The background image is a landscape photograph. In the foreground, there is a hillside covered with light-colored, gravelly soil and sparse vegetation. Several tall, thin stems with clusters of small, bright pink flowers are prominent. In the middle ground, a steep, light-colored slope, likely a fire burn area, rises. The background features a range of dark, forested mountains under a clear blue sky with some wispy clouds.

Early Detection Surveys for Invasive Plants in the Holy Fire Burn Area, Santa Ana Mountains

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Holy Fire

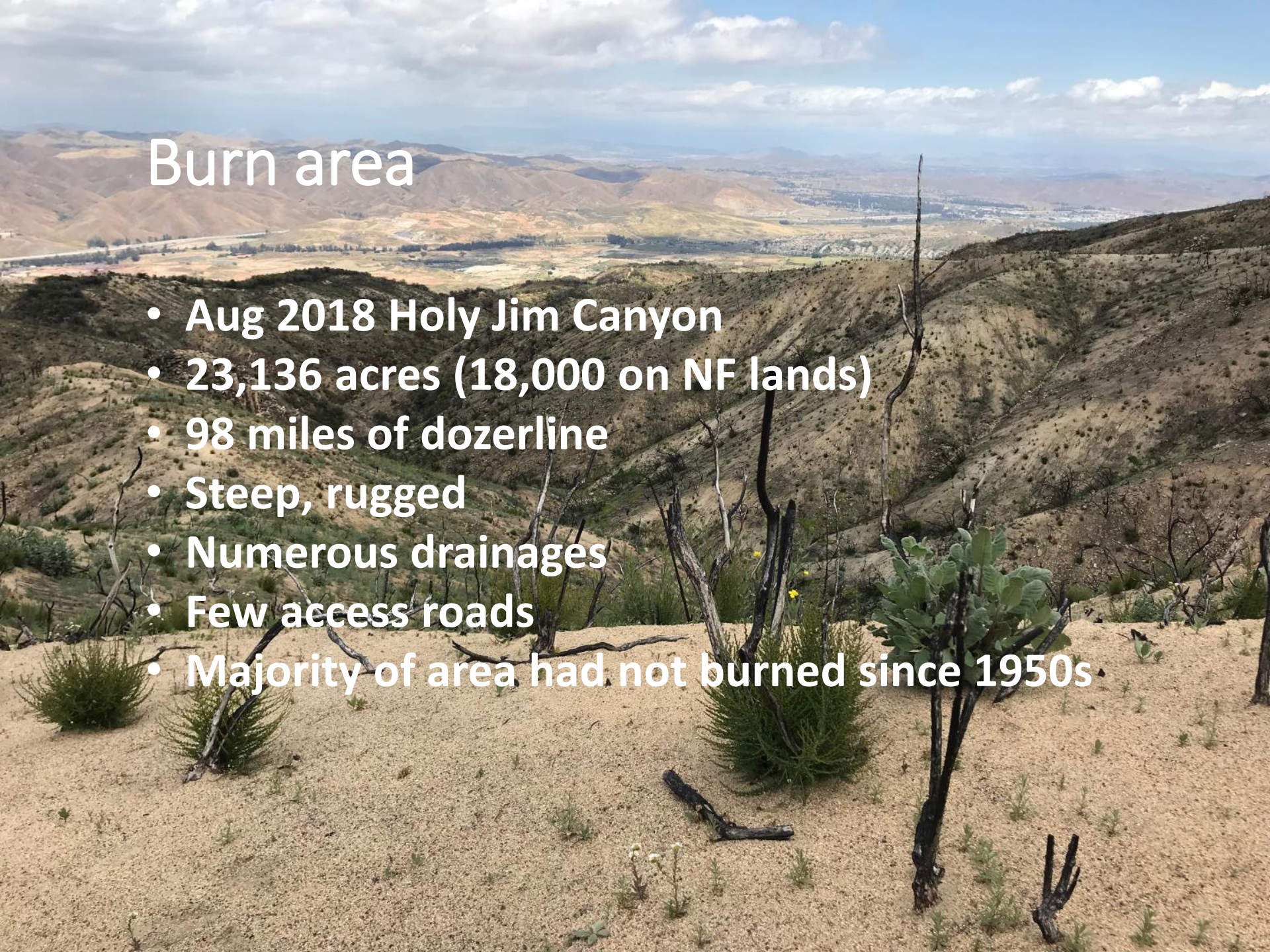
Cleveland NF, Santa Ana
Mountains



Sources: Earthstar Geographics | County of Riverside, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Burn area

- Aug 2018 Holy Jim Canyon
- 23,136 acres (18,000 on NF lands)
- 98 miles of dozerline
- Steep, rugged
- Numerous drainages
- Few access roads
- Majority of area had not burned since 1950s



The need for surveys after fire events:

Ash/chemicals stimulate
germination

Burn areas cleared of
competing vegetation

Fire response equipment
may have introduced weed
propagules

Likely to locate previously
unknown invasive species
or new infestations



Project Scope

- Floristic surveys in 2019
- Early detection rapid response for invasive species subject to EDRR protocols
- Report high priority infestations as soon as possible to CNF

Methods

- Prioritize areas impacted by fire suppression activities (dozerlines, staging areas, etc.)
- Historical invasive infestations; historical rare plant locations
- Survey throughout growing season



Results

21 survey days completed Apr-Aug 2019

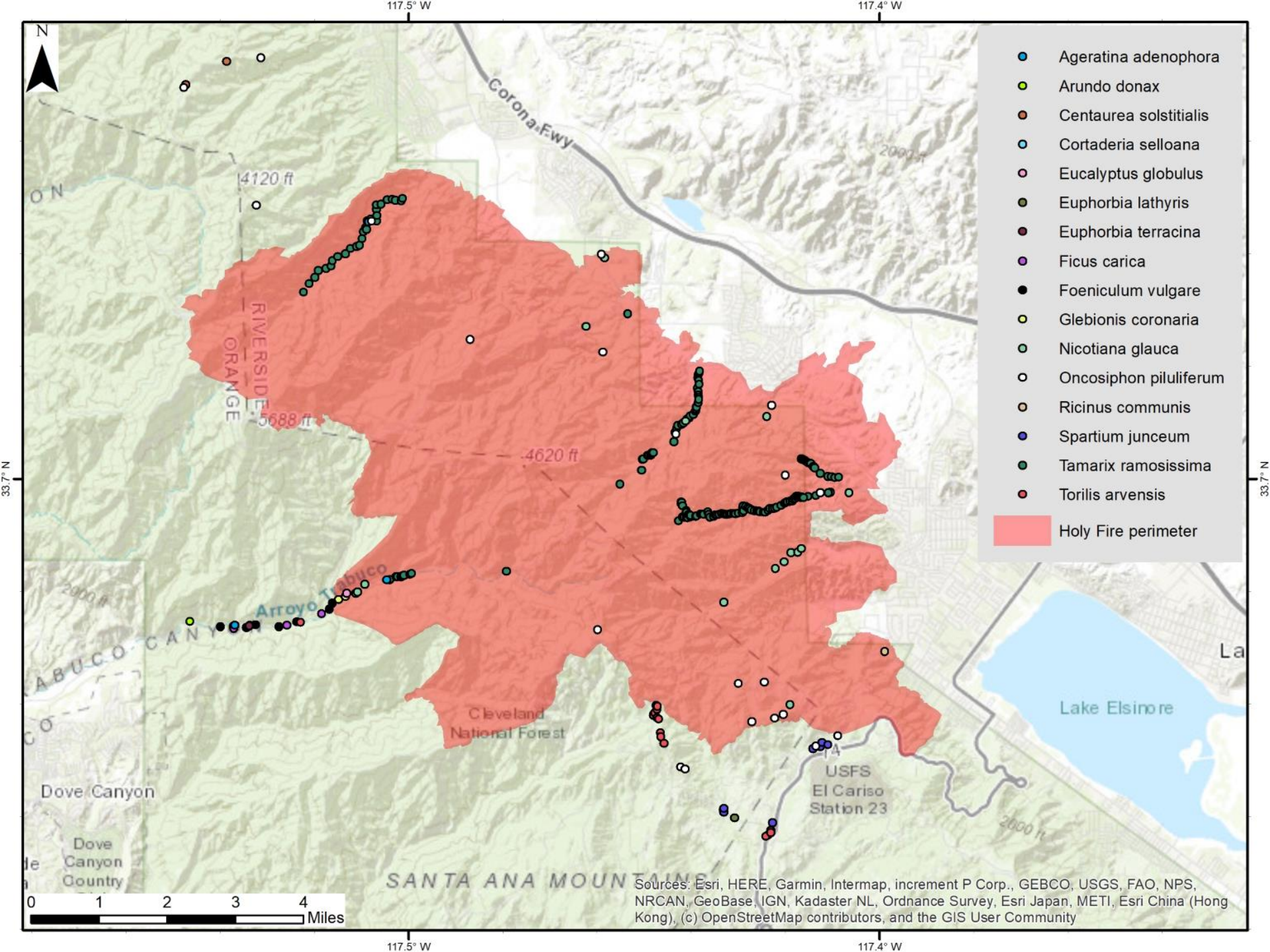
- 16 high priority invasive species mapped across project area (incl. unburned areas)**
- 15 listed and sensitive rare plants incl. 8 CNPS 1B/Forest Sensitive and 7 watch list**

Table 2. Special status species mapped by RSABG survey teams in the project area.

Species	Common name	USDA Plant Code	Conservation Status ^b	Total occurrences mapped
<i>Calochortus weedii</i> var. <i>intermedius</i>	Intermediate mariposa lily	CAWEI	FS Sensitive; CNPS 1B.2	11
<i>Chorizanthe polygonoides</i> var. <i>longispina</i>	Long-spined spineflower	CHPOL	CNPS 1B.2	1
<i>Clinopodium chandleri</i>	San Miguel savory	CLCH5	FS Sensitive; CNPS 1B.2	1
<i>Hesperocyparis forbesii</i>	Tecate cypress	HEFO10	FS Sensitive; CNPS 1B.1	1
<i>Lepechinia cardiophylla</i>	Heart-leaved pitcher sage	LECA4	FS Sensitive; CNPS 1B.2	5
<i>Monardella hypoleuca</i> ssp. <i>intermedia</i>	Intermediate monardella	MOHY	CNPS 1B.3	8
<i>Monardella macrantha</i> ssp. <i>hallii</i>	Hall's monardella	MOMAH	FS Sensitive; CNPS 1B.3	3
<i>Phacelia keckii</i>	Santiago Peak phacelia	PHSUK	FS Sensitive; CNPS 1B.3	9

Invasive species mapped in burn area 2019

Species	Common name	Cal-IPC Rating 2022	Total infestations mapped
<i>Ageratina adenophora</i>	Crofton weed	moderate	2
<i>Arundo donax</i>	Giant reed	high	1
<i>Centaurea solstitialis</i>	Yellow star thistle	high	2
<i>Cortaderia selloana</i>	Pampas grass	high	1
<i>Eucalyptus globulus</i>	Blue gum	limited	1
<i>Euphorbia lathyris</i>	Caper spurge	watch	1
<i>Euphorbia terracina</i>	Carnation weed	limited	1
<i>Ficus carica</i>	Edible fig	moderate	1
<i>Foeniculum vulgare</i>	Fennel	moderate	1
<i>Glebionis coronaria</i>	Crown daisy	limited	1
<i>Nicotiana glauca</i>	Tree tobacco	moderate	6
<i>Oncosiphon pilulifer</i>	Stinknet	high	13
<i>Ricinus communis</i>	Castor bean	limited	1
<i>Spartium junceum</i>	Spanish broom	high	3
<i>Tamarix ramosissima</i>	Saltcedar	high	7
<i>Torilis arvensis</i>	tall sock-destroyer	moderate	2



Saltcedar (*Tamarix ramosissima*)

- Cal-IPC rating: High
- 7 infestations detected, all in burned drainages with water
- Coldwater Creek (critical habitat for Federally Endangered Southern California steelhead trout)
- Estimated >20,000 seedlings found
- Early successional after fire and other disturbances*
- Establishment can drastically alter riparian plant community composition

*<https://www.fs.fed.us/database/feis/plants/tree/tamspp/all.html#FIRE%20EFFECTS>



Tamarix ramosissima seedlings,
Indian Canyon, 24 July 2019

Stinknet (*Oncosiphon pilulifer*)

- Annual, sunflower family (Asteraceae)
- Cal-IPC rating: High
- First Santa Ana Mtns observation was in 2011 (R. Vanderhoff)
- 13 occurrences detected in project area
- Various habitats, primarily on bulldozer lines and burned ridges
- Scattered, small patches of 1–100 plants
- Ca. 200 total individuals found



Oncosiphon pilulifer near Main Divide Road, 9 Jul 2019



Summary

- Post-fire early detection rapid response surveys are important to document new infestations and the status of rare plants, esp. fire followers
- Invasive plants often considered serious threat to rare species
- Early detection and prompt reporting facilitates effective treatment

Photo courtesy of Lance Criley, USFS
Rangeland Management Specialist



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Thank You!

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