Ramona-Barona Climate Adaptation and Action Plan

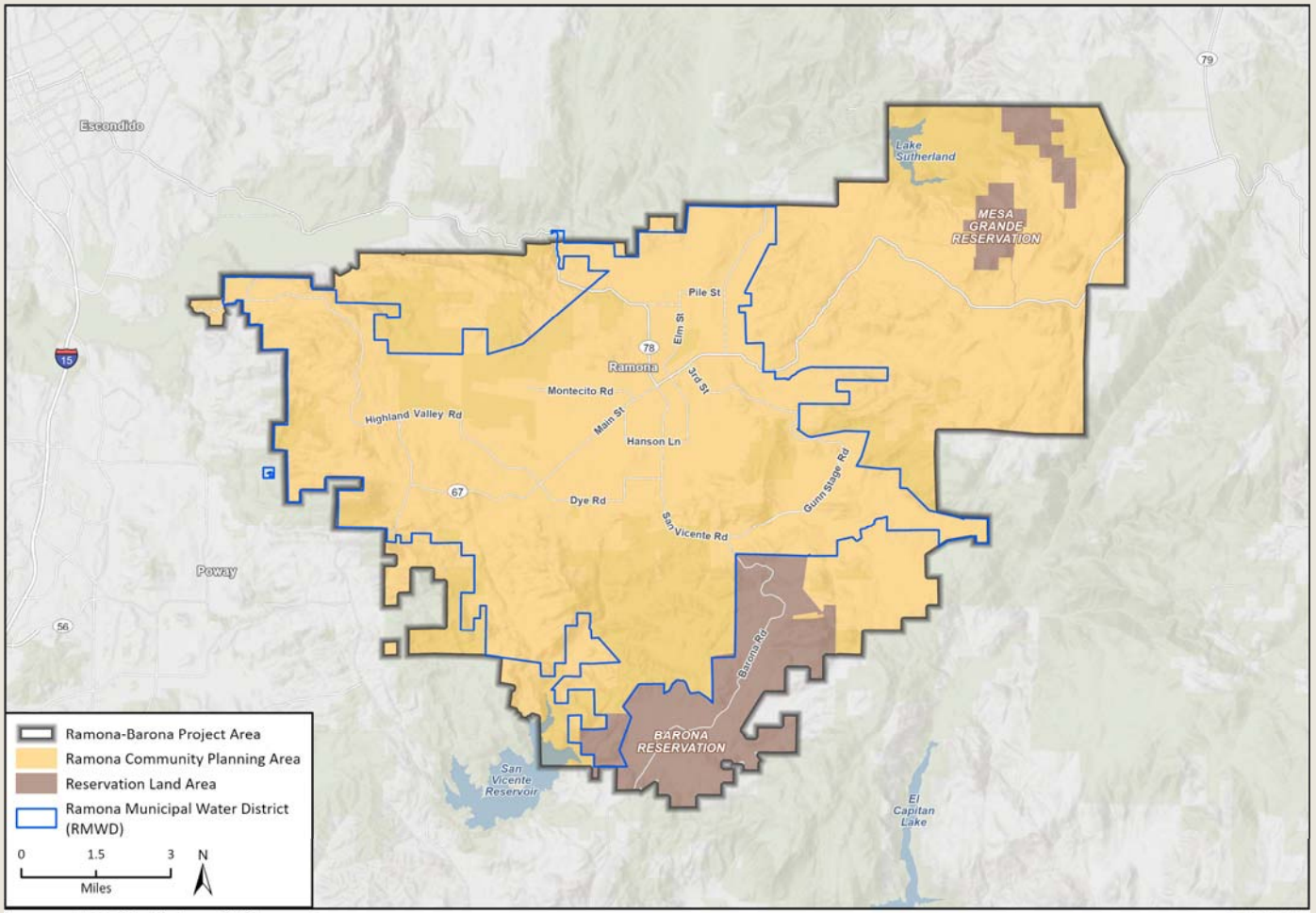
Parks and Recreation
Community Advisory Committee
Pop-up 03/18/2025

Meeting Purpose

- Share an Overview of the Project
- Share the Key Findings of Baseline Analyses for the Project
- Gather Feedback on Key Strategies for the Ramona-Barona Climate Adaptation and Action Plan

Project Overview

Project Area



Basemap provided by Esri and its licensors © 2024.
Additional data provided by SanGIS and SANDAG, 2024; NHD, 2024; CPAD, 2024; RMWD, 2024.

23-14731 EPS CCVA
Fig X Project Area

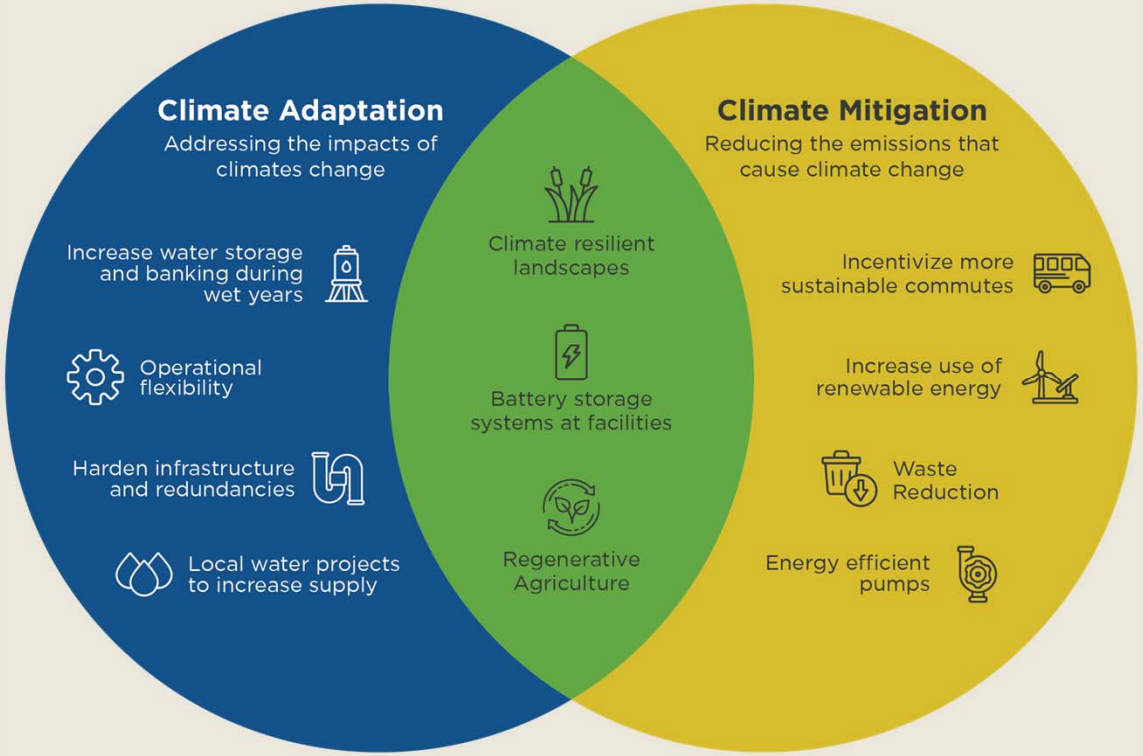
What Makes a Community Resilient?

Community Needs

- Water Security
  - Securing reliable water sources in a changing climate
- Wildfire Resilience
  - Continuing to address fuels and provide fuel breaks to protect residents
- Improved Evacuation Routes
  - Providing safe and efficient evacuation during climate-related emergencies
- Reliable Power
  - Enhancing power reliability during climate-related events such as extreme heat events, wind events, etc.
- Agriculture Protection and Resilience
  - Safeguarding agriculture, which is vulnerable to climate change
  - Promoting resilience through carbon storage and irrigated agriculture which can serve as fire breaks
- Flood Management and Stormwater Control
  - Addressing flood risks and managing excess stormwater flows to protect communities and infrastructure

Project Overview – Baseline Analyses

- Climate Change Vulnerability Assessment
- Greenhouse Gas Analysis
- Natural and Working Lands Analysis



Project Overview – Measures and Actions

Measures and Actions Development to:

- Address key climate change vulnerabilities
- Reduce greenhouse gas emissions
- Protect existing carbon stocks and sequester carbon

Funding Strategy

- Identification of potential financing or funding sources to implement measures

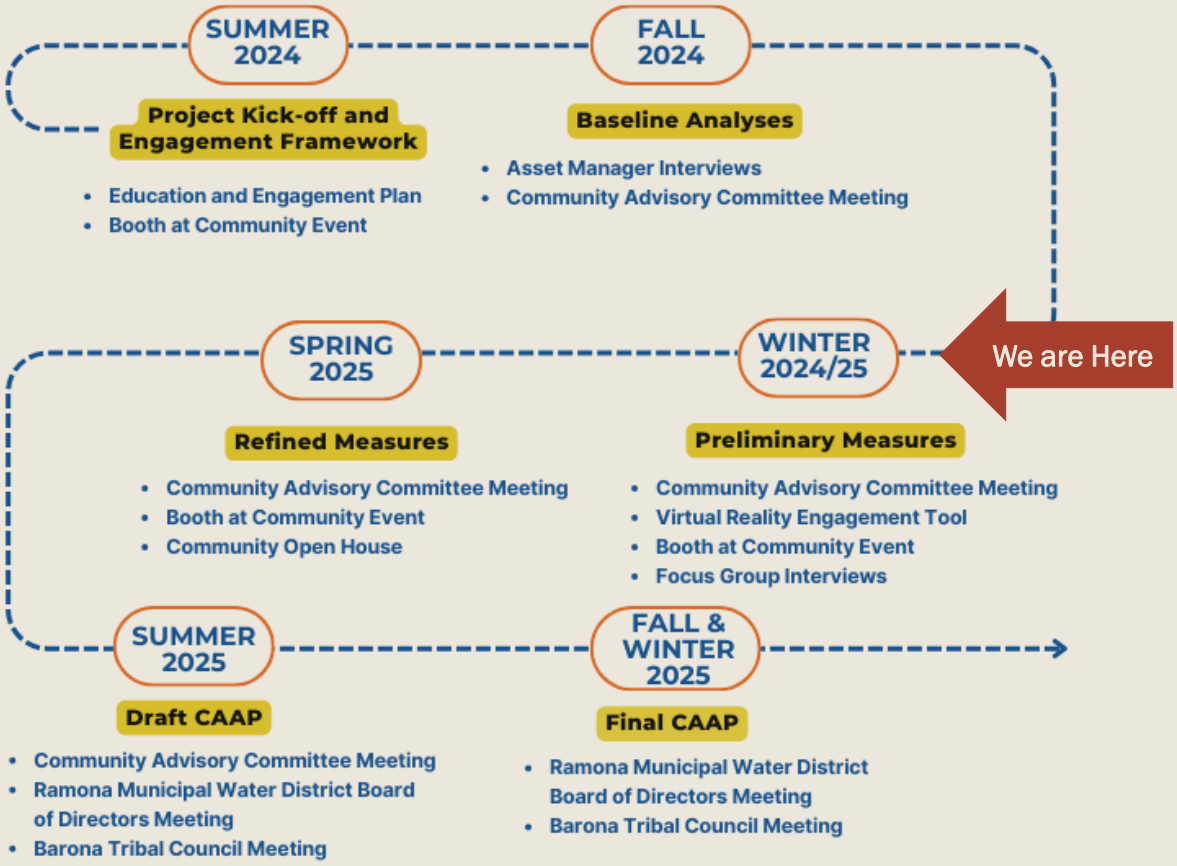
Project Overview – Community Engagement

- Community Advisory Committee Meetings (4)
- Booth at Community Events (3)
- Community Open House (2)
- Focus Group Interviews (3)
- Ramona Municipal Water District Board of Directors Meeting
- Barona Tribal Council Meeting
- Virtual Reality Engagement Tool

SUSTAINABLE RAMONA EST. 2020

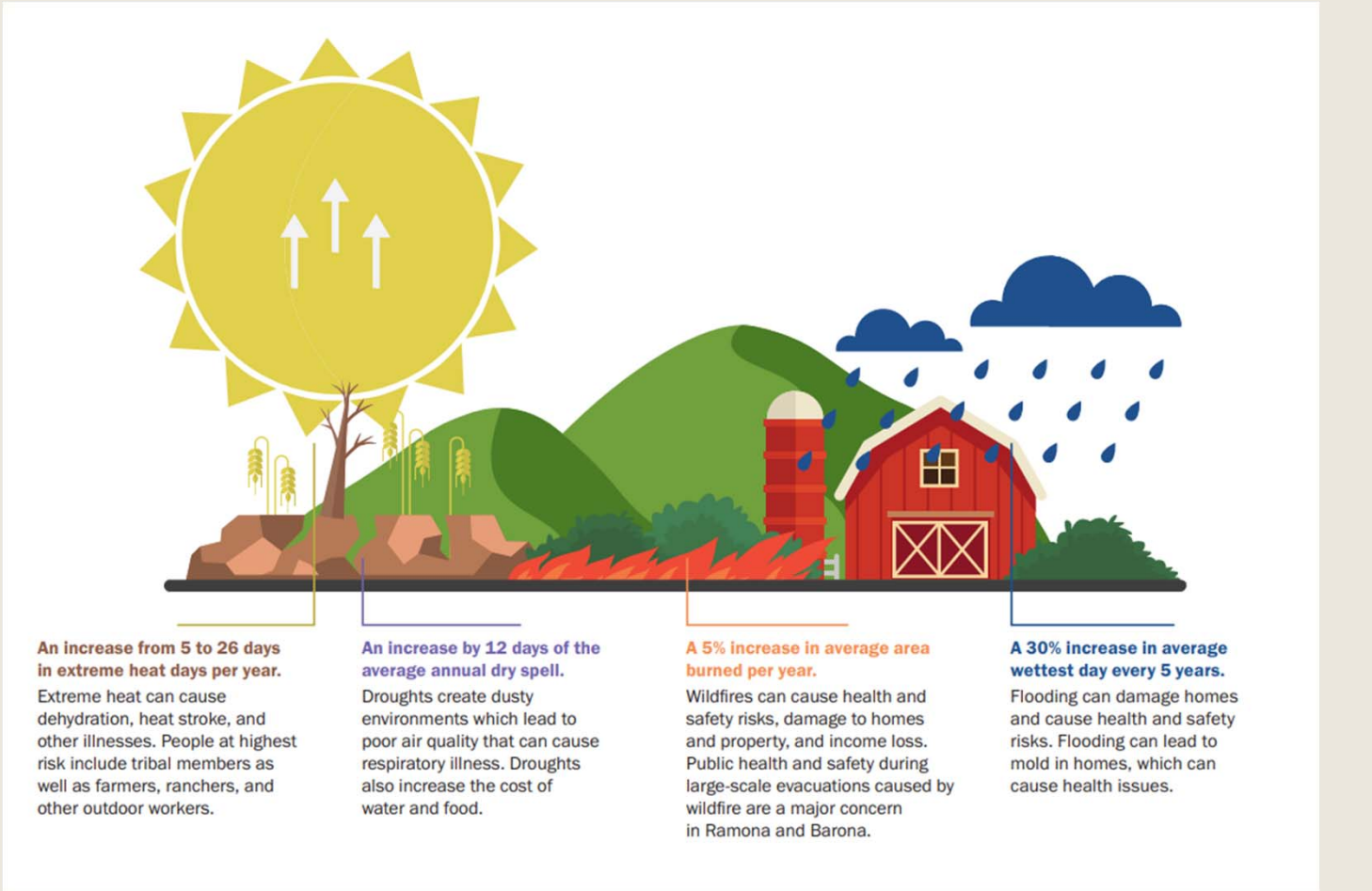
4th Annual Ramona Earth Day Festival
Saturday, April 26, 2025
11 am to 5 pm
Begent Ranch

Project Schedule



Key Findings of the Vulnerability Analysis

Key Findings of Vulnerability Assessment



An increase from 5 to 26 days in extreme heat days per year.

Extreme heat can cause dehydration, heat stroke, and other illnesses. People at highest risk include tribal members as well as farmers, ranchers, and other outdoor workers.

An increase by 12 days of the average annual dry spell.

Droughts create dusty environments which lead to poor air quality that can cause respiratory illness. Droughts also increase the cost of water and food.

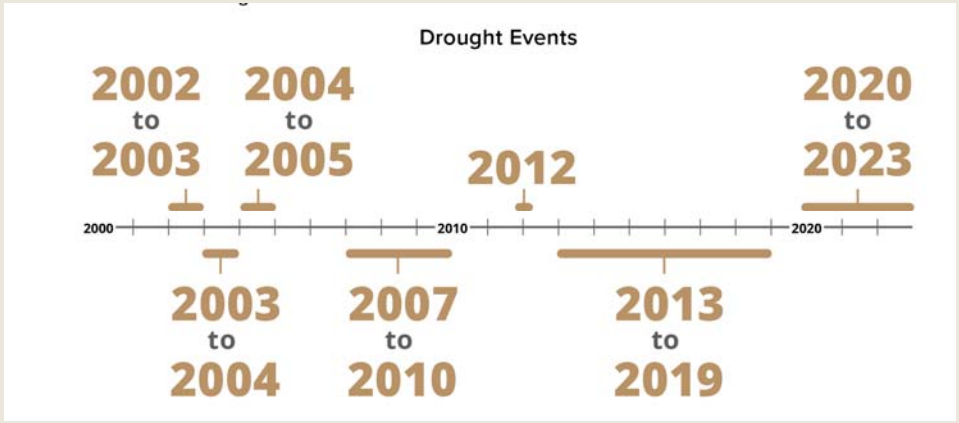
A 5% increase in average area burned per year.

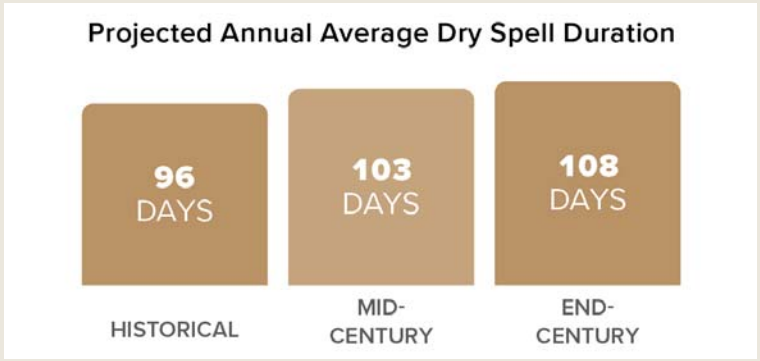
Wildfires can cause health and safety risks, damage to homes and property, and income loss. Public health and safety during large-scale evacuations caused by wildfire are a major concern in Ramona and Barona.

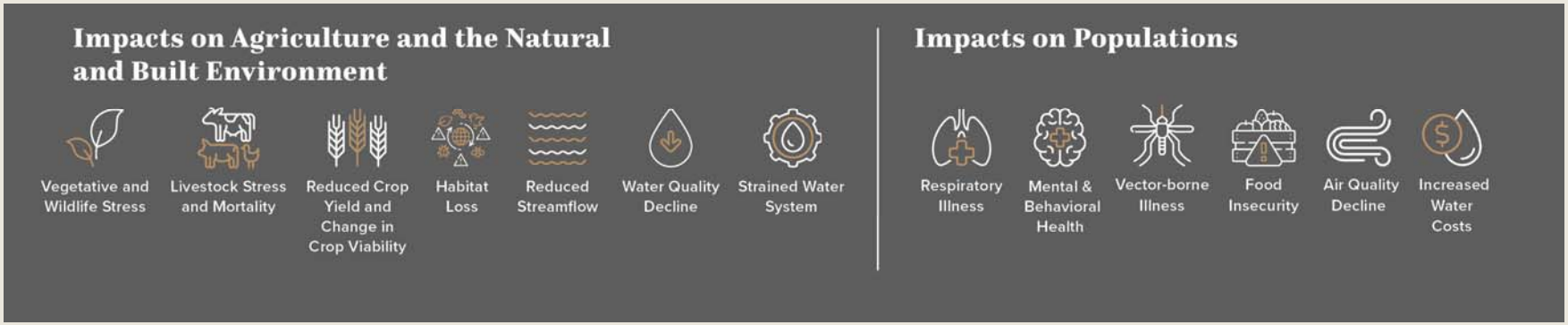
A 30% increase in average wettest day every 5 years.

Flooding can damage homes and cause health and safety risks. Flooding can lead to mold in homes, which can cause health issues.

Drought and Water Supply

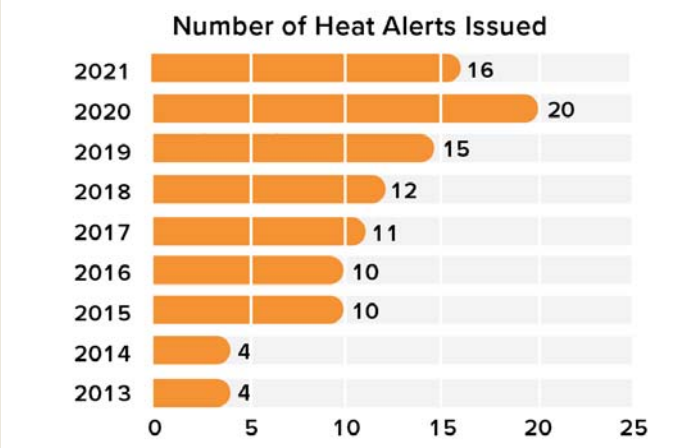




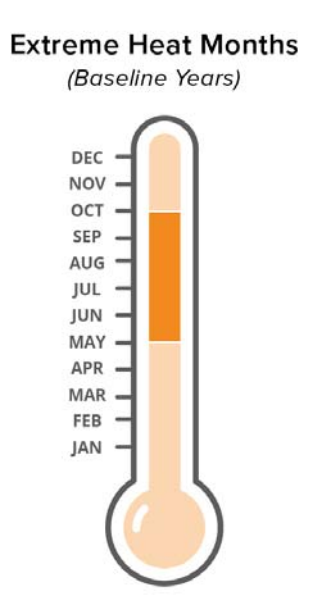


Extreme Heat

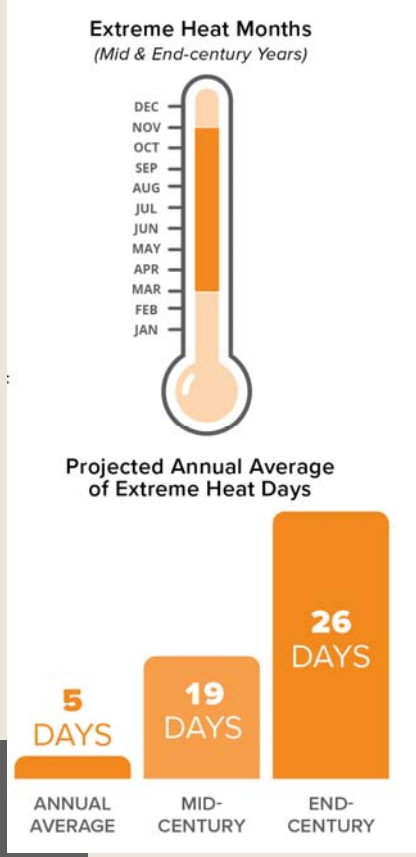
Past



Present



Future



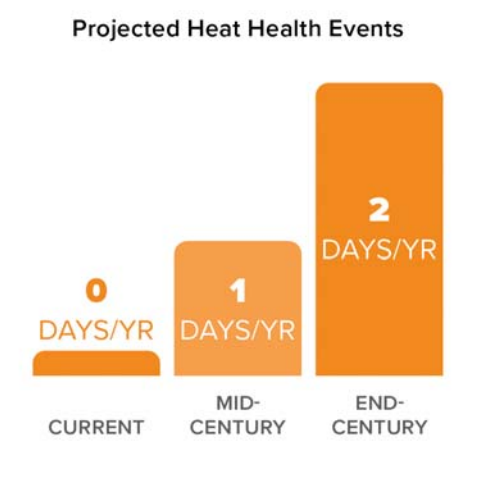
Impacts on Agriculture and the Natural and Built Environment

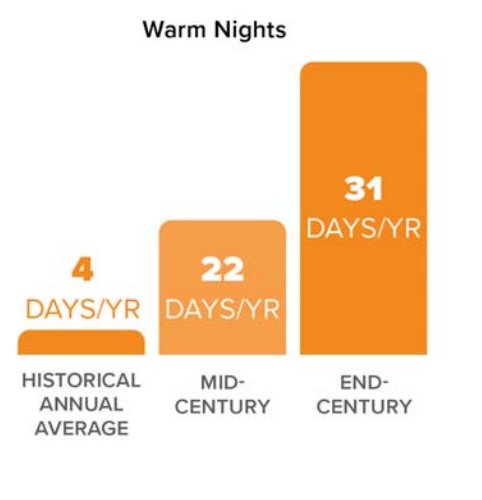
- Cracked Pavement
- Grid Overload
- Reduced Crop Yield
- Wildlife & Vegetative Stress
- Strained Emergency Services
- Livestock Stress and Mortality

Impacts on Vulnerable Populations

- Dehydration
- Heat Stroke
- Health-related Mortality
- Heart Disease
- Respiratory Illness
- Mental & Behavioral Health

Warm Nights and Heat Health Events

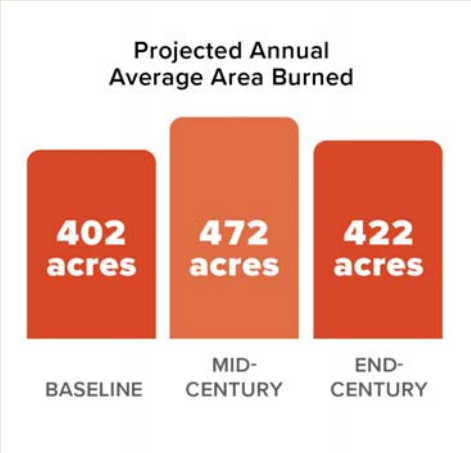




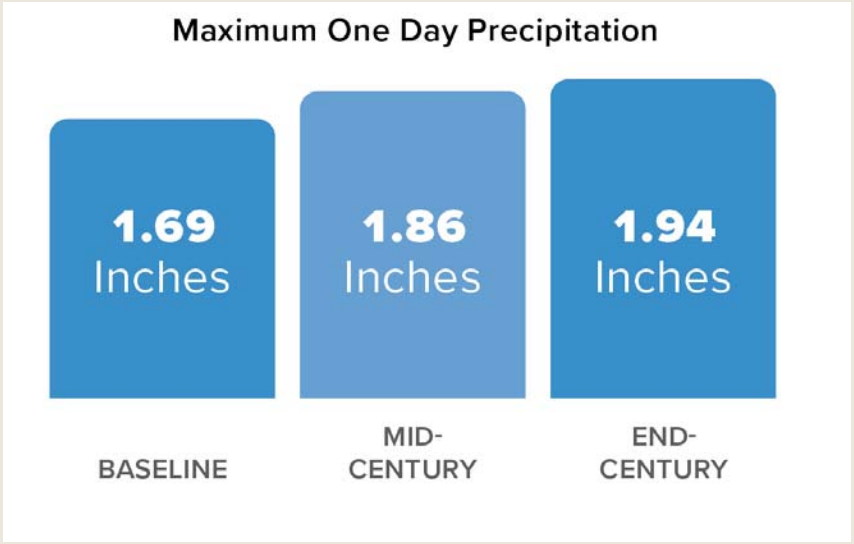
Wildfire

Acres Burned by Decade Over the Past 50 Years

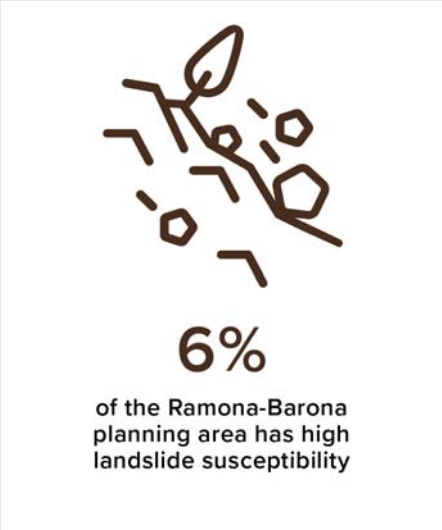
Decade	Ramona-Barona Planning Areas Acres Burned	Total Acres Burned
1970s	18,764	20,117
1980s	2,229	6,355
1990s	3,141	28,366
2000s	77,624	433,250
2010s	565	778
2020s	226	226

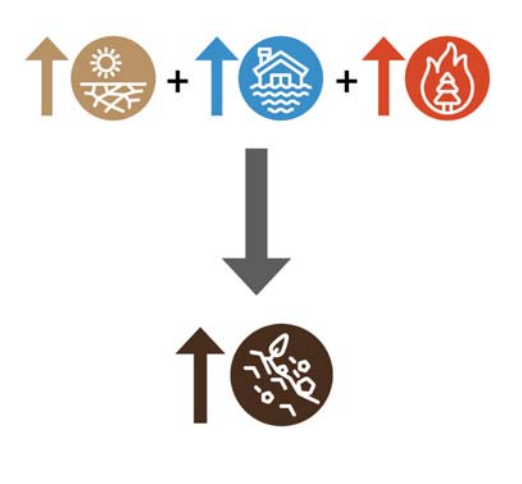


Extreme Precipitation and Flooding



Landslide RIsk





Impacts on Agriculture and the Natural and Built Environment

- Habitat Loss
- Erosion
- Strained Emergency Services
- Property Damage
- Road Closures

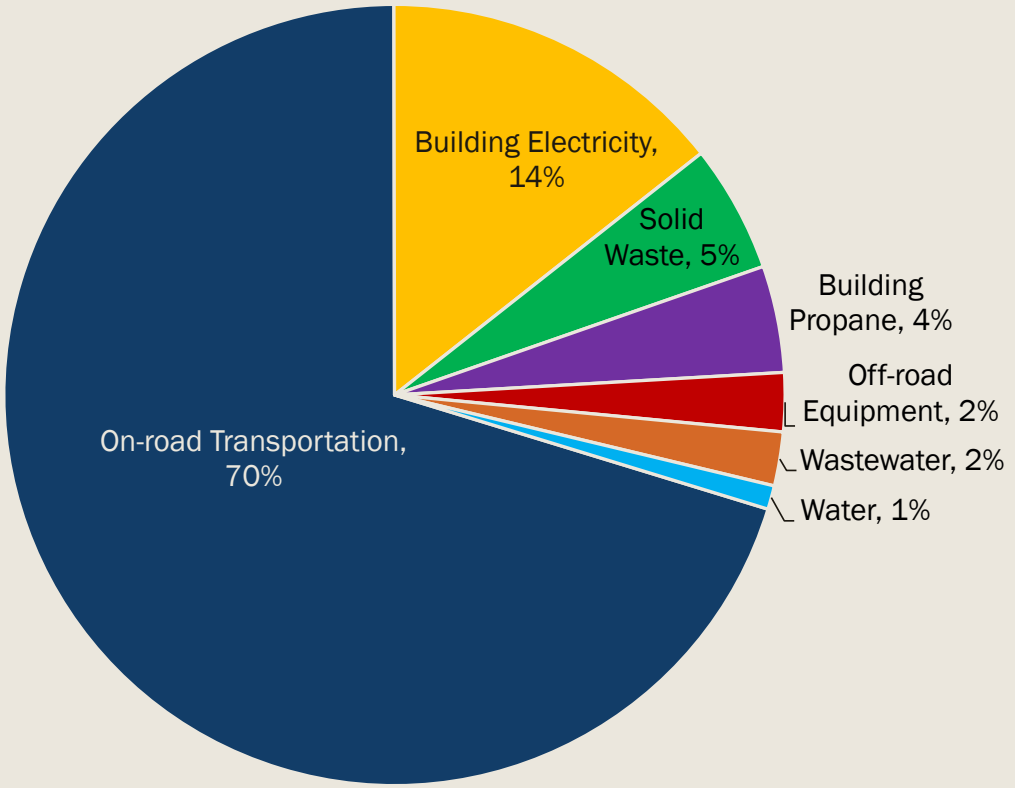
Impacts on Populations Public Health and Safety Risks

- Public Health and Safety Risks
- Fatal and Nonfatal Injury
- Income Loss
- Mental and Behavioral Stress
- Water-borne Disease

Key Findings of the Baseline Analyses

Greenhouse Gas Analysis

2022 Ramona-Barona GHG Emissions	
Sector (Largest to Smallest)	**MT CO_2e**
On-Road Transportation	203,312
Building Electricity	41,678
Solid Waste	15,314
Building Propane	12,779
Off-road Equipment	7,030
Wastewater	6,457
Water	2,840
Total	**289,409**



Evacuation Route Analysis

Objective Evaluate emergency evacuation roadway capacity and timeline scenarios for the Ramona-Barona Planning Area.

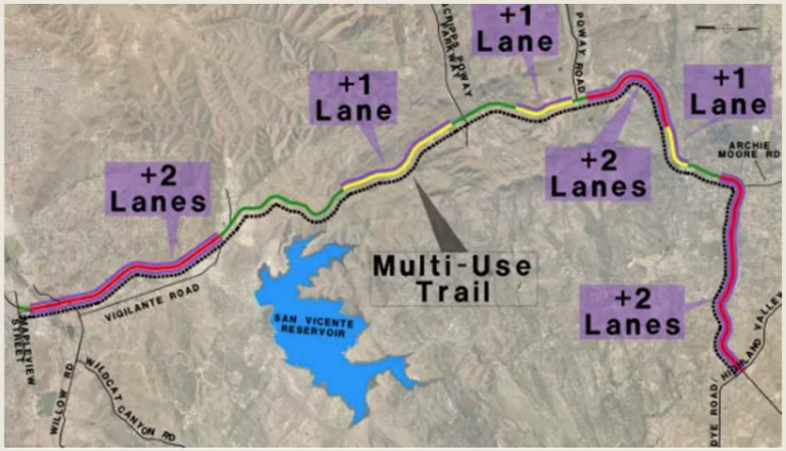
Key Findings

- **Full Study Area Evacuation Using SR-67, SR-78, Highland Valley Road, and Wildcat Canyon Road**
  - Using **all routes and vehicles**, evacuation takes approximately **7.8 hours** during the evening.
  - With **only one lane available**, evacuation takes approximately **35.8 hours** during the evening.
- **Evacuation Using Only SR-67**
  - Adding **one additional lane** of egress reduces evening evacuation time from **45 hours** to **22 hours**.
  - Adding **two additional lanes** of egress reduces evening evacuation time from **45 hours** to **16 hours**.

Final document is on CAAP website!

https://ramona-baronacaap.rinconconsultants.com/

Caltrans is currently requesting input on Hwy 67 widening alternatives: https://engage.dot.ca.gov/sr-67improvements



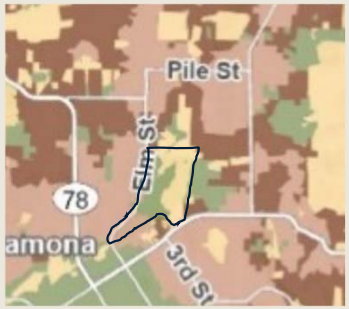
How does this fit into Ramona Community Park?

- Need to consider how park may change as climate becomes hotter, drier, with flashier precipitation
- Supports use of site as CAL FIRE base camp, emergency evacuation site and resilience center
  - Linkage to the $10M Community Resilience Center Grant
- Supports additional funding ($) for land management and stormwater management within the park and community as a whole

Wildfire Risk Assessment – Using Park as Example

What is looked at? Critical facilities, surface fuel types, difficulty in suppressing a fire, burn probability

Outputs from Iodp h#P ds=#Flame Length, Crown Fire Potential and Rate of Spread under Average, 90th Percentile and 97th Percentile Fire Weather -> Modeled Fire Risk ->Recommended Vegetation Treatment Areas



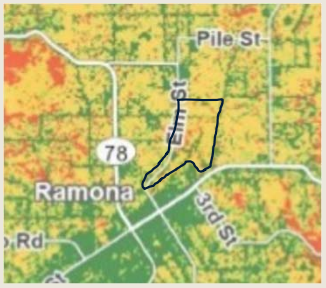
Wildland Urban Interface (WUI)

- Influence Zone
- Interface
- Intermix
- Not WUI

Note: crown fire map (not shown) is not interesting for Ramona as we have few trees and thus is all surface fire

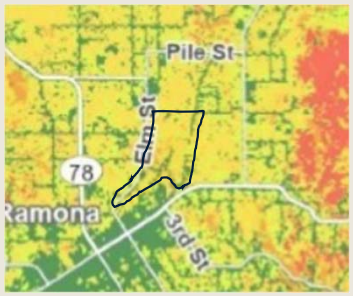
Flame Length (Average Scenario)

- 0 - 4 ft (25,075 ac)
- 5 - 8 ft (31,255 ac)
- 9 - 11 ft (2,061 ac)
- > 11 ft (31,840 ac)



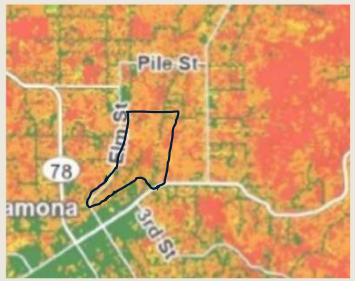
Flame Length (97th Percentile Scenario)

- 0 - 4 ft (13,930 ac)
- 5 - 8 ft (9,578 ac)
- 9 - 11 ft (31,982 ac)
- > 11 ft (34,741 ac)



Rate of Spread (Average Scenario)

- 0 - 4 ft/min (12,141 ac)
- 5 - 8 ft/min (1,228 ac)
- 9 - 20 ft/min (12,738 ac)
- 21 - 40 ft/min (31,951 ac)
- 41 - 80 ft/min (17,208 ac)
- > 80 ft/min (14,963 ac)



Rate of Spread (97th Percentile Scenario)

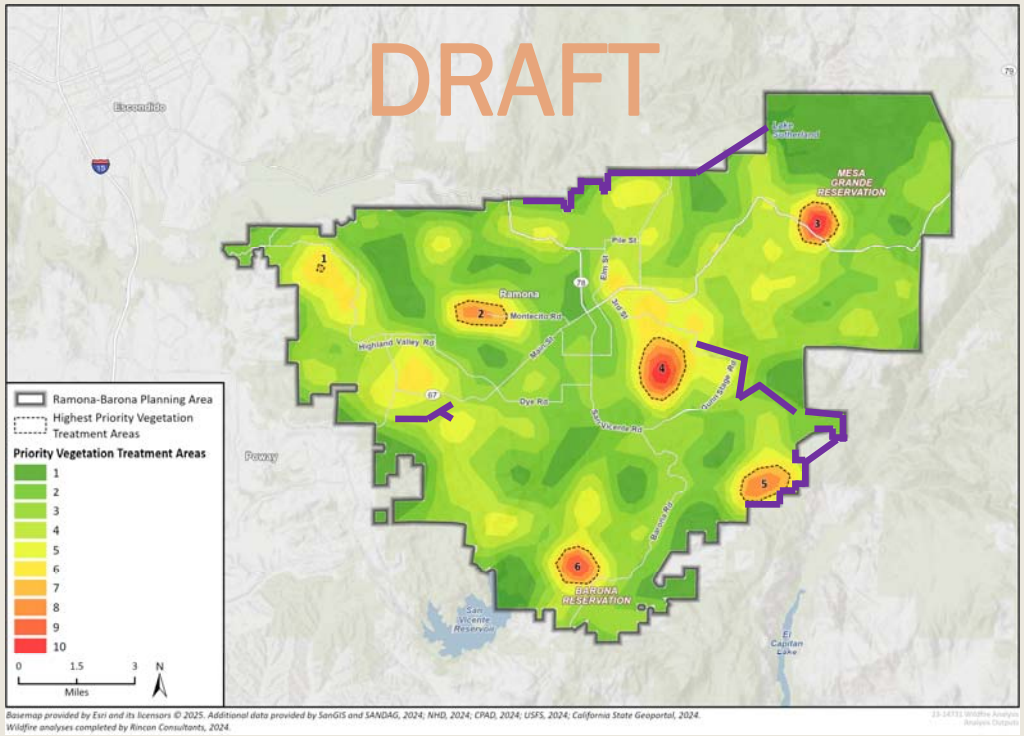
- 0 - 4 ft/min (11,236 ac)
- 5 - 8 ft/min (238 ac)
- 9 - 20 ft/min (787 ac)
- 21 - 40 ft/min (4,047 ac)
- 41 - 80 ft/min (28,041 ac)
- > 80 ft/min (45,882 ac)

Wildfire Risk Assessment

Objective Identify high priority areas in the Ramona-Barona Planning Area to target wildfire risk reduction strategies.

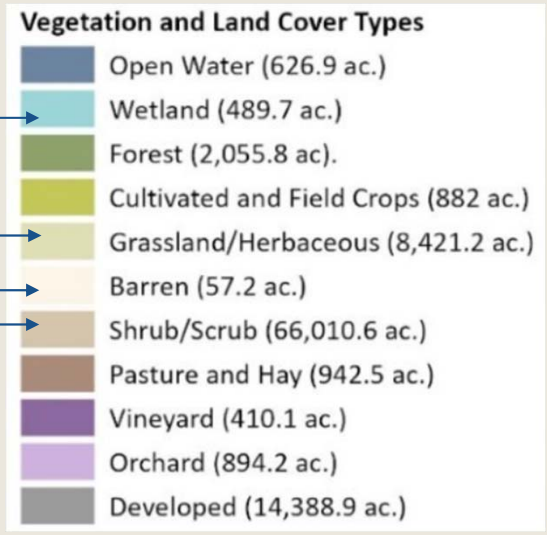
Key Findings

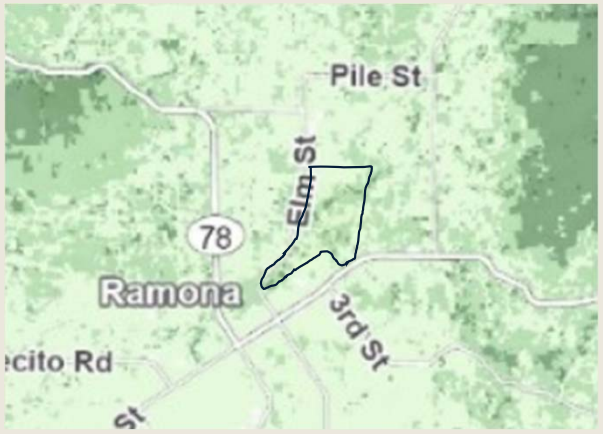
- **Prioritize Vegetation Treatment**: Focus on high-priority areas to reduce wildfire risk.
- **Implement Fuel Breaks**: Establish fuel breaks in Wildland-Urban Interface (WUI) zones to prevent wildfire spread into residential, commercial, and industrial areas.
- **Enhance Roadside Vegetation Treatment**: Treat vegetation along roadsides to aid evacuation efforts.
- **Promote Community Efforts**: Encourage home hardening and defensible space maintenance to protect built infrastructure.
- **Note: Does Not Include Fire Safe Council's Historical Fuel Breaks (shown in purple)**

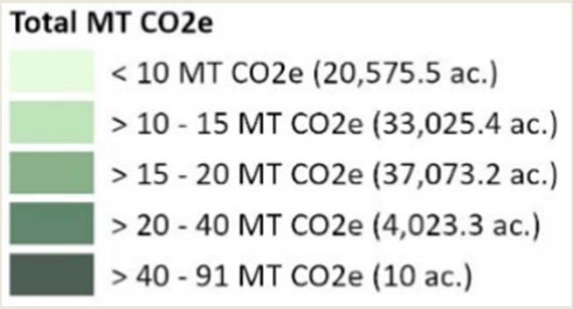


Natural and Working Lands Analysis
Carbon Stock Estimates – Using Park as an Example

- Carbon stock per acre (metric tons CO_2e/acre)
  - Shrub/scrub – 69
  - Wetland – 61
  - Barren - 44
  - Grassland or Developed – 42
  - Cultivated/Field Crop – 46
  - Forest - 92
- Park – 145 acres
  - Mostly shrubs/grass
    - (69+42)/2 x 145 =
    - 8,000 metric tons CO_2 captured in park





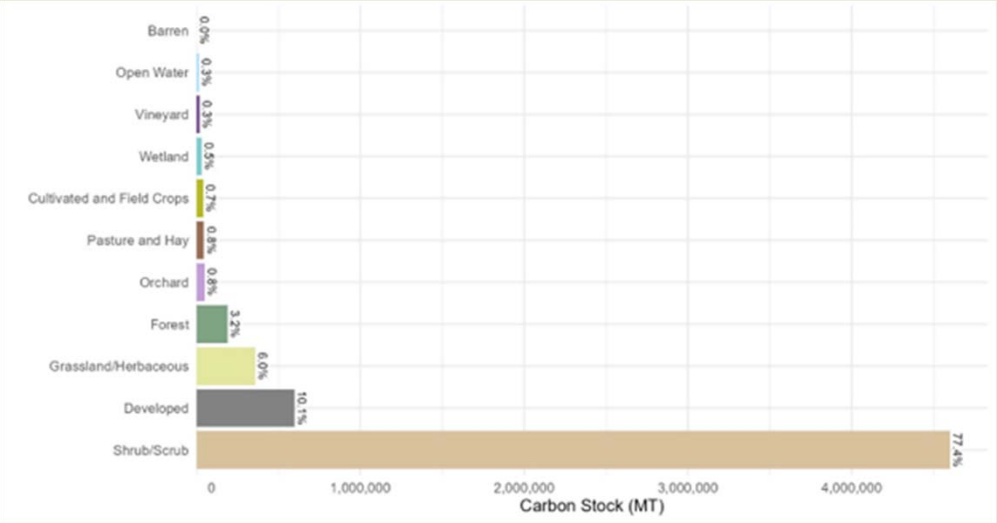


Natural and Working Lands Analysis
Carbon Stock Estimates

Key Findings

- 5.9 million metric tons of carbon dioxide equivalent (CO_2e) stored in Ramona and Barona lands
- Shrub/scrub land stored the most carbon overall (69% of overall land cover)
- Carbon stock per acre results
  - Forested lands - 92 metric tons CO_2e/acre
  - Shrub/scrub - 69 metric tons CO_2e/acre
  - Wetland – 61 metric tons CO_2e/acre
  - Orchard – 54 metric tons CO_2e/acre

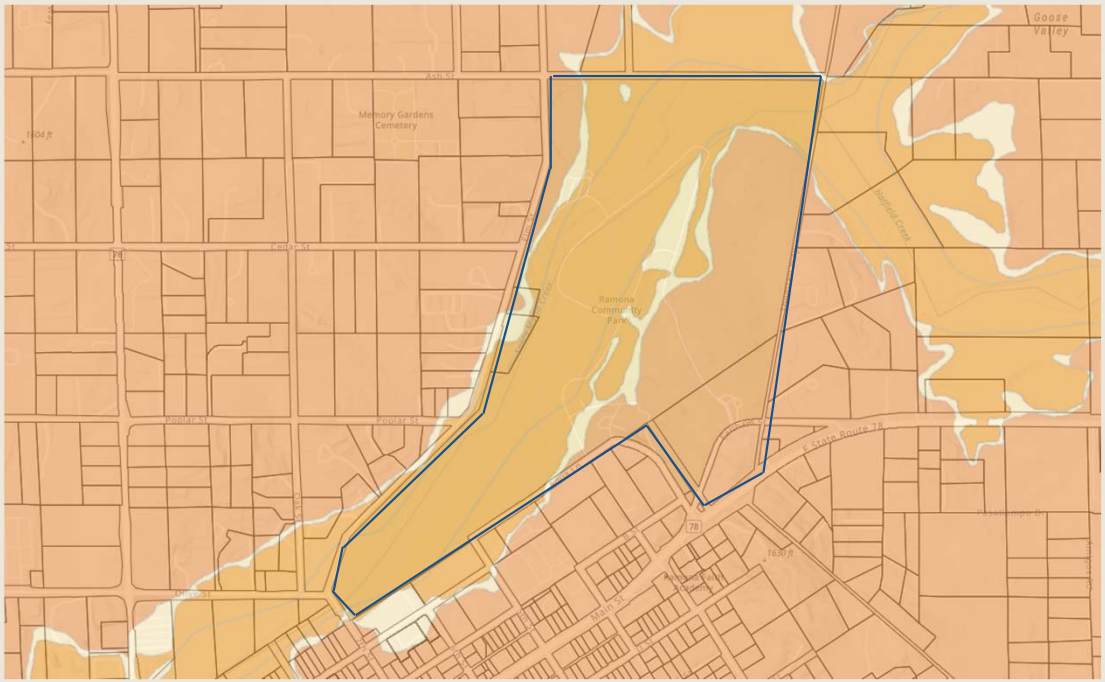
Ramona-Barona Planning Area Total Carbon Stock



Ramona Community Park as a Flood Barrier

- Flooding projected to increase with flashier precipitation
- Majority of park is in floodplain of Santa Maria Creek
- Other than the County, RMWD has control over the longest length of creek (1 mile)
- Park is upstream on Santa Maria Creek from most of the town
- Opportunities:
  - Use as part of flood control strategy to reduce flooding impacts downstream
  - Use to capture stormwater for future reuse
  - Potential for creek releases using groundwater to maintain habitat
  - Potential to reduce high groundwater levels in community by lowering water table at this elevation

Flood Plain Map



Activity Time!