Use of Indaziflam for Site Preparation at Bommer Canyon Preserve

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Habitat Restoration & Enhancement Program

Irvine Ranch Conservancy

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Bommer Canyon Overview

- 4,000-acre preserve (City of Irvine)
- Popular recreation area bordering urban development
- Management services by IRC
- Two restoration projects underway
- City IPM policy limits herbicide use (glyphosate and Prop 65)

Vicinity map of Bommer Canyon Preserve

0 0.5 1 Miles

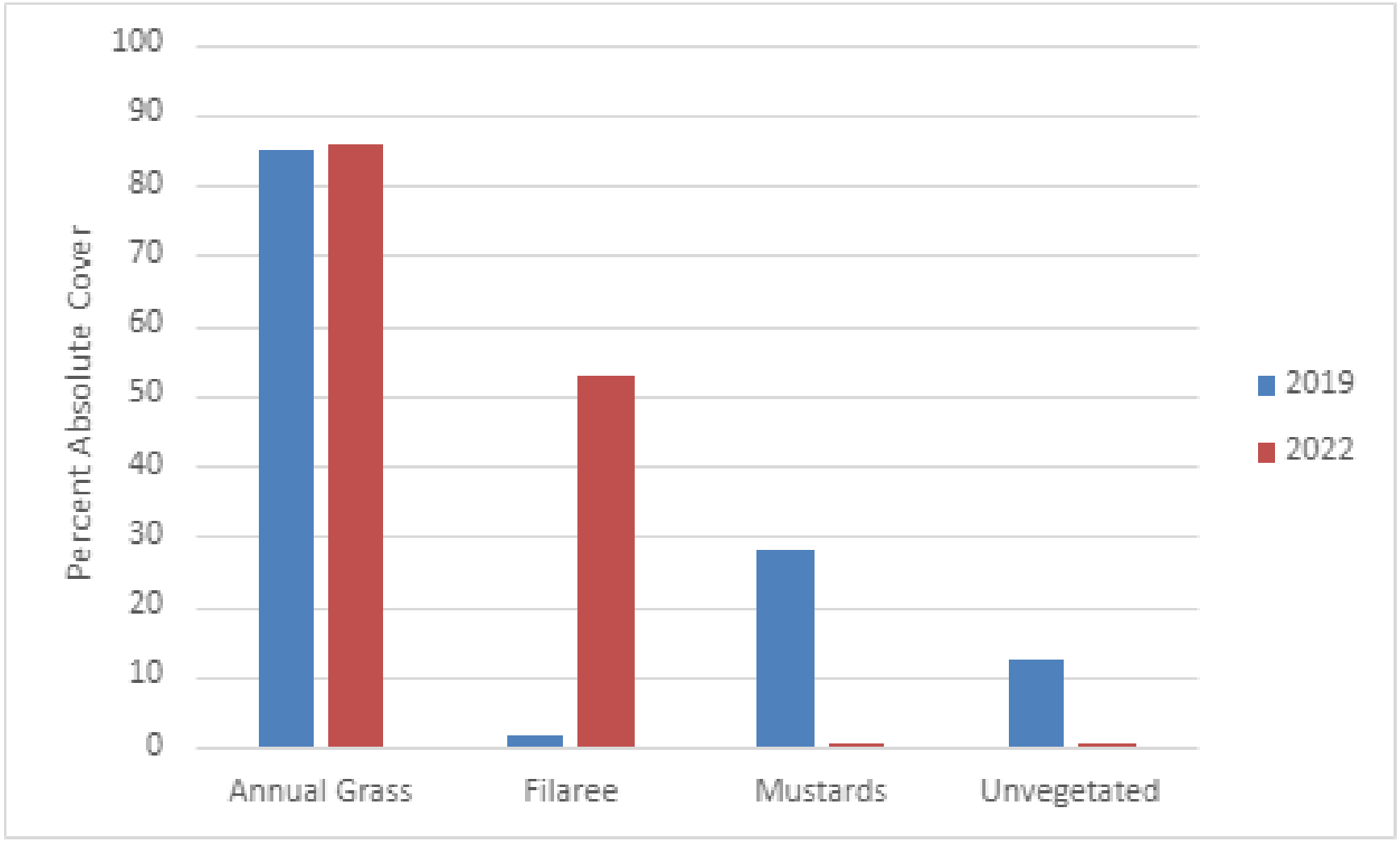
N

Map created by Irvine Ranch Conservancy October 2025

Bommer Meadow Project (2018 to present)

- 9.8 acres
- Restoration to oak savannah and CSS
- Seed-based restoration requires <u>site preparation</u>
- Non-chemical techniques tried:
  - organic herbicides, grazing, mowing, small-scale solarization and container planting
- Non-chemical techniques not effective at scale

Non-chemical Site Preparation Results



Indaziflam

- Pre-emergent, broad-spectrum herbicide
- Cellulose biosynthesis inhibitor (Group 29)
- Trade names Esplanade 200SC, also Rejuvra, Alion
- Persistent in soil (eight months, up to three years?)
- Used to manage annual grasses in rangelands, around orchards/ perennial crops, ornamentals, hardscape settings
- Label includes “release and restoration of desirable vegetation in parks and open spaces”
- Very low rates: 3.5 to 7 fl oz/acre (max of 10 fl oz/ acre in 12-month period)
- Requires activation from rainfall within several weeks of application

Indaziflam for Restoration Site Preparation?

Advantages

- Persistence
- Low rates
- One time application

Disadvantages

- Uncertain duration of activity
- Precise application required
- No control of perennials
- Impacts to native seedbank
- Effects on soil biota?

Indaziflam at Bommer Meadow

- In 2022, City allowed use of Indaziflam (Esplanade 200SC) and Triclopyr (Garlon 4 Ultra) for site preparation
- Indaziflam applied December 2022
- Rate: 6.2 oz/acre, 0.28 oz/ gallon
- Suspended concentrate
- Applied via spray trailer (4 mph, 50 psi, 21.5 gallons/ acre)

Seeding Trial One Year after Indaziflam Applied

Tasks Prior to Year 2 Seeding

<u>Control of Indaziflam resistant weeds</u>:

- *Erigeron canadensis*
- *Salsola tragus*
- *Croton setiger*

<u>Clearing the Seedbed</u>:

- Mowing
- Raking

Seeding Results Year 2 after Indaziflam Applied

Species		Seed Rate (# PLS)	Germination	Family	Seed Size
Acmispon glaber var. glaber		16	No	Fabaceae	Large
Artemisia californica		10	No	Asteraceae	Small
Bromus carinatus		8	No	Poaceae	Medium
Corethrogyne filaginifolia		4	No	Asteraceae	Small
Cryptantha intermedia		2	Yes	Boraginaceae	Medium
Deinandra fasciculata		2.4	Yes	Asteraceae	Small
Encelia californica		8	Yes	Asteraceae	Large
Eriogonum fasciculatum var. fasciculatum		12	Yes	Polyganaceae	Small
Eschscholzia californica		8	No	Papaveraceae	Small
Eucrypta chrysanthemifolia		4	No	Hydrophylaceae	Medium
Grindelia camporum		1.6	No	Asteraceae	Large
Isocoma menziesii var. vernonioides		8	No	Asteraceae	Small
Lupinus succulentus		12	No	Fabaceae	Large
Malacothamnus fasciculatum		4	No	Malvaceae	Large
Malacothrix saxatilis var. tenuifolia		0.8	No	Asteraceae	Small
Phacelia cicutaria var. hispida		2	Yes	Hydrophylaceae	Medium
Phacelia parryi		2.4	No	Hydrophylaceae	Medium
Plantago erecta		8	No	Plantaginaceae	Large
Salvia mellifera		12	Yes	Lamiaceae	Large
Stipa pulchra		24	No	Poaceae	Medium
Croton setiger	x		Yes	Euphorbiaceae	Large
Erigeron canadensis	x		Yes	Asteraceae	Small
Salsola tragus	x		Yes	Chenopodiaceae	Medium

Indaziflam Activity Still Evident after Two Years

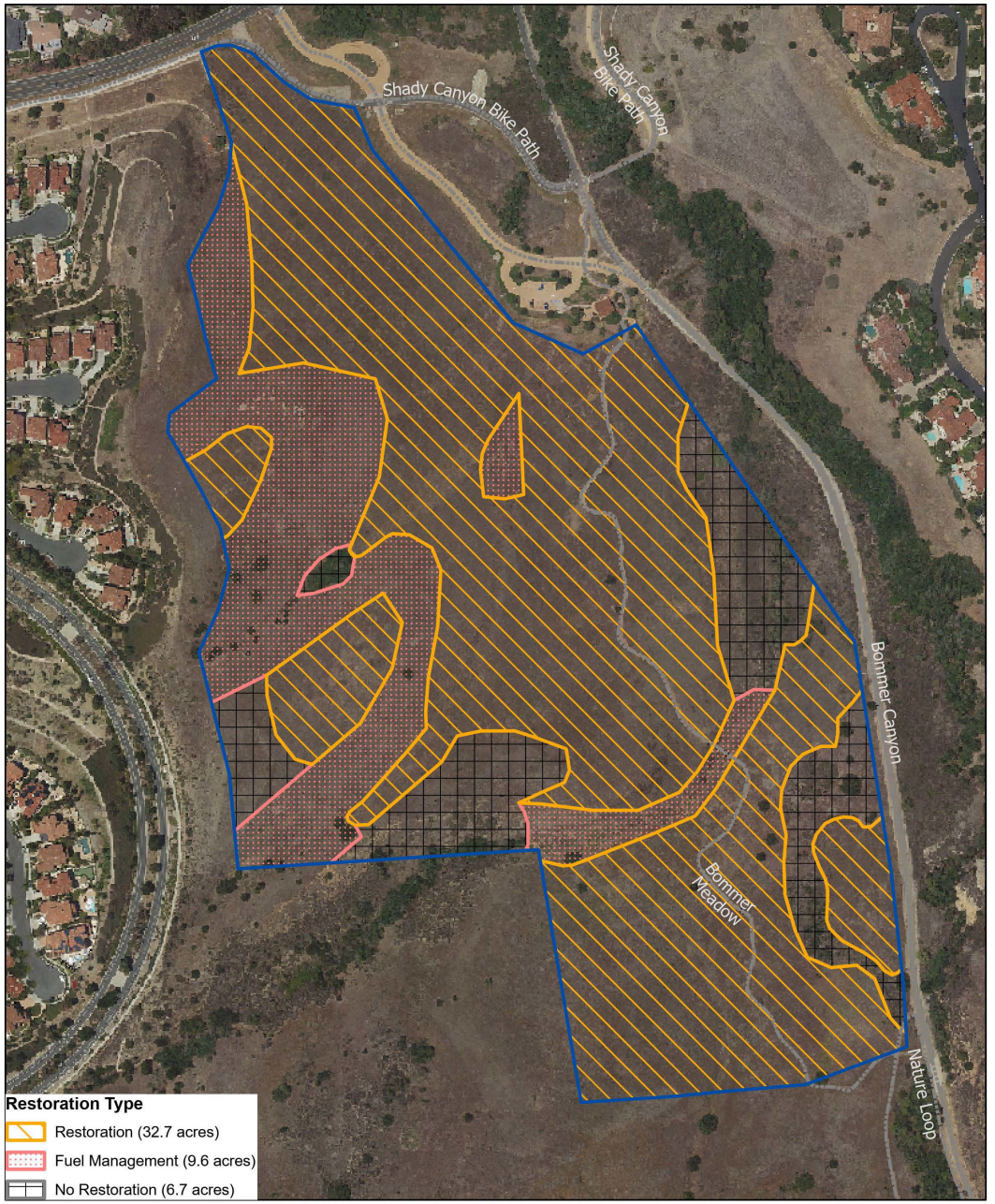
Year 3 Plan: Thin Encelia + Add Supplemental Seed for Diversity

Comparison of Labor Costs (Year 1 after Seeding)

Site	Site Prep Herbicide	Year 1 Labor (hours/acre)	Year 1 Labor Costs ($/acre)
Bommer Meadow	Indaziflam	82	$2,132
West Loma	Glyphosate	227	$5,902
Chino Hills	Glyphosate	339	$8,825

Fire Prevention, Fuel Reduction & Restoration Project (2023 to present)

- Goal: Replace flammable invasive grasses and mustard with less flammable native vegetation
- Grant-funded three-year project
- 49-acre site including 33 acres intensive restoration
- Avoidance of steep slopes and partially intact habitat
- Varied topography: restoration to oak savannah, riparian, CSS, and cactus scrub
- Installation of cuttings, container plants, and cactus pads complement direct seeding



Fire Prevention, Fuel Modification and Restoration at Bommer Canyon

Mowing and Indaziflam Application

- Thick thatch layer present
- Applied via spray trailer at two rates: 6.8 fl oz/acre (300 gallons), 6.0 fl oz/acre (225 gallons)
- Better control with the higher rate
- Problems with missed strips

Increased Weed Challenges

- *Croton*
- *Salsola*
- *Erodium*
- *Lactuca*
- *Helminthotheca*
- *Avena*
- *Bromus*
- *Convolvulus* (perennial)
- *Rumex* (perennial)

Supplemental and labor-intensive weed control measures were needed

Comparison of Thatch Levels at Time of Application

Conclusions

- Indaziflam provides more than two years of weed control, particularly against annual grasses and mustards.
- Effective at very low rates but requires precise application.
- Ineffective against Russian thistle, horseweed, and doveweed.
- Less effective at sites with substantial thatch cover.
- Year 1 (post-seeding) labor costs were greatly reduced relative to glyphosate-based site preparation.

Recommendations

- Remove excess thatch before applying. If not possible, then higher application rates may be needed.
- Seeding may be done two years after application, but sensitive species may be affected. If possible, wait three years before seeding.
- Do not apply using backpack sprayers.
- GPS technology may improve consistency of spray trailer applications.
- Consider using Indaziflam for other restoration applications: around slow-growing cactus, installation of container shrubs into annual weedy vegetation.

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