

Introduction to Scenario Planning

Northern California Climate Adaptation Project

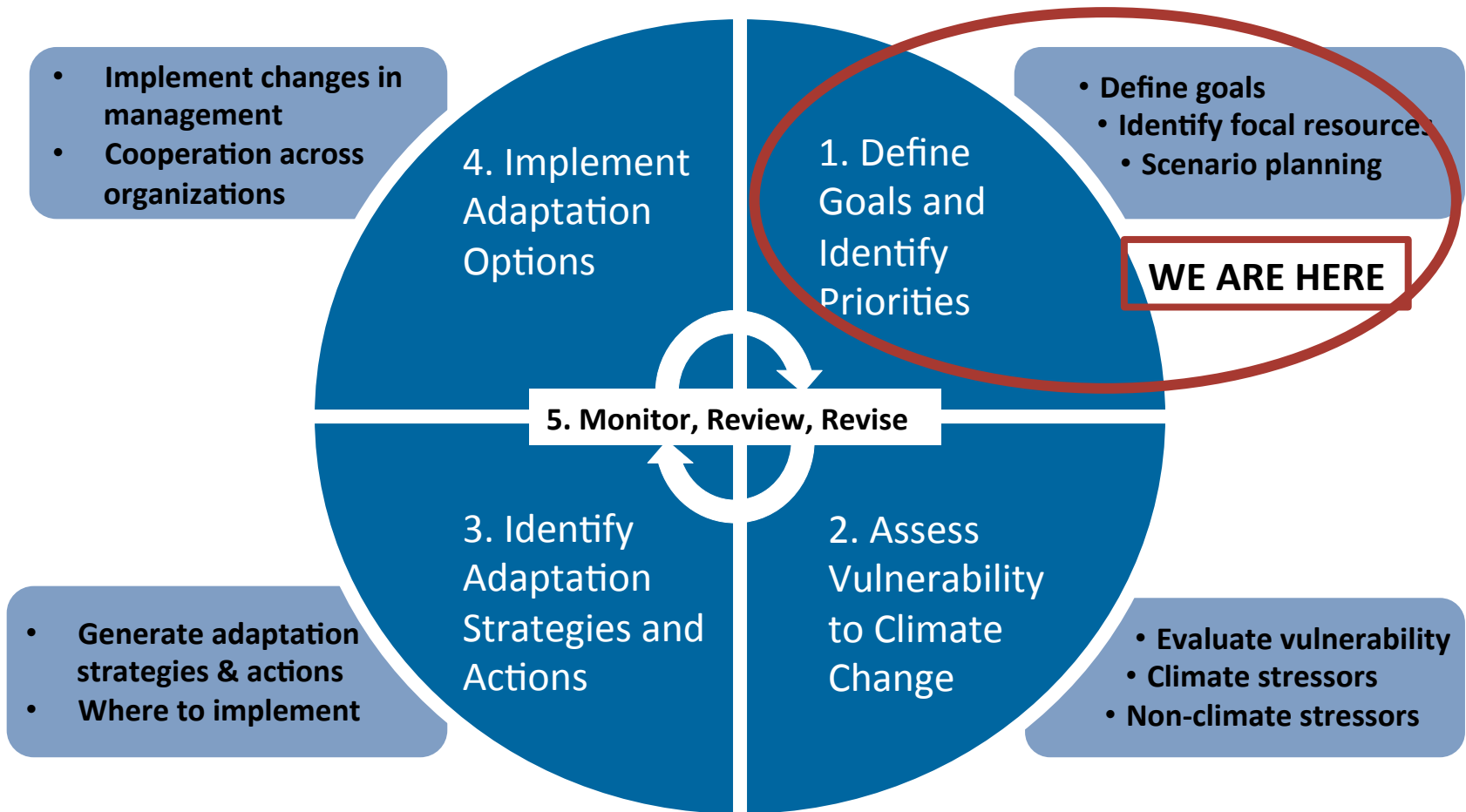
Whitney Reynier, Associate Scientist

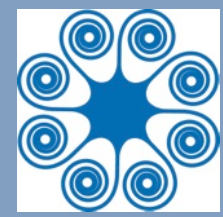
EcoAdapt

whitney@ecoadapt.org



Climate-smart planning process





What is scenario planning?

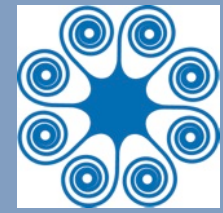
A process in which we envision multiple plausible futures, and consider effects on our priorities and decisions

Scenarios → plausible futures that we develop given what we know from science and expert knowledge



Credit: J. Armstrong

© Jonny Armstrong



What is scenario planning?

Scenario planning is a method for.....

- exploring what the future *could* look like
- comparing how resources *could* be affected
- comparing what management actions *could* be taken

Expert knowledge-driven rather than analysis-driven



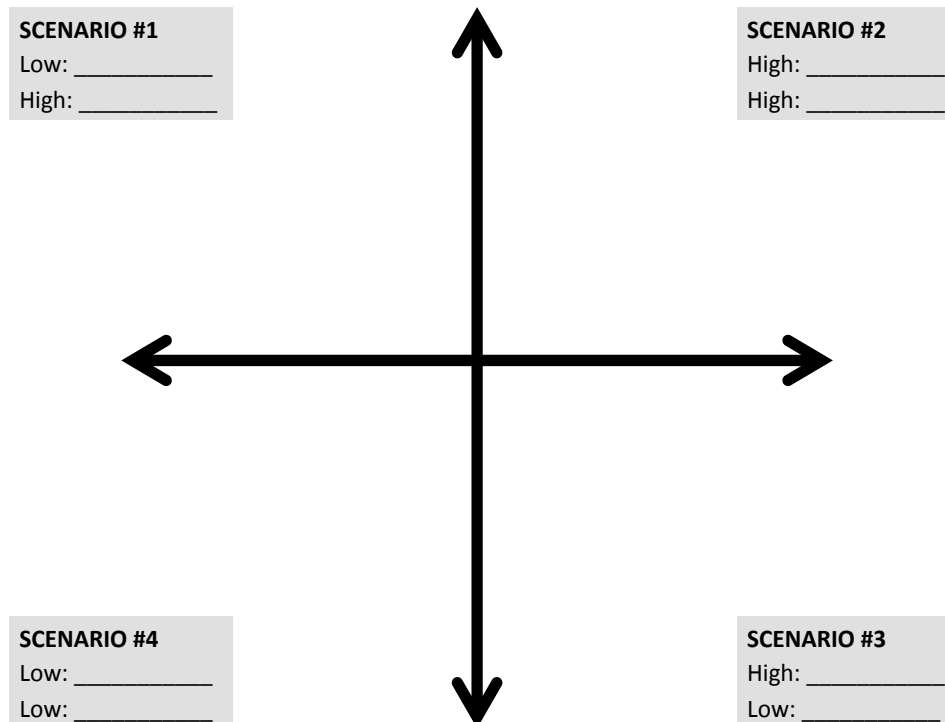
Why scenario planning?

UNCERTAINTY

- Rate, magnitude, direction of change
- Ecosystem or species responses

COMPLEXITY

- Interacting stressors: land use change, institutional capacity, social systems, ecological relationships, etc.



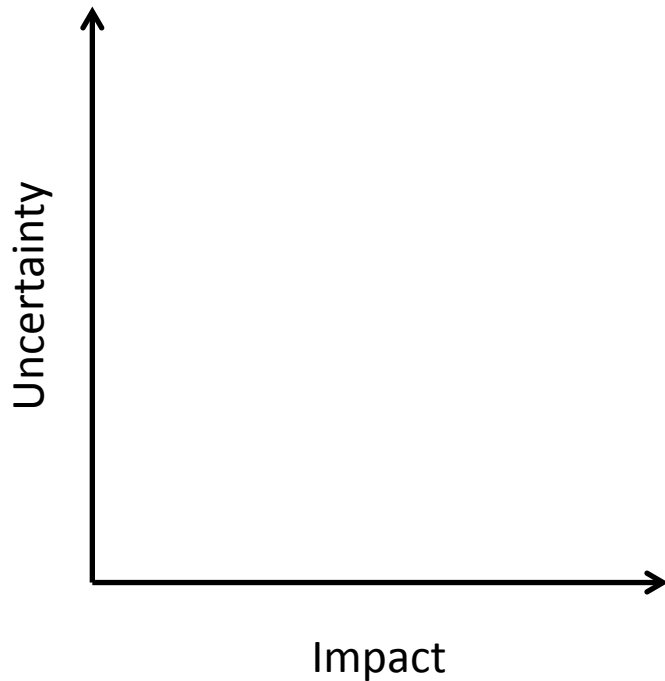
How is scenario planning done?

1. Assemble regional partners and stakeholders and identify key resources
2. Identify and prioritize critical climate drivers
3. Select and define future scenarios
4. Evaluate potential impacts of future scenarios on focal resources
5. Identify potential adaptation options under each scenario



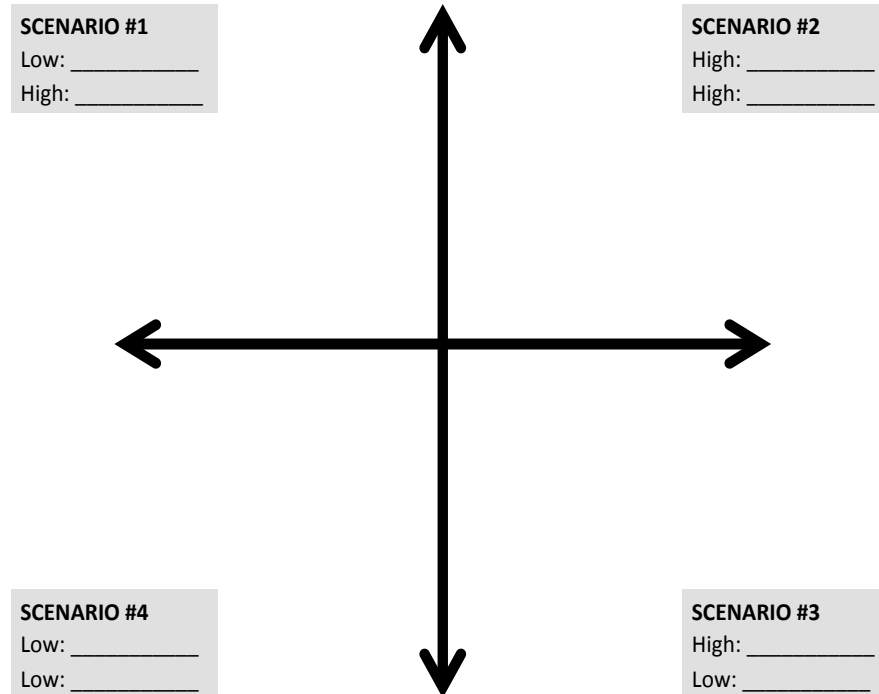
Process and Objectives

1. Compare *impact* and *uncertainty* of different climate drivers on focal resources



2. Select *two* key climate drivers

3. Create *four* scenarios and compare resource impacts across different futures



Example Case Study

Identify focal resources



Coastal Redwood Forest

Example Case Study

Identify and prioritize critical climate drivers

Temperature

Rainfall

Wildfire

Fog

Disease

Example Case Study

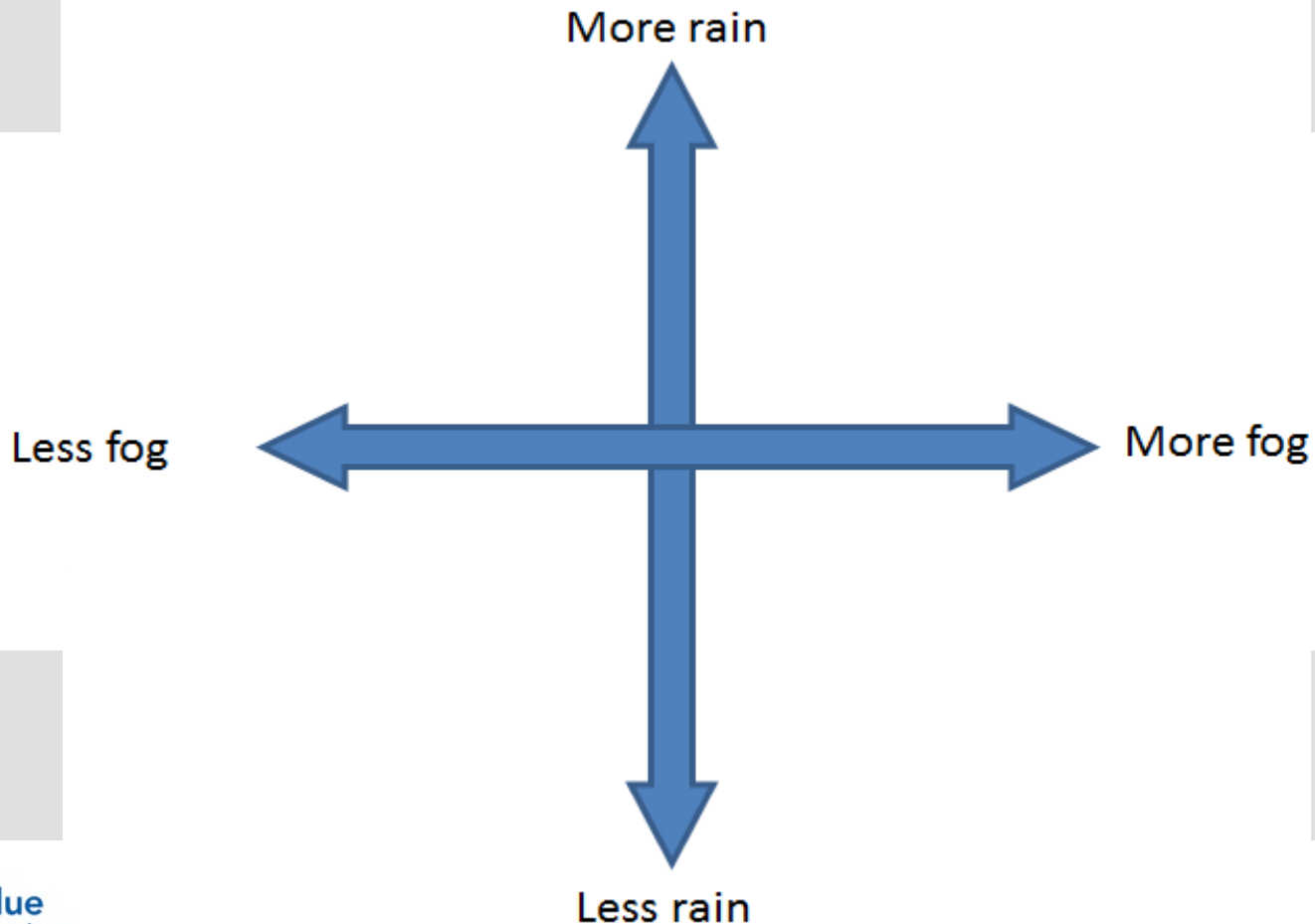
Select and define future scenarios

SCENARIO #1

Low: Fog
High: Rain

SCENARIO #2

High: Fog
High: Rain



SCENARIO #4

Low: Fog
Low: Rain

SCENARIO #3

High: Fog
Low: Rain

Example Case Study

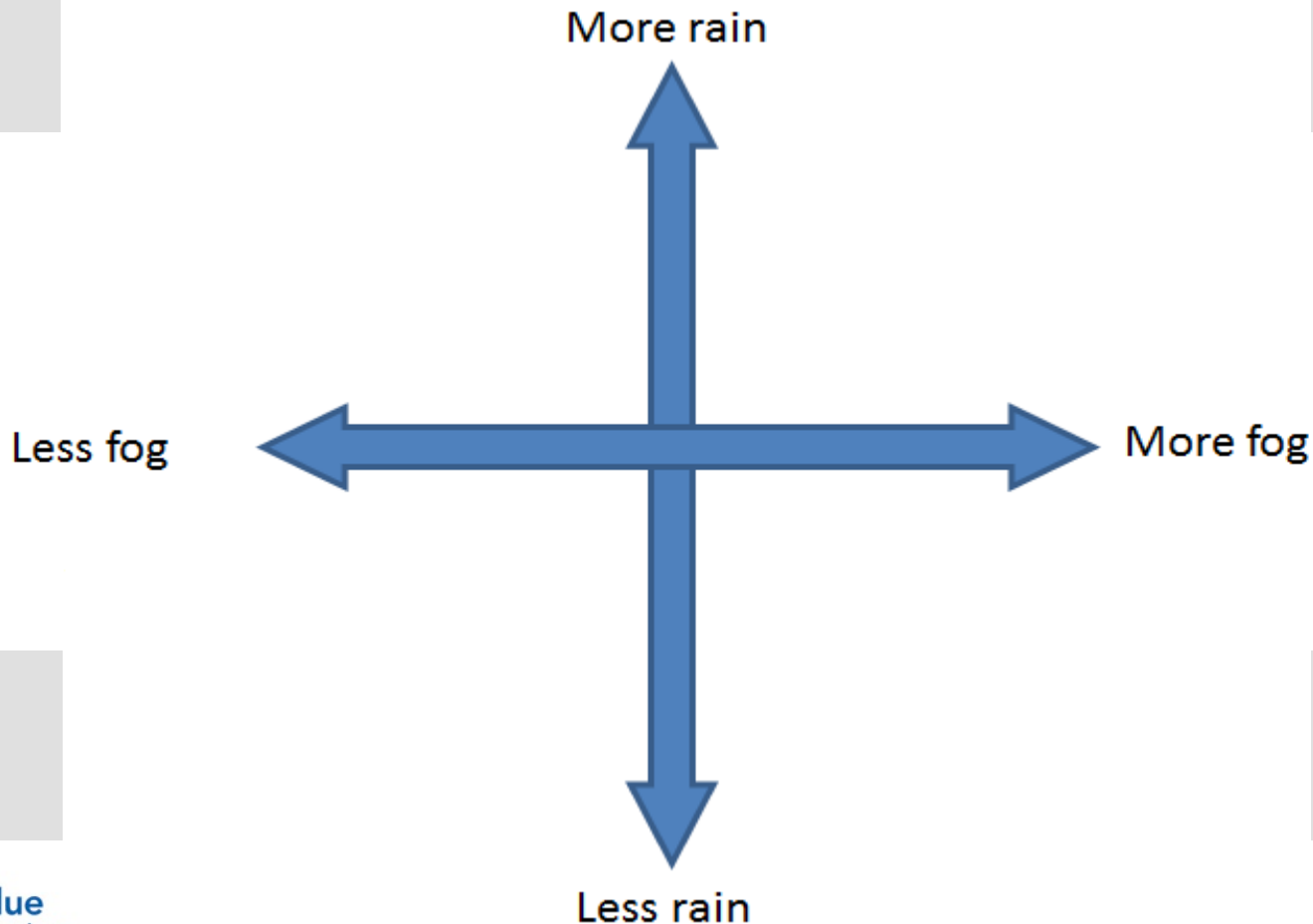
Evaluate resource impacts under future scenarios

SCENARIO #1

Low: Fog
High: Rain

SCENARIO #2

High: Fog
High: Rain



SCENARIO #4

Low: Fog
Low: Rain

SCENARIO #3

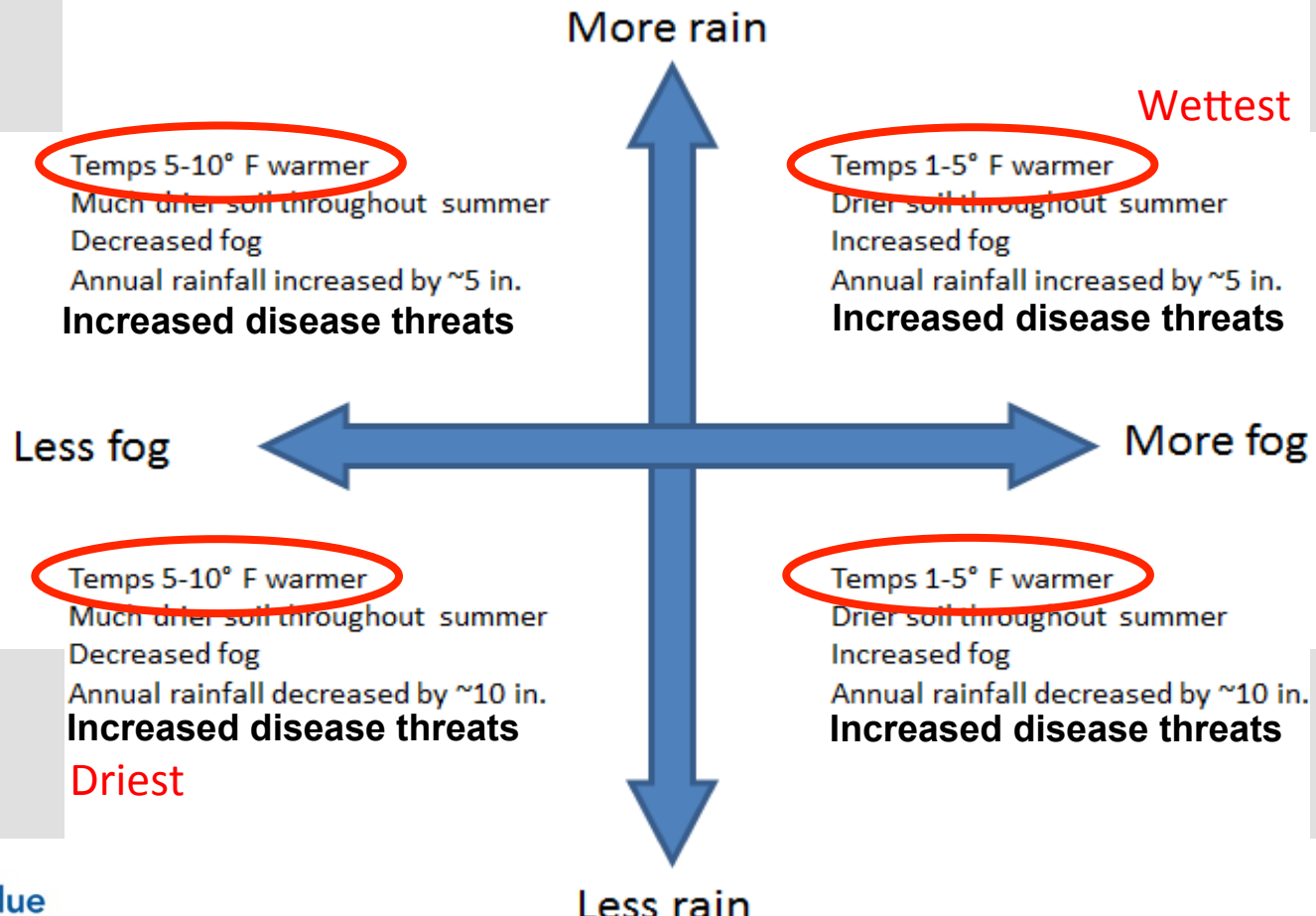
High: Fog
Low: Rain

Example Case Study

Evaluate resource impacts under future scenarios

SCENARIO #1
Low: Fog
High: Rain

SCENARIO #2
High: Fog
High: Rain



SCENARIO #4
Low: Fog
Low: Rain

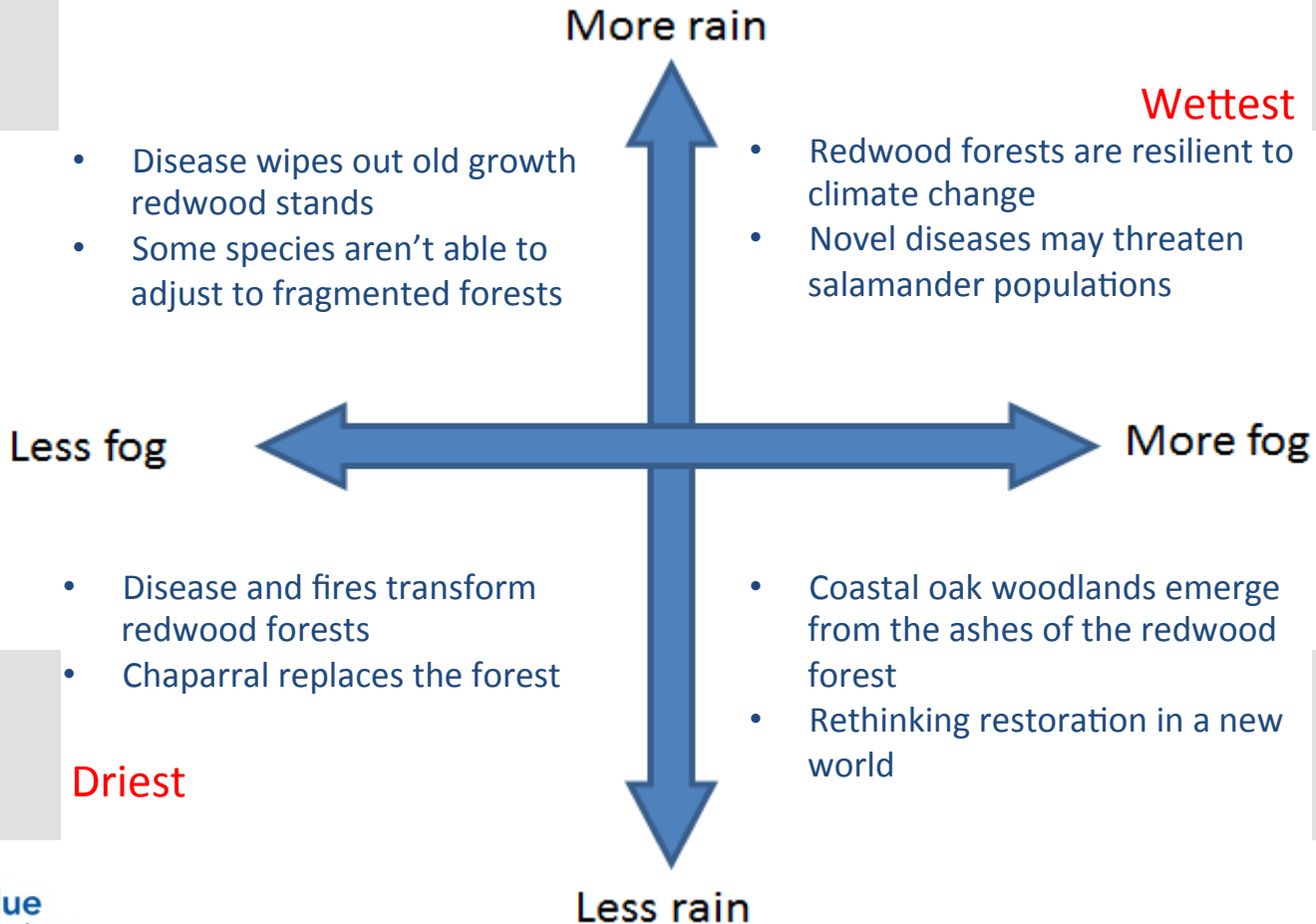
SCENARIO #3
High: Fog
Low: Rain

Example Case Study

Evaluate resource impacts under future scenarios

SCENARIO #1
Low: Fog
High: Rain

SCENARIO #2
High: Fog
High: Rain



SCENARIO #4
Low: Fog
Low: Rain

SCENARIO #3
High: Fog
Low: Rain

Example Case Study

Evaluate resource impacts under future scenarios

SCENARIO #1

Low: Fog

High: Rain



More rain

Wettest



SCENARIO #2

High: Fog

High: Rain

Less fog



More fog



SCENARIO #3

High: Fog

Low: Rain

SCENARIO #4

Low: Fog

Low: Rain

Driest

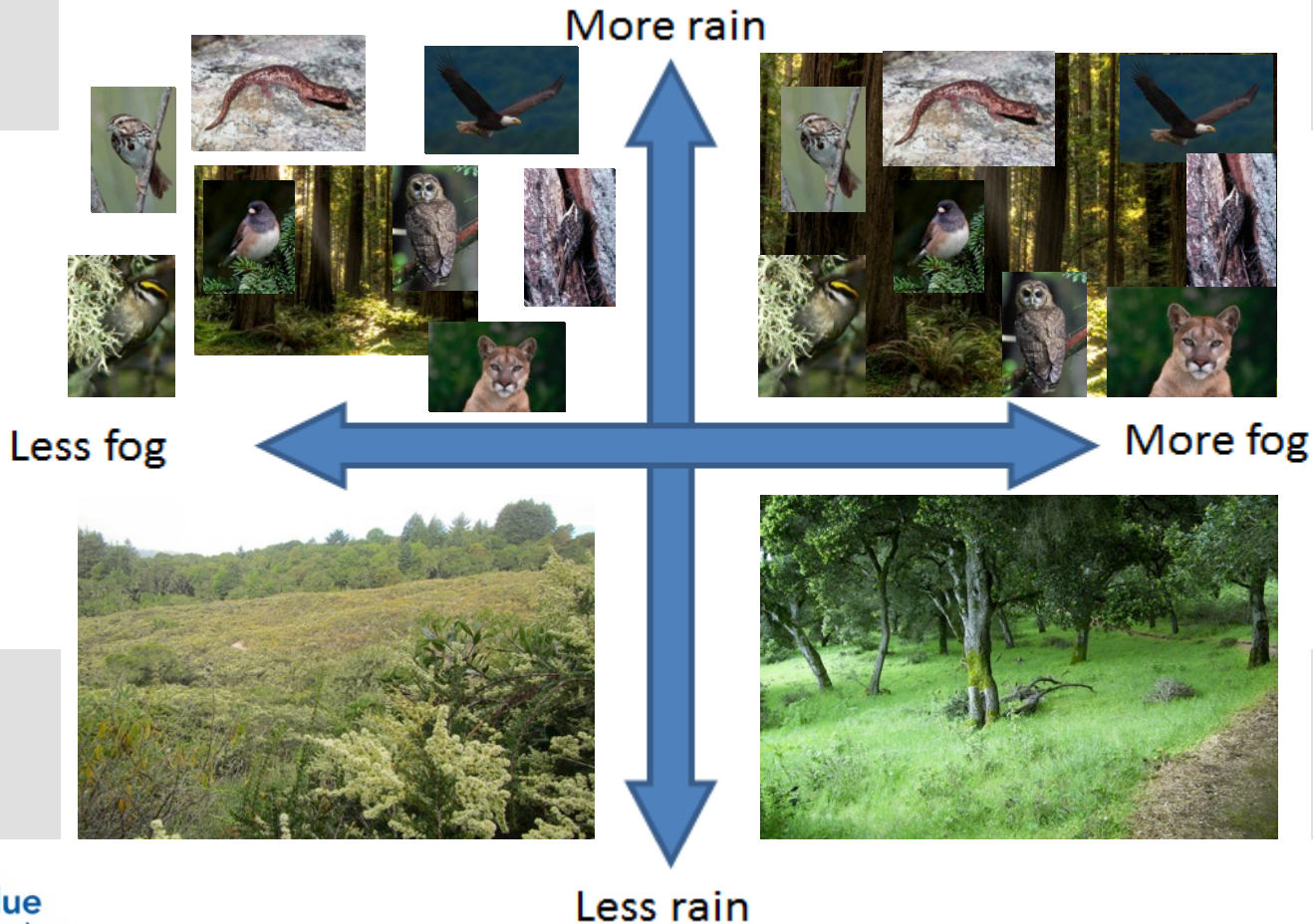
Less rain

Example Case Study

Evaluate resource impacts under future scenarios

SCENARIO #1
Low: Fog
High: Rain

SCENARIO #2
High: Fog
High: Rain



SCENARIO #4
Low: Fog
Low: Rain

SCENARIO #3
High: Fog
Low: Rain

Example Case Study

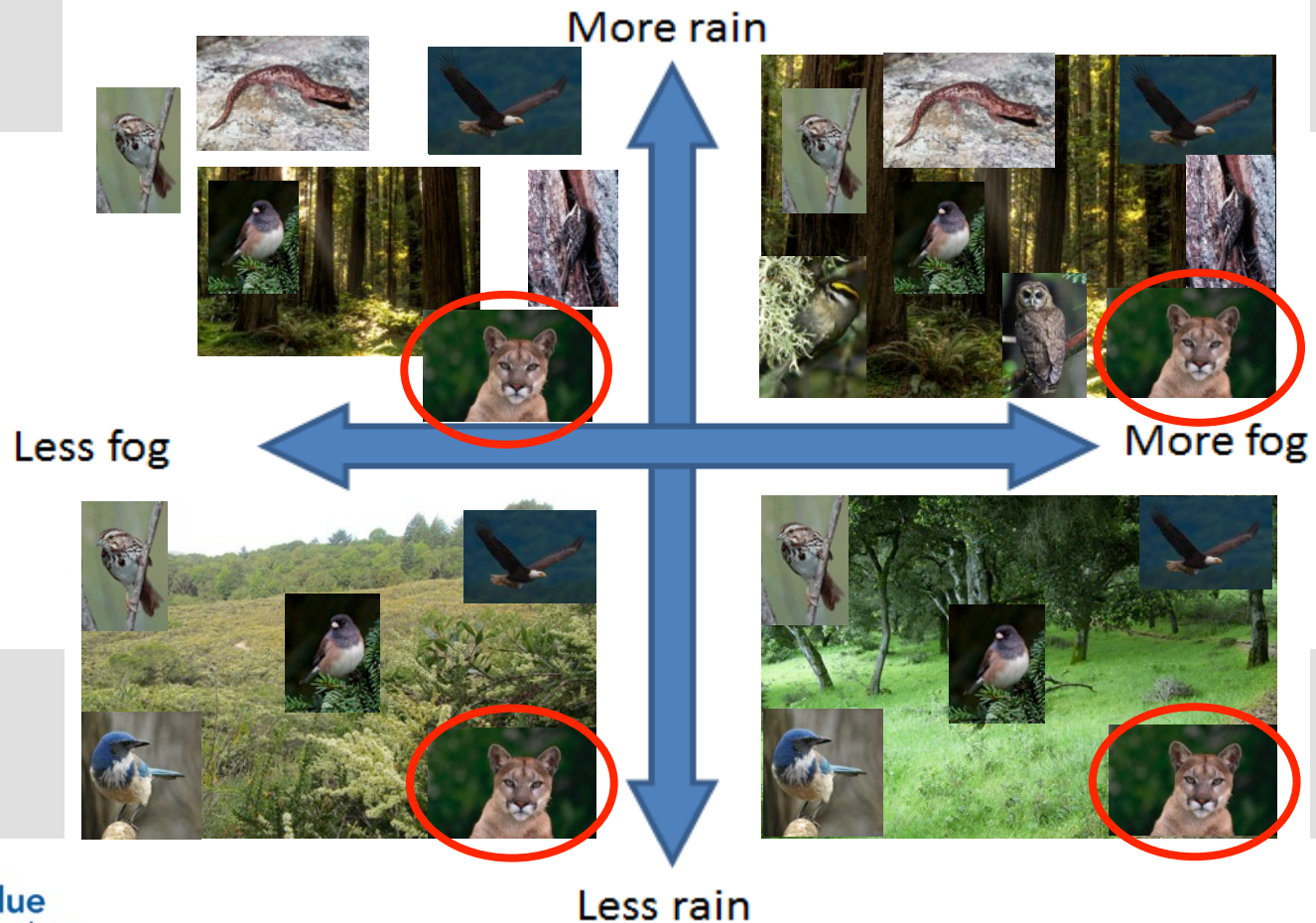
Evaluate resource impacts under future scenarios

SCENARIO #1
Low: Fog
High: Rain

SCENARIO #2
High: Fog
High: Rain

SCENARIO #4
Low: Fog
Low: Rain

SCENARIO #3
High: Fog
Low: Rain



Example Case Study

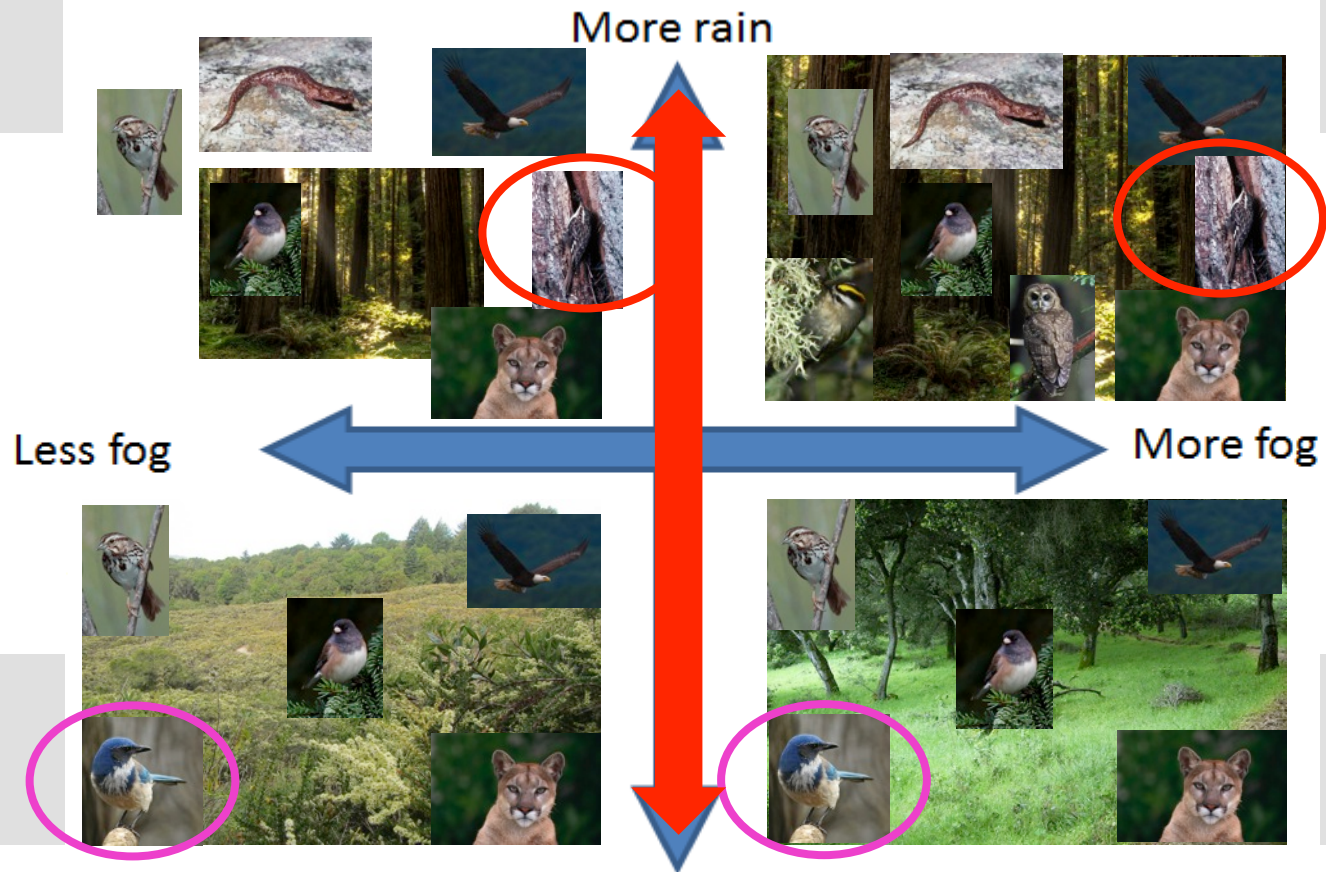
Evaluate resource impacts under future scenarios

SCENARIO #1
Low: Fog
High: Rain

SCENARIO #2
High: Fog
High: Rain

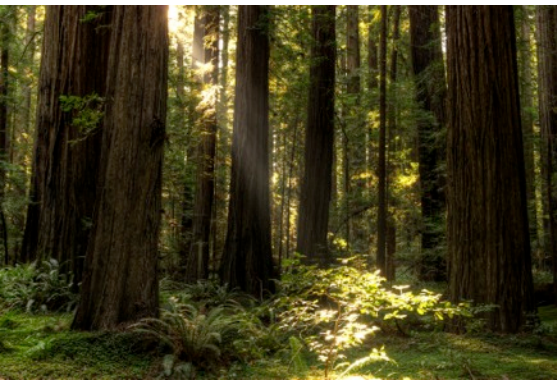
SCENARIO #4
Low: Fog
Low: Rain

SCENARIO #3
High: Fog
Low: Rain



Lessons Learned

- Identified:
 - Variety of impacts, incl. similarities & differences
 - Small and large ecosystem changes
 - Most vulnerable/resilient species
 - Importance of different factors driving each change



Example Case Study

Identify potential adaptation options

SCENARIO #1
Low: Fog
High: Rain

Redwood Contraction

- Identify and protect redwood refugia
- **Protect migration corridors for redwood habitat specialists**

SCENARIO #2
High: Fog
High: Rain

Resilient Redwoods

- Minimize non-climate stressors
- **Protect migration corridors for redwood habitat specialists**

SCENARIO #4
Low: Fog
Low: Rain

- Prevent human fire ignitions
- **Protect migration corridors for redwood habitat specialists**

Chaparral Takes Over

SCENARIO #3
High: Fog
Low: Rain

- Prioritize redwood refugia for restoration
- **Protect migration corridors for redwood habitat specialists**

Oak Woodlands Creep In

Benefits of Scenario Planning

- Encourages thinking beyond historical trends
- Embraces uncertainty rather than ignoring it
- Identifies impacts to resources across different future climates
- Highlights adaptation strategies that apply across different future climates



Questions?

Contact:

Whitney Reynier, EcoAdapt

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Today: Workshop Goal

To develop a common understanding of the range of possible future conditions in Northern California and what those changes could mean for focal resources

Agenda

8:00-8:10

Welcome and introductions

8:10-8:30

Introduction to scenario planning

8:30-9:10

Climate trends in Northern California

9:10-9:50

Selecting climate drivers

9:50-10:15

Large group discussion

10:15-10:30

Break

10:30-11:45

Defining scenarios and evaluating impacts on resources

11:45-12:45

Lunch (provided)

12:45-1:30

Large group discussion

1:30-2:00

Workshop wrap-up and next steps

2:00

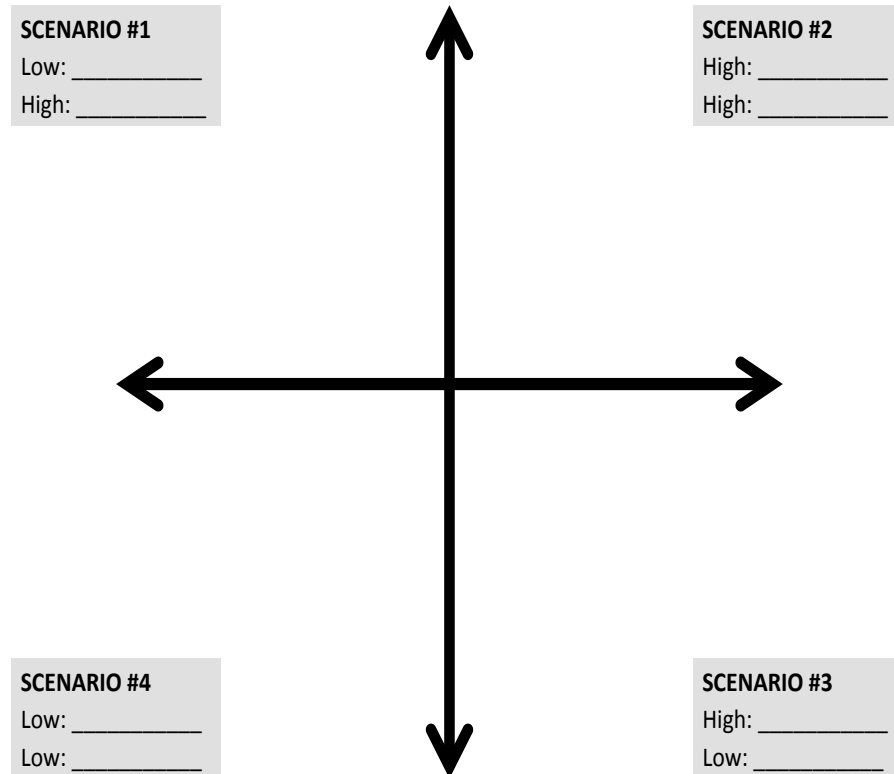
Adjourn



Overview of Group Exercise

Desired Outcome: To define a suite of future climate scenarios and evaluate the impacts of different scenarios on focal resources

- Two parts:
 - Selecting climate drivers
 - Defining scenarios and evaluating impacts on focal resources

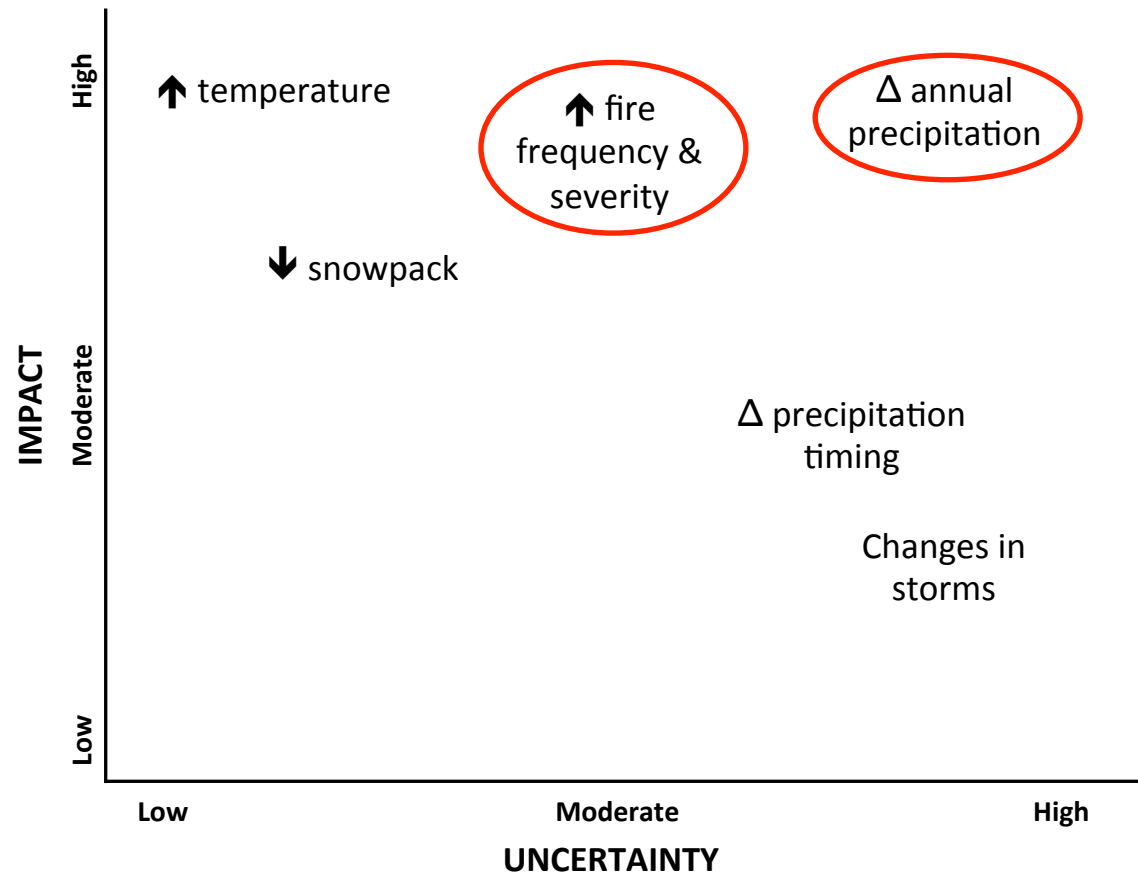


Overview of Group Exercise

Desired Outcome: To define a suite of future climate scenarios and evaluate the impacts of different scenarios on focal resources

Select climate drivers by:

- A. Ranking each driver by its impact and uncertainty
- B. Circling the **TOP 2** drivers that represent priorities for your focal resources*



*Often these are drivers with greater uncertainty and impact

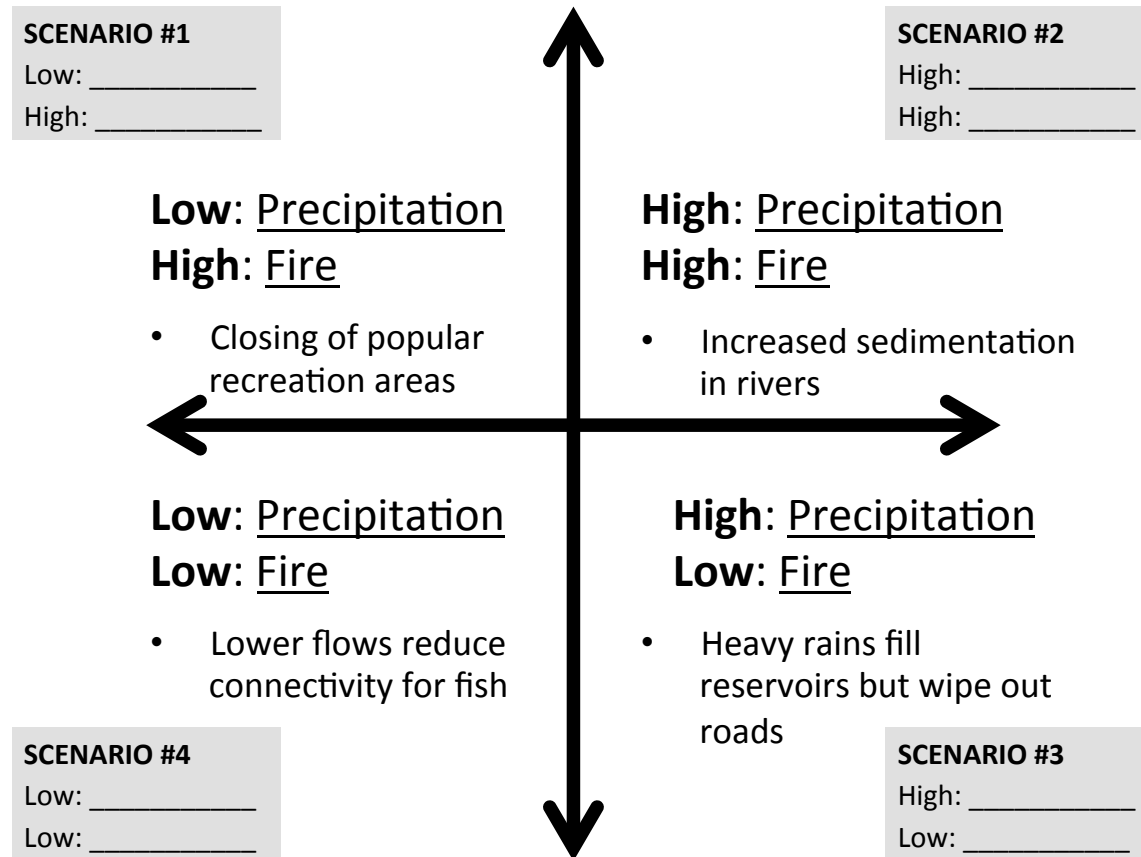
**~45 minutes for Climate Drivers
then reconvene at 10:30 am for
large group discussion**

Overview of Group Exercise

Desired Outcome: To define a suite of future climate scenarios and evaluate the impacts of different scenarios on focal resources

Define scenarios and evaluate impacts by:

- Identifying the opposite extremes of each scenario
- Identifying the major impacts that would occur on your focal resources



**~1.25 hours for Scenarios and
Impacts then break for lunch at
11:45 am**