Methods in the Field

- Surveys of lots in Fall and Spring of 2003 and Spring of 2004
- Walk slowly length of transect (~10 minutes)
- Count all birds seen or heard

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Oak, Eucalyptus, and Singing Birds

Or the effects of exotic versus native forest cover on abundance, composition, diversity, and evenness of avian species

Diana Kiyo Wakimoto, UC Santa Cruz

Field Sites

- Paired sites of eucalyptus and oak
- Four small paired sites of oak and eucalyptus were surveyed in spring 2003 and fall 2003
- Four small paired sites and three large paired sites were surveyed in spring 2004

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Purpose of this Study

- Determine the abundance and species diversity of birds in both eucalyptus and oak groves
- Use this information to form a preliminary assessment of eucalyptus for bird habitat
- Use results as an impetus for further population/banding studies

Data Analysis

- Rarefaction curves for sampling effort using EcoSim 7.0 (Gottelli and Entsminger 2001)
- ANOVA for differences in species abundance levels between habitat types
- Shannon-Weaver indices for diversity (H value)
- Evenness (equitability) indices (J value)

Why use Birds as an Indicator Species?

- Birds are part of a large, diverse taxonomic order
- Easy to count both by ear and by sight
- Birds are charismatic megafauna= people are interested in what happens to them
- Birds are cool!

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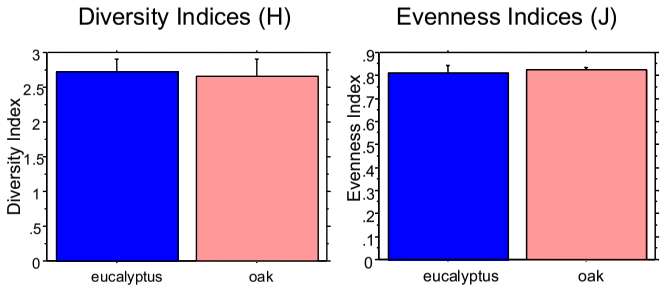
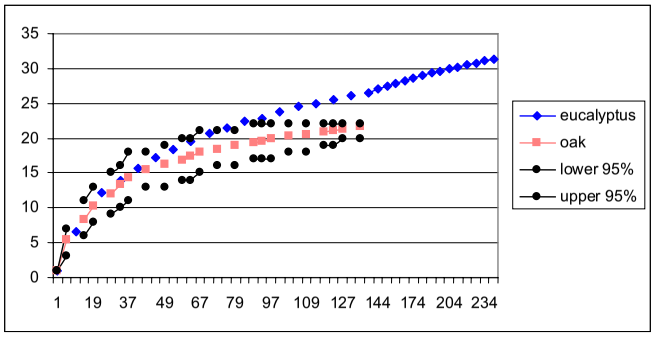


None of the overall results are statistically significant (P> 0.05)

Rarefaction Curve Spring 2004- Small lots



Sampling effort sufficient to determine composition of woodlots

Summary Results- Spring 2003

Eucalyptus

Abundance: 430

Richness: 37 species

Shannon-Weaver: 2.93

Evenness: 0.812

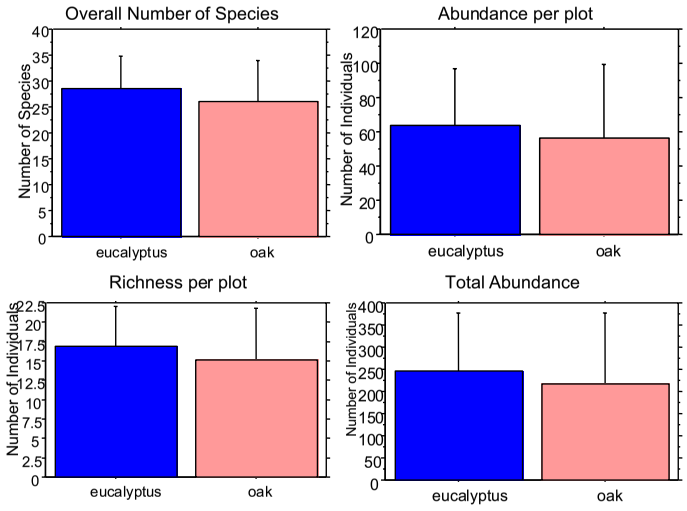
Oak

Abundance: 473

Richness: 38 species

Shannon-Weaver: 3.03

Evenness: 0.831

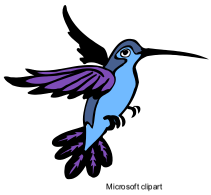


Summary Results Spring 2004 Small Tracts

Eucalyptus	Oak
Abundance- 257	Abundance- 145
Richness- 32 species	Richness- 22 species
Shannon-Weaver- 2.75	Shannon-Weaver- 2.59
Evenness- 0.793	Evenness- 0.838

Spring 2003- Results of ANOVA

Oak	Eucalyptus
Song Sparrow	
Spotted Towhee	European starling
Bewick's wren	Allen's hummingbird
Bushtit	



Microsoft clipart

Spring 2004 (small tracts) ANOVA results

Eucalyptus

Total abundance

Pacific-slope flycatcher

European starlings

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Summary Results for Fall 2003

Eucalyptus	Oak
Abundance: 125	Abundance: 101
Richness: 22 species	Richness: 18 species
Shannon-Weaver: 2.44	Shannon-Weaver: 2.36
Evenness: 0.788	Evenness: 0.816

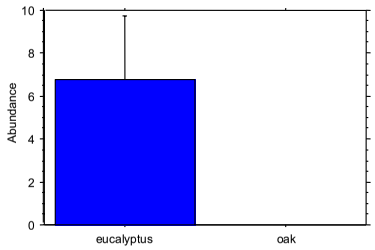
Summary Results for Large Tracts Spring 2004

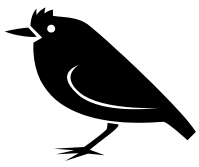
Eucalyptus	Oak
Abundance: 135	Abundance: 129
Richness: 23 species	Richness: 26 species
Shannon-Weaver: 2.73	Shannon-Weaver: 2.64
Evenness: 0.870	Evenness: 0.810

Fall 2003- ANOVA Results

Eucalyptus

European Starlings





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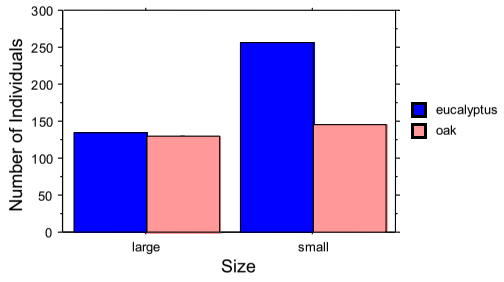
Effects of size and woodlot type on Total abundance

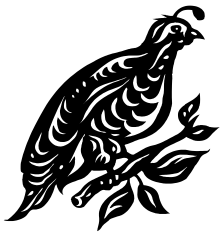


P= <0.0001

Spring 2004 (large tracts) ANOVA results

Eucalyptus

California quail



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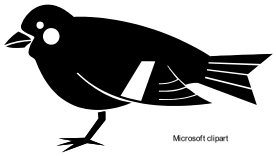

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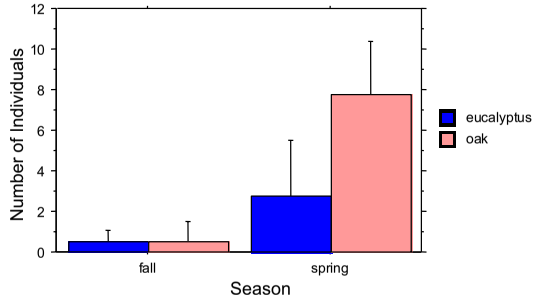
house finch

Bewick's Wren Effects of Woodlot and Season



P= 0.0273

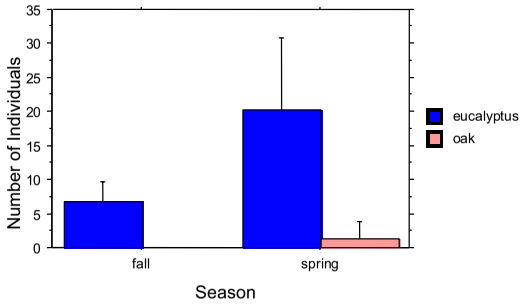
www.gos.org/meetings/ cedw-20010706.jpg

Cedar Waxwing

Bewick's Wren

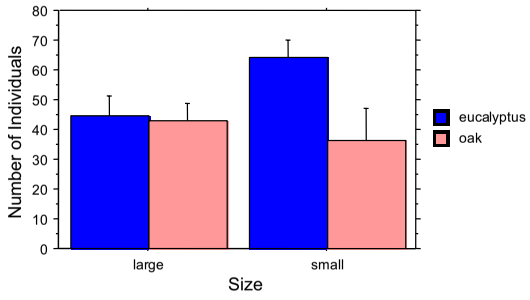
www.ktsweb.com/tweeters/ images/Bewicks_Wren.jpg

European Starling Woodlot & Season effects



P= 0.0508

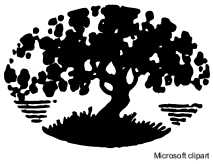
Effect of size and woodlot type on abundance per plot



P= 0.0110

Areas for further research

- Need to do banding and population studies to determine if the habitats are source/sinks
- Look at landscape-level dynamics
- Experimental studies, manipulations



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Species only found in one type of woodlot (not statistically significant but interesting)

- Found only in eucalyptus: American kestrel, sharp-shinned hawk, tree swallow, Northern mockingbird, cedar waxwing, red-winged blackbird
- Found only in oak: red-shouldered hawk, yellow-rumped warbler, ruby-crowned kinglet, golden-crowned sparrow, house finch
- Results from pooling all seasons and woodlots

Conclusions

- Eucalyptus are not dead-zones for birds
- Eucalyptus have equivalent species richness, diversity and evenness to oak
- This study is a starting point for more research on the topic of eucalyptus effects and management

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So what do we know from this observational study?

- Both oak and eucalyptus are utilized by many species of birds
- Abundance values and H values are often higher in eucalyptus, but oak has higher J values
- The two woodlot types share many of the same species, although there are some significant differences

Acknowledgements

- ESNERR for support of this research
- Kerstin Wasson for being my senior thesis advisor
- Dan Doak for help with statistics
- Susie Fork, Todd Newberry, and Monika Rohrer for help with fieldwork

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Anecdotal observations about eucalyptus tracts

Big Sur Ornithological Lab reports gumming at the base of the bill on yellow-rumped warblers

PRBO reports catching fewer birds in mist-nets set in eucalyptus than expected by chance alone

Microsoft clipart


Microsoft clipart