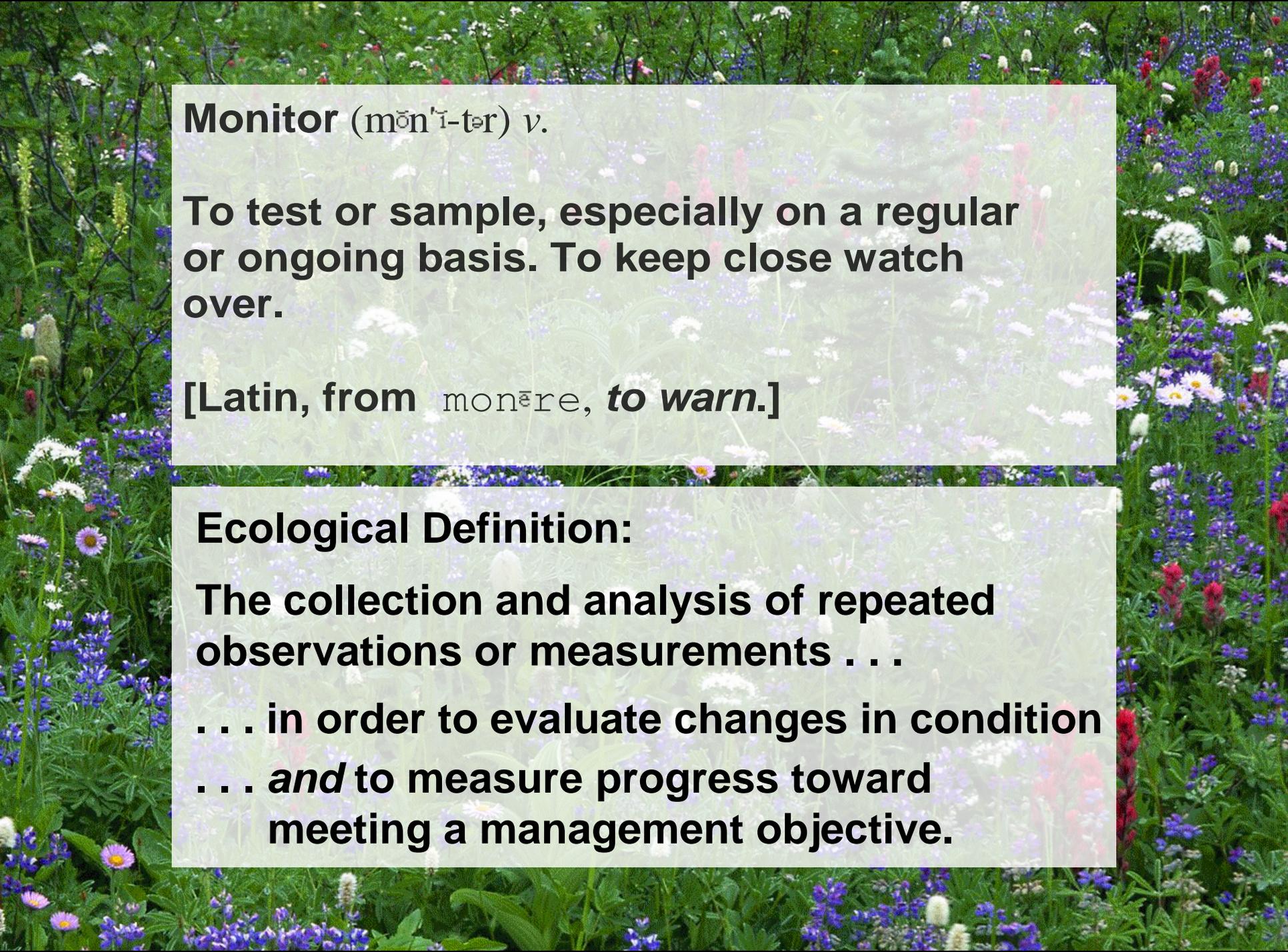


# 1: Introduction to Monitoring

- 1. Distinguish *Adaptive Management* monitoring from other similar data-gathering activities.**
- 2. Identify the key steps in designing and implementing a monitoring program.**
- 3. Draft and critique an ecological model.**



**Monitor** (mŏn'ī-tēr) *v.*

**To test or sample, especially on a regular or ongoing basis. To keep close watch over.**

**[Latin, from *monēre*, *to warn.*]**

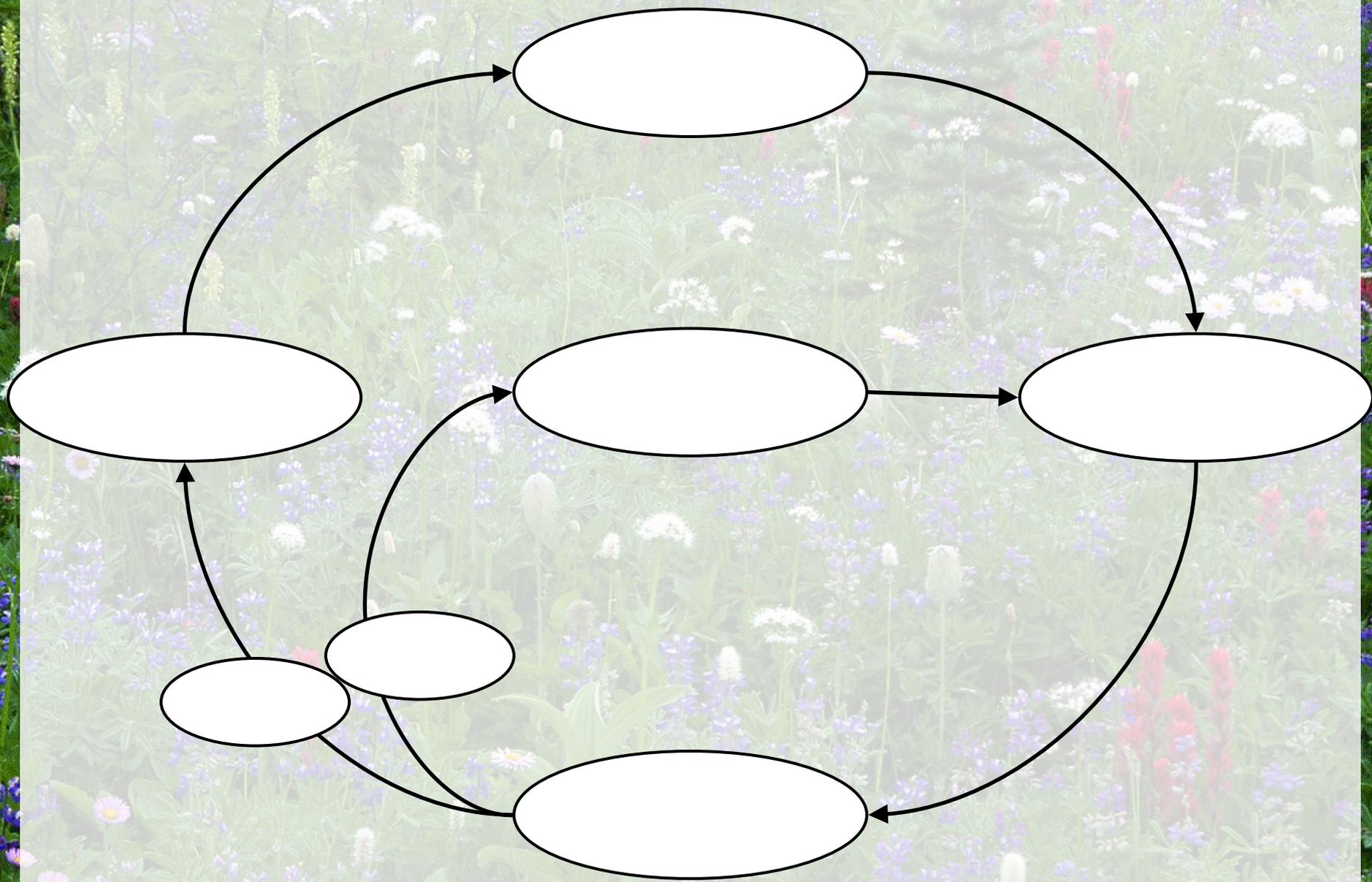
**Ecological Definition:**

**The collection and analysis of repeated observations or measurements . . .**

**. . . in order to evaluate changes in condition**

**. . . *and* to measure progress toward meeting a management objective.**

# Adaptive Management Cycle



# Adaptive Management Cycle

resource objective

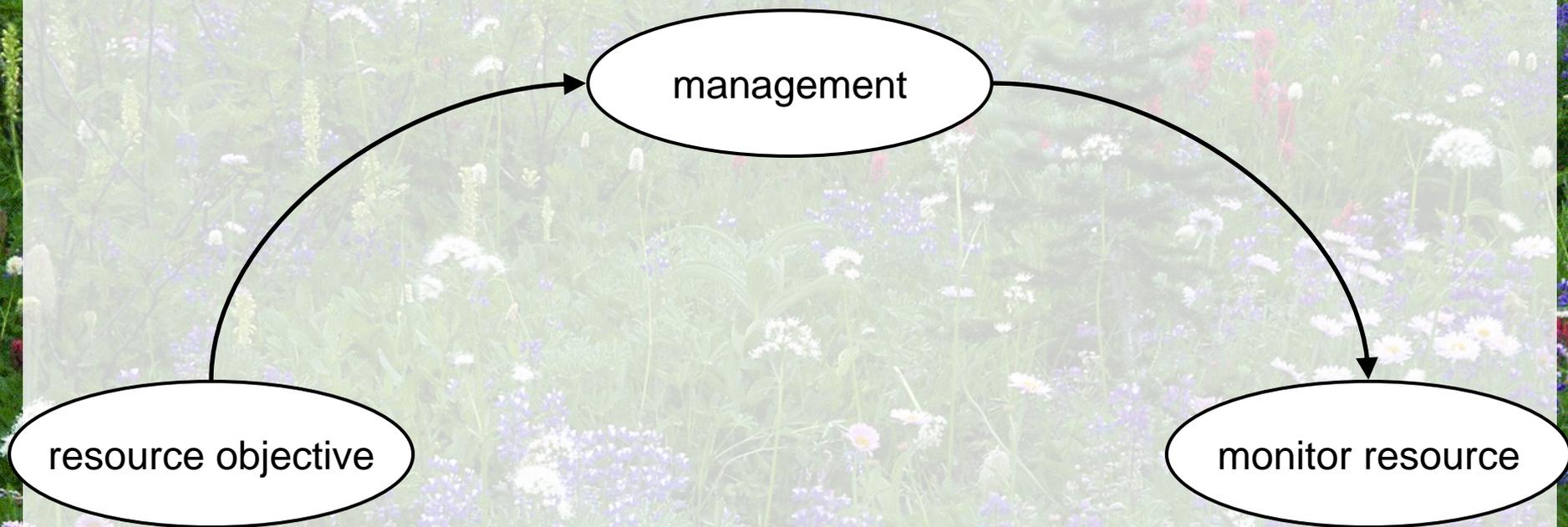
# Adaptive Management Cycle

resource objective

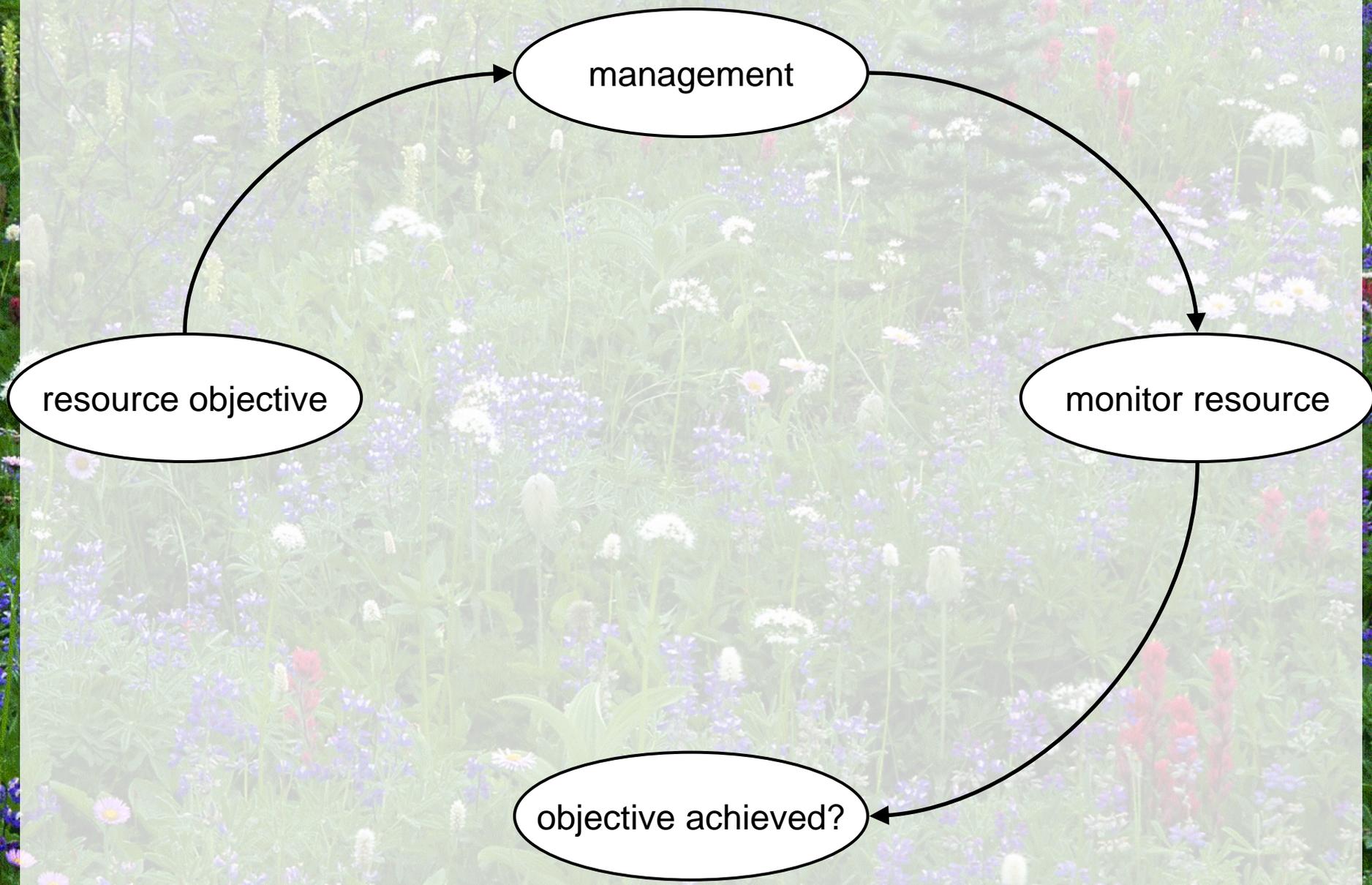
management



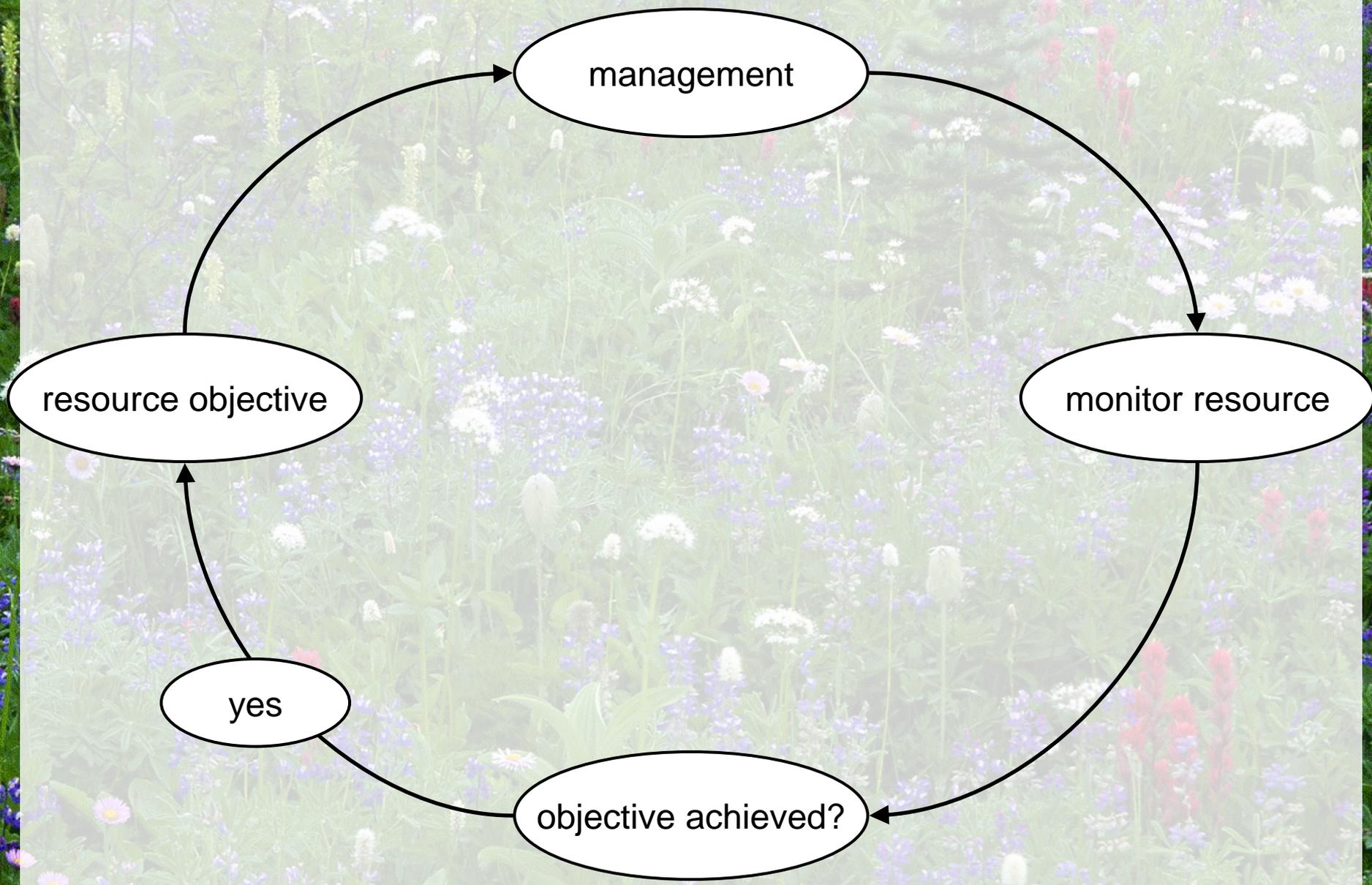
# Adaptive Management Cycle



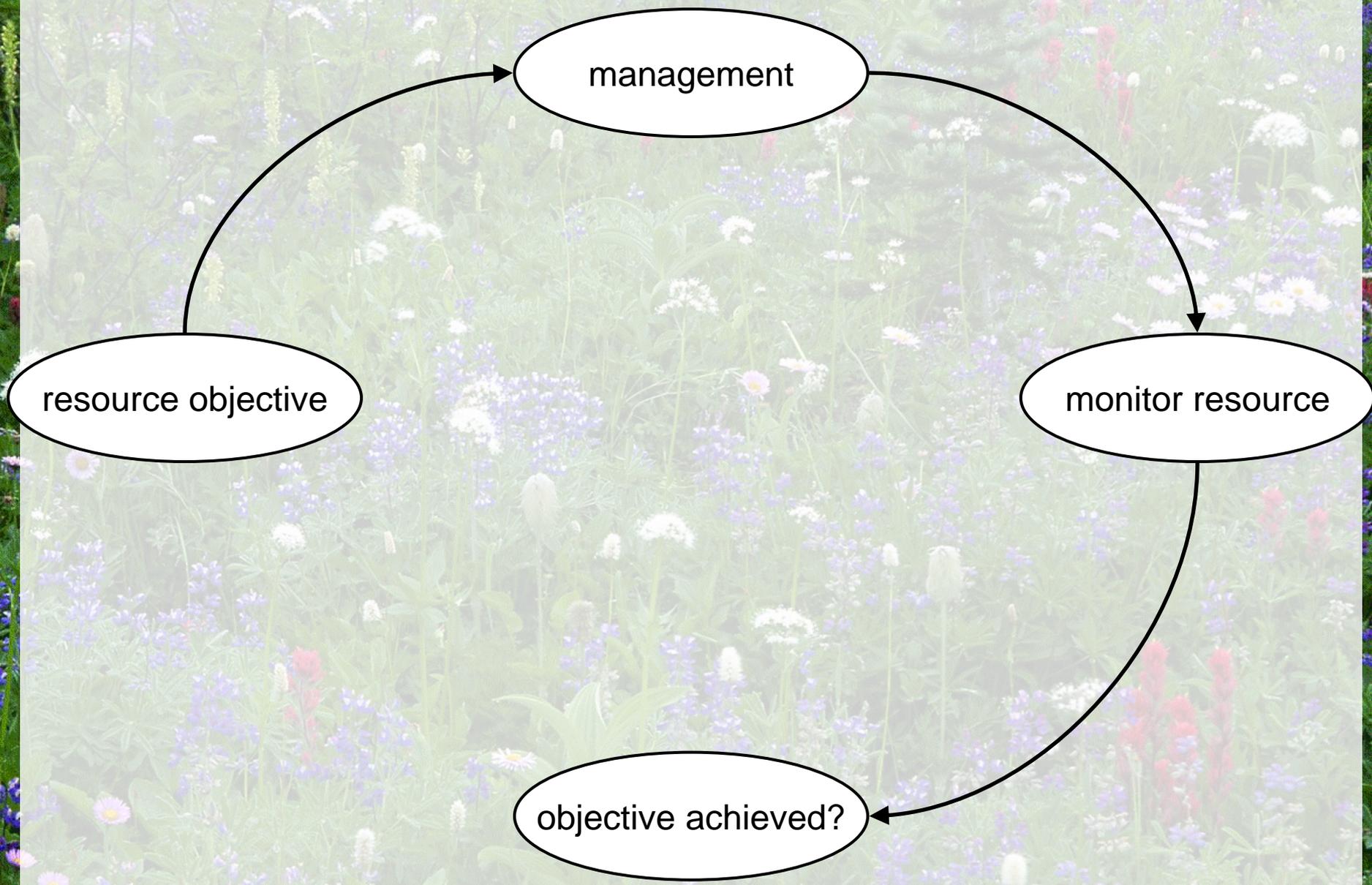
# Adaptive Management Cycle



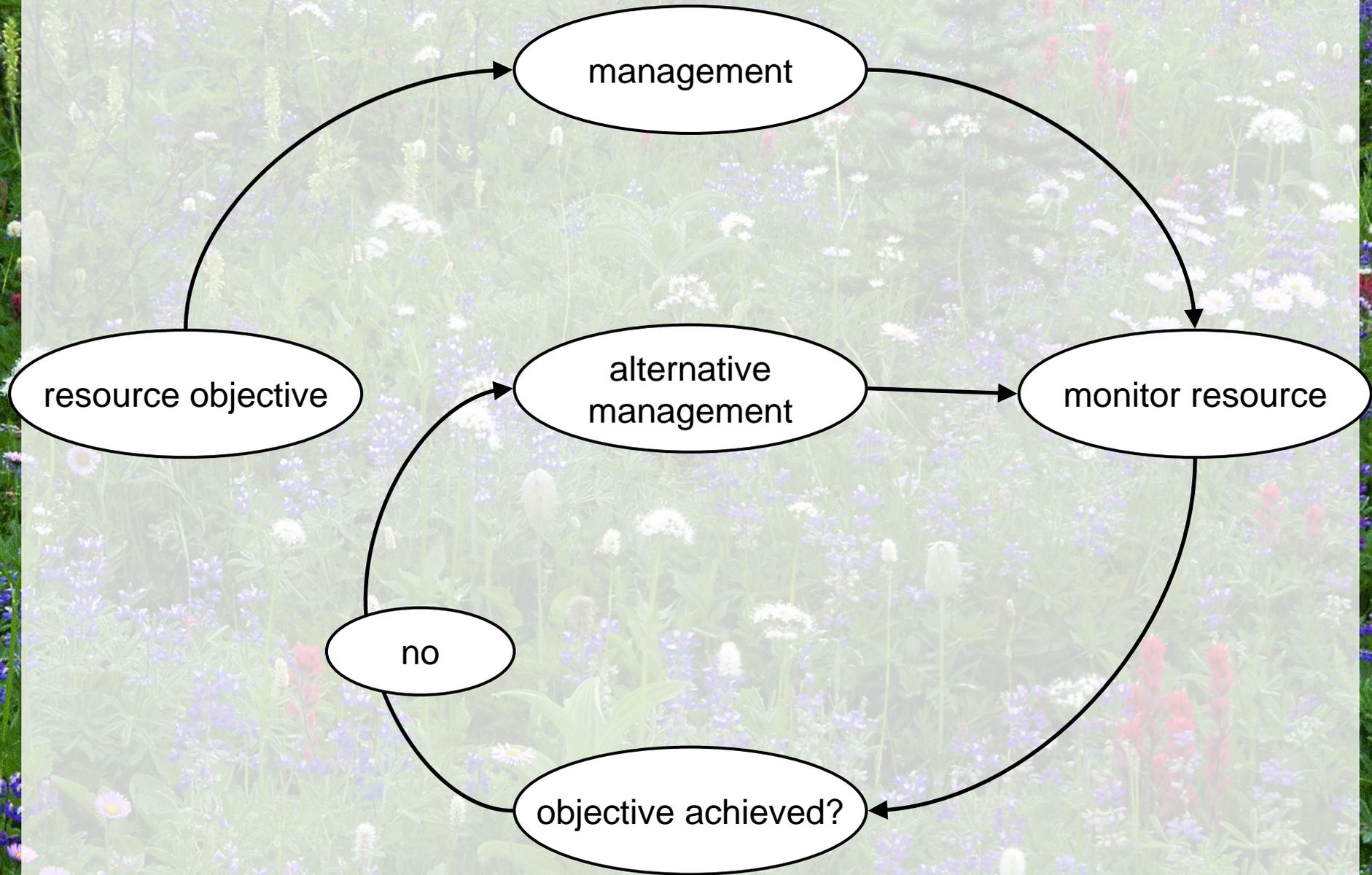
# Adaptive Management Cycle



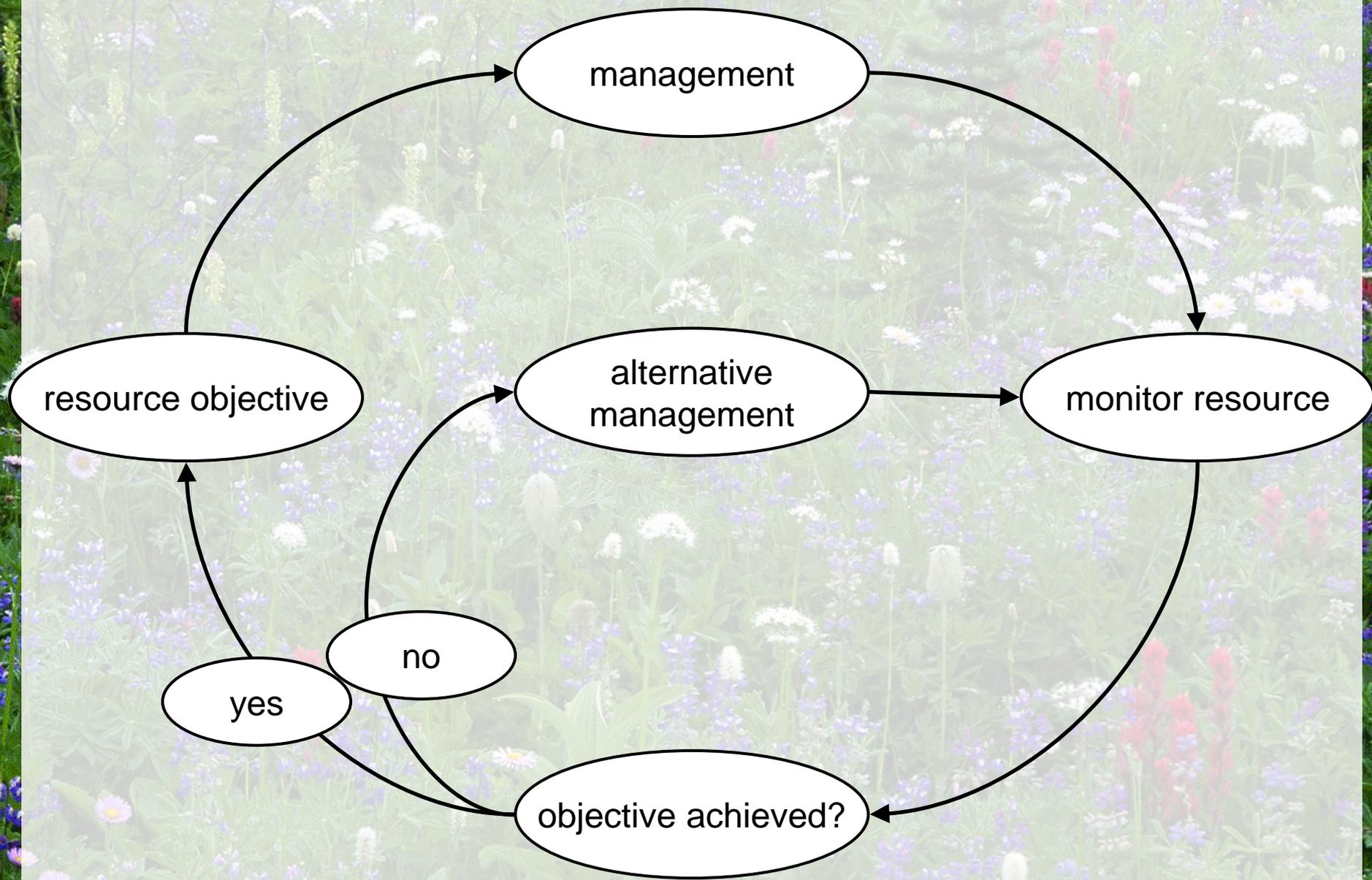
# Adaptive Management Cycle



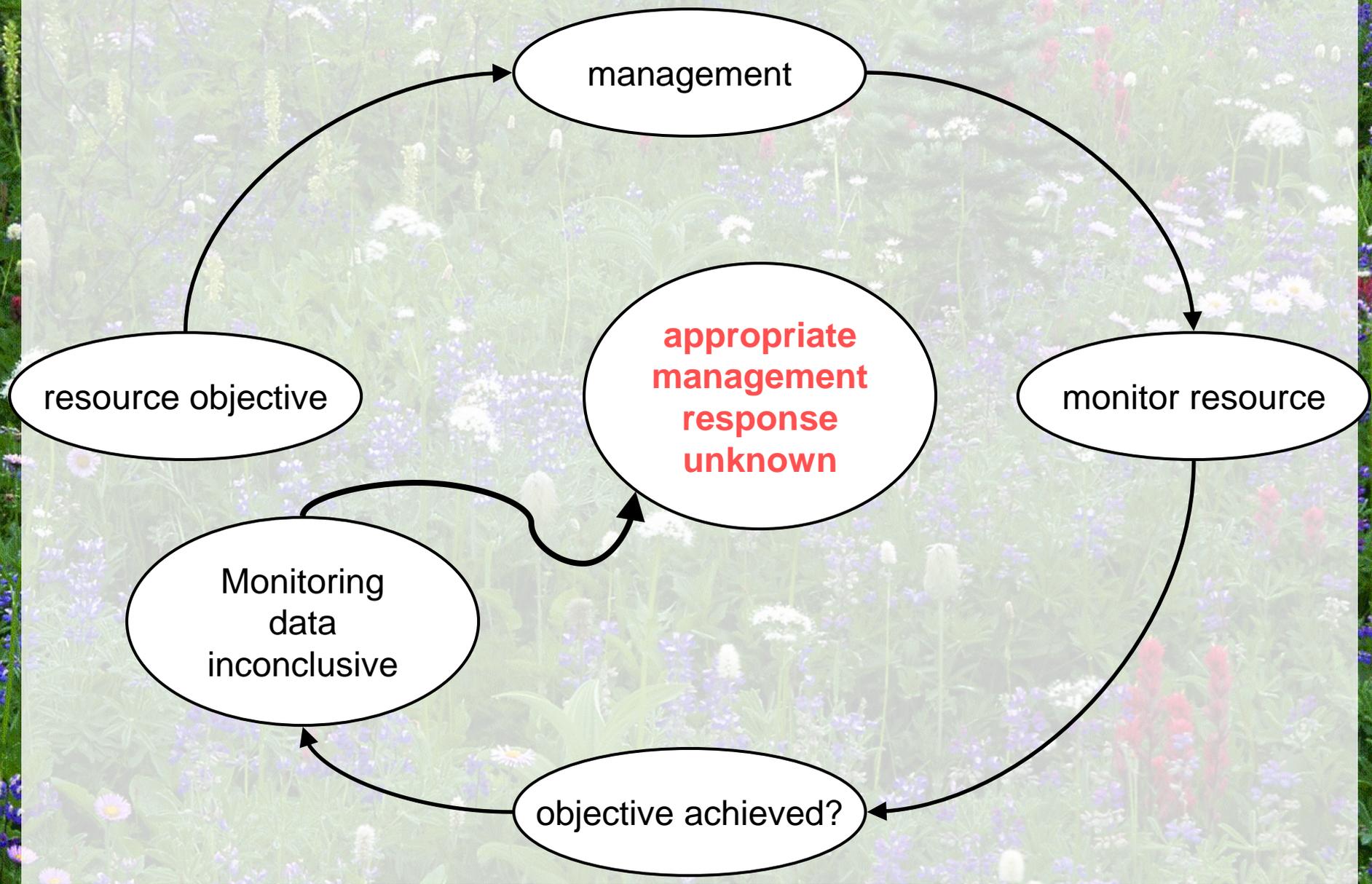
# Adaptive Management Cycle

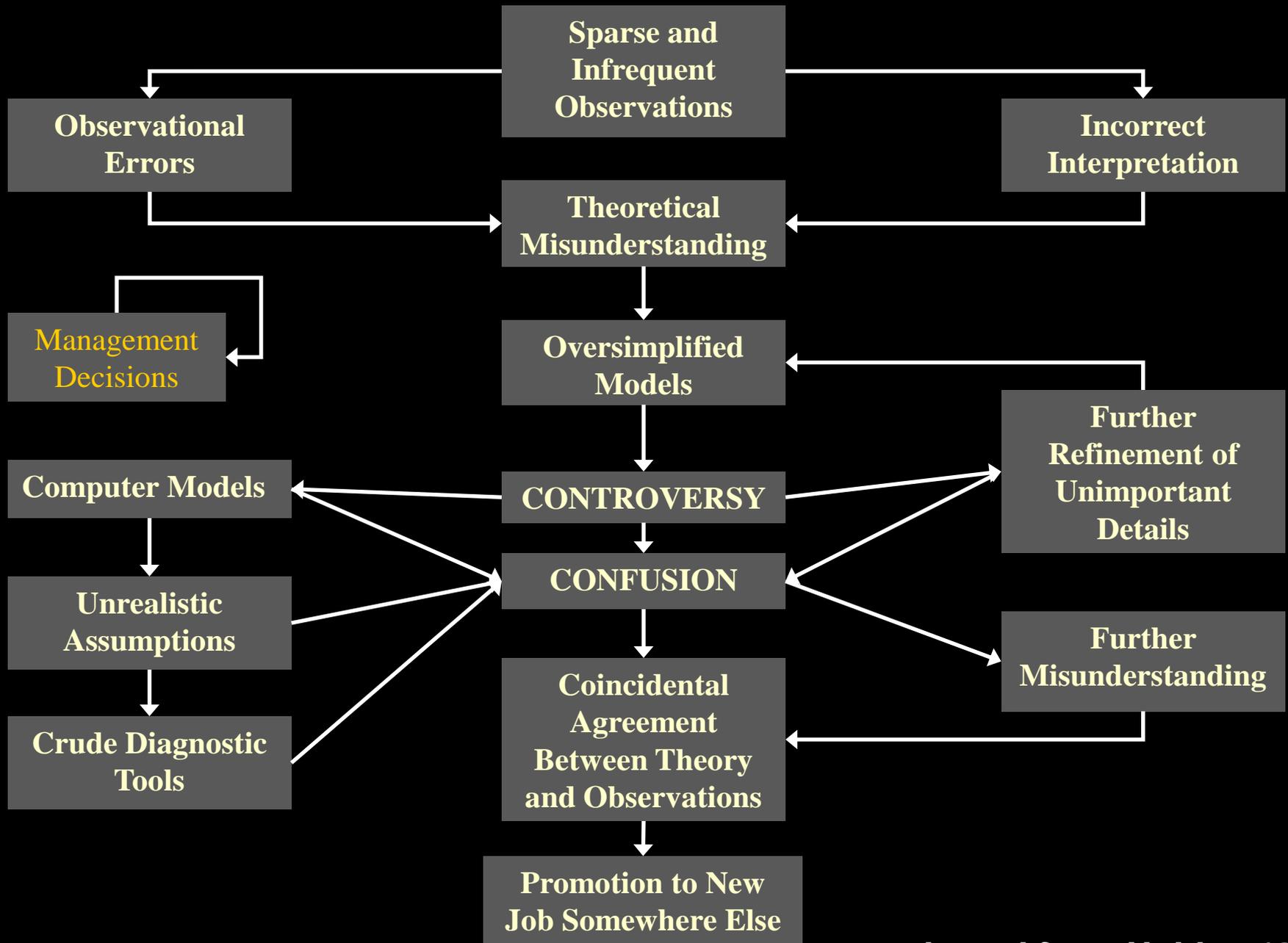


# Adaptive Management Cycle



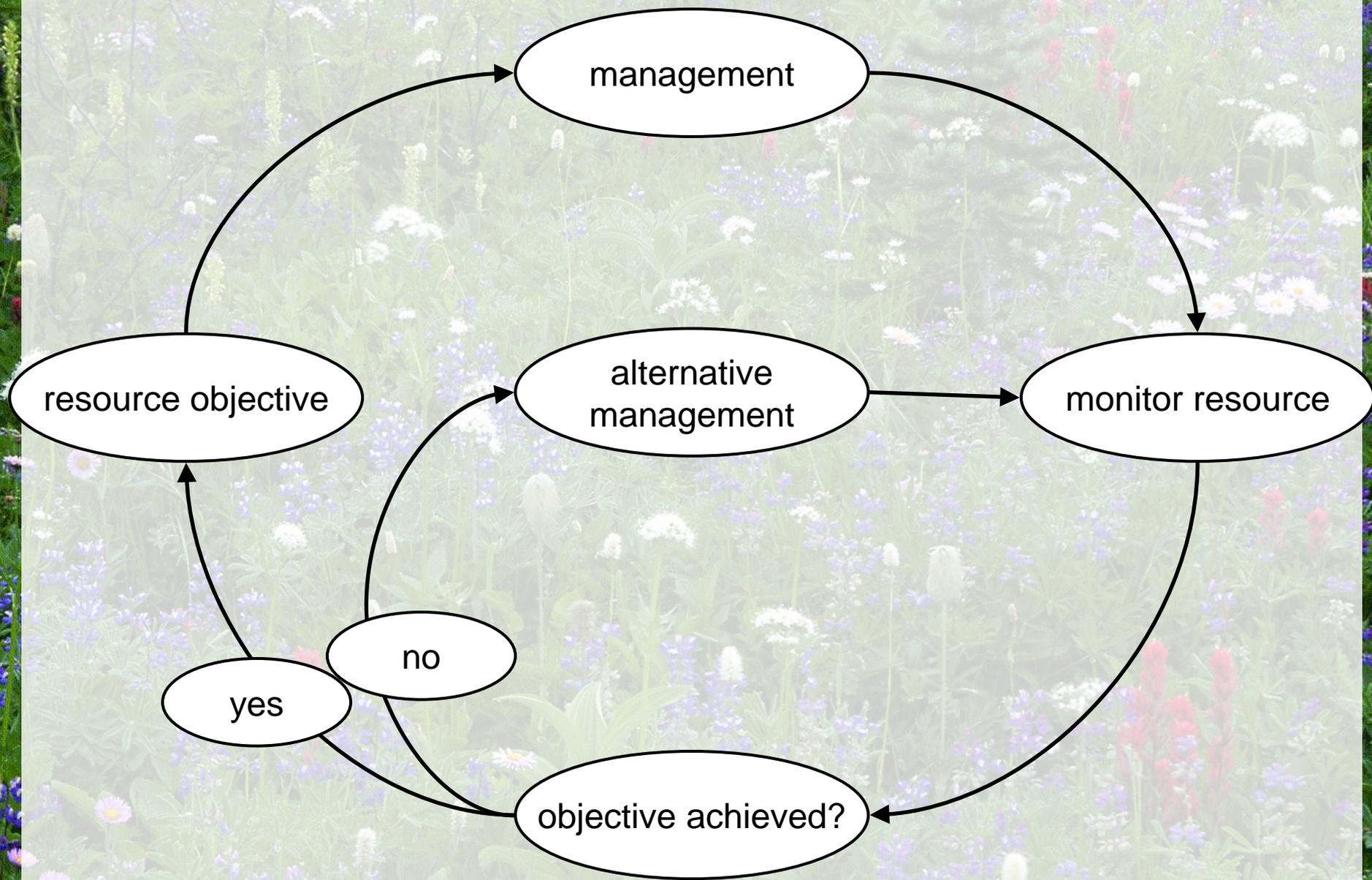
# Adaptive Management Cycle



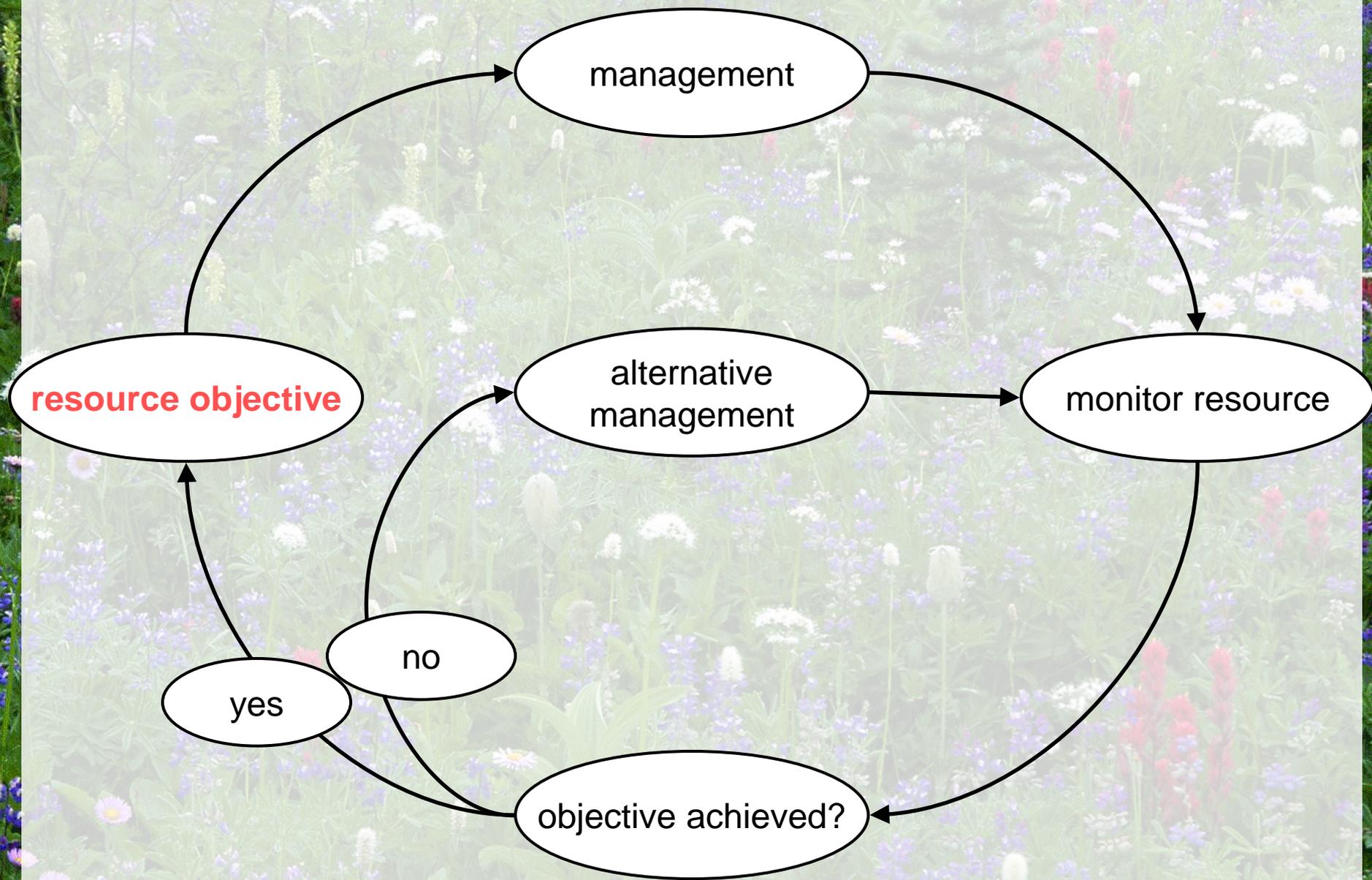


*adapted from Hobbs, 1998*

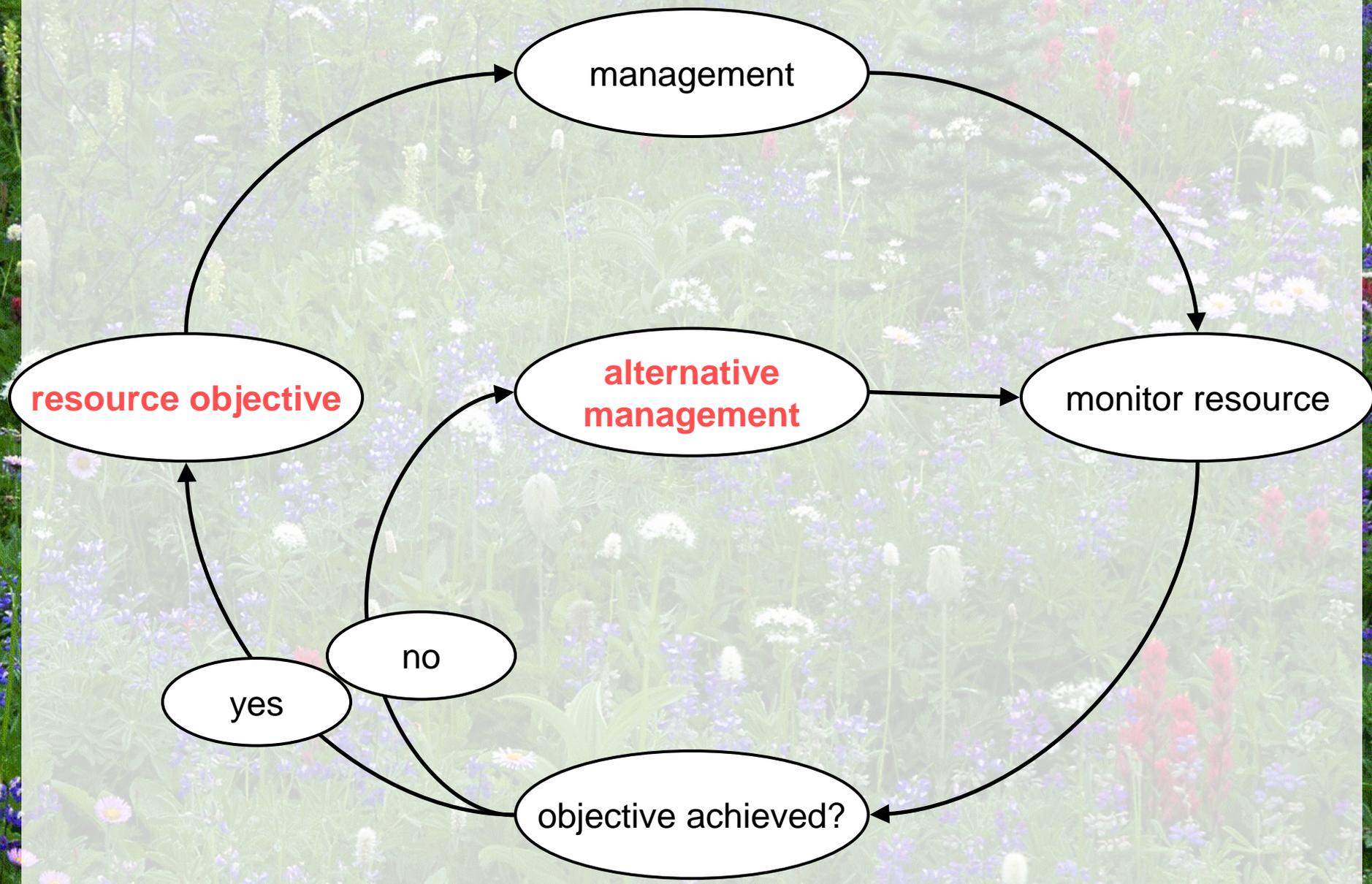
# Adaptive Management Cycle



# Adaptive Management Cycle



# Adaptive Management Cycle







A monitoring program can focus on:

***Resource Monitoring*** – measures a attribute of the plant resource itself.



***Habitat Monitoring*** – measures how well a management activity meets objectives for the habitat.



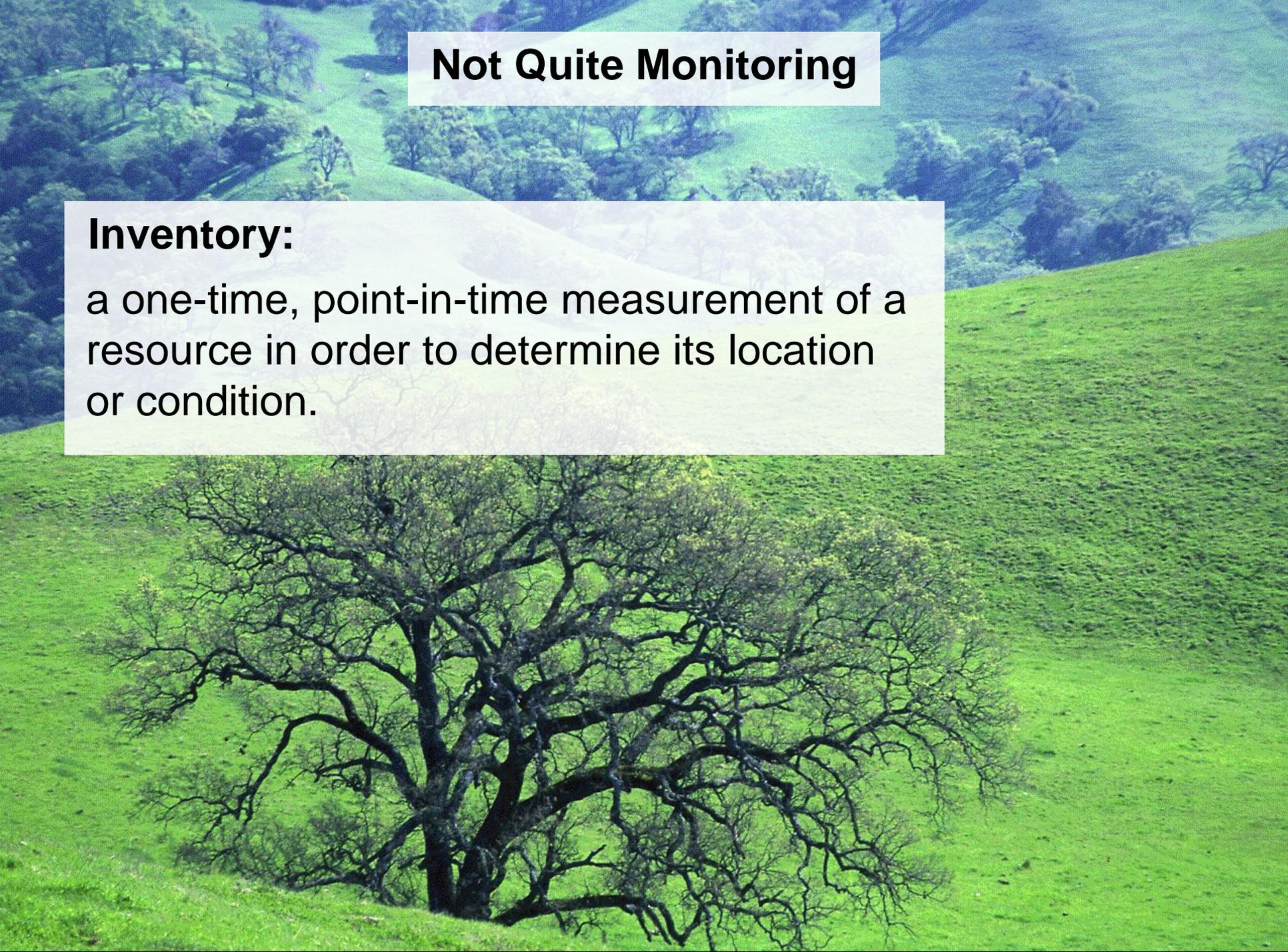
# Not Quite Monitoring



# Not Quite Monitoring

## **Inventory:**

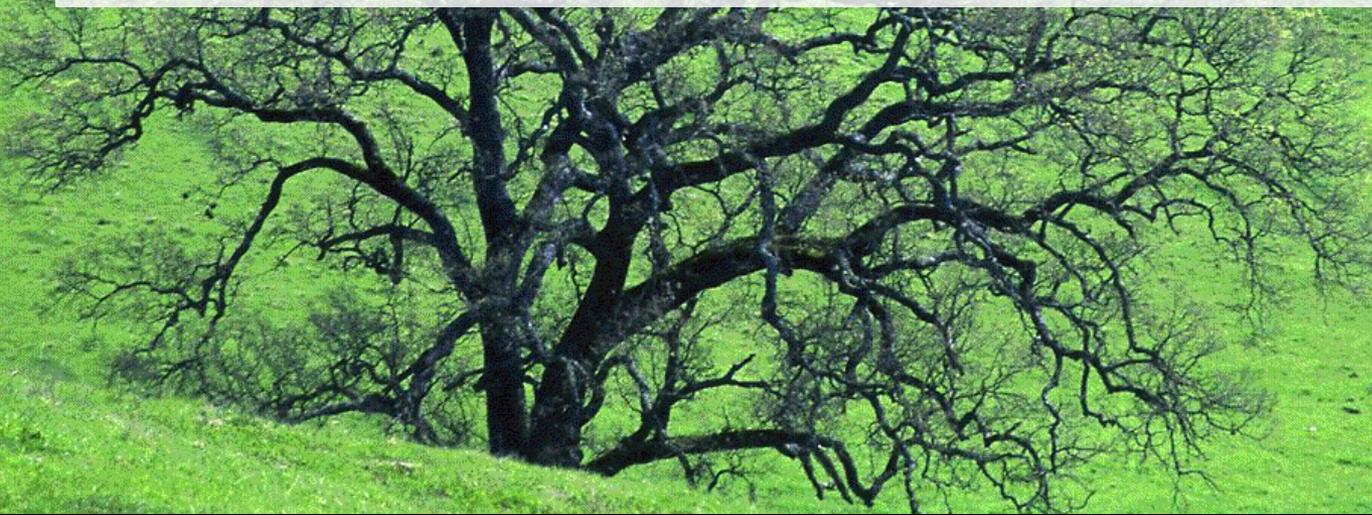
a one-time, point-in-time measurement of a resource in order to determine its location or condition.



# Not Quite Monitoring

## **Natural History Study:**

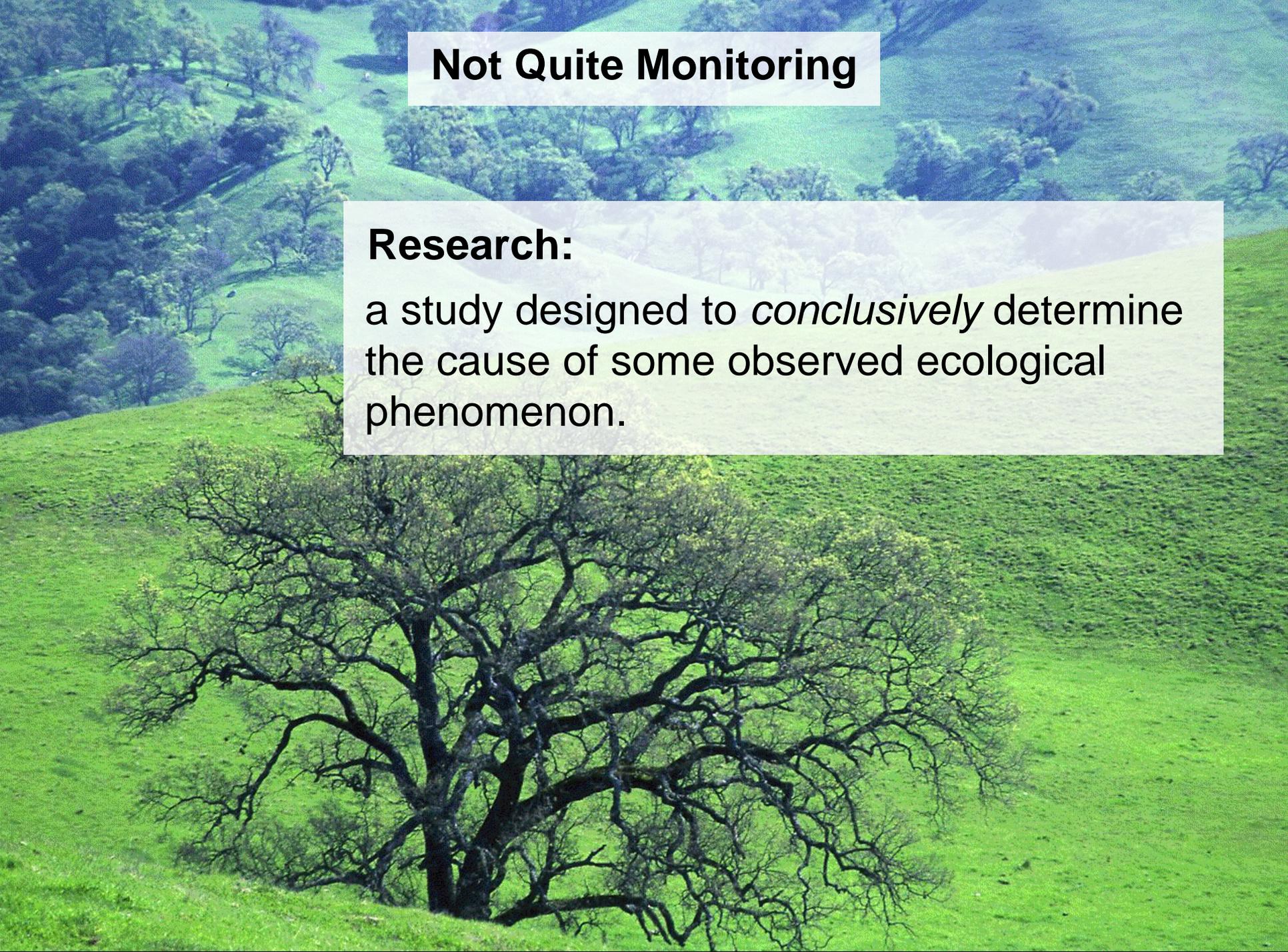
Investigations into basic ecological questions (e.g., pollination mechanisms, life history, seed viability, seedbank longevity).



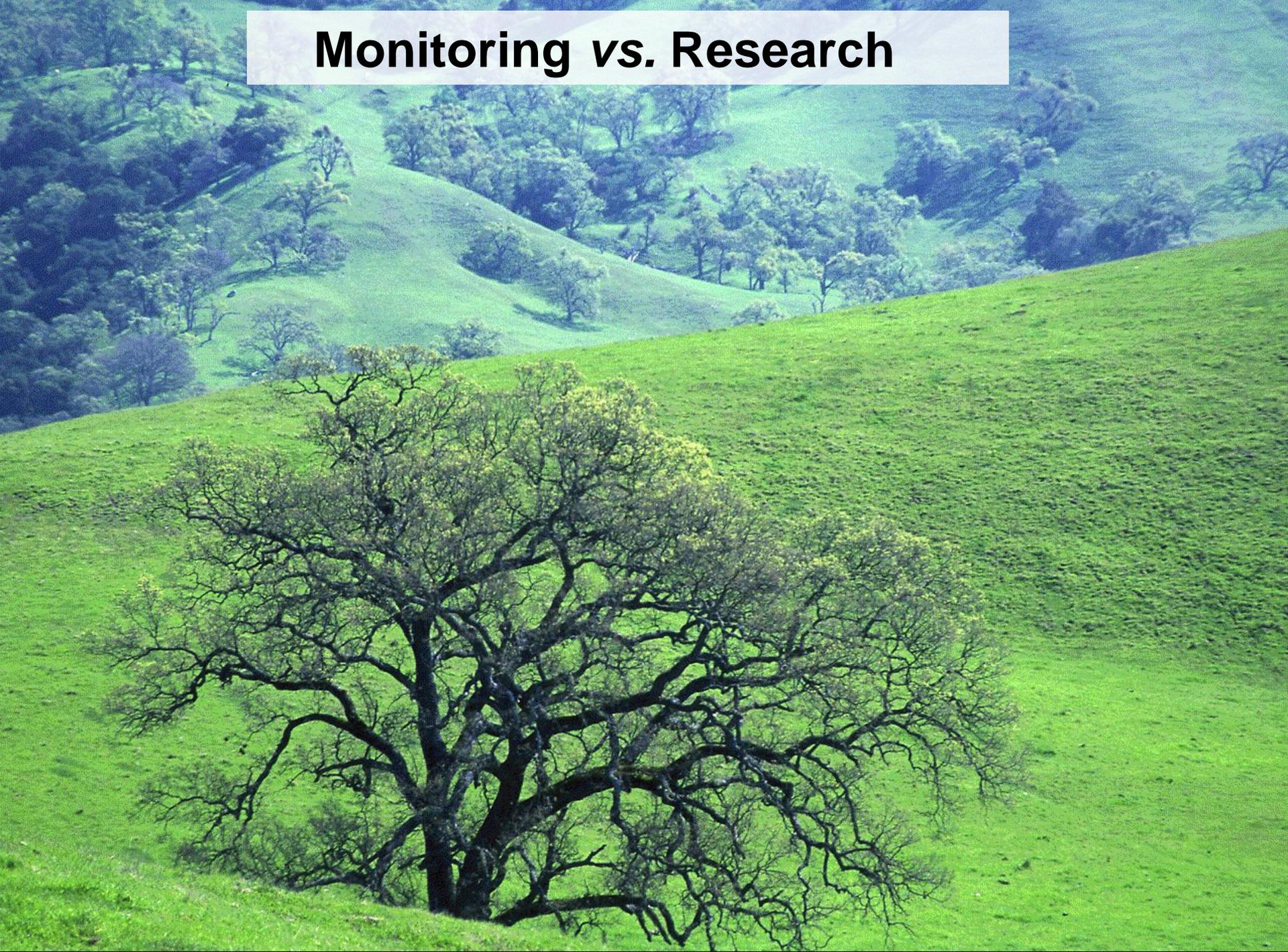
# Not Quite Monitoring

## Research:

a study designed to *conclusively* determine the cause of some observed ecological phenomenon.



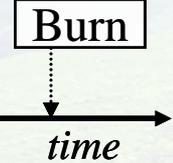
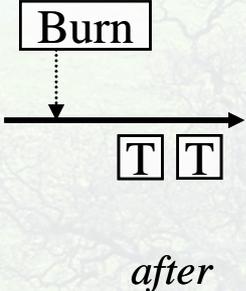
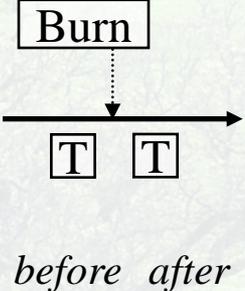
# Monitoring vs. Research



# Monitoring vs. Research

A	B	C	D	E	F

# Monitoring vs. Research

<b>A</b> • no monitoring	<b>B</b> • post monitoring only	<b>C</b> • pre & post monitoring	<b>D</b>	<b>E</b>	<b>F</b>
					

**T** unit where treatment is applied

# Monitoring vs. Research

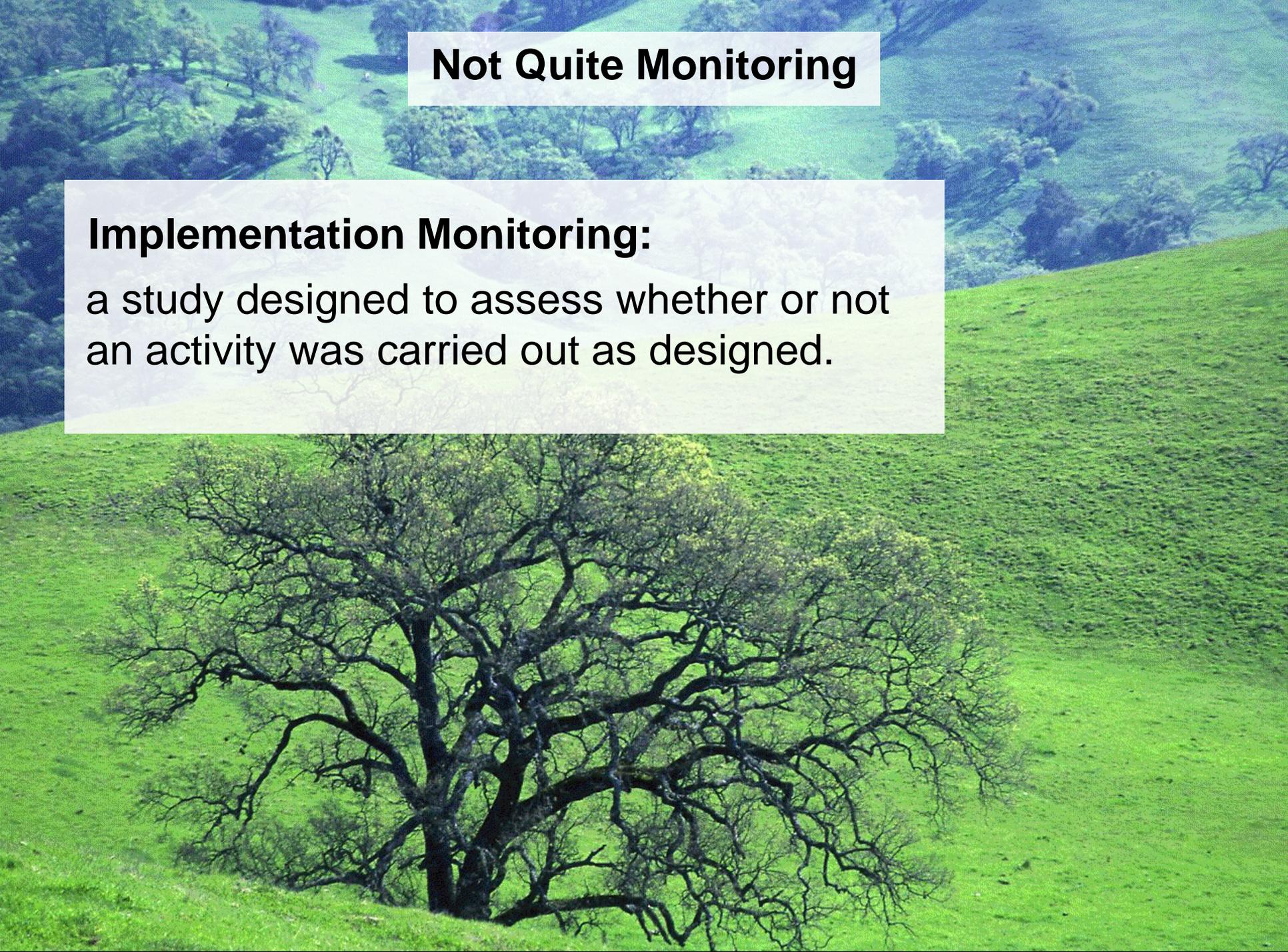
<b>A</b> • no monitoring	<b>B</b> • post monitoring only	<b>C</b> • pre & post monitoring	<b>D</b> • pre & post monitoring • treatment & control	<b>E</b> • pre & post monitoring • treatment & control • minimum replication	<b>F</b> • pre & post monitoring • treatment & control • good replication
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Burn</div>                      ↓                      —————→  <i>time</i> </div>	<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Burn</div>                      ↓                      —————→                      [T] [T]                      after                 </div>	<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Burn</div>                      ↓                      —————→                      [T] [T]                      before after                 </div>	<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Burn</div>                      ↓                      —————→                      [T] [T]                      [C] [C]                      before after                 </div>	<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Burn</div>                      ↓                      —————→                      [T] [T]                      [C] [C]                      [C] [C]                      [T] [T]                      [T] [C]                      [C] [C]                      before after                 </div>	<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Burn</div>                      ↓                      —————→                      [TC] [TC]                      [CT] [CT]                      [TC] [TC]                      [TC] [TC]                      [CT] [CT]                      [CT] [CT]                      [TC] [TC]                      [CT] [CT]                      before after                 </div>

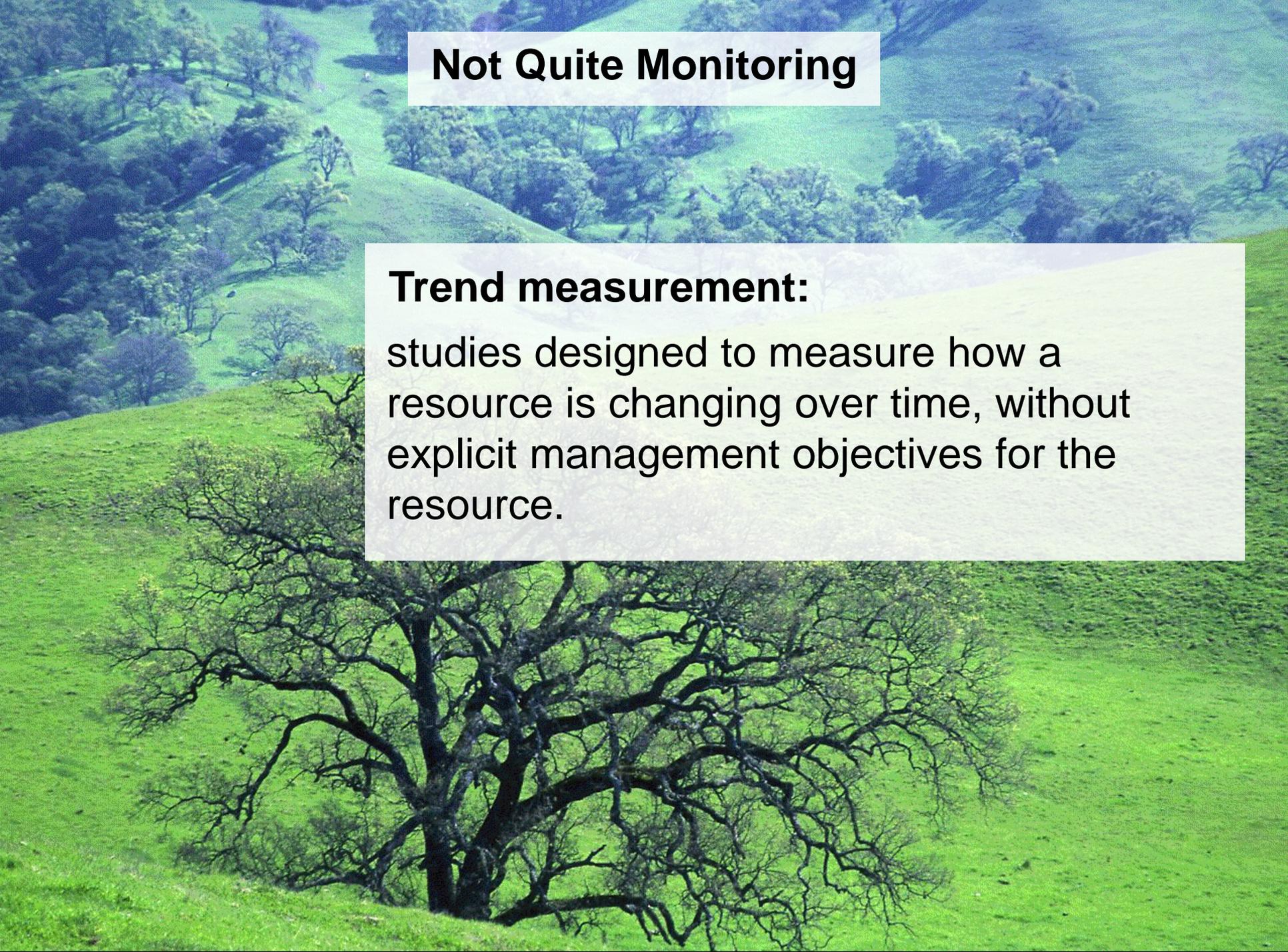
[T] unit where treatment is applied    [C] control unit

# Not Quite Monitoring

## **Implementation Monitoring:**

a study designed to assess whether or not an activity was carried out as designed.

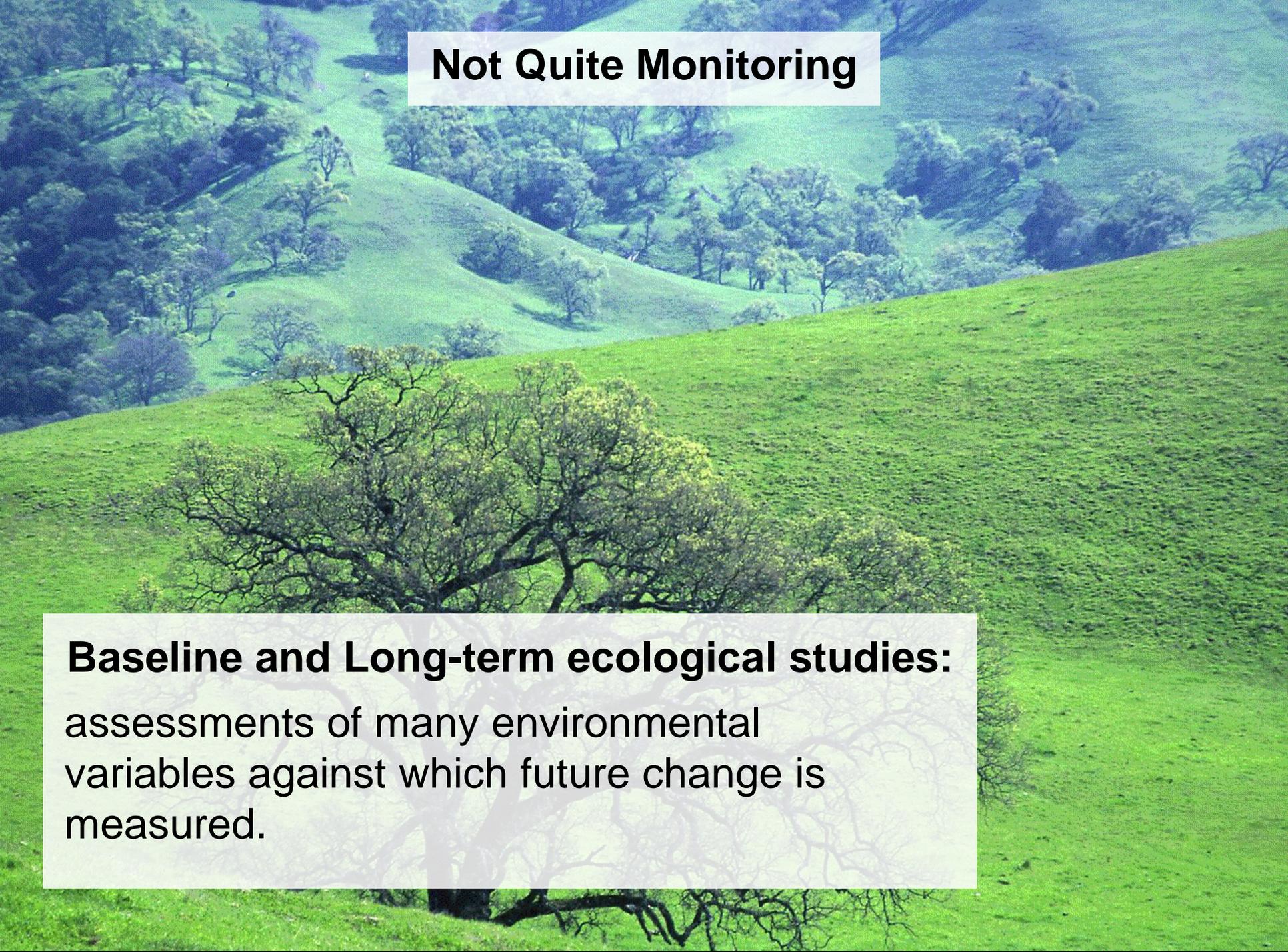




## Not Quite Monitoring

### **Trend measurement:**

studies designed to measure how a resource is changing over time, without explicit management objectives for the resource.

A scenic landscape of rolling green hills with scattered trees under a clear sky. The hills are covered in lush green grass, and several trees of varying sizes are scattered across the slopes. The sky is a clear, bright blue. The overall scene is peaceful and natural.

## Not Quite Monitoring

### **Baseline and Long-term ecological studies:**

assessments of many environmental variables against which future change is measured.

