●	Low-high for public depending on closure low-medium for environment based on area treated	Lower playability. Field may not meet cosmetic requirements for tournament play.	None	None	Maintaining dense, healthy turf, manual removal for some weeds	Strain injuries from manual removal. Ineffective for some weeds; field may not meet cosmetic requirements for tournament play. Increased costs.
Sports fields	◐	Low-high for public depending on closure low-medium for environment based on area treated	Minor loss of traction and resultant injuries. Field may not be usable for some sports, or usable for reduced time	None	None	Maintaining dense, healthy turf, manual removal for some weeds	Strain injuries from manual removal. Ineffective for some weeds and some uses. Increased costs.
Meadows	○	Low-high for public depending on closure; low-medium for environment based on area treated	Increased bee sting hazard, change in appearance of meadow	None	None	Mechanical removal, change definition of "meadow" to allow flowers, other plants	Increased bee sting hazard. Strain injuries from hand removal - probably not feasible in most cases due to size of area
Established landscapes/edges/between plants/building perimeters	○	Low-medium for public depending on accessibility; low medium for environment based on area treated	Weedy landscapes, decrease in scenic value, loss of intended use, possible fire hazards	None	None	Mulching, hand removal, weed barriers, ground cover	Strain injuries from hand removal. Cost issues. Not effective for some weeds.
Aquatic weeds	◐	Very low for public based on accessibility; high for environment	Weed-clogged waterways decrease in scenic value, loss of intended use	None	Possible ecosystem effects, fish die-offs	Mechanical control, herbivorous fish, dyes	Strain injuries from mechanical control, ecosystem effects - especially from fish. Fish not legal in many locales.
Childrens Play Areas	○	Medium-high for public based on closure low-medium for environment	Weedy landscapes, loss of intended use	None	None	Hand/mechanical control, reduced-risk herbicides, resodding	Increased costs. Eye irritation risk from RR herbicides
Unlandscaped vacant lots	○	Low for public due to inaccessibility; low-medium for environment	Possible fire hazards	None	None	Hand/mechanical control, reduced-risk herbicides, relandscaping	Removing all weeds creates erosion potential. Costs of relandscaping.

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Parking lots	●	Low-Medium for public depending on closure; medium-high for environment due to runoff potential	Weedy parking lots	None	None	Hand/mechanical control, repeated reduced-risk herbicides, flaming, sealing cracks	Flaming not safe for 24-hr lots; strain injuries from mechanical control, cost and access issues for 24-hr lots
Median strips - landscaped - wide	●	Low for public due to inaccessibility; low-medium for environment	Decrease in scenic value, possible fire or traffic hazards	None	None	Hand/mechanical control, repeated reduced-risk herbicides, relandscape with ground covers/mulch	Strain injuries from mechanical control, eye irritation hazards for RR herbicides, cost issues
Median strips - landscaped or unlandscaped - narrow	●	Very low for public due to inaccessibility; low-medium for environment	Decrease in scenic value, possible fire or traffic hazards	None	None	Hand/mechanical control, repeated reduced-risk herbicides, relandscape with ground covers/mulch	Traffic safety hazard for workers, strain injuries from mechanical control, eye irritation hazards for RR herbicides, cost issues
Roadside weeds	●	Low-medium for public due to inaccessibility; low-medium for environment	Fire hazards, traffic visibility hazards	None	None	Hand/mechanical control, repeated reduced-risk herbicides	Fire hazards from machinery and mowing, eye irritation hazards for burndown herbicides, cost issues
Pavement cracks	○	Low-medium for public due to inaccessibility; medium-high for environment due to runoff potential	Weedy sidewalks and plazas, loss of aesthetic value	None	None	Hand/mechanical control, repeated reduced-risk herbicides, flaming, caulking cracks.	Strain injuries from mechanical control, eye irritation hazards for burndown herbicides, fire hazards from flaming, cost issues

<sup>1</sup>Rating of estimated need for systemic herbicide use: Solid circle = high need, empty circle = little or no need.

High need areas: Medium to high risk to the public or environment if no control is undertaken, and/or control mandated by law, combined with a lack of safer alternatives.

Low need areas: Low risk if no control is undertaken, or medium risk if safer alternatives are available.

Medium need areas: All other cases.

<sup>2</sup>Chemical exposure potential: Estimated level of exposure to chemical treatments under typical scenarios.

High potential: Large volumes of chemical applied as broadcast spray

Low potential: Small volumes applied, or medium volumes applied in a bait or other formulation that prevents exposure