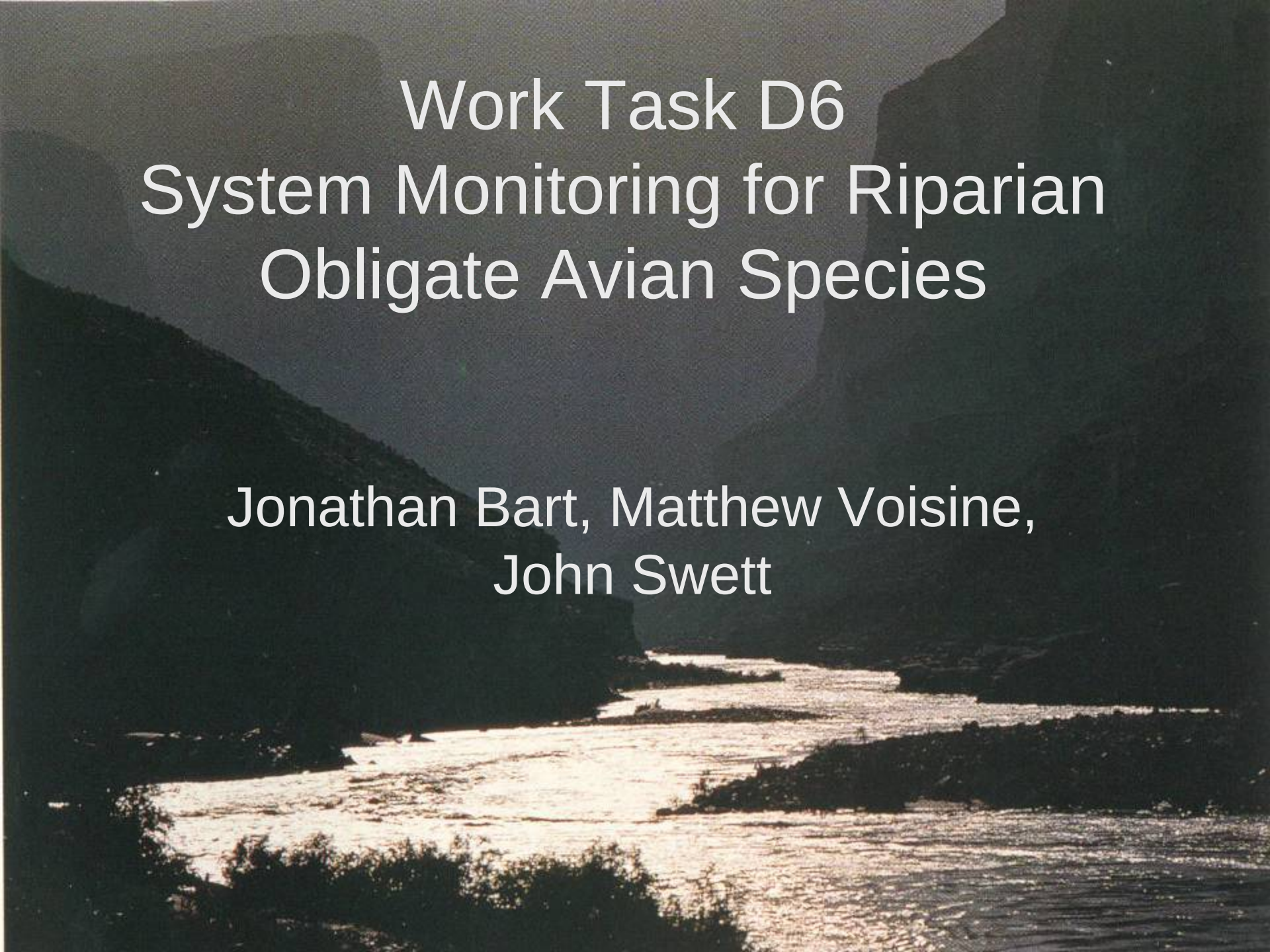


Work Task D6
System Monitoring for Riparian Obligate Avian Species

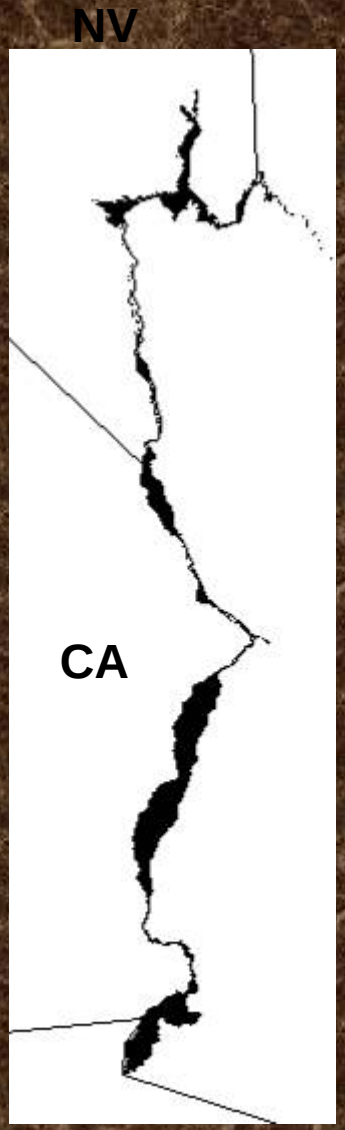
Jonathan Bart, Matthew Voisine,
John Swett

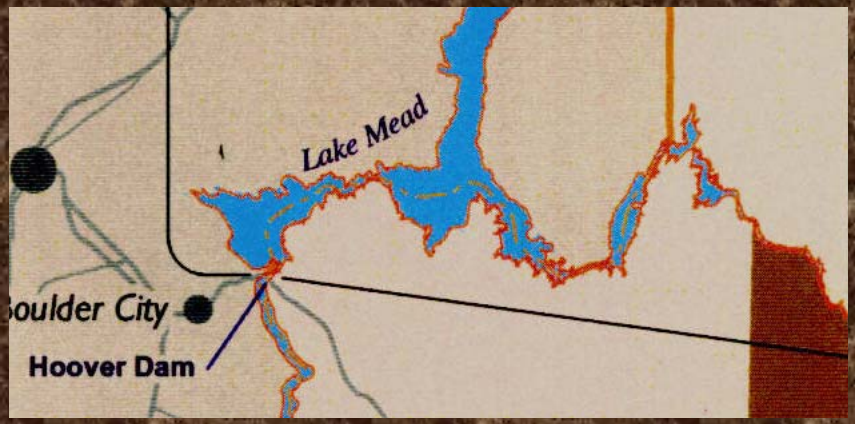
Approach
Goals
Objectives
Methods

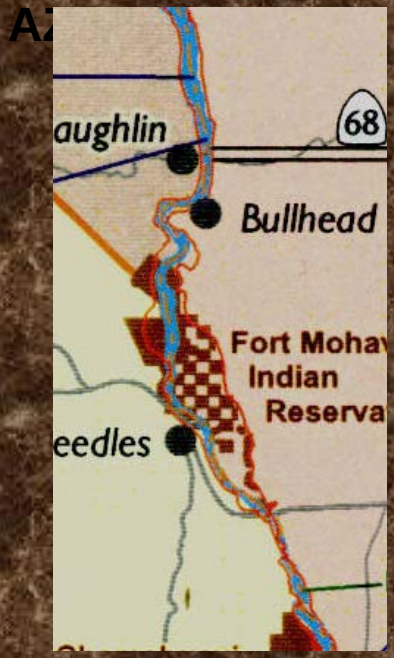
Broad goal

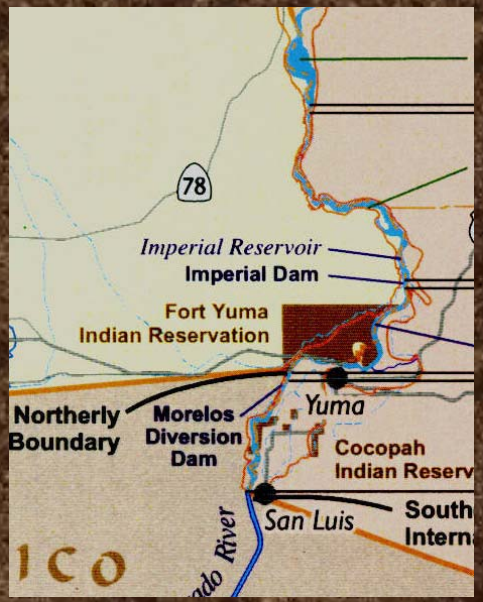
Fulfill the requirement to “monitor riparian, obligate bird species covered under the LCR MSCP to document long-term trend and habitat use.”

Study area

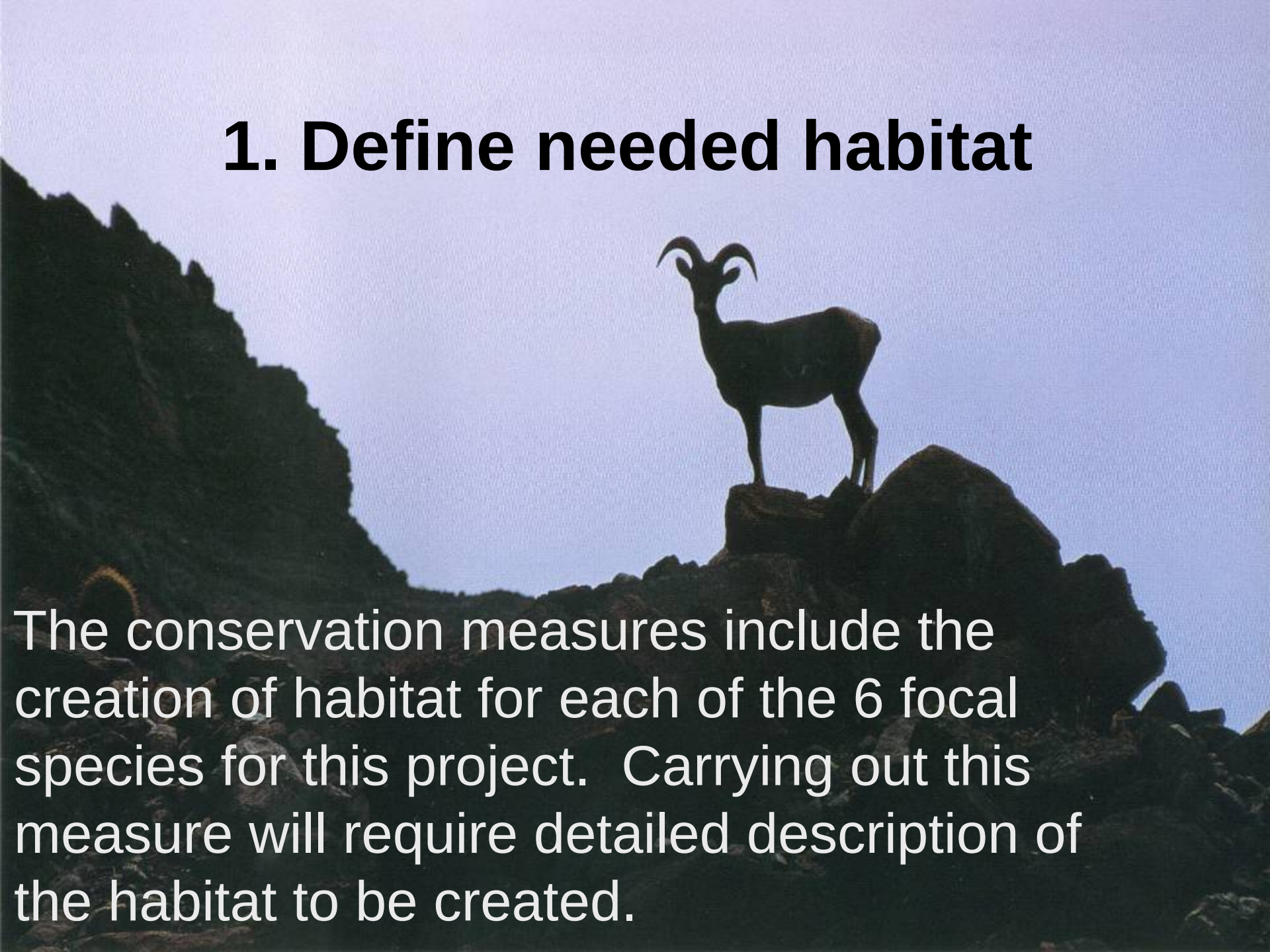

NV
CA


Lake Mead
Boulder City
Hoover Dam


AZ
aughlin
68
Bullhead
Fort Moha
Indian
Reserva
eedles

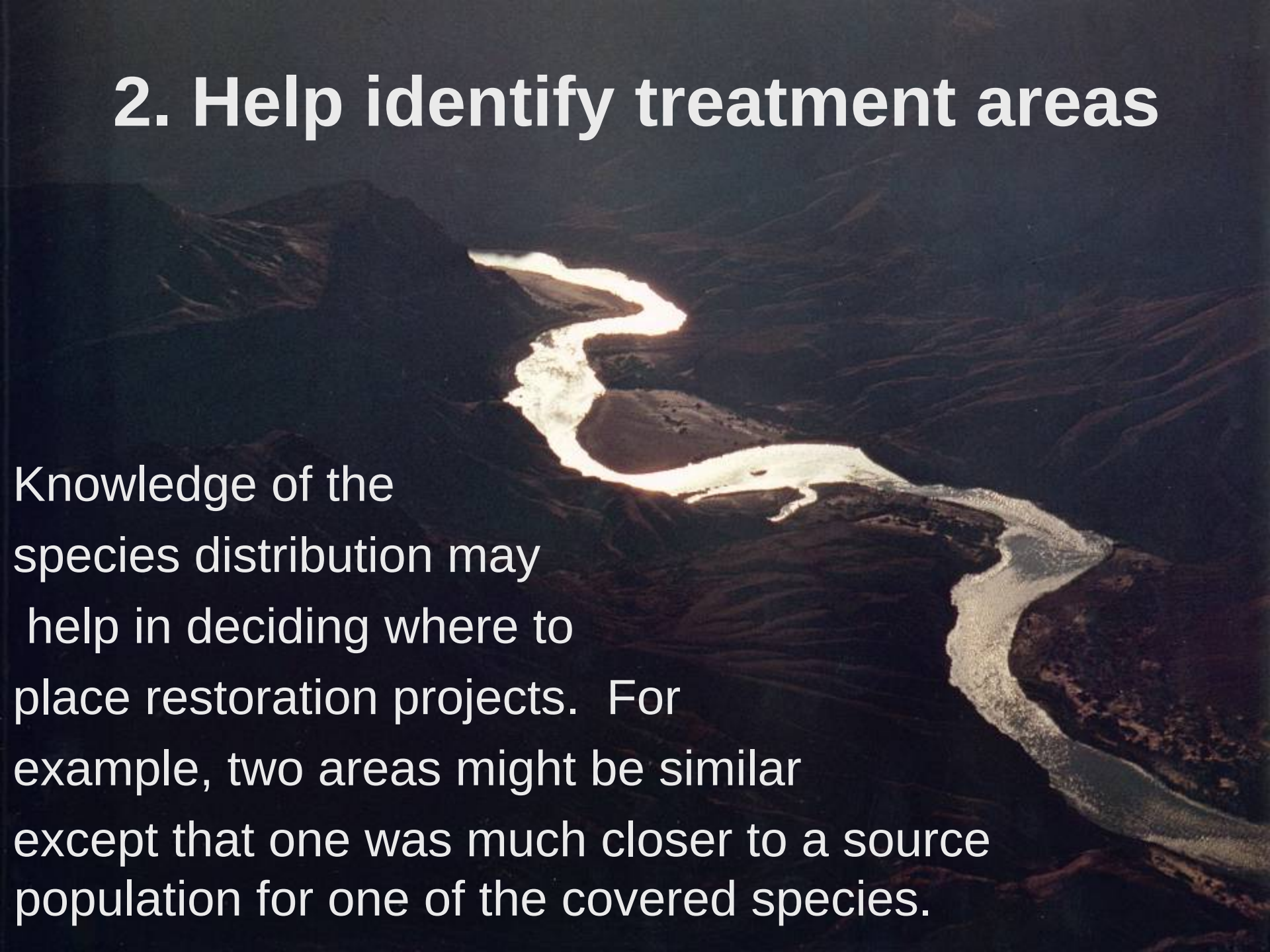

78
Imperial Reservoir
Imperial Dam
Fort Yuma
Indian Reservation
Yuma
Northerly
Boundary
Morelos
Diversion
Dam
Cocopah
Indian Reserv
San Luis
South
Intern
ICO

1. Define needed habitat

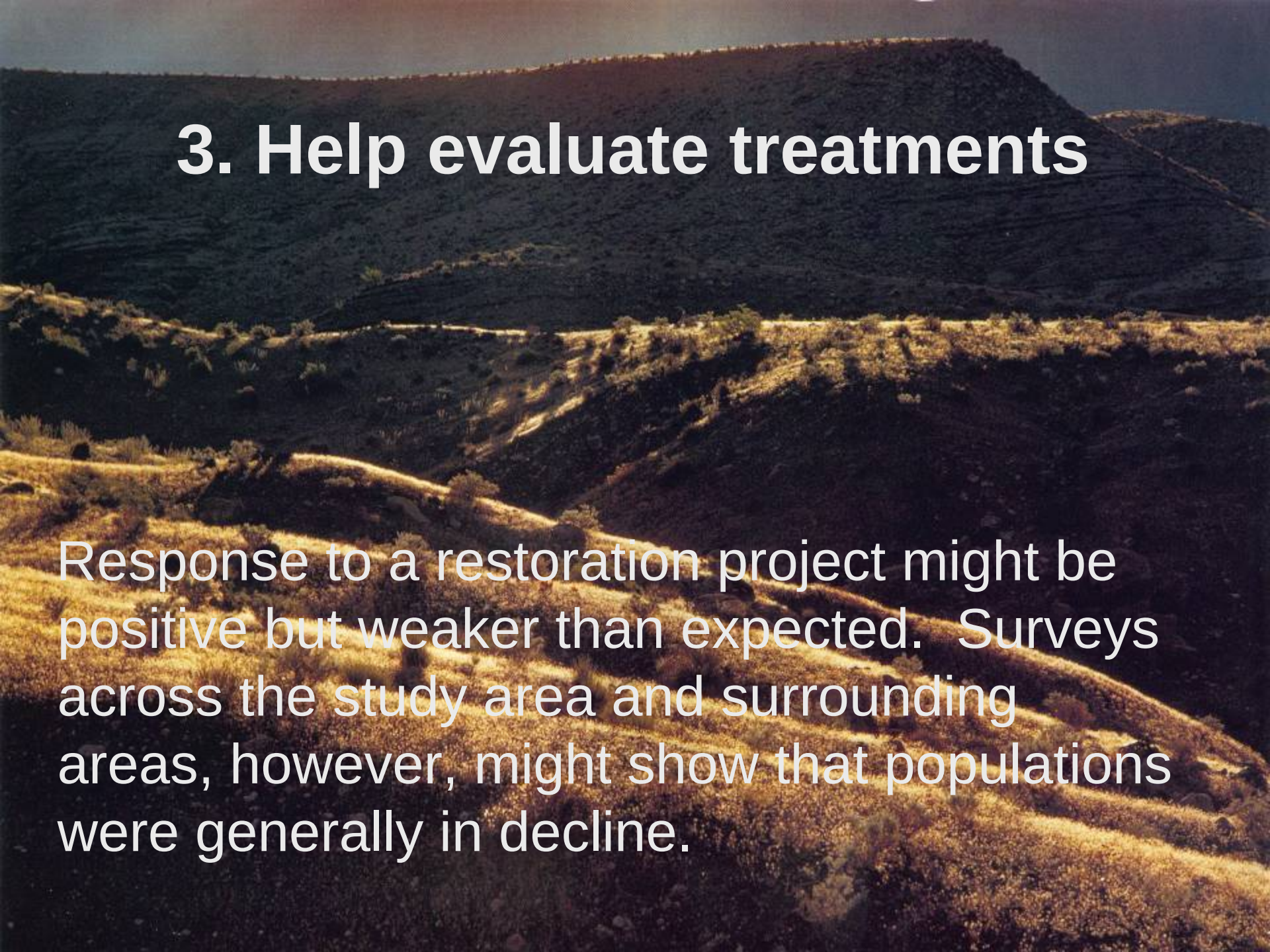


The conservation measures include the creation of habitat for each of the 6 focal species for this project. Carrying out this measure will require detailed description of the habitat to be created.

2. Help identify treatment areas

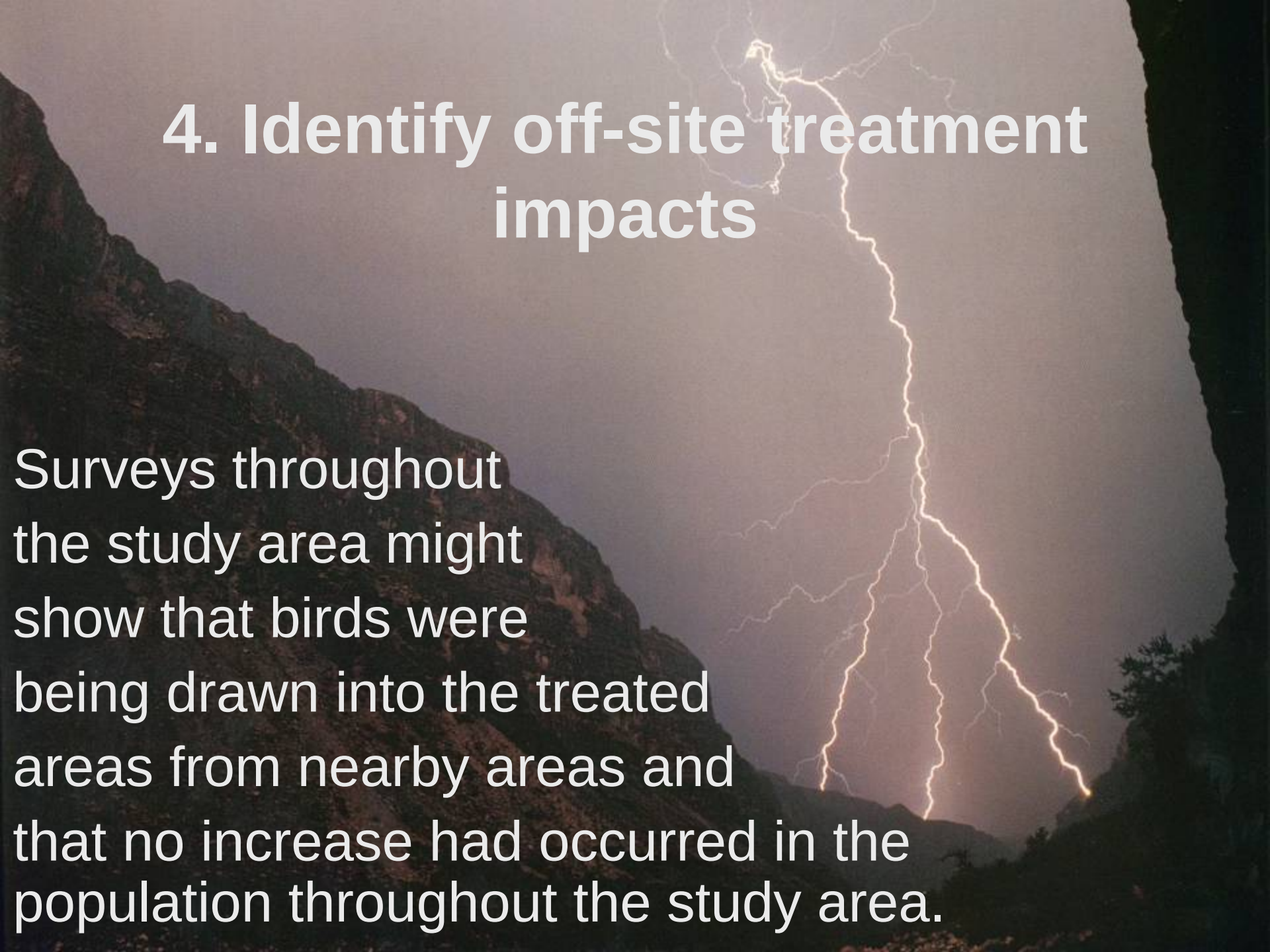


Knowledge of the species distribution may help in deciding where to place restoration projects. For example, two areas might be similar except that one was much closer to a source population for one of the covered species.



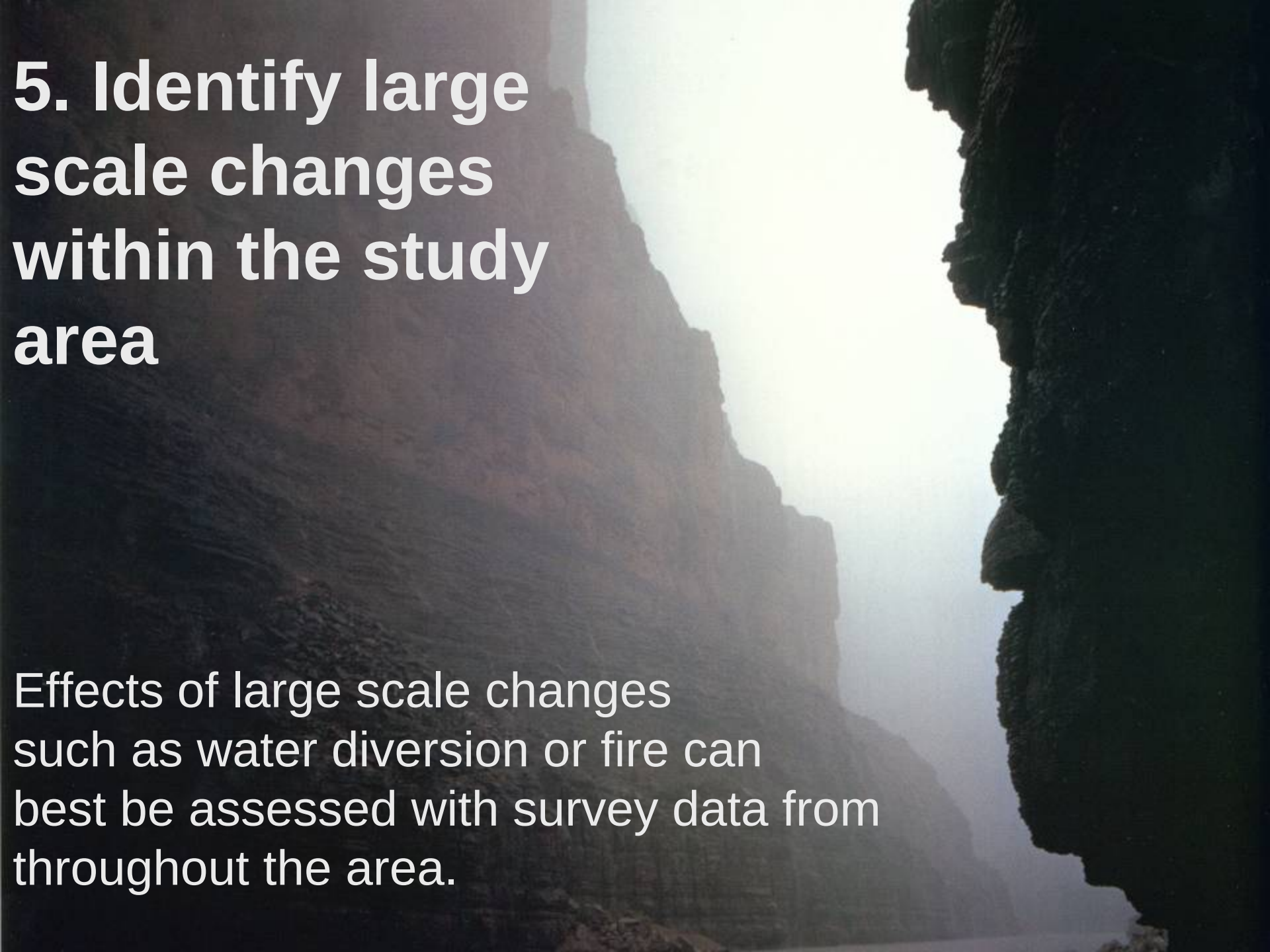
3. Help evaluate treatments

Response to a restoration project might be positive but weaker than expected. Surveys across the study area and surrounding areas, however, might show that populations were generally in decline.



4. Identify off-site treatment impacts

Surveys throughout the study area might show that birds were being drawn into the treated areas from nearby areas and that no increase had occurred in the population throughout the study area.



5. Identify large scale changes within the study area

Effects of large scale changes such as water diversion or fire can best be assessed with survey data from throughout the area.

6. Contribute to status assessments

One reason for choosing the covered species is that concern for them exists. In the future, status assessments may be needed to determine whether they warrant protection under the ESA or similar rules. Data from the study area will be of high value in any such analysis.

Summary

1. Define needed habitat
2. Help identify treatment areas
3. Help evaluate treatments
4. Identify off-site treatment impacts
5. Assess changes at larger scales
6. Contribute to status assessments

Objectives (qualitative)

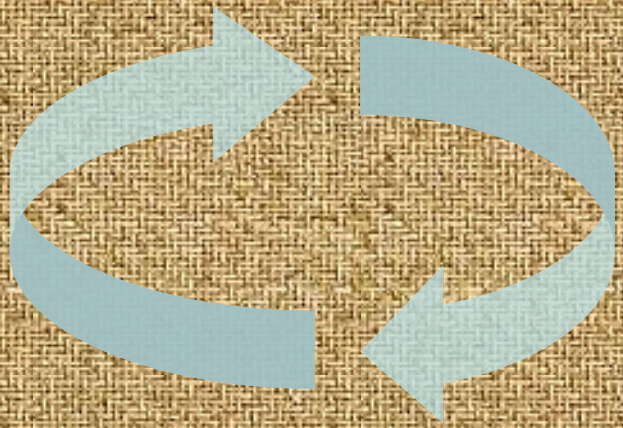
- Define high-quality habitat (goals 1-3)
  - identify most important habitat parameters (criteria)
  - establish desired ranges for each (standards)

- Assess population size and trends (goals 4-6)
  - within treated areas
  - throughout the study area

Setting quantitative objectives

- **In theory**
  - **Accuracy target is fixed and stated at outset**
  - **Determine the needed sample size**
- **Usual reality**

Predicted accuracy



Resources available

- **Our approach: Largely resource driven**
  - **Thus, predicted accuracy will be discussed after discussing methods**

Initial resource levels

- **PI available as needed for design, one week of initial field work, periodic consultation with field team, data management, analysis, and preparation of reports**
- **One four-person team available full-time throughout the breeding season to conduct bird surveys and record habitat measurements**

Overview of Methods - 1

- **Planning**
  - **Literature review & consultation with experts**
  - **Build GIS project (habitat, roads, etc)**
  - **Week of exploratory field work (PI)**
  - **Stratify study area and select point locations**
- **Field work**
  - **Conduct point counts**
  - **Intensive study of selected pairs**
  - **Delineate territories**

Overview of Methods - 2

Analysis

- Point counts
  - Use in combination with BBS data for temporal variation
  - Explore “panel designs”
  - Recommend sample sizes and allocation of effort for long-term program
  - Combine with GIS habitat layers from landscape level habitat analyses
- Intensive habitat data
  - Tailor measures to each species
  - Use hypothesis-testing approach
  - Carry out sensitivity analyses

Planning

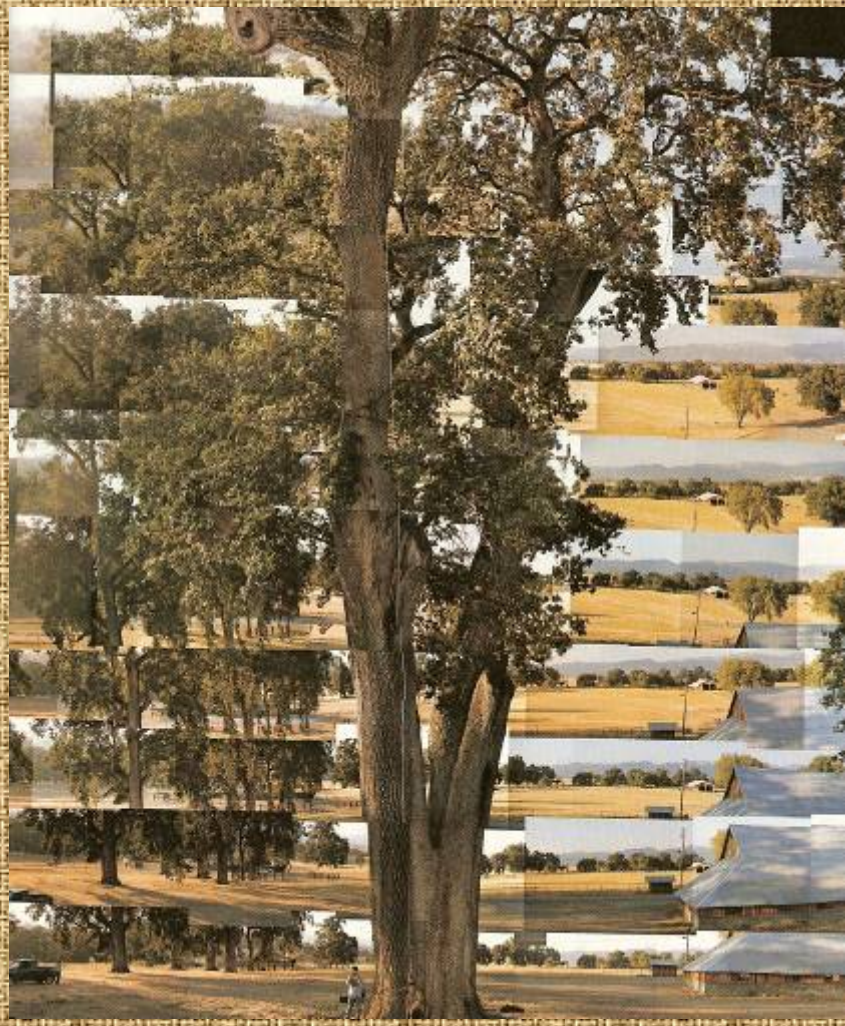
- Statistical population: territorial pairs of the 6 focal species (excludes migrants)
- Review species accounts (BOR), BNAs, other literature and reports
- Confer with Ken Rosenberg, Chuck Hunter, Troy Corman, etc.
- Build the GIS project for landscape analyses
- Week(s) of field work, unstructured but thorough coverage of study area
- Stratify study area, determine sampling intensity, select point count locations

Field work

- Detailed daily work schedule developed
- 600 point counts
  - Only for the 6 focal species
  - Estimate distance, especially <> 50 m
  - Record “song/no song” in each 30 sec interval
- Select 60 territories (10/species)
  - Visit each 3 times for 1 hr/visit to map boundaries and record substrate, behavior, and songs
  - Record habitat data at 5+ locations (next slide)
  - Select nearby non-utilized areas and collect similar habitat data

Habitat measurements

- **Will be designed after review of literature on focal species and consultation with experts**
- **Potential different variables for different species**
- **Define hypotheses about habitat to be tested**
- **Clearly non-utilized areas in the territories will be excluded**



Analysis – point counts

- **Population size, $\hat{Y}$**

$$\hat{Y} = 2A\frac{\bar{y}}{P_s} = 2A\frac{\sum W_h \bar{y}_h}{0.00785 P_s}$$

$\hat{Y}$

A = size (km^2) of the study area

$\bar{y}$ = mean N of singing birds (males) per point count

P_s = Probability that a male sings during a point count

W_h = Proportion of study area in stratum h

0.00785 = area covered by a 50-m point count

Variance is derivable using standard survey sampling methods

Analysis – Point counts

- **Population trend**
  - **Point counts for density in the study area; Breeding Bird Survey data for variance in temporal trends**
  - **Panel designs (i.e., “partial replacement” strategies)**
  - **Will probably recommend fixed radius plots and methods to estimate detection rates**
  - **Power to detect trend vs. sample size curves will be derived**

Analysis – data from focal birds

- Estimate P(song) during time budget (P_s)
- Identify critical habitat parameters and ranges
  - Variables used by the species for nesting, foraging, or as perches (from t-b data)
  - Variables for which value appears to matter (from used/non-used comparison)
  - Variables as “different” from one another as possible
- Will probably use multivariate methods for habitat analyses, but which ones still uncertain

Schedule

Planning

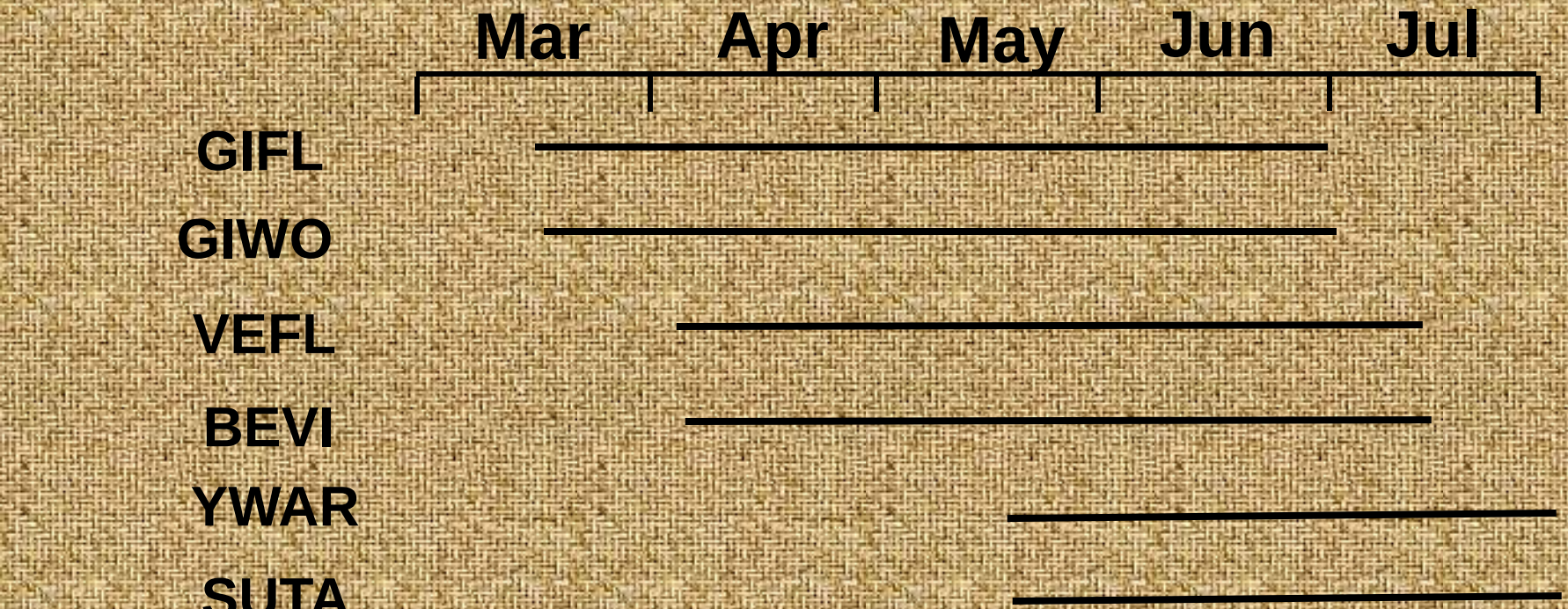
Training
Recon

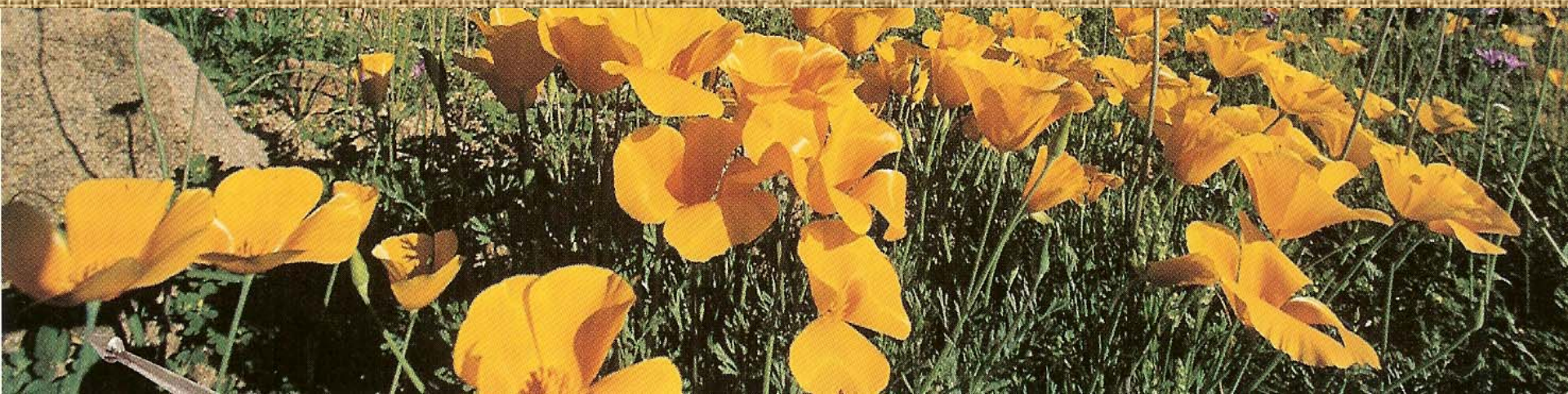
Time budgets
Point cts
Habitat

Analysis
reports

April | May | June | July

Phenology





Review of Goals & Methods

Goals	Point counts	Focal bird surveys
Define needed habitat		XX
Help identify treatment areas	XX	XX
Help evaluate treatments		XX
Identify off-site treatment impacts	XX	XX
Assess changes at larger scales	XX	
Contribute to status assessments		XX