

# Santa Cruz Mountains Climate Adaptation Project

## Climate Change Adaptation Planning Workshop

November 19-20, 2020



# Agenda

## Workshop Series:

- Part 1. November 19<sup>th</sup>: Review vulnerability assessment results
- Part 2. November 20<sup>th</sup>: Develop adaptation strategies

**09:00-09:30**

**Welcome, project overview, and introductions**

**09:30-10:00**

Vulnerability assessment results for habitats and species

**10:00-10:10**

**Break**

**10:10-11:30**

Climate-driven trends in vegetation distribution

**11:30-12:00**

Identifying priorities for adaptation planning

**12:00**

**Adjourn**



# Santa Cruz Mountains

## Climate Adaptation Project Overview

### **1. Project Scoping Meeting (June 2019)**

- Select natural resources of interest, define project boundary, identify climate variables and timeframes for spatial analysis

### **2. Vulnerability Assessment (Fall 2019)**

- Vulnerability Assessment Workshop: Oct 2019
- Synthesize vulnerability information: 2020

### **3. Spatial Analysis (Summer 2019-Summer 2020)**

- Downscaled maps and trends for climatic and hydrologic variables, vegetation, and fire

### **4. Adaptation Planning (Fall 2020)**

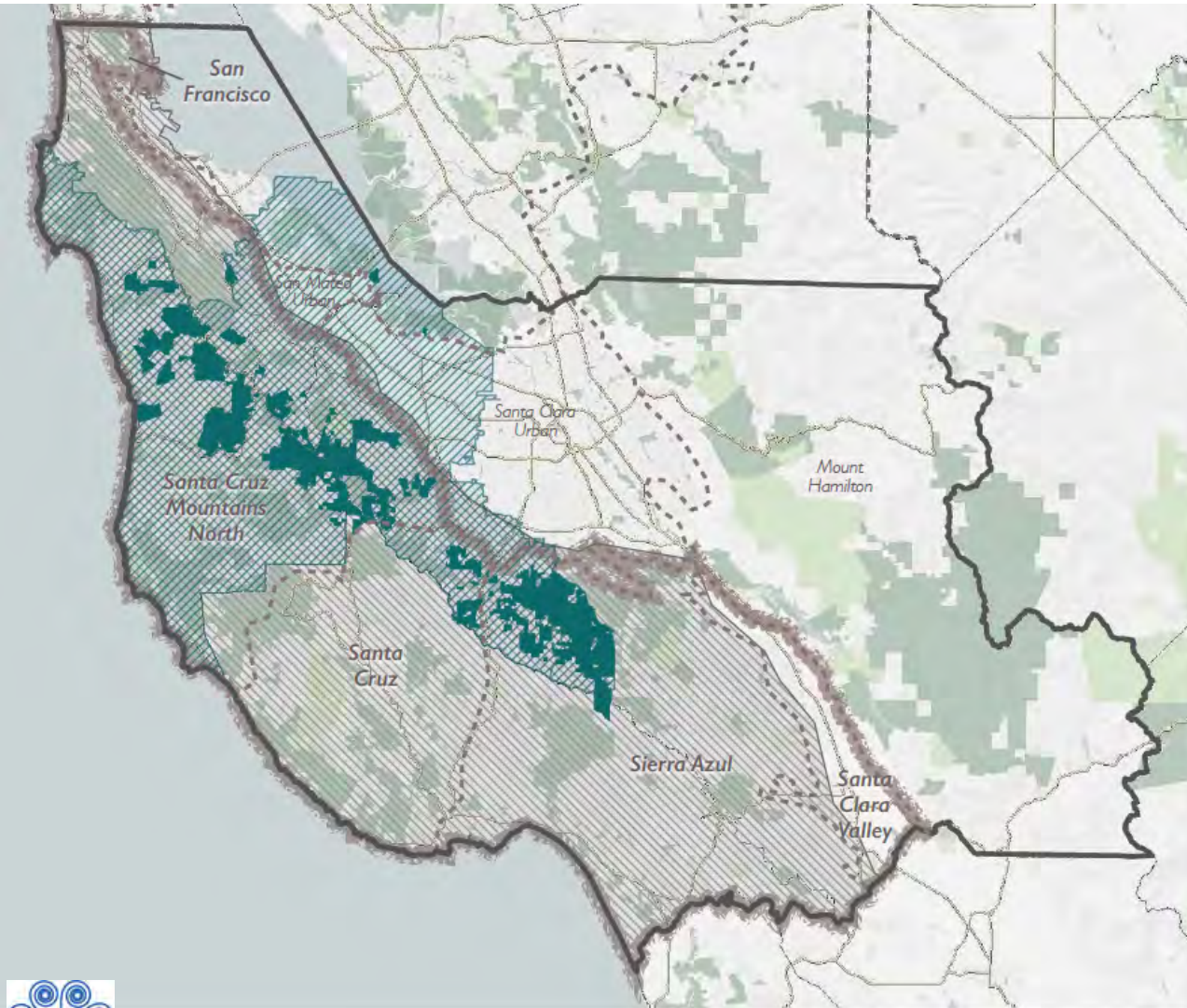
- Two workshops (Midpen, SCMSN): Nov/Dec 2020
- Synthesize adaptation information: Winter 2021

### **5. Final climate vulnerability and adaptation products, spatial analysis (Spring 2021)**





# Santa Cruz Mountains Climate Adaptation Project Boundary



## GEOGRAPHIC EXTENTS

- Vegetation assessment (Based on Landscape Units)
- Climate assessment (Based on counties)

## BOUNDARIES

- MROSD boundary
- SCMSN boundary
- Landscape Unit

## PROTECTED AREAS

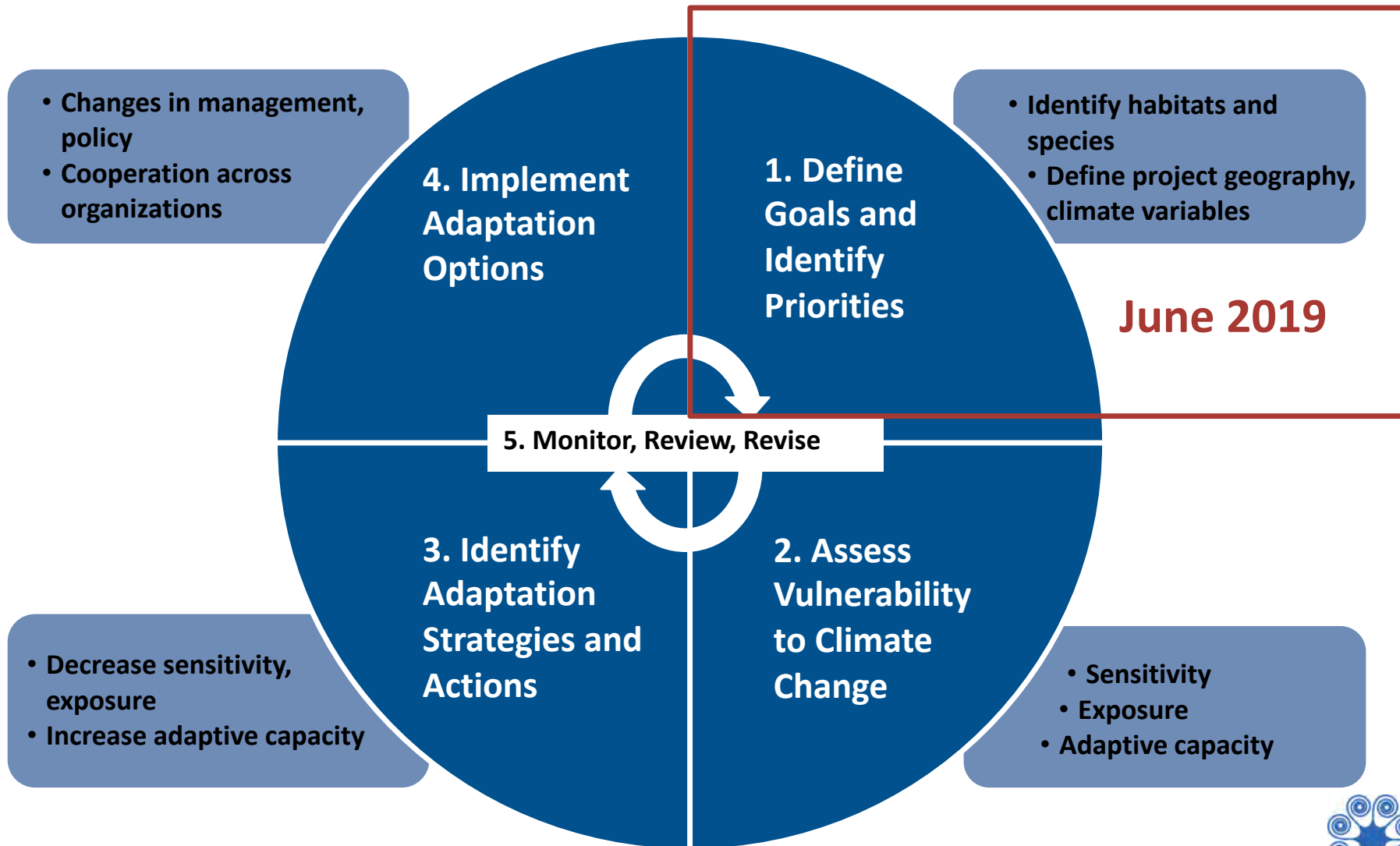
- MROSD preserve
- Protected area (CPAD 2018)
- Conservation easement (CCED 2018)

## REFERENCE

- County boundary
- Major road



# Climate Adaptation Framework



# Focal Resources List

## Habitats

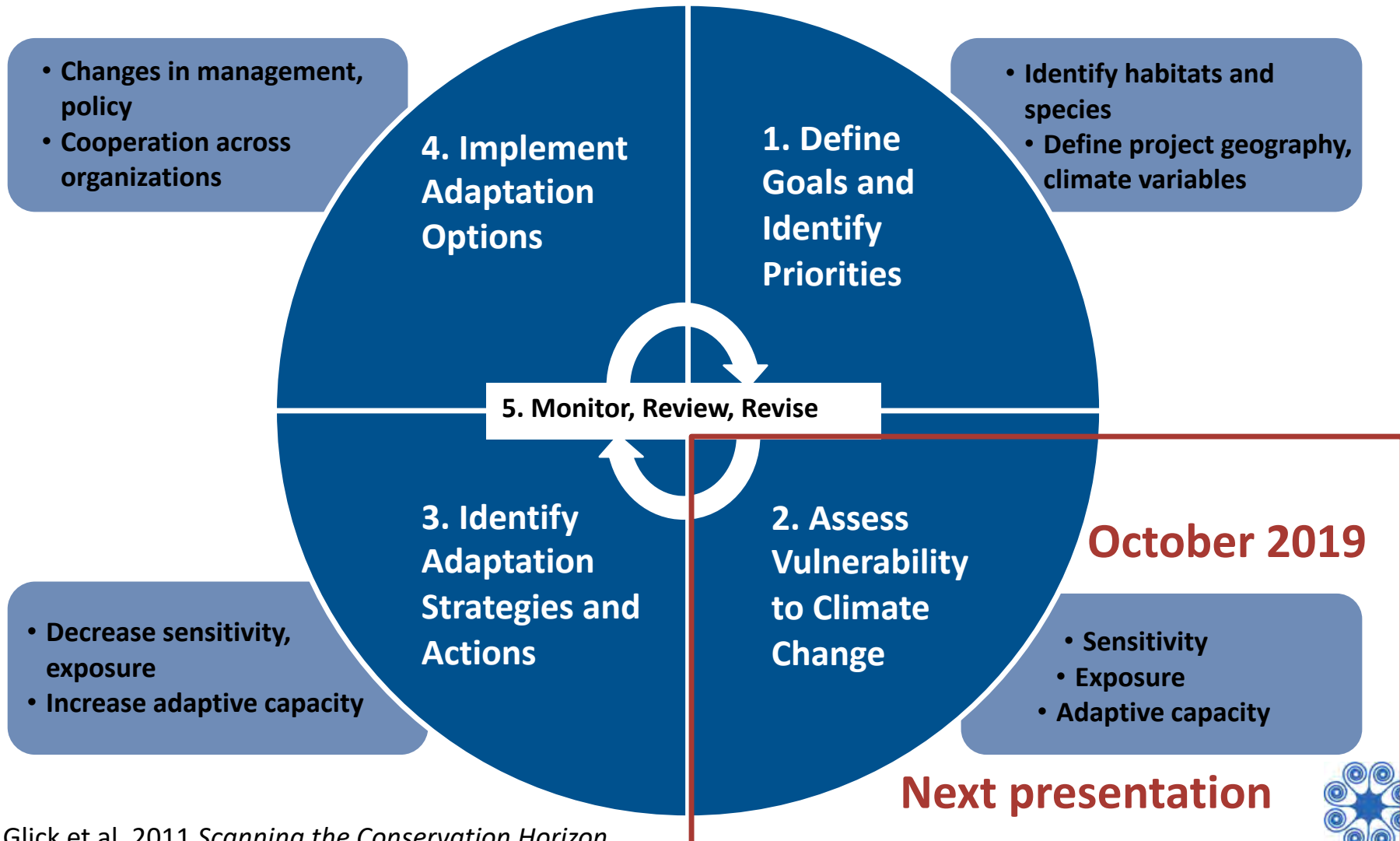
- Coastal dunes, wet meadows, and prairie
- Coastal scrub
- Mixed grasslands
- Chaparral shrublands
- Oak woodlands
- Mixed evergreen/montane hardwood forests
- Coastal redwood forests
- Rivers, streams, and floodplains
- Freshwater marshes, wetlands, and ponds
- Seeps and springs

## Species/Species Groups

- American badger & western burrowing owl
- Bats
- Butterflies
- Coyote brush
- California red-legged frog & San Francisco garter snake
- Marbled murrelet
- Salamanders
- Salmonids
- Wide-ranging mammals



# Climate Adaptation Framework



# Climate Adaptation Framework





# Final Products

1. Short synthesis report on climate projections, trends, and impacts
2. Vulnerability-adaptation briefs
3. Short report summarizing workshop proceedings
4. Print-ready maps and GIS layers



## Habitat Description

Alluvial scrub habitats commonly inhabit outwash fans, river wash deposits, and riverine deposits at canyon mouths toward the base of mountain ranges, including the San Gabriel, San Bernardino, San Jacinto, and Santa Ana ranges. Alluvial scrub habitats can also be found on wash deposits of regional rivers, including the Santa Ana River and its tributaries. Alluvial scrub consists mainly of flood-adapted drought-deciduous subshrubs and evergreen woody shrubs.

## Habitat Vulnerability

**Sensitivity & Exposure**  
Alluvial scrub habitats are critically sensitive to climate drivers that alter hydrologic, flooding, and scouring regimes and/or that alter moisture availability, as these factors affect habitat distribution, composition, and survival. Other climate drivers (temperature, wildfire) affect habitat composition. Alluvial scrub habitats are also very sensitive to non-climatic drivers that exacerbate climate-driven changes. Dams, water diversions, and flood control structures compound hydrological alterations and habitat connectivity, while invasive species can directly compete with alluvial scrub vegetation for increasingly limited resources.

Moderate-High Vulnerability



## Drivers of Alluvial Scrub Habitats

- **Climate sensitivities:** Precipitation, soil moisture, drought, flow regimes (high/low flows), air temperature, snowpack depth, snowmelt timing
- **Disturbance regimes:** Flooding & erosion, wildfire
- **Non-climate sensitivities:** Dams, water diversions & flood control structures, invasive & problematic species

Projected Climate and Climate-Driven Changes	Potential Impacts on Alluvial Scrub Habitats
<b>Altered precipitation &amp; soil moisture</b> <i>Variable annual precipitation volume and timing; increased climatic water deficit; longer, more severe droughts</i>	<ul style="list-style-type: none"> <li>• Altered distribution, species composition, productivity, and succession patterns; drier conditions may inhibit succession, limit annual species' establishment, and/or cause conversion to more xeric communities</li> <li>• Altered invasive species pressure</li> </ul>
<b>Increasing temperatures</b> <i>+2.5 to +9°C by 2100</i>	<ul style="list-style-type: none"> <li>• Altered distribution</li> <li>• Altered species composition; freeze-sensitive species may have more growth opportunities, but hot conditions may impair success of annuals</li> </ul>
<b>Altered stream flow &amp; flooding regimes</b> <i>Increased winter flow/flood volume; earlier, shorter, lower volume spring runoff; decreased summer flow</i>	<ul style="list-style-type: none"> <li>• Altered distribution</li> <li>• Altered succession patterns and species composition; more frequent flooding may increase habitat heterogeneity</li> <li>• Altered pollination/dispersal via impacts on ground-dwelling insects</li> </ul>
<b>Altered fire regimes</b> <i>Increased fire size, frequency, and severity</i>	<ul style="list-style-type: none"> <li>• Altered species composition and population structure</li> <li>• Impeded vegetation recovery with shorter fire return intervals</li> <li>• Altered pollination/dispersal via impacts on ground-dwelling insects</li> </ul>

## Adaptive Capacity

**Factors that enhance adaptive capacity:**

- + Disturbance-adapted community with diverse reproductive capabilities
- + Moderate spatial/successional and floristic diversity; provides habitat for many rare animals
- + Provides variety of ecosystem services: biodiversity, flood and erosion protection, and water supply/quality/sediment transport

**Factors that undermine adaptive capacity:**

- Eliminated from 90-95% of historical habitat area; currently fragmented and generally isolated along unaltered streams and alluvial outwashes
- Landscape barriers, specific soil requirements, and limited dispersal capacity may limit migration opportunities in response to climatic stressors
- Low-moderate functional group diversity



All final products will be available to Midpen and the Network

# Introductions

- Name
- Brief description of site or habitat that you work on regularly and primary challenges





# Next Up

Vulnerability assessment results!



# Brainstorming Adaptation Priorities

HABITATS	ACTIVITIES/TOPICS	SITES/PROJECTS
Redwood forest	Connectivity, linkages	Irish Ridge restoration site
Grasslands	Fuels management (negative + positive impacts; areas where we're working against the tide vs. working more in line with where things are going with CC)	
Black oak	Road infrastructure and erosion	
Coast live oak	Grazing	
Rare plants in riparian areas	Larger, intact tracts vs. mosaic habitats	
Floodplains	Hydrologic connectivity, plant communities and transpiration, soil moisture, etc.	
Canyon live oak		

