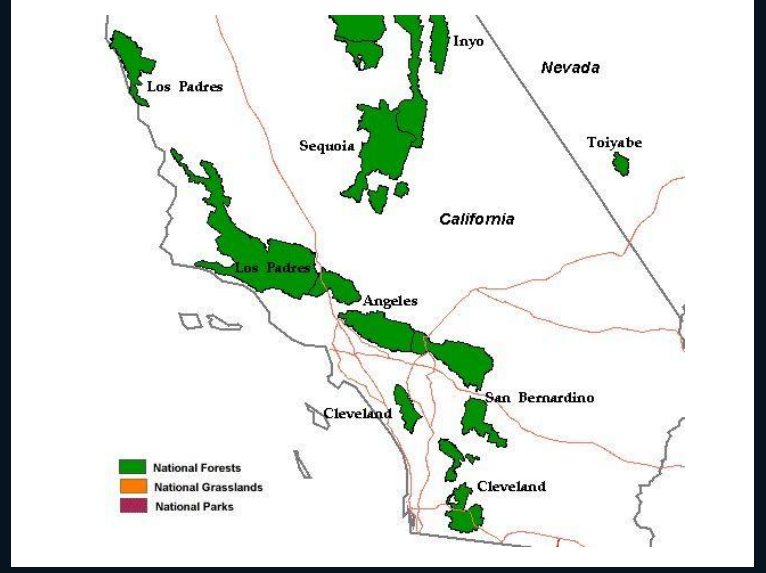

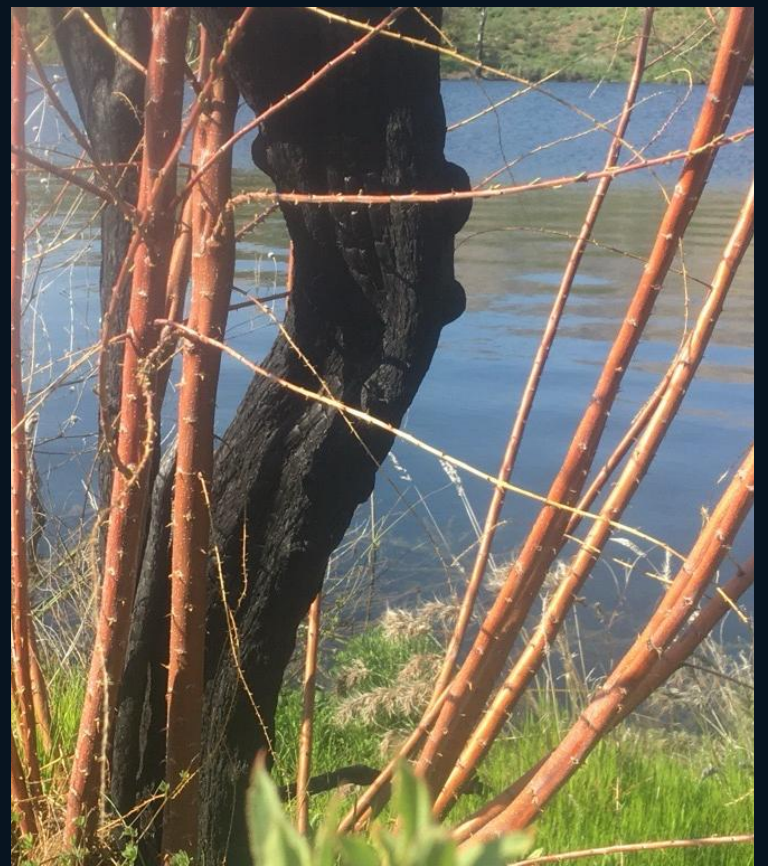

Channel Islands Restoration

Lessons learned on *Tamarix ramosissima* and other invasive species removal in the Los Padres National Forest

Contact:
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Location

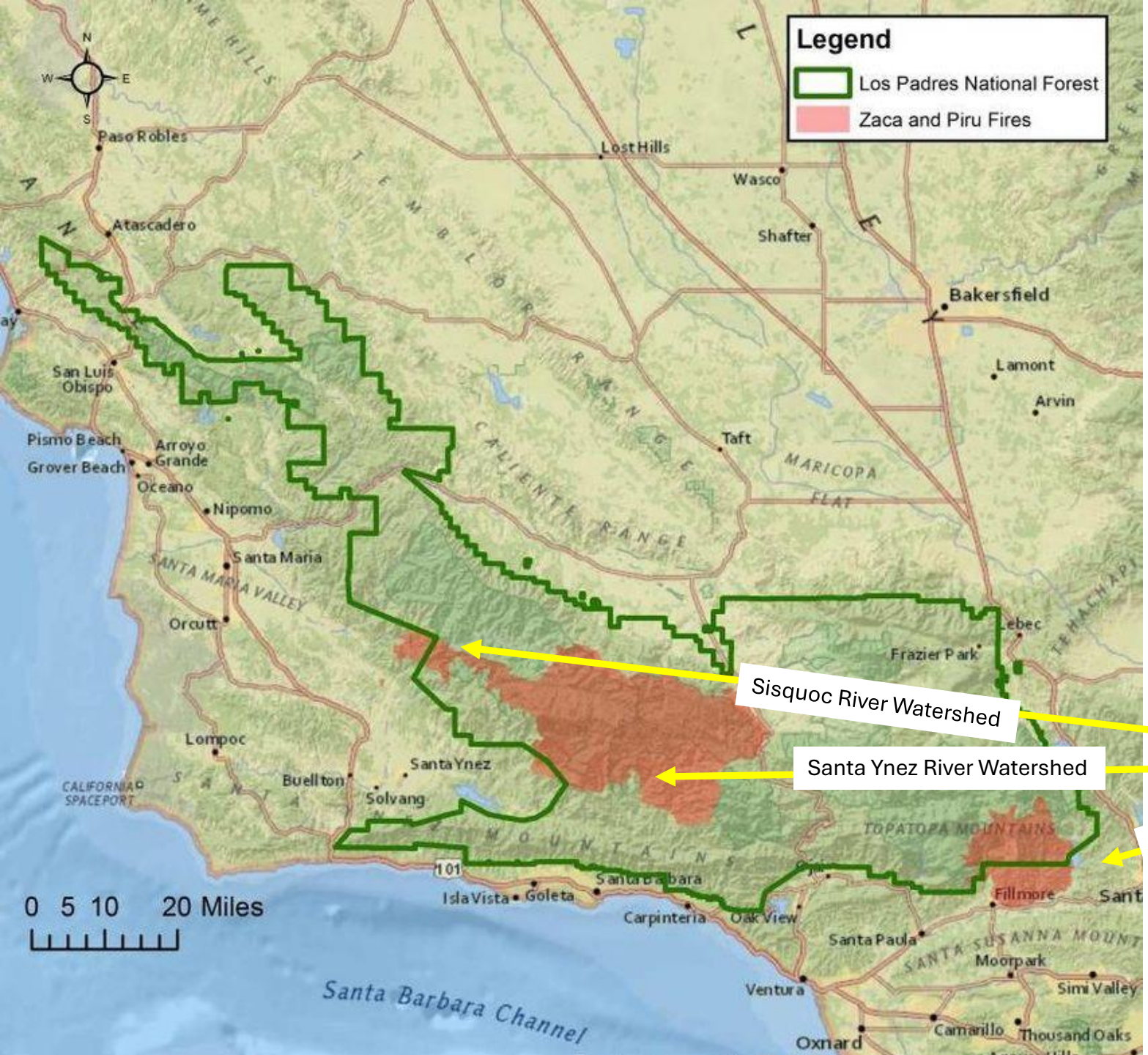
Los Padres National Forest Watersheds

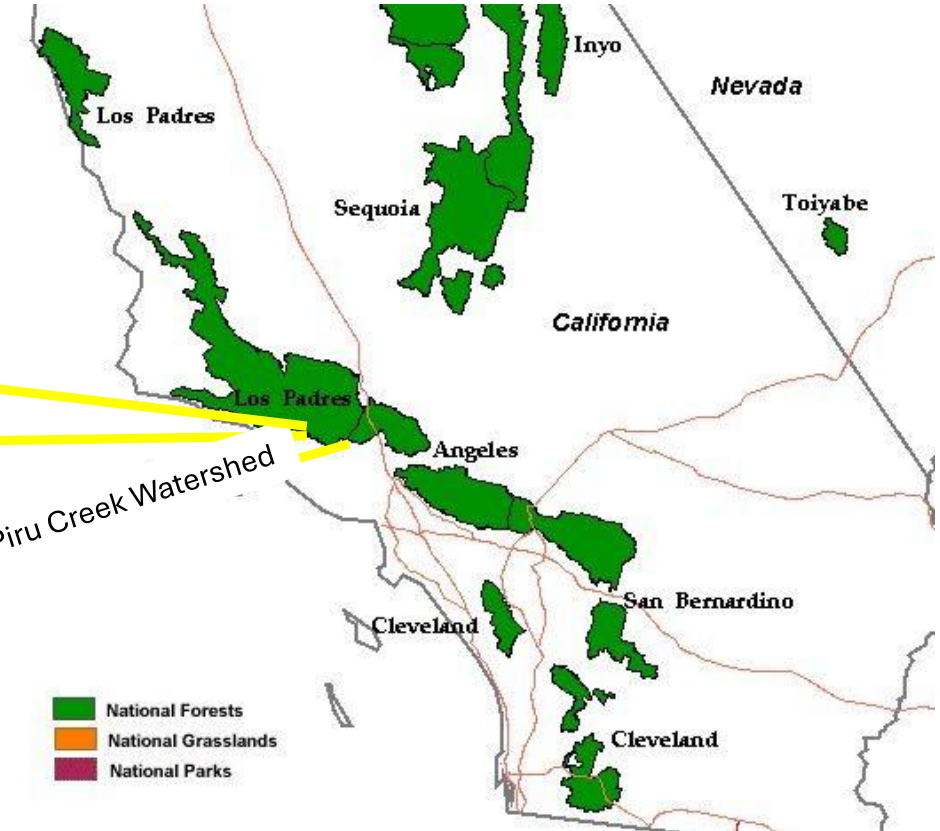
- 2015 - 2023 Sisquoc River
- 2018-2024 Santa Ynez River
- 2015-2025 Piru Creek

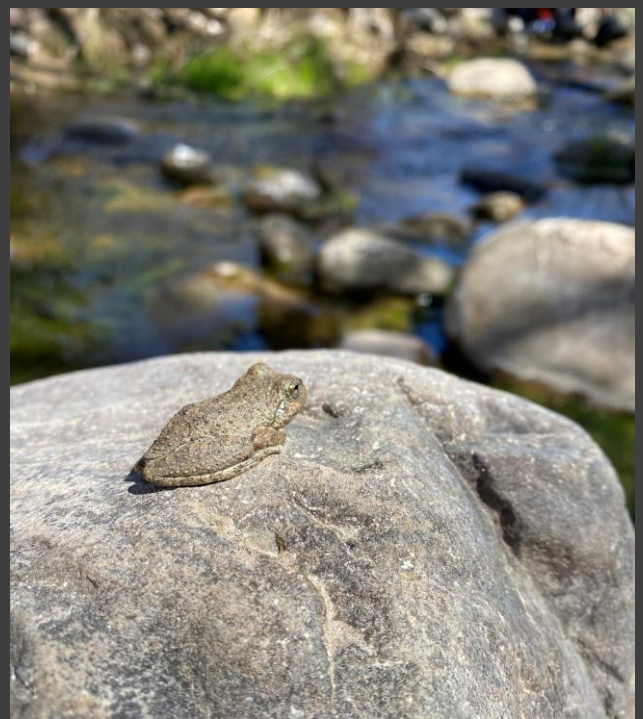
Burn Scar Mitigation Funding from the National Fish and Wildlife Federation

Zaca Fire (July 4 - August 31, 2007)

240,207 acres. At the time California's 2nd largest fire in history (now 13th)







- The Los Padres National Forest covers **~ 1.75 million acres**. Our work area was in the southern portion over Zaca and Piru burn scars that reached over **240,207 acres.**
- Tamarisk and other nonnative species move into Forest burn scars and human disturbance threatening biodiversity and causing harm to ecosystem services such as regulating air, water purification, pollination, natural climate regulation and movement of sediment and water.
- As Restoration Ecologists, our goal was to eradicate tamarisk in the Forest, including areas that are hard to reach, and provide community input and education.
- We met the LPNF Natural Resources Ranger at the Cal IPC symposium around 2015 who recommended the project as an application to NFWF from the released Zaca Fire funds.
- The project treatment areas covered **four watersheds** (including the Santa Clara River) with **two wild and scenic rivers** (Sisquoc River, and reaches of Piru Creek), **three reservoirs** (Gibraltar, Jameson and Piru) two Wilderness Areas (Dick Smith and Sespe)

‘A’ listed factors of tamarisk in the Los Padres Forest Watersheds

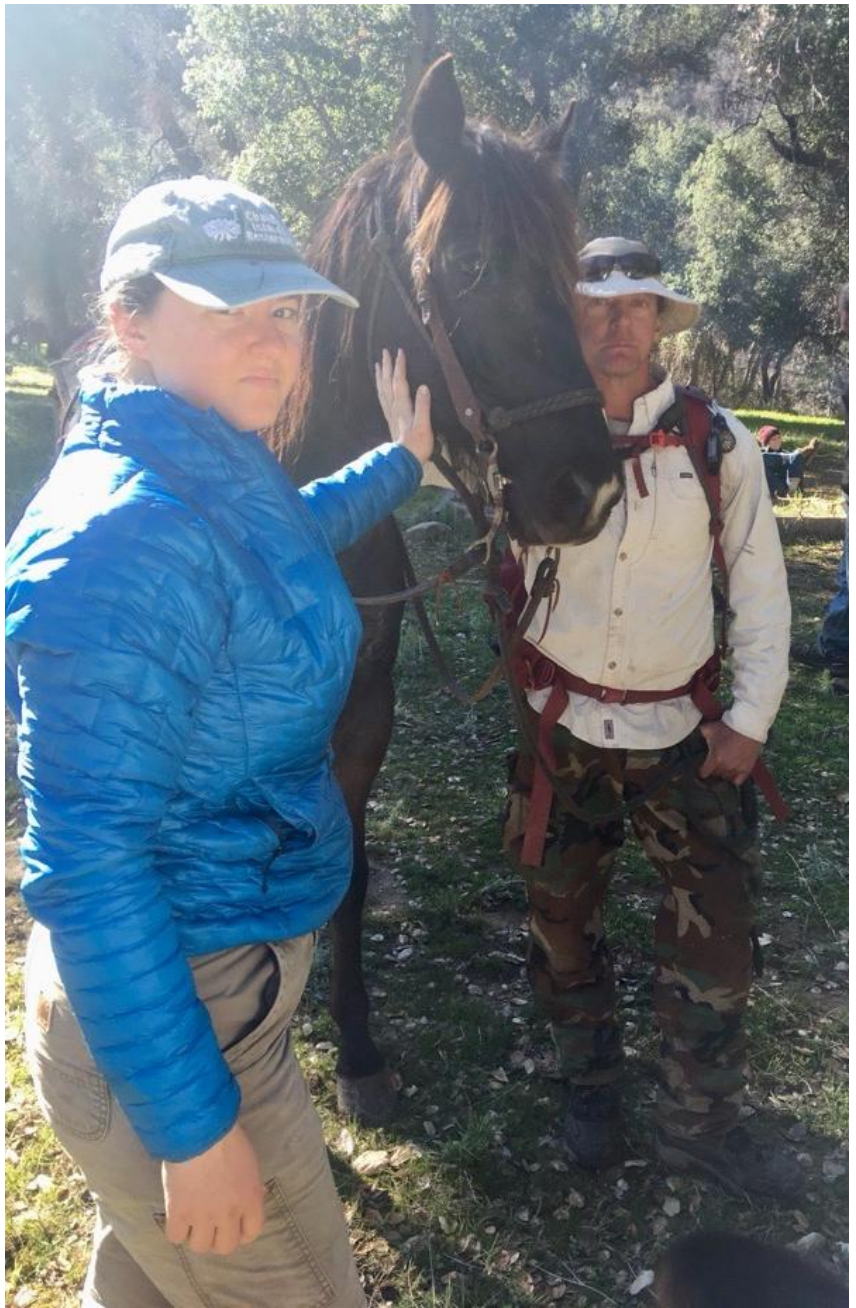
1.1 Impact on abiotic ecosystem processes : A. Severe *
1.2 Impact on plant community: A. Severe
1.3 Impact on higher trophic levels: A. Severe
2.1 Role of anthropogenic and natural disturbance in establishment
2.2 Local rate of spread with no management: A. Severe
2.4 Innate reproductive potential: A. Severe
2.6 Potential for natural long-distance dispersal: A. Severe
3.1 Ecological amplitude/Range: A. Severe
Cal IPC Plant Assessment Form
Tamarix ramosissima Plant Assessment Form – California Invasive Plant Council

*Evapotranspiration rates of tamarisk are among the highest of any phreatophyte evaluated in southwestern North America, including native riparian trees
Heavy salt deposits
Uses more water and siphons it from the ground more quickly than native riparian trees.

Project Planning

- Pre-trip Logistics
- Weather
- Distance and Accessibility
- Wilderness Regulations
- Endangered Species: Amphibian training by LPNF Biologist
- Water for crew and horses
- Herbicide equipment and travel
- Data Collection: Planning and field work tracking, grant and pesticide use reporting
- Volunteer training
- Communications confirmation

Our mule train – the most important members of the crew. Los Padres Outfitters provided access support and camp staging areas. The average crew size was 3 CIR and 6 volunteers.



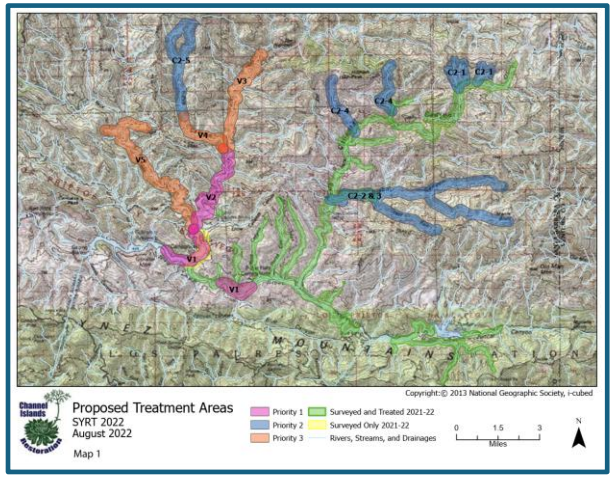
Best Management Practices

- Cut all trunks as low as possible and apply herbicide within 5 minutes directly to the cut surfaces. Cut and daub as many sprouts as possible. Leave in place but clear of cut stumps
- Use application daubers that are safer, more accurate and require less herbicide brought on the trip
- 100% Polaris (Imazapyr)
- Log treated points and carry out follow up via survey
- Washing boots and removing seeds from clothes

- As well as treatments, data collection is an essential part of the work and mandatory for Pesticide Use Reporting provided to the Forest and NFWF in final programmatic reports.

- We use our ArcGIS maps on our phones. Our GIS Tech creates maps we can use offline in areas without cell service. From the field map, she creates detailed PDFs of the work done and miles covered.

- During the grant terms, approximately 250 river miles were surveyed and over 2000 mature trees treated.



v. 1.0
05/20/2021

PESTICIDE APPLICATION DAILY LOG

Addendum to Form FS 2100-2. See Reverse Side for Instructions.

*Required

APPLICATOR INFORMATION

*Agency/Contractor:	*Applicator Name/Phone/Email:	*CA DPR License #:
Channel Islands Restoration	Doug Morgan	162092

SITE INFORMATION

*Project Name:	NEPA ID#:	Forest/District	Location Name/Sale Org/#
(Santa Ynez River Tamarisk) Alternative Work: ORD Potholes Tamarisk		Los Padres Forest / Ojai	1. Potholes

*GPS (UTMs or Lat/Long):	*Target Pest(s)
Latitude 34°32'3.22"N Longitude 118°48'9.67"W	Tamarisk (*tamarix ramosissima*)

Notes (Soil Type, Stump Category, Diameter Range, Proximity to Water, etc.):

Soil Type: Riparian chaparral.
Diameter Range – less than 1 inch – 6 inches.
Water Proximity: approx. out with 50ft from water

APPLICATION INFORMATION

*Date Planned:	*Date of Application:	*Application Area (include UOM):	Wind speed (mph)	Temp °F	Rel Humidity %	Slope %
3/6,3/7,3/9,3/10,3/10 2024	3/6,3/7,3/9,3/10,3/10 2024	80 Acre	10 mph	75 F	20 %	Up to 10 degrees

Application Equipment:	*Application Method:	*Calibrated Spray (GPA)
Loppers and Dauber Bottle (4-inch foam tip)	Cut and Daub	0.0625%

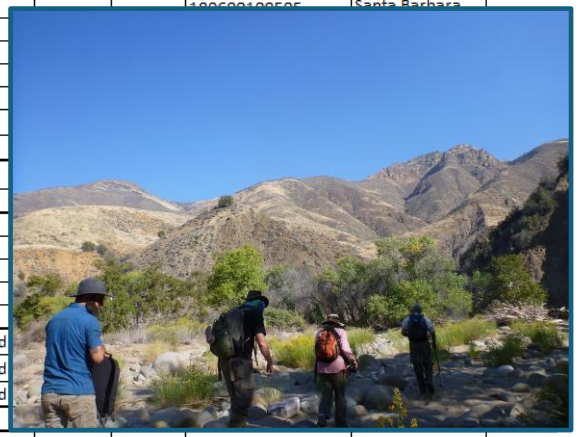
*Vol Applied (incl. UOM)	*Calibrated Volume (incl. UOM)	*Product Rate (incl. UOM)	% Solution (mark one) *		
8 ounces	8 oz	9 pints per acre	100%	100 % a.i.	v/v

*Product/Trade Name	Active Ingredient (a.i)	*Diluent
Polaris	Imazapyr	N/A

NOTES:

Blue tracker dye added

#	# Trip **	Date of Trips	Location	Species common name	Species botanincal name	Growth Stage- Average Stump Diameter	#Total Treated	IPM Treatment	Acreage	River miles treated	HU-12 Watersheds	Ranger District	Volunteer
	1	2/12/21-2/15/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Adults 2 inch	48	Cut and Daub	72.3	10.5	180600100402	Santa Barbara	5
	2	2/25/21-3/1/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Adults 2 inch	161	Cut and Daub	258.18	6.8	180600100402	Santa Barbara	4
	3	Cancelled	Santa Ynez River *	Tamarisk	*n/a*	Cancelled	n/a	n/a	0	0	180600100402	Santa Barbara	
	4	3/25/21-3/29/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Adults 2 inch	452	Cut and Daub	363.64	7.6	180600100402	Santa Barbara	5
	5	4/7/21-4/12/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Adults 2 inch	194	Cut and Daub	236.36	10.5	180600100402	Santa Barbara	2
	6	4/22/21-4/26/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Adults 2 inch	29	Cut and Daub	254.55	9.4	180600100402	Santa Barbara	2
	7	Cancelled	Santa Ynez River *	Tamarisk	n/a	n/a	n/a	Cut and Daub	0	0	180600100402	Santa Barbara	
	8	10/28/21-11/1/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Seedlings Adults 2 inch	3164 463	Cut and Daub	145.45	1.6	180600100402	Santa Barbara	4
	9	11/11/21-11/15/21	Santa Ynez River *	Tamarisk	*Tamarix ramossisima*	Seedlings Adults 2 inch	643 459	Cut and Daub	400	3.2	180600100402	Santa Barbara	2
	1	8/6/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults	111	Cut and Daub					
	3	9/11/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults		Cut and Daub					
	4	9/12/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults		Cut and Daub					
	5	9/20/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults		Cut and Daub					
	6	9/27/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults	111	Chip					
	7	9/28/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults		Chip					
	8	10/10/23	Paradise Road/ HWY154	Spanish broom	*Spartium junceum*	Adults		Chip					
	1	3/22/24	Vista Overlook	Veldt Grass	*Ehrharta erecta*	Preseeding	5300	Foliar Spray					
	2	3/28/24	Paradise Road/ HWY154	Veldt Grass	*Ehrharta erecta*	Early		Foliar Spray					
	1	7/19/23	East Camino Cielo	Fennel	*Foeniculum vulgare*	Adults	5000	Foliar Spray					
	2	7/20/23	East Camino Cielo	Fennel	*Foeniculum vulgare*	Adults		Foliar Spray					
	3	5/22/24	East Camino Cielo	Fennel	*Foeniculum vulgare*	Adults		Foliar Spray					
	4	5/23/24	East Camino Cielo	Fennel	*Foeniculum vulgare*	Adults		Foliar Spray					
	5	6/14/24	East Camino Cielo	Fennel	*Foeniculum vulgare*	Adults		Foliar Spray					
	1	8/17/2023-8/18/23	SYR- Juncal Creek	Yellow star thistle	*Centaurea solstitialis*	Seeding	5% coverage	Hand pulled/Bagged					
	2	8/23/23-8/24/23	SYR- Juncal Creek	Yellow star thistle	*Centaurea solstitialis*	Seeding		Hand pulled/Bagged					
	3	8/18/13	SYR- Juncal Creek	Yellow star thistle	*Centaurea solstitialis*	Seeding		Hand pulled/Bagged					
	1	3/6/24-3/11/24	Piru Potholes *	Tamarisk	*Tamarix ramossisima*	Adults 2 inch	17	Cut and Daub					
	1	10/26/24	Piru Lake *	Tamarisk	*Tamarix ramossisima*						180701020603	Ojai	17



How we provide our cost match, education opportunities and community involvement

- River Walkers: Helping to survey
- Off-trail specialist : Climbing
- Camp Jacks/Cooks: Helping outfitters
- Shuttle Drivers: Transport to trail head
- Front Country Weather Monitor and Safety Contact
- Videographer/Photographer
- Supplies Manager e.g.: Los Padres Outfitters reduced costs
- Education Specialist E.g. volunteer geologists, botanists
- Financial Donors
- Translating volunteer hours to field tech costs

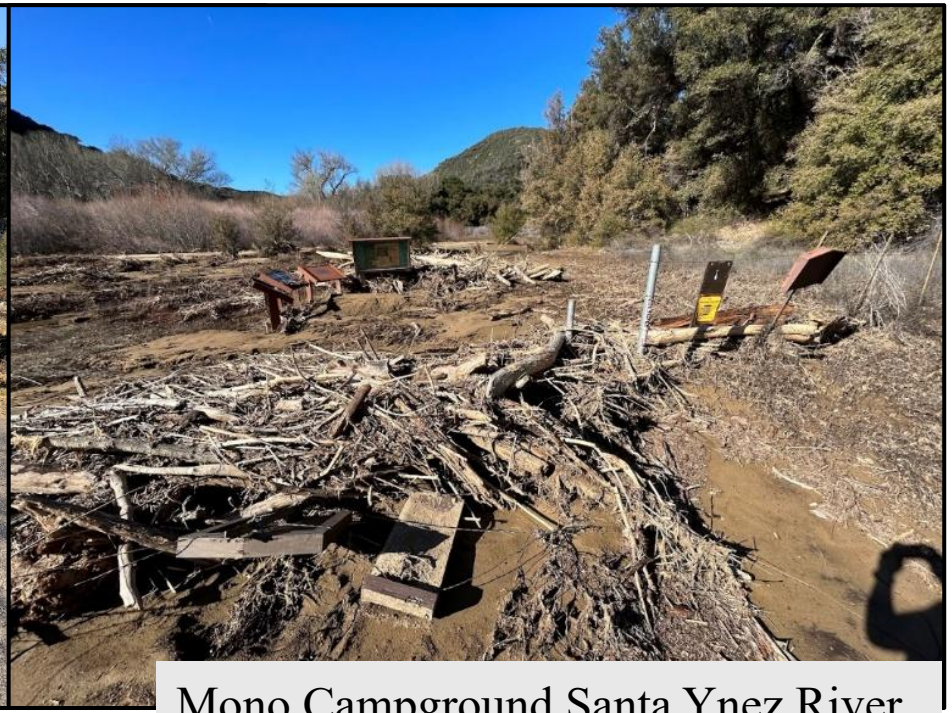
Known challenges:

- Heavy work and stamina needed. Regular awareness of snakes and post fire increase encounters with plants such as *Eriodictyon parryi* (poodle dog bush)
- Complicated by being so far away from medical support
- Herbicide best management
- Keeping up with data

Solutions:

- Crew preparation
- Front country monitors and checking Garmins.
- Testing and designing safe carriers and equipment for herbicide.
- Keep up with data!

Forest Road 5NI8.2 washout Santa Ynez River January 2023 Photo LPNF



Mono Campground Santa Ynez River January 2023 Photo LPNF

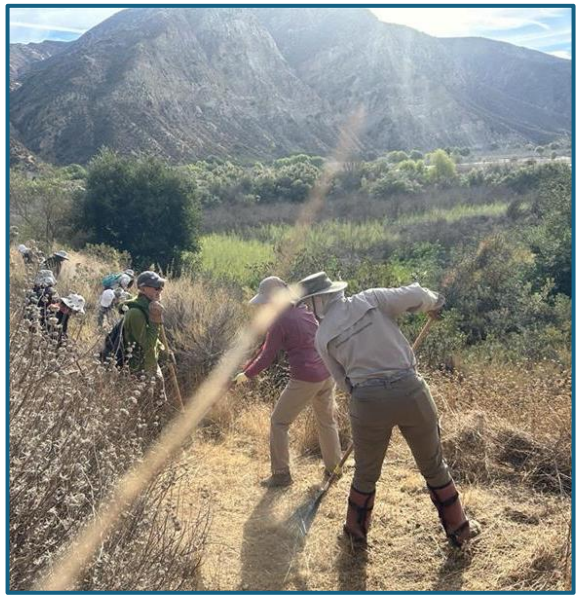
Unforeseen Challenges

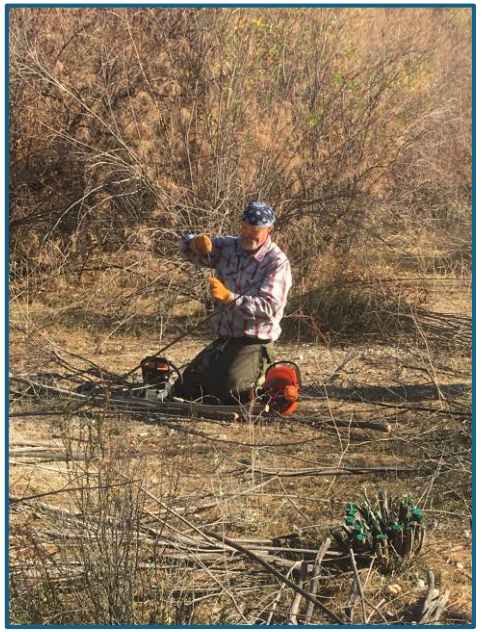
- Post Thomas Fire. Access and sediment Floods
- Covid
- Winter 2022, 2023, 2024 storm flooding

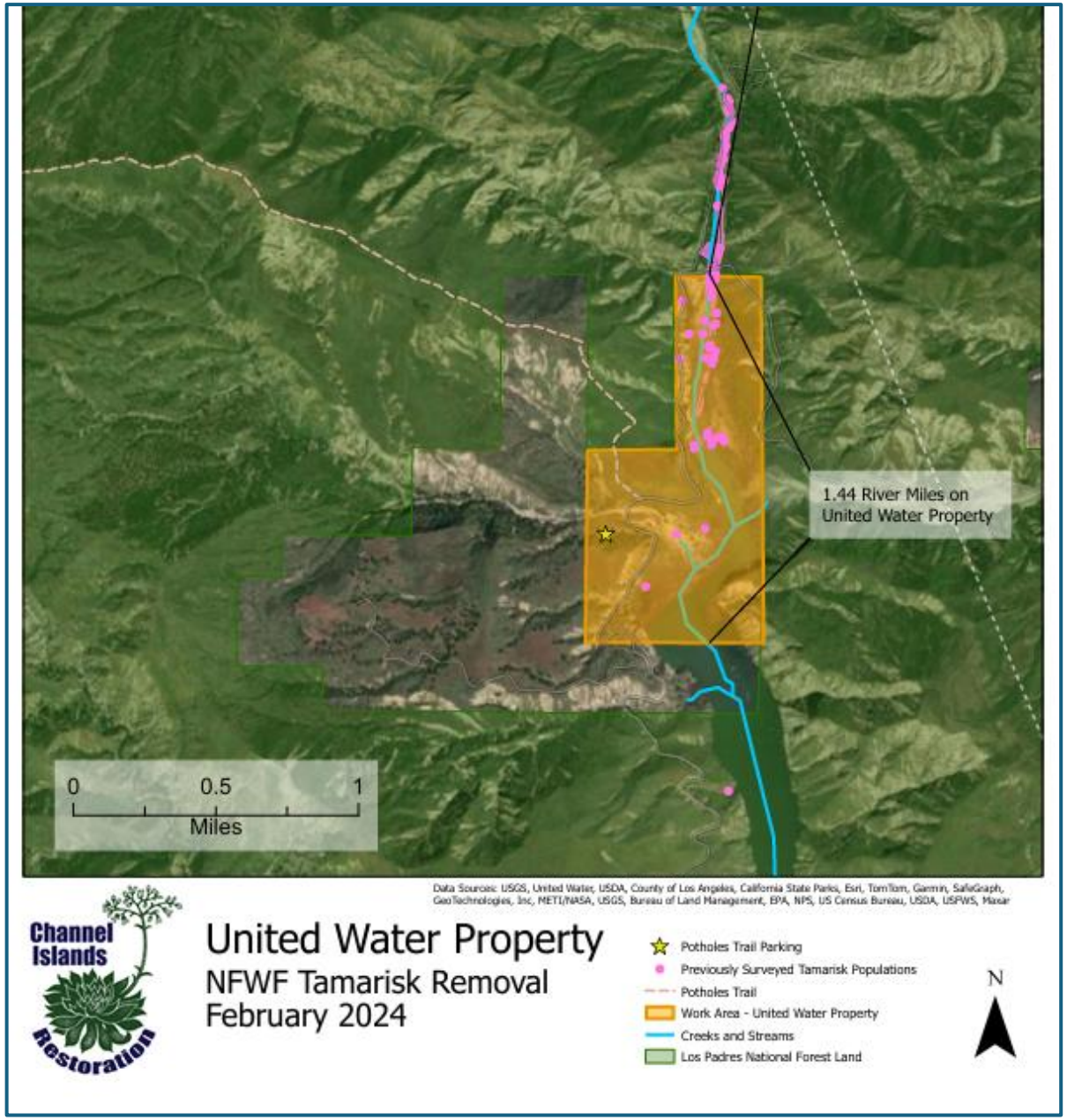
Response

We didn't give up! We identified the problem and with NFWF and LPNF created a solution we called **"Post Storm Treatment projects" (PST)** that focused on the more accessible front country perimeters and could include other species of concern to the Forest. NFWF accepted an amended scope of work that we designed with LPNF. With support from The City of Santa Barbara Parks and United Water Conservation District were able to adapt on project scope and have an opportunity for success despite the access challenges.

PST 1 - Lower Piru Creek at the top of Lake Piru – Access given from United Water Conservation District

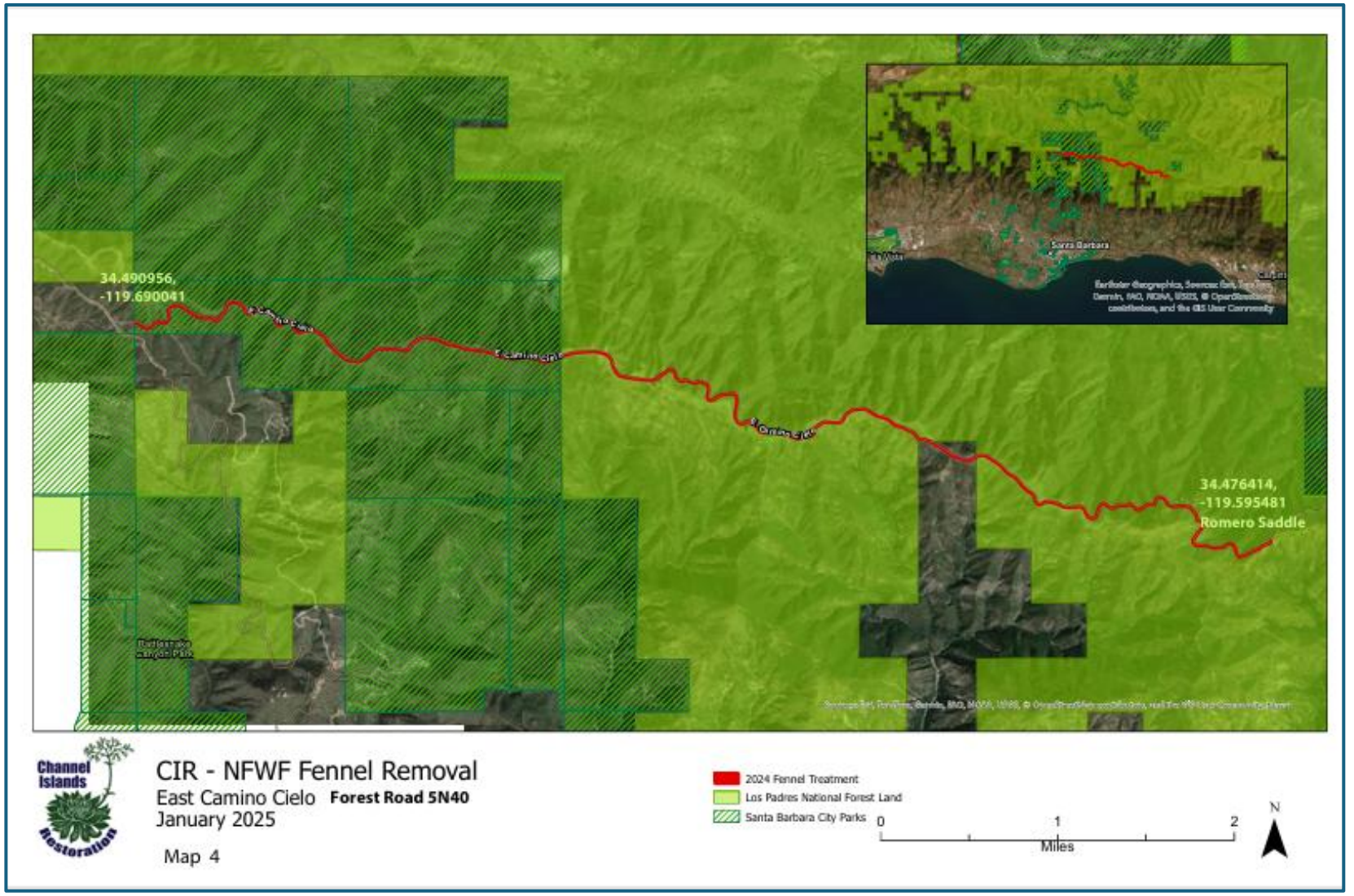




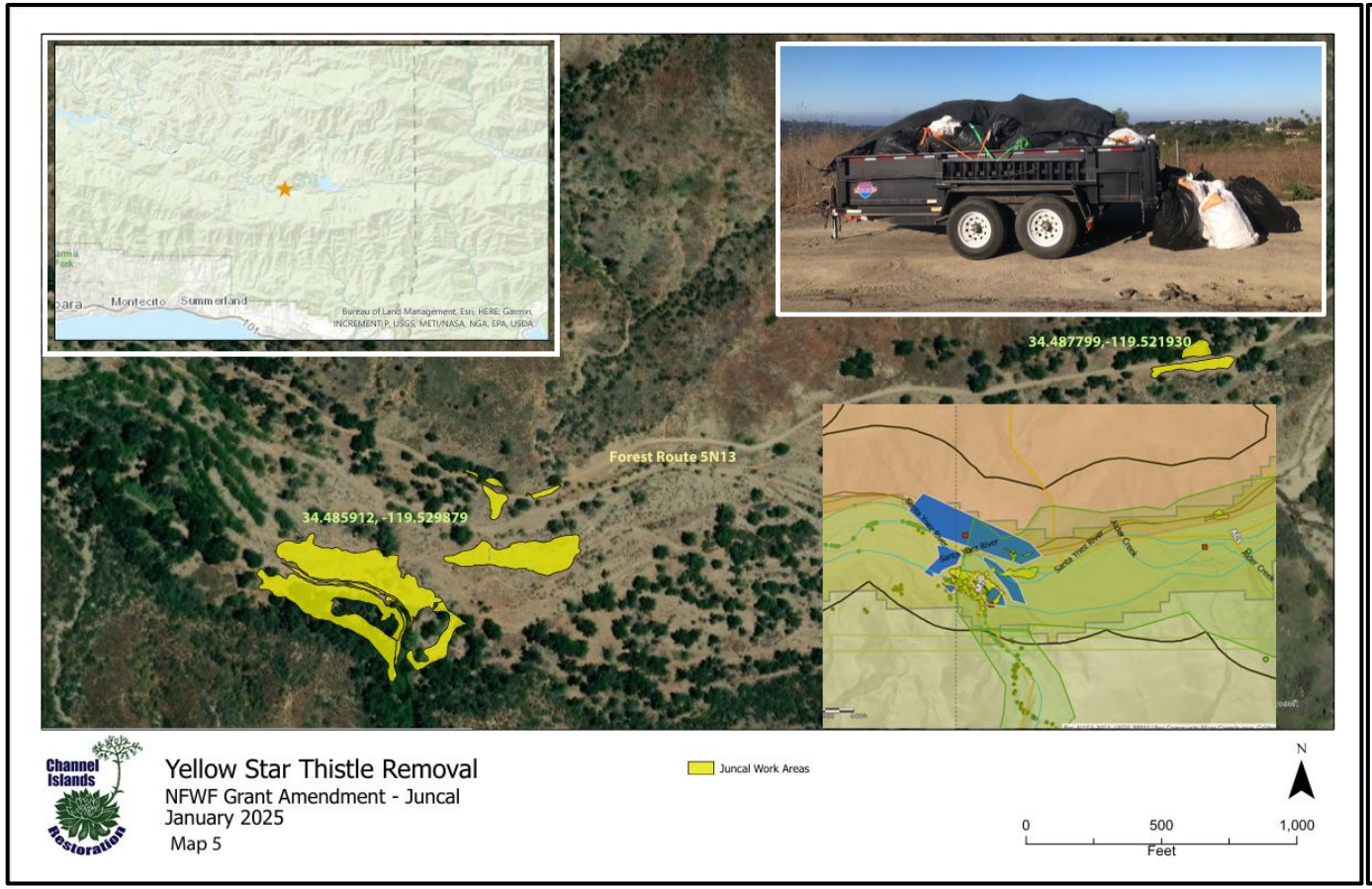


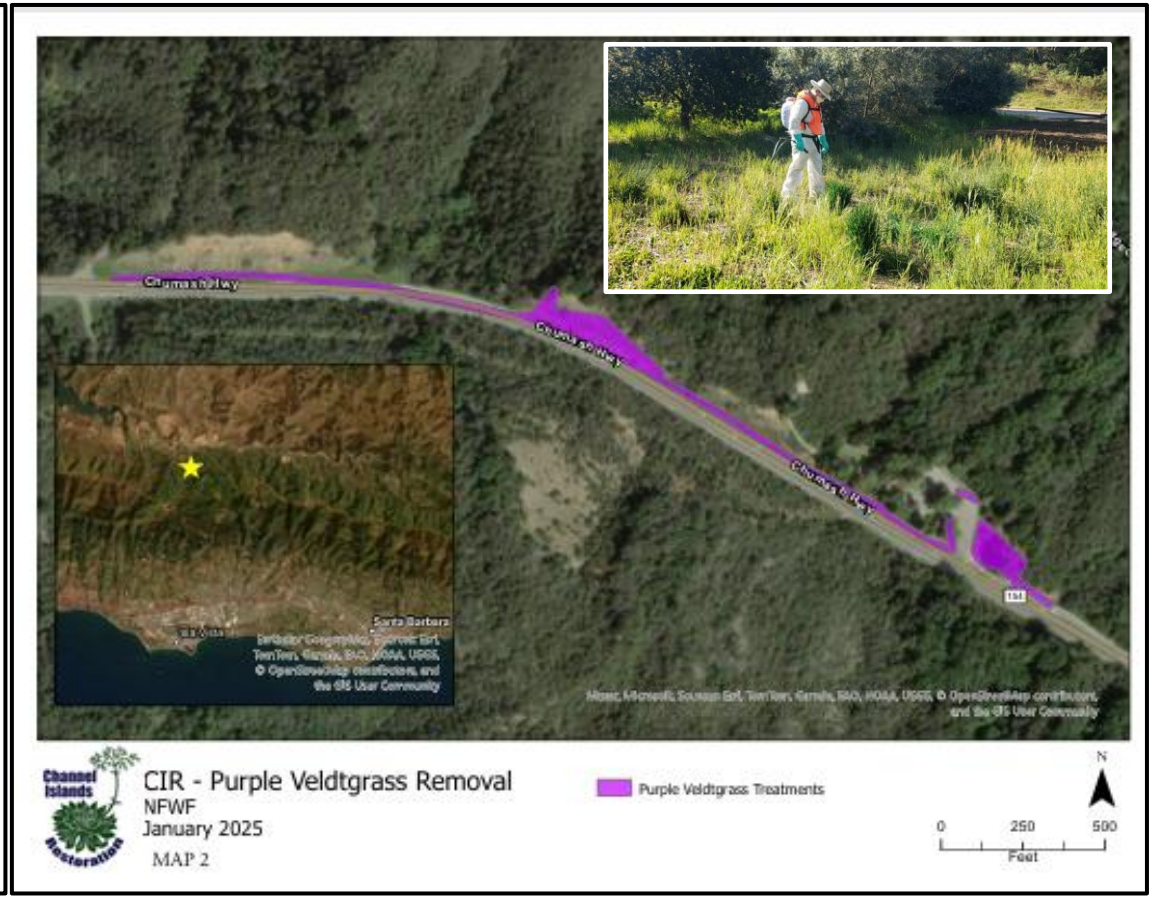
PST 2 - Santa Barbara City Parks

Foeniculum vulgare (Fennel) creates fire fule and blocks road sight lines along East Camino Cielo (ECC) ridgeline which runs above Santa Barbara on the southern side, and the forest on the northern slope. ECC is a vector of fennel into the forest ~5000 plants foliar treated.



PST 3 and 4 - LPNF land, outside of original work area and scope





Murietta Juncal Forest Road
~ 5% mature *Centaurea solstitialis* (yellow star thistle) hand pulled, bagged and hauled out of 1.7 Acre coverage in 5 days – overwhelming and more than we could handle in this context.

Highway 154 and Paradise Road
~ 5300 *Ehrharta erecta* (Veldt grass) and 111 *Spartium junceum* (Spanish broom) treated on Hwy 154.
Veldt grass is a concern for the forest as it encroaches south along 101.

Our definitions of success:

- Significant progress towards complete tamarisk eradication via removal of mature trees at headwaters and down tributaries.
- Being able to adapt to obstacles and still produce significant restoration work.
- Creating progressive partnerships and collaborations to support funding and cross jurisdictional lines.

Most Successful outcomes

- **Upper Santa Ynez Watershed tributary tamarisk**
  Significant removal and confirmation of success via follow up surveys.
- **Potholes – Piru Creek Watershed**
  Ability via the post storm treatment scope to return to survey past work and make retreatments.
- **Piru Lake**
  Large known population worked on and future work possible.
- **Fennel along East Camino Cielo, Spanish broom and Veldt grass along Hwy 154**
  Removal of dead brush and mature plants. Cleared area to give an opportunity for treatment program.
- **Support from NFWF and the Forest**
  This made the work of finding new project work scopes with new budgets and writing contract amendments possible.
- **Partner Collaborations**
- NFWF and LPNF were open to crossing jurisdictional boundaries with United Water Conservation District and the City of Santa Barbara

Unsuccessful

- **2 adult populations in a tributary of the Upper Sisquoc River Watershed**
  Due to a sequence of logistical events in difficult terrain.
- **Yellow star thistle**
  95% more left than we were able to remove. It is a significant and increasing monoculture. Taking it on was time consuming with the methods and resources we had. However, it enabled a look at what plan might be possible.

Lessons Learned

- Having backup plans such as the Post Storm Treatment projects written into grant proposals is a protective feature of the grant success.
- At the start of the project, 94,869 seedlings were removed. We soon saw this to be an inefficient use of time. Many die off or are scoured in rain events.
- Adaptive management is an essential component of restoration since it is in the natural landscape, susceptible to that dynamic nature.
- Volunteer effort is extremely beneficial in effort resources and education. However, having a mixed schedule of crew only days, as well as volunteer, helps with concentrated professional effort that increases the acreage of treated targets. Having an equal mix of volunteer and crew only trips is the ideal.
- Time stamp photos, one team member only responsible for data collection and importing to final report data immediately on return would be something we would plan for next time.
- Important - We surmounted the challenges of trying to work across jurisdictional lines which we did and was a positive experience for those involved. It was an important and beneficial outcome of the funding given and allowed the adaptive management outcome to be possible…….

Contact:
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- ….Most importantly, keeping up the effort.
- CIR supports the holistic approach in the CDPR's Sustainable Pest Management Roadmap
- Finding ways to collaborate with partners is a vital way towards that.

Thank you!

- **NFWF**
- **LPNF**
- **Our Volunteers!**
- **Collaborators :**

United Water Conservation District
Santa Barbara City Parks