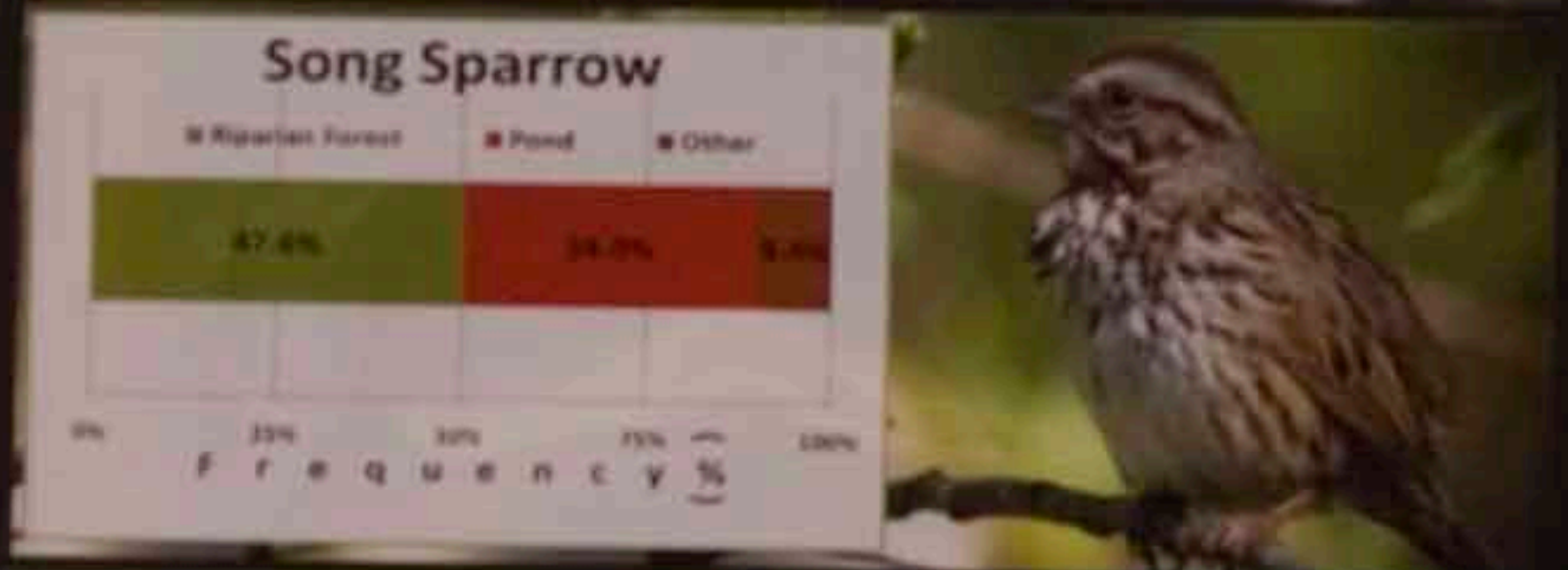
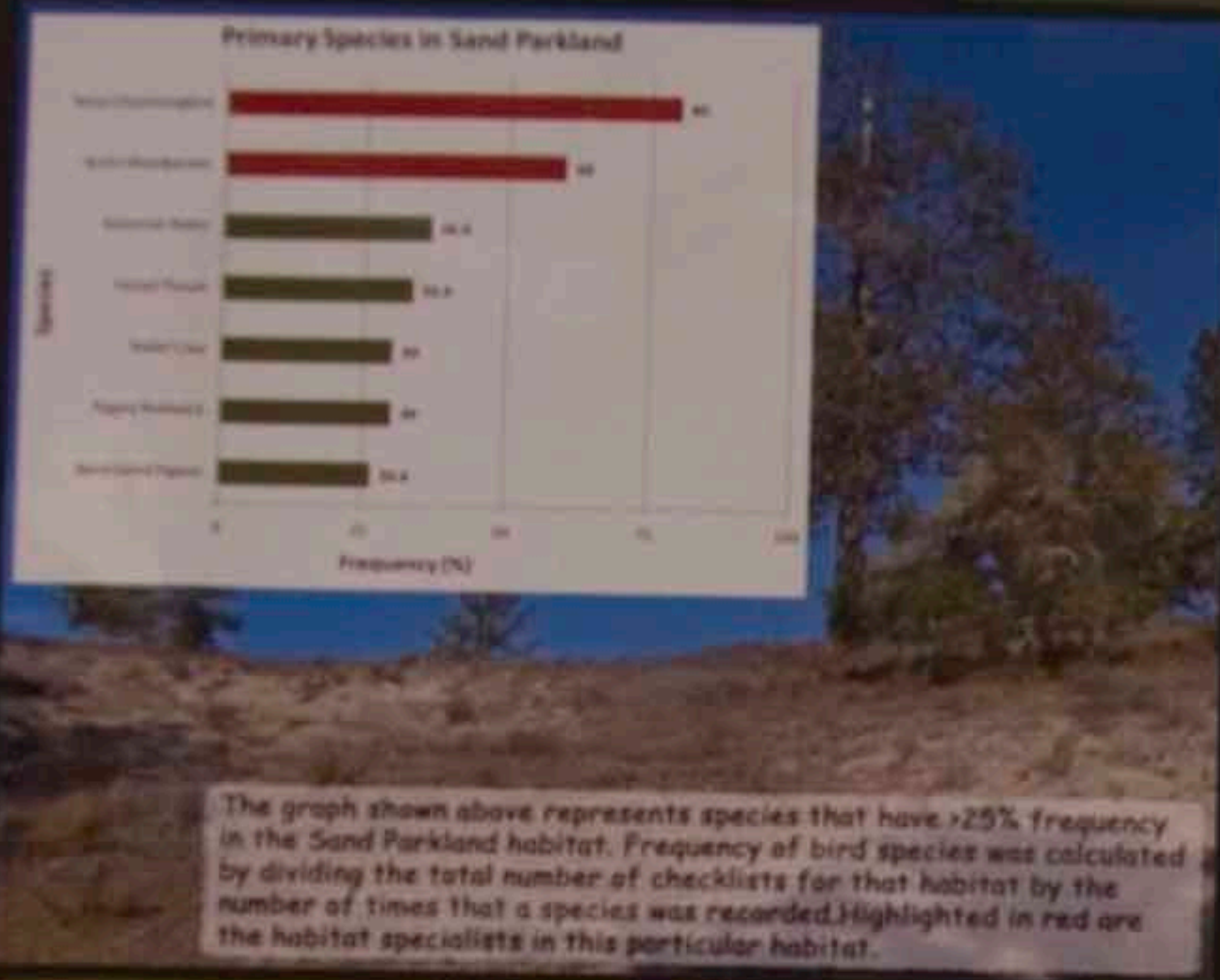


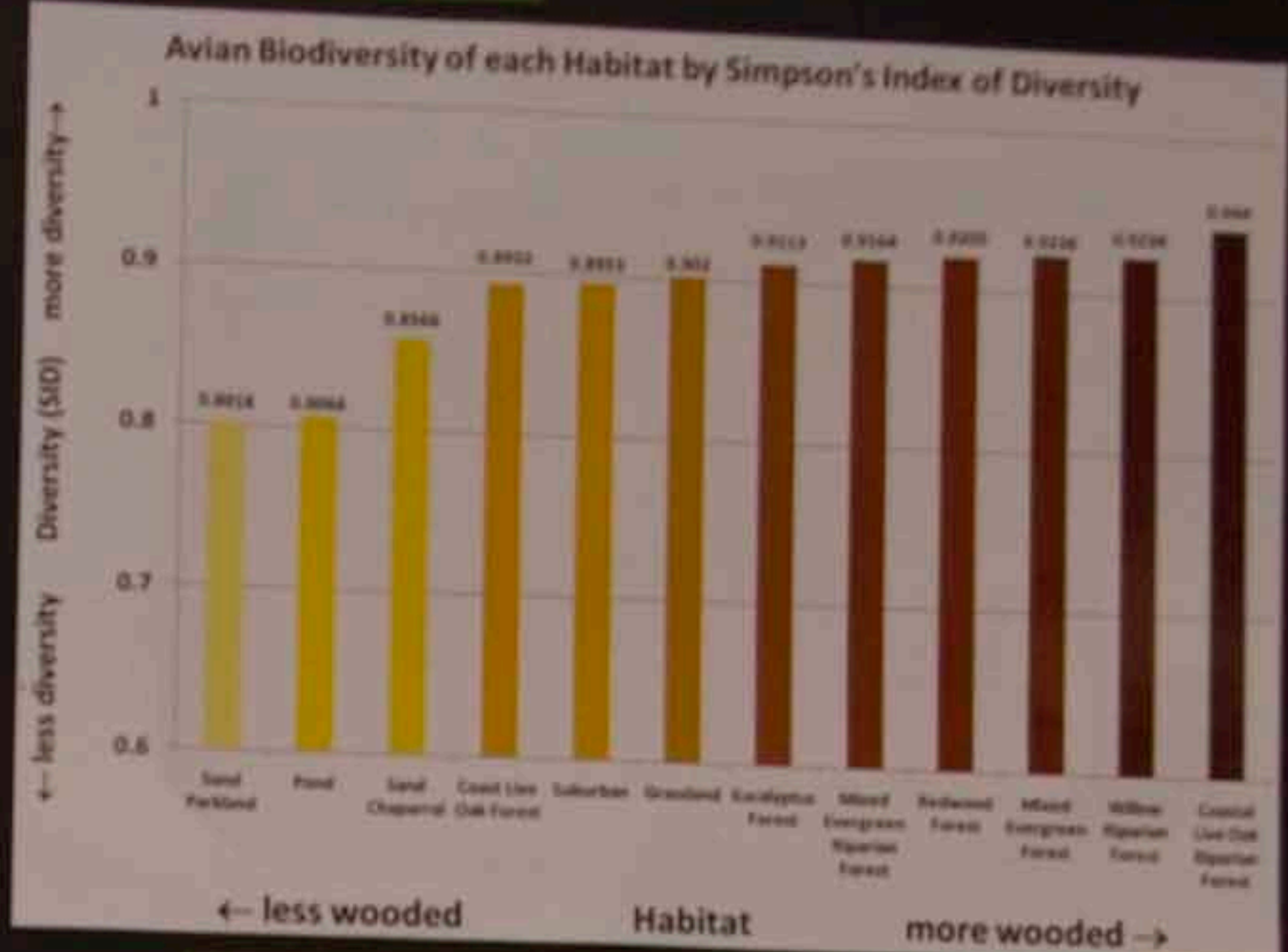
INTRODUCTION

Quail Hollow Ranch County Park, located in the foothills of the Santa Cruz Mountains, is well known for its avian diversity. During the past several years, research in the park's avian life. This project was designed to provide an insight to the birds of the park, to better understand its species and to offer recommendations on how to best manage the park's biologically important sites. From the beginning, research in this area has been performed in this biologically important sites. From the beginning, Quail Hollow Ranch's landscape has changed dramatically, primarily an open grassland converted to oak-chaparral and sand-parkland, mixed evergreen forest and riparian associated habitats have become dominant through ecological succession. As habitats appear and disappear, some species do as well. This has led to the "What bird species are habitat specialists and what is their distribution?" We have been studying Quail Hollow Ranch since 2000 and began a formal study in late summer 2008. Through a series of weekly monitoring using point-counts, we are able to analyze and compare species across the park, and determine their habitat associations, as well as the relationships between the park and ecological succession. This will provide a "guide" to the park's avian life, and how to best manage its ecological succession process.

DATA



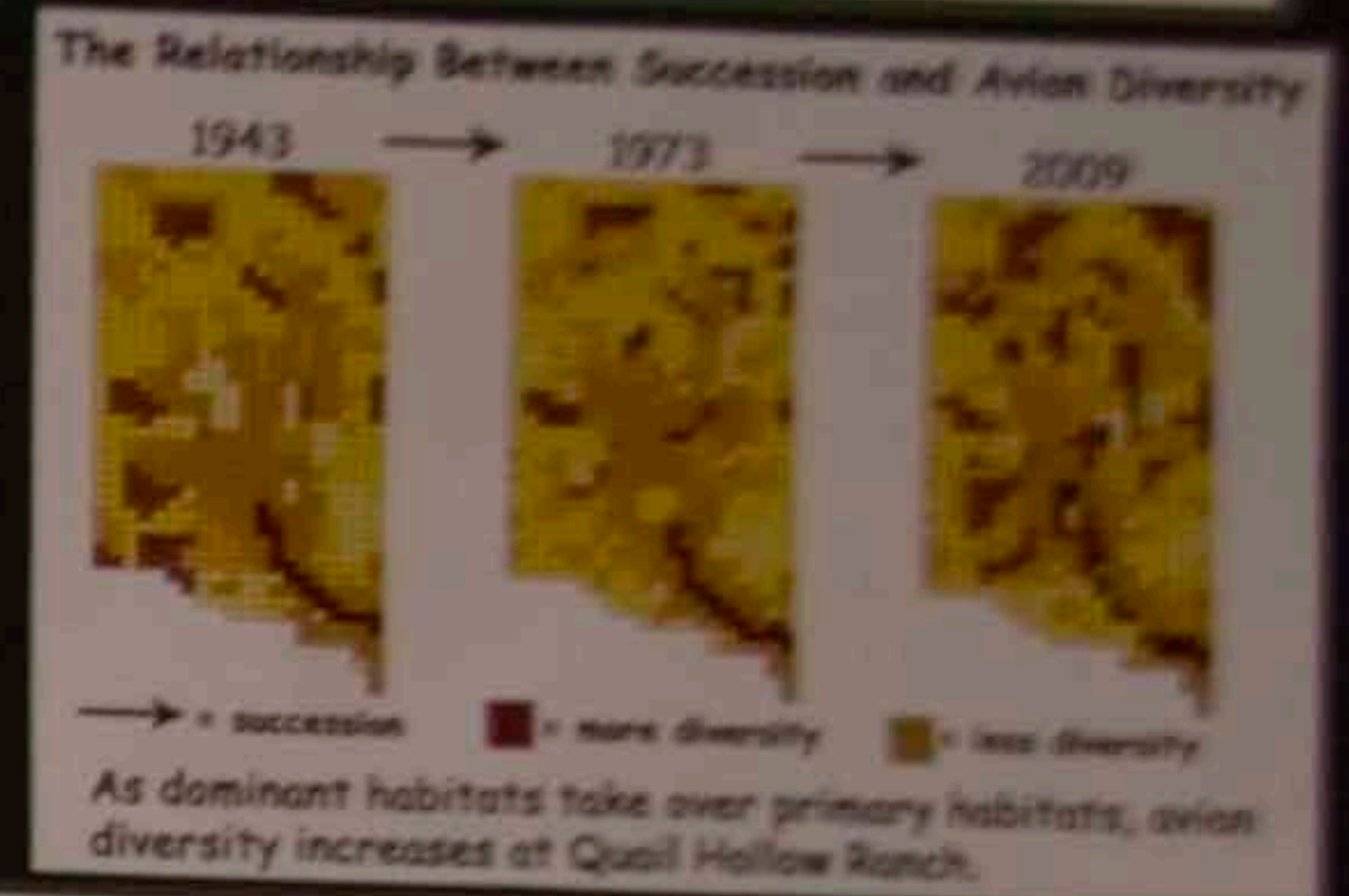
HABITAT SPECIALIST: Song Sparrows are habitat specialists, a species that only occurs in one or two habitats; primarily occurring in Riparian Forest and Pond habitats (both associated with water). They are rarely seen outside of the few habitats they are present in. Habitat specialists contribute to their habitat's diversity because they are only present there.



Habitat biodiversity data was analyzed using an index of the Simpson's Diversity formula. The one we used was the Simpson's Index of Diversity. The numbers that come out of this formula range from 0-1, 1 being infinite diversity. The higher the number the habitat receives, the more diverse it is. The diversity in the Simpson's Diversity formula is not just derived from the richness (number of species recorded) in the habitat, but the evenness (the relative abundance of the different species making up the richness of an area) as well.

Chesus

RESULTS



The maps shown above represent Quail Hollow Ranch in 1943, 1973, and 2009. Each square has been assigned a habitat by reviewing aerial photos in these years. The color of each square correlates to the amount of diversity, calculated by Simpson's Index of Diversity formula (shown at left).

HYPOTHESIS

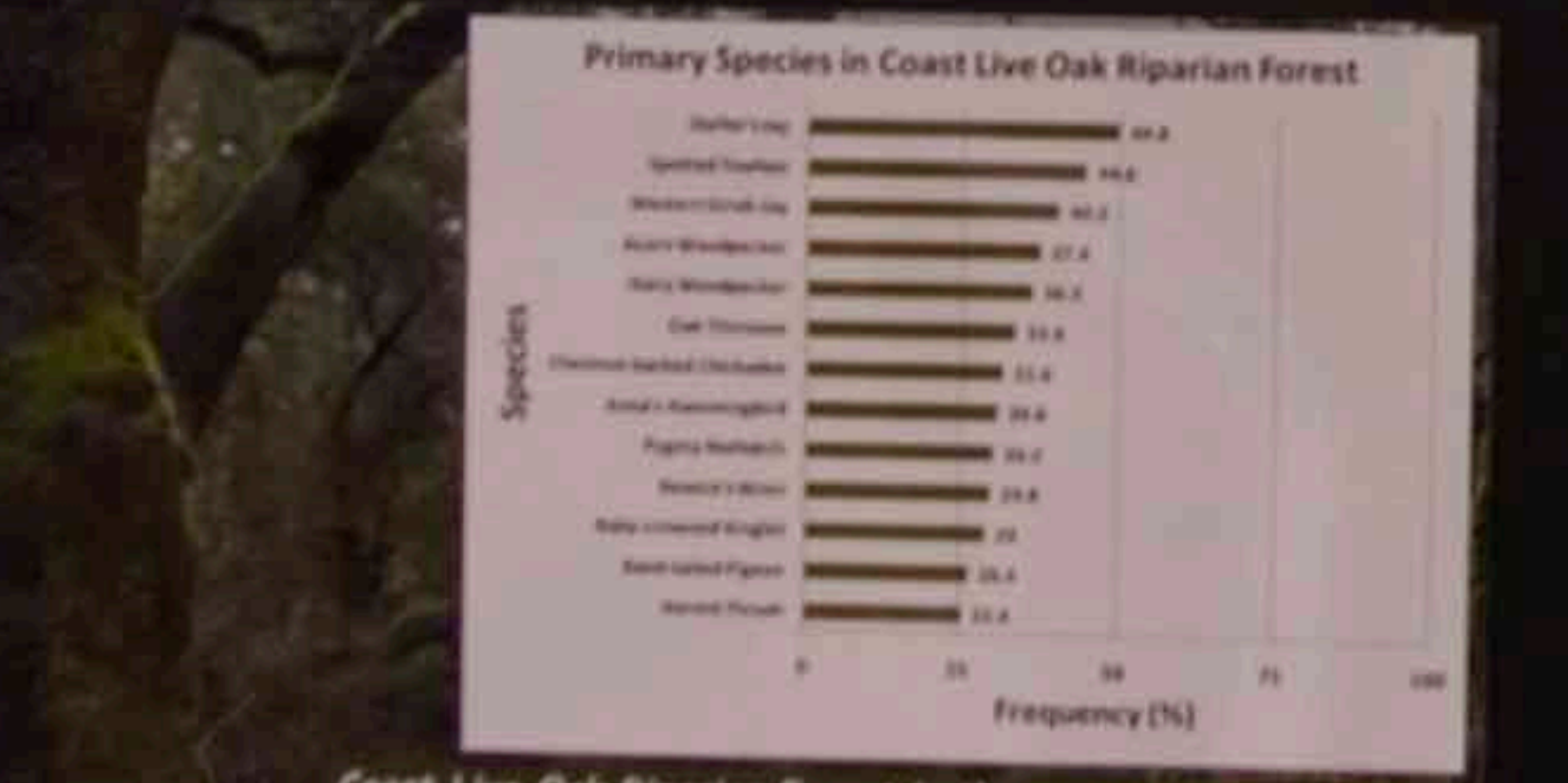
As ecological succession proceeds, Quail Hollow Ranch's overall avian biodiversity will increase. Habitat specialists contribute more diversity to their habitat because they are relatively rare in other habitats and have a consistent population size because they rarely or immigrate or emigrate to different habitats.

PROCEDURE

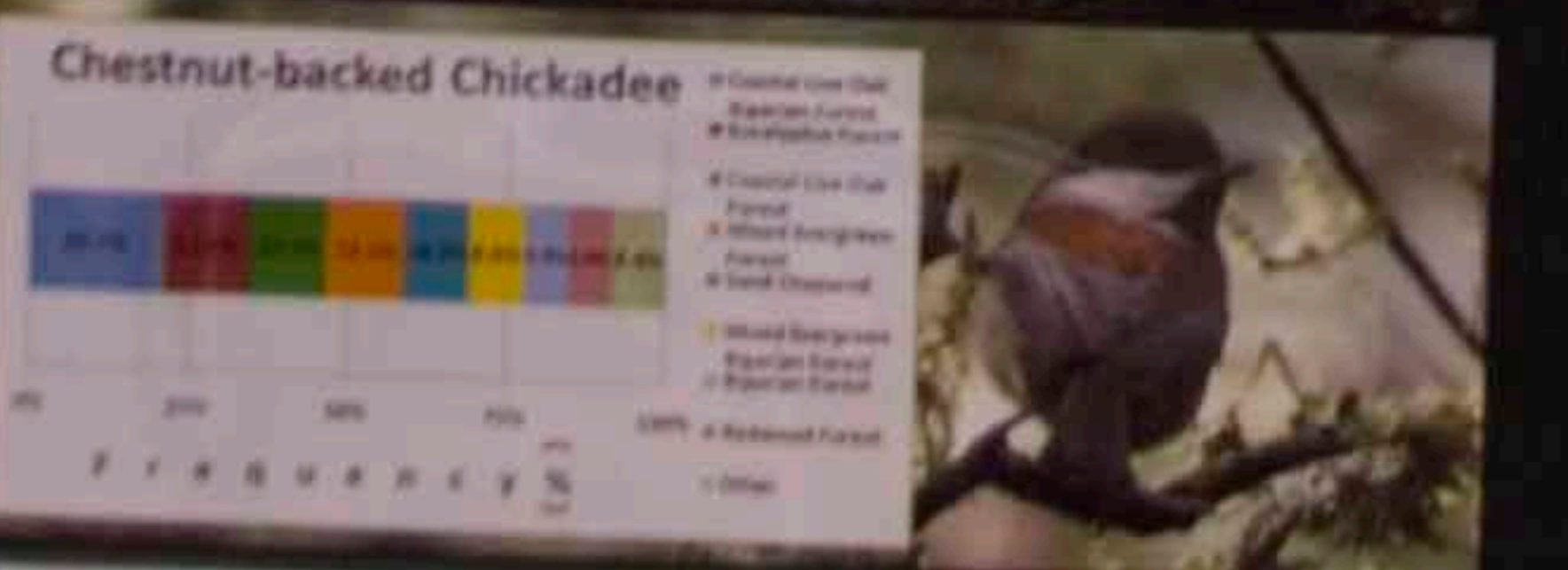
- Record data at least once a week
- Count all birds within a 30m radius for 5 minutes at each point
- Record data and temperature (C°)/wind speed (mph)
- Store on computer and eBird

MATERIALS

- Binoculars
- Weather indicator
- Clipboard and pencil
- Global Positioning System (GPS)



Coast Live Oak Riparian Forest is the most diverse habitat at the park. The total species number is high and the population sizes are similar which adds to diversity. The graph above shows species with >25% frequency in the habitat.



GENERALISTS: Chestnut-backed Chickadees are considered to be generalists at Quail Hollow. Generalists occur in a wide variety of habitats and are not dependent on one or two particular habitats.

Quail Hollow Ranch County Park
 Location: East Ben Lomond, Santa Cruz Co., Ca.
 Size: 300 acres
 Terrain: Located in a tear-drop shaped valley in the foothills of the Santa Cruz Mountains
 Highlighted in Purple: Sand Parkland (see top left)
 Highlighted in Red: Coast Live Oak Riparian Forest (see bottom left)



Alex Rinkert and Connor Chesus (from San Lorenzo Valley High School) monitoring at Quail Hollow Ranch at point 13.

Background information was collected and then put into the Simpson's formula. The results that have been gathered can be analyzed in a multitude of ways. Avian diversity must be analyzed as an average of the park's total diversity, not just in each habitat. The larger the space a diverse habitat occupies, the higher the total avian diversity of the park will be. If a habitat that supports little diversity is succeeded by a habitat with higher diversity, there is a potential that a habitat specialist will be present in the less diverse habitat and avian diversity will become lower because there is no area to support this species. Although, a more diverse habitat will overtake that deficit by increasing area and avian diversity will rise.

Change in Habitat Area from 1943-2009

Habitat	%
Riparian Forest	100%
Mixed Evergreen Forest	100%
Coast Live Oak Forest	100%
Suburban	100%
Coast Live Oak Forest	100%
Coast Live Oak Riparian Forest	100%
Redwood Forest	100%
Sand Chaparral	100%
Coast Live Oak Riparian Forest	100%
Grassland	100%
Pond	100%
Coast Live Oak Forest	100%

This chart shows the percent of change in habitat area from 1943-2009. It can be seen that wooded habitats are increasing, and less wooded habitats are decreasing.

CONCLUSION

It is clear that there is higher avian diversity in more wooded habitats. Those wooded habitats, or dominant habitats, that are taking over habitats that are less wooded, or primary habitats, are increasing the average diversity of the park even though habitat specialist species may be lost. Dominant habitats are increasing their total area in the park through ecological succession, and this raises the average diversity in the park. Simpson's Index of Diversity can prove that wooded habitats support more diversity and this can also give us an idea to what the ranch's avian life will be like in the future as this natural process continues.

