

Santa Cruz Mountains Climate Adaptation Project

Climate Change Vulnerability Assessment Workshop

October 15, 2019
Los Altos, CA



Agenda

09:00-09:30	Welcome and introductions
09:30-10:15	Climate trends
10:15-10:45	Intro to vulnerability assessments and adaptation
10:45-11:00	Break
11:00-12:00	Vulnerability assessment: Habitats
12:00-12:30	Lunch
12:30-1:15	Vulnerability assessment: Habitats (continued)
1:15-1:45	Habitat assessment: report-back
1:45-2:00	Break
2:00-3:30	Vulnerability assessment: Species
3:30-3:55	Species assessment: report-back
3:55-4:00	Wrap-up and next steps





Mission: To create a robust future in the face of climate change

How? Providing support, training, and assistance to make planning and management less vulnerable.

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Adaptation Ladder of Engagement®

7 Sharing

6 Evaluation

5 Integration

4 Implementation

3 Planning

2 Assessment

1 Awareness



State of Adaptation Program

finding out how people are fishing

Awareness to Action

teaching others to fish

Climate Adaptation Knowledge Exchange

connecting the fishing community

National Adaptation Forum

gathering at the fish market

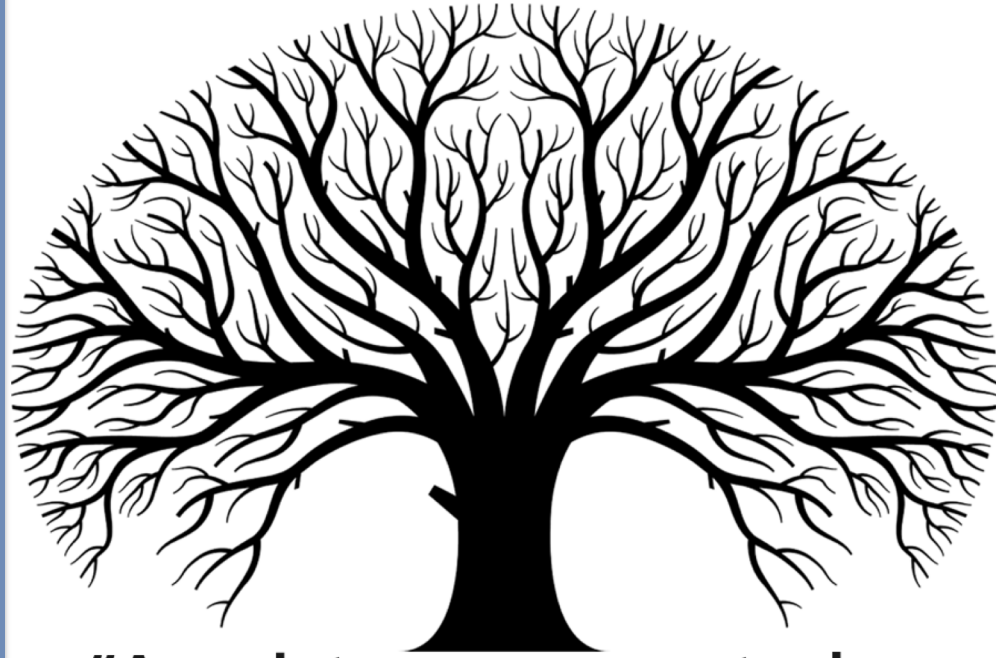
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Need to incorporate climate change into near-, medium-, and long-term planning

- Minimize risk of wasting time, money, and effort
- Maximize likelihood of success



"A society grows great when old men plant trees whose shade they know they shall never sit in." Greek Proverb



Responding to Climate Change

Mitigation is what we do to decrease the potential of climate change itself.

- ✓ Drive less
- ✓ Use less energy
- ✓ Plant/protect more trees, corals, mangroves to sequester/store carbon



Adaptation is how we prepare for and respond to the changes that we are already experiencing/expected to experience.

- ✓ Protect climate refugia
- ✓ Protect biodiversity
- ✓ Reduce non-climate stresses (pollution, disease)



Why Engage in Adaptation Planning?

Adaptation planning **can help:**

- Shift the *way* you are implementing current actions
- Identify new approaches to management
- Prioritize no-regrets actions with high likelihood of success/impact
- Identify cross-resource opportunities that:
 - Accomplish objectives across a range of resources
 - Can be used to leverage funding, partnerships, etc.



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: Fall 2019/early Winter 2020

3. Spatial Analysis (Summer 2019-Summer 2020)

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

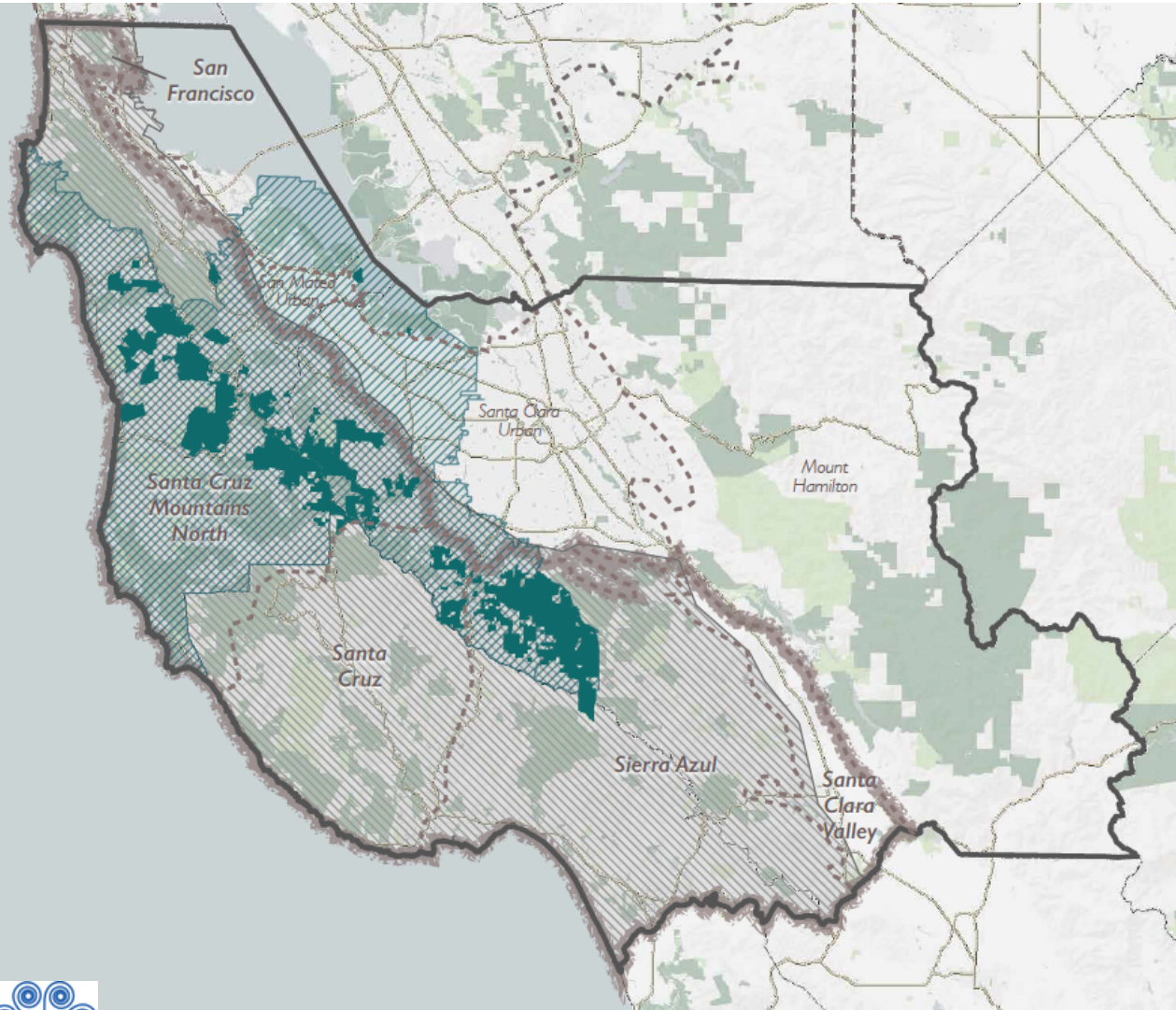
4. Adaptation Planning (Winter/Spring 2020)

- Two workshops (Midpen, SCMSN): Feb/Mar 2020
- Synthesize adaptation information: Spring/early Summer 2020

5. Final climate vulnerability and adaptation products, spatial analysis (July 2020)



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

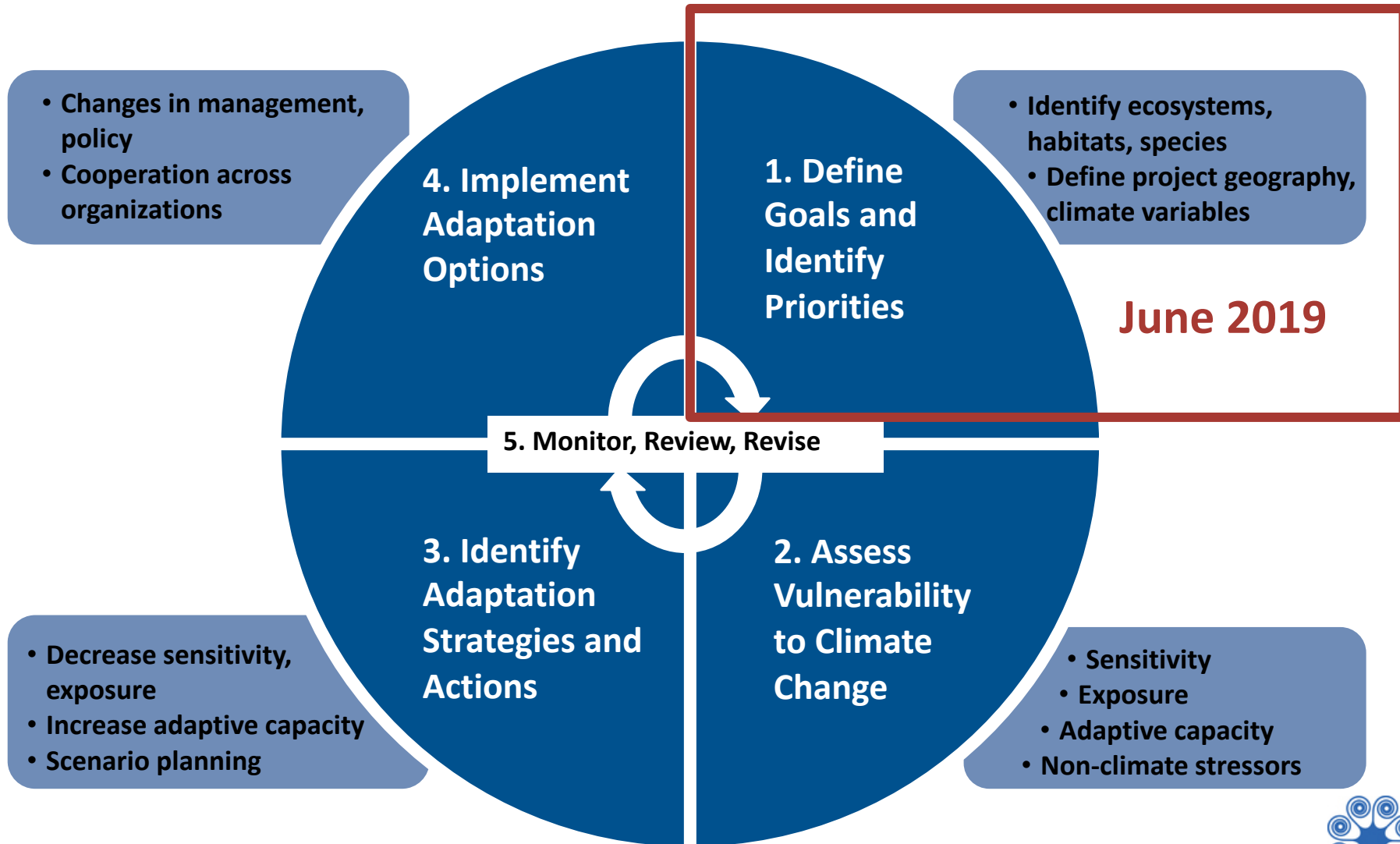
- MROSD preserve
- Protected area (CPAD 2018)
- Conservation easement (CCED 2018)

REFERENCE

- County boundary
- Major road



Climate Adaptation Framework



Focal Resources List

Habitats

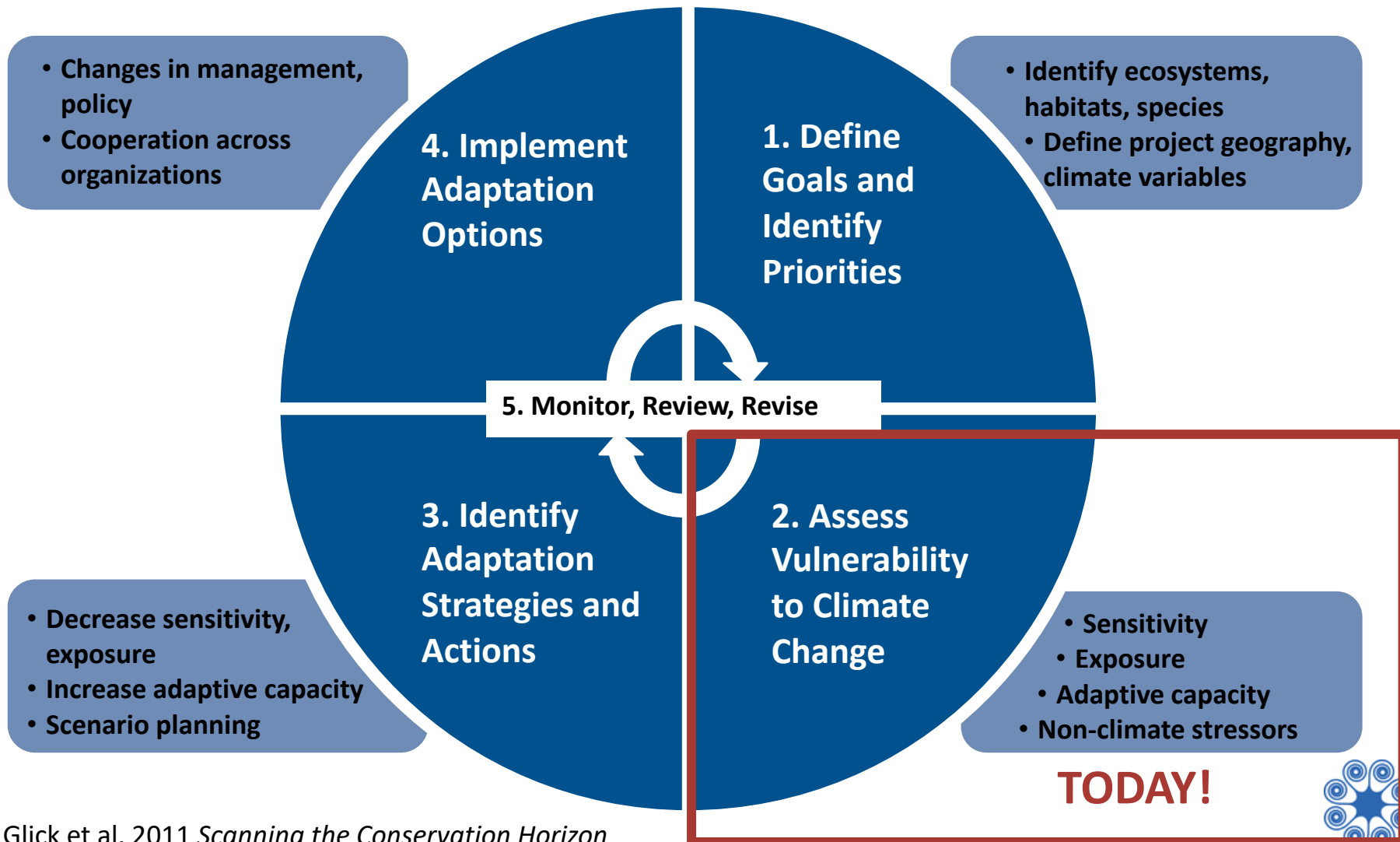
- Coastal dunes, wet meadows, and prairie
- Coastal scrub
- Mixed grasslands
- Chaparral shrublands
- Oak woodlands
- Mixed evergreen/montane hardwood
- Coastal redwood forest
- Rivers, streams, and floodplains
- Freshwater marshes, wetlands, and ponds
- Seeps and springs

Species/Species Groups

- Bats
- Wide-ranging mammals (mountain lion, deer)
- Marbled murrelet
- Badger/burrowing owl
- Anadromous fish
- Salamanders
- California red-legged frog, San Francisco garter snake
- Butterflies (Callippe, Bay Checkerspot, Mission Blue)
- Tanoak/Sudden oak death
- Coyote brush
- Fire-dependent/adapted group



Climate Adaptation Framework




Climate Adaptation Framework



Final Products

1. Short synthesis report on climate projections, trends, and impacts
2. Two-page 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
<p>Altered precipitation & soil moisture <i>Variable annual precipitation volume and timing; increased climatic water deficit; longer, more severe droughts</i></p>	<ul style="list-style-type: none"> 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 Altered invasive species pressure
<p>Increasing temperatures <i>+2.5 to +9°C by 2100</i></p>	<ul style="list-style-type: none"> Altered distribution Altered species composition; freeze-sensitive species may have more growth opportunities, but hot conditions may impair success of annuals
<p>Altered stream flow & flooding regimes <i>Increased winter flow/flood volume; earlier, shorter, lower volume spring runoff; decreased summer flow</i></p>	<ul style="list-style-type: none"> Altered distribution Altered succession patterns and species composition; more frequent flooding may increase habitat heterogeneity Altered pollination/dispersal via impacts on ground-dwelling insects
<p>Altered fire regimes <i>Increased fire size, frequency, and severity</i></p>	<ul style="list-style-type: none"> Altered species composition and population structure Impeded vegetation recovery with shorter fire return intervals Altered pollination/dispersal via impacts on ground-dwelling insects

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

Today's Objectives

1. Provide participants with baseline knowledge and understanding of climate trends (current, historic, projected future) for the region
2. Assess vulnerabilities of habitats and species to climate change by evaluating sensitivity and adaptive capacity
3. Provide two case studies of adaptation in action

