

Unposting the Scientific Poster: Demonstrating a New Format “Poster 2.0” for Communicating Student (and Faculty) Research Findings

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UNIVERSITY OF ALBERTA
AUGUSTANA CAMPUS

The Augustana Campus of the University of Alberta is located at ᑭᓱᓂᓴᓂᓴᓴᓴᓴ (asiniskaw sipsis - Stoney Creek) in Treaty 6 territory. This territory provided a travelling route and home to the Maskwacis Nēhiyawak, Niitsitapi, Nakoda, and Tsuut'ina Nations, the Métis, and other Indigenous peoples.

GOOD-BYE WALL OF TEXT! Read this section and get the main take-home message!

- Introduction**
- Posters are a standard presentation format both in the classroom and at conferences, including the poster session here at UBEA (even virtually)!
 - Posters have the power to be effective at communicating research findings
 - They often are INFORMATION OVERLOAD!
 - As instructors, we tell our students to use techniques such as bulleted lists, photos, figures and tables in order to have their poster be an engaging medium to translate their research.
 - REALITY: CLUTTER!!!! “Wall of Text”.
 - A new poster design format “Poster 2.0” envisioned by Michigan State University doctoral student Mike Morrison is aiming to change the way in which we create posters
 - Towards achieving goal of clearly and concisely communicating research findings.
 - In this presentation, I will highlight examples of this new poster format taken from a Tropical Ecology Field Studies Course that I co-taught in January 2020.



Sample Unposted Posters

Effect of balsa (Ochroma pyramidale) abundance on the recovery of native tree species in Osa Vieja restoration plots

Introduction
With increasing agricultural practices and the abandonment there is an increased need for effective restoration methods, especially in the Neotropics. One of the most abundant of high biodiversity. For this reason, the balsa tree has been chosen as a suitable candidate to accelerate natural forest succession due to its pioneer status.

Purpose
Analyze the effects of balsa on the recovery of the Osa Vieja restoration plots.
Provide an evidence-based recommendation to future and ongoing restoration projects.

Objectives
Explore the impact of balsa abundance on the recovery of native tree species.
Determine the abundance of each native tree species.

Hypothesis
Higher abundance of balsa in a tropical restoration plot than there will be a greater proportion of native trees, that are also because of the beneficial-ecological conditions that balsa provides.

Methods
Use of a plot to determine the abundance of native tree species.
Use of a plot to determine the abundance of native tree species.

Data Analysis
Statistical analysis of the data using a t-test.

Results
• Greater cover, species richness, Pielou's H evenness, Shannon index, and Simpson's index were non-significant between treatments and no interaction was reported.
• Upon comparison, certain species had a significant difference in the proportion of dead trees.

Discussion
• Contrary to the other studies, we found no improvement in the survival of trees in the presence of greater abundance of balsa.
• Our findings could be a result of balsa's need for weeding using such as the ropes to better understand whether.
• Spatial differences regarding moisture and soil quality could be affecting the data interpretation.

Telling it as it is: abundance of balsa is not a predictor for survival of trees, some trees just survive better than others.

Influence of balsa (Ochroma pyramidale) on invertebrate diversity in Osa Peninsula restoration plots

Carlynn Cook, Gabriel Godziuk, Makenzie Kruger, Sara Paulgaard, Jackson Sweder

Background
Balsa trees can be used as an effective tool in Neotropical forest restoration, due to being:
• Strong pioneer species
• Native
• Provides of shade, habitat and nutrients
• Osa Conservation has created four different revegetation treatments:
• High balsa (75%)
• Medium balsa (50%)
• Low balsa (25%)
• Natural regeneration

Using invertebrate diversity, we hope to provide a method for measuring the trajectory of the high, low, and natural regeneration plots in relation to old growth forest.

Methods
Soil traps traps
Soil traps traps
Soil traps traps
Soil traps traps
Soil traps traps

Results
• Statistical analysis of our descriptive variables found a significant difference in evenness (Shannon's H') and species richness (Simpson's D) between low balsa (25%) and old growth forest (Figure 1).
• Analysis of the data using an ordination plot (Figure 1) showed:
• High balsa plots are most similar to old growth forest plots.
• Low balsa plots are least similar to old growth forest plots.

Discussion
• Significance in the evenness between treatments may be the result of high thermometer counts.
• Invertebrate diversity can indicate the success of revegetation projects.
• Balsa facilitates invertebrate community structure that is more similar to old growth forest.
• Planting balsa is an effective treatment to increase succession rates of Neotropical forests.
• Our methods could be used in future studies

Invertebrate communities indicate balsa effectiveness in Neotropical forest restoration.

High (75%) Low (0%) Natural Old Growth

More Pictures & Info Here!

Traditional Poster Samples

Understory plant diversity within three forest types of the Osa Peninsula, Costa Rica

Jaynita Maru and Carly Heck
University of Alberta, Augustana Campus

1. BACKGROUND
Understory plant diversity is a key component of forest health and resilience. It provides habitat and food resources for many species, and plays a role in nutrient cycling and soil stabilization. In the Osa Peninsula, Costa Rica, three forest types are present: Old Growth, Secondary, and Restored. This study aims to compare the understory plant diversity within these three forest types.

2. METHODS
We conducted a field survey of the understory plant diversity within three forest types (Old Growth, Secondary, and Restored) in the Osa Peninsula, Costa Rica. We used a 10x10m plot and recorded the presence of all plant species within the plot.

3. RESULTS
Old Growth: 150 species
Secondary: 120 species
Restored: 100 species

4. DISCUSSION
The results of this study indicate that Old Growth forests have the highest understory plant diversity, followed by Secondary forests, and Restored forests have the lowest diversity.

5. CONCLUSION
Old Growth forests have the highest understory plant diversity, followed by Secondary forests, and Restored forests have the lowest diversity.

ACKNOWLEDGEMENTS
We thank the Osa Peninsula Biological Research Station for providing access to the study area.

REFERENCES
Maru, J., & Heck, C. (2020). Understory plant diversity within three forest types of the Osa Peninsula, Costa Rica. *Journal of Tropical Ecology*, 36(2), 123-135.

Local Abundance of Leaf-nosed Bats on the Osa Peninsula, Costa Rica

Kyrin Houlder and Jonathan Neilson

Introduction
Leaf-nosed bats are an important group of bats in Costa Rica. They are known for their echolocation and their role in insect control. This study aims to determine the local abundance of leaf-nosed bats on the Osa Peninsula, Costa Rica.

Methods for Analysis
We used a mist-netting technique to capture bats and record their species and sex. We also used a mist-netting technique to capture bats and record their species and sex.

Results
We captured 10 leaf-nosed bats during the study period. 5 were of species X and 5 were of species Y.

Discussion
The results of this study indicate that leaf-nosed bats are abundant on the Osa Peninsula, Costa Rica.



Click here to access more detailed information

Uncovering Traits in Recovering Grasslands: A Functional Assessment of Oil and Gas Well Pad Reclamation

Randi C. Lupardus, Emily Taylor, George O'Connell, Jennifer A. J. Hill, Anna C. McArthur

Motivation
Identify differences in taxonomic, trait and functional diversity (FD) metrics between well pads reclaimed under old or new criteria and adjacent reference sites.
Determine if there are trait-environment relationships including long-term biological and edaphic legacy effects across reclamation criteria.

Methods
Collected plant and soil data on dry, midgrass prairie sites (18 Reference, 12 old criteria & new criteria) in southern Alberta, Canada. Statistical analysis of the data using a t-test.

Results and Implications
Biological and edaphic filters influenced community assembly post reclamation.
New and old criteria well pads had different plant trait composition from reference.
Old well pads had high introduced species and low trait functional diversity (FD).
Old well pads may be considered in an ageded successional state.
Short, native, seric species with large seeds should be used in Osa reclaimed sites.
Seedlings with native species does not suffice to restore grasslands.
Well pad reclamation criteria
Well pad reclamation criteria
Well pad reclamation criteria
Well pad reclamation criteria
Well pad reclamation criteria

Seeding reclaimed well pads with native grassland species is not enough; functional traits of species matter!

Take a picture to save more

More Pictures & Info Here!

Can you appreciate the difference that this new poster format could potentially provide to your future students – perhaps making it more fun and engaging for your students to make and present their poster in your next class.

- References**
- <https://www.npr.org/sections/health-shots/2019/06/11/729314248/to-save-the-science-poster-researchers-want-to-kill-it-and-start-over>
 - How to create a better research poster in less time (including templates) <https://www.youtube.com/watch?v=1RwJbhkCA58>
 - Poster unposted templates can be found here: <https://osf.io/ef53g/>
 - Purrington's Advice on designing scientific posters available at <http://www.swarthmore.edu/NatSci/cpurrrin1/posteradvice.htm>

Acknowledgements

Thanks to the members of the 2015/16 Costa Rica Field Studies Course and Randi Lupardus who shared their traditional posters to compare with the 'Unposted' posters.

POSTER SESSION TODAY!



Non-Cognitive Predictors of Student Success: A Predictive Validity Comparison Between Domestic and International Students

Jacob Smith, Dr. Thea Schofield, Dr. Antonio Ibarra, Stephen Choi, Benn Mullins, Dr. Emily Williams
Michigan State University

Abstract
Given increasing interest in utilizing non-cognitive predictors in the college admissions process and rising enrollment of international students, research is warranted to compare the predictive validity of these measures across domestic and international students. Results indicate some predictive validity differences do exist, and an explanation for this differential validity, as well as a consideration of these relationships, are tested.

Background
Though cognitive predictors of student success (e.g., ACT, SAT) are well established, there is increasing interest in non-cognitive predictors of student success (e.g., situational judgment, adaptability), and these have been found to predict student performance (Chavall et al., 2014; Emery et al., 2016). Even in 2016 to 2017 academic year, the number of international students studying in U.S. increased yearly. In 2014, 3.2% of students international with new 1 million enrolled (Institute of International Education, 2014). Previous work by Thea and colleagues (2016) found some differences in non-cognitive measures across Chinese and Caucasian American students, along with differential validity for a Pearson measure non-cognitive measure. The current research is an extension of Thea et al., 2016, exploring differential validity in two large samples of students, testing an explanation for these differences in validity, and testing a possible mediator of these relationships between non-cognitive predictors and GPA.

Research Question & Hypotheses
Research Question 1: Will non-cognitive measures display differential validity between domestic and international students?
H1: Non-cognitive measures may be functioning as a proxy for English ability. All: Differential validity will be associated (or by English proficiency).
H2: Non-cognitive predictors may be more important for individuals from more culturally distant countries, as adjustment may be more difficult necessitating greater non-cognitive abilities.
H3: Non-cognitive measures will exhibit greater validity for international students from more culturally distant countries.

Method
Sample 1: 1762 students at large, Midwestern university
- 34.2% (605) female
- 31.2% (550) international (5.7% Chinese)
Sample 2: 1687 students at large, Midwestern university
- 32.8% (555) female
- 13.7% international (11.4% Chinese)

Method (cont.)
Measures:
Situational Judgment Test – Standardized measure of an individual's responses, attitudes, and behavioral tendencies relevant to college student experiences and performance.
- Scores of seven scales: Reasoning, Leadership, Social Responsibility, Adaptability, Performance, Confidence, Learning, Academic Ethics.
Situational Judgment Test (SJT) – Provides typical situations college students would encounter in university, allowed to answer individuals ability to best appropriately.
GPA – 1st semester cumulative GPA on a 4.0 scale.
TOEFL – Standardized test to measure "ability to use and understand English in an academic setting."
Statistical Analysis: Difference variable representing international students.
Sample 1 – Based on measures only, Sample 2 – Based on measures and Cultural Distance. The latter distance between individual's countries, based on use of 10,000 cultural distance (Hofstede et al., 2010).
Statistical Analysis: 11 two-way ANOVA comparing predictors separately between 1, 2, and lower country on variety of aspects (e.g., validity and bias), Cohen's d (Cohen, 2014).

Results:
Correlations between non-cognitive predictor scores and 1st semester GPA (Table 1) in a bivariate relationship for international students as well as right measures. Regression results (Table 2) indicate consistent differential validity for international students for SJT, Confidence, Learning, Social Responsibility, and Performance. Including TOEFL scores in regression, available for a subset of 1687 individuals from Sample 1, did not substantially alter standardized regression weights (β = -.012 to .010 Results are shown).
Multilevel regression was utilized to test if cultural distance on 10,000 scale mediated non-cognitive predictor validity of 11 international students from Sample 1. Results indicate cultural distance did not significantly mediate validity (Results are shown).
Missing subset of 73 international students from Sample 1, did not find that the performance mediated validity of non-cognitive predictors (p > .05). Results are shown.
Correlations between 10,000 cultural distance and personal culture distance.

Measure	Sample 1	Sample 2	Domestic	International
GPA	0.34	0.38	0.36	0.39
Reasoning	0.18	0.22	0.19	0.21
Leadership	0.16	0.20	0.17	0.19
Social Responsibility	0.15	0.19	0.16	0.18
Adaptability	0.14	0.18	0.15	0.17
Performance	0.13	0.17	0.14	0.16
Confidence	0.12	0.16	0.13	0.15
Learning	0.11	0.15	0.12	0.14
Academic Ethics	0.10	0.14	0.11	0.13
TOEFL	0.10	0.14	0.10	0.14

β Bold numbers indicate significant relationships (p < .05)

Discussion:
This differential validity for the non-cognitive predictors, specifically the SJT, Confidence, Learning, and Performance, for international students does not seem to be the way for English language ability, but to mediate validity of non-cognitive predictors.

Applications:
The results on predicting international students' success may be an area of research between cultural distance via 10,000 distance measure relative to more individuals. The results indicate differential validity for English differential validity for international students.

Conclusions:
The results on predicting international students' success may be an area of research between cultural distance via 10,000 distance measure relative to more individuals. The results indicate differential validity for English differential validity for international students.

Method (cont.)
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Poster '2.0' (Mike Morrison)

The image shows a man in a dark suit and white shirt pointing towards a large poster. The poster is divided into two main sections: a white sidebar on the left and a large yellow main area on the right. The white sidebar contains text under the heading 'Poster 2.0' and is organized into sections: 'Intro', 'Methods', and 'Results'. The yellow main area features a purple box with the word 'THEORY' and large, bold text stating 'This poster layout could communicate findings more quickly.' At the bottom of the yellow area is a QR code and the text 'Watch the Cartoon (includes templates)'. The man's name, 'Mike', is written in the top right corner of the poster.

Poster 2.0

Intro

- 10,000+ posters presented every year.
- All use the same 'wall of text' template.
- Increasing the knowledge transfer speed of the common template could speed insight & discovery across science.

Methods

- Negative space & large main takeaway helps people quickly find signal in the noise.
- A plain-english translation of your main finding is interpreted faster than jargon.
- Introvert bar: Tight summary provides 1-4min of additional detail (away from presenter's personal space).
- QR code links to full paper.
- You can add an optional 'cheat sheet' right sidebar for extra figures and tables.

Results

- Early feedback from people who've used it is extremely positive, including 6 people who won poster awards.
- Others have reported more & deeper attendee engagement (better questions).
- We're planning a formal validation study.
- You probably read this summary in less than 2 minutes.
- Now you have time left to go read other posters (yo!).

THEORY

This poster layout could communicate findings more quickly.

Watch the Cartoon
(includes templates)

Mike

Title:

Subtitle



PRESENTER:

Leeroy Jenkins

BACKGROUND: Who cares? Explain why your study matters in the fastest, most brutal way possible (feel free to add graphics!).

METHODS

1. Collected [what] from [population]
2. Tested it with X process.
3. Illustrate your methods if you can.
4. **Try a flowchart!**

RESULTS

- Graph/table with **essential results only**.
- All the other correlations in the ammo bar.

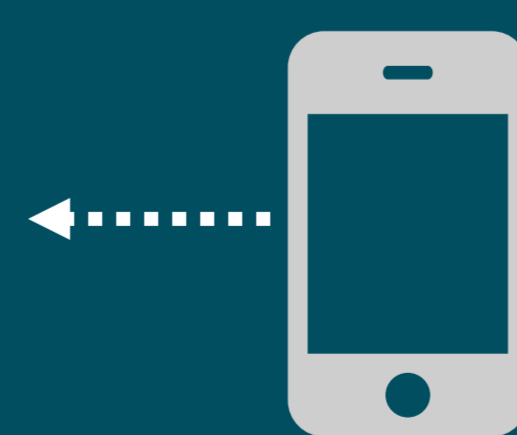


Main finding goes here, translated into plain English. Emphasize the important words.

AMMO BAR

Delete this and replace it with your...

- Extra Graphs
- Extra Correlation tables
- Extra Figures
- Extra nuance that you're worried about leaving out.
- **Keep it messy!** This section is just for you.

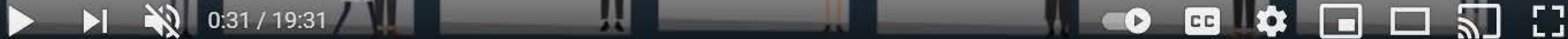


Take a picture to download the full paper

Leeroy Jenkins, author2, author3, author4, author5, author6, author7, author42



POSTER SESSION TODAY!



What does "work meaningfulness" mean?

Work meaningfulness is...
Experiencing a sense of **connectedness** between parts of your work and your deepest values and goals.



Increasing Situational Judgement Test Prediction Using Item Level Variance

Item-level analysis improved the predictive accuracy of an existing Situational Judgement Test.



The Mediating Role of Attention in the Emotion-Performance Relationship

When you're in a **bad mood** at work, it **pulls your attention** away from your task, which **lowers your performance**.



Poster 2.0 Costa Rica Field Studies Course

Effect of balsa (*Ochroma pyramidale*) abundance on the recovery of native tree species in Osa Verde restoration plots

Kayleigh Bartley, Megan Berg, Novie Bordey, Gillian Larsen, Meghan Lynch

Introduction

With growing agricultural practice and site abandonment there is an increased need for effective restoration methods, especially in the Neotropics due to their possession of high biodiversity^{1,6}. For this reason, the balsa tree has been chosen as a possible candidate to accelerate natural forest succession due to its pioneer status.⁴

Purpose

- Analyze the effects of balsa on the recovery of the Osa Conservation restoration plots
- Provide an evidence-based recommendation to future and ongoing restoration projects

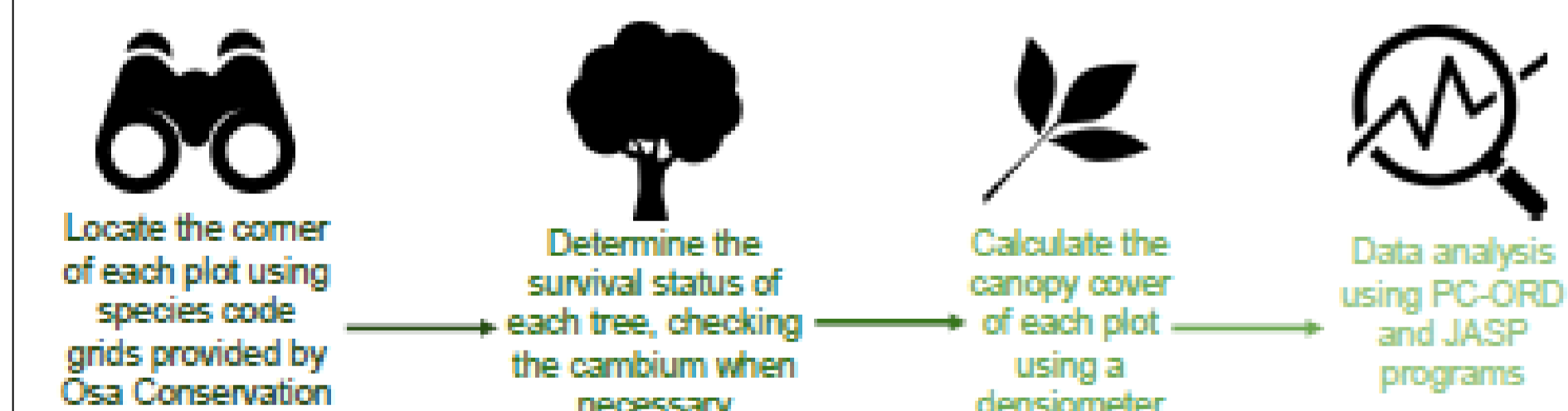
Objectives



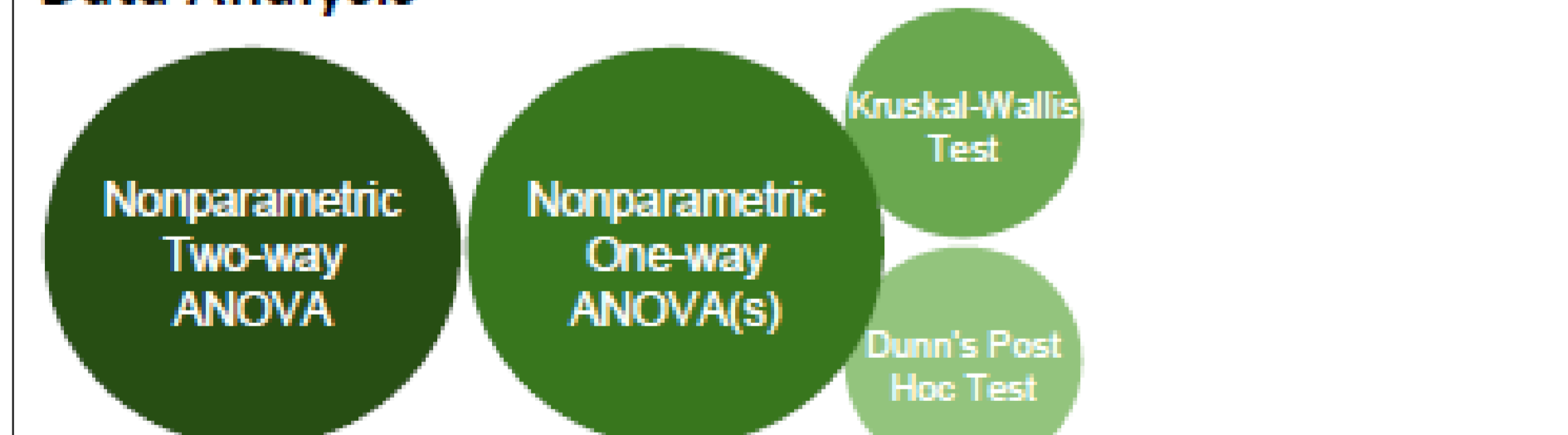
Hypothesis

If higher amounts of balsa are planted in a tropical restoration plot then there will be a greater proportion of native trees that are alive because of the beneficial ecological conditions that balsa provides.

Methods



Data Analysis



Results

- Canopy cover, species richness, Pielou's J evenness, Shannon Index, and Simpson's Index were non-significant between treatment types
- The proportion alive for each species was non-significant between treatments and no interaction was reported
- Upon comparison, certain species had a significant difference in the proportion of alive trees

Discussion

- Contrary to the other studies, we found no improvement in the survival of trees in the presence of greater abundance of balsa^{2,3,5}
- Our finding could be a result of balsa's need for weeding during early life stages to foster better establishment³
- Spatial differences regarding moisture and soil quality could be affecting the plots (2020 conversation with Hilary; unreferenced)



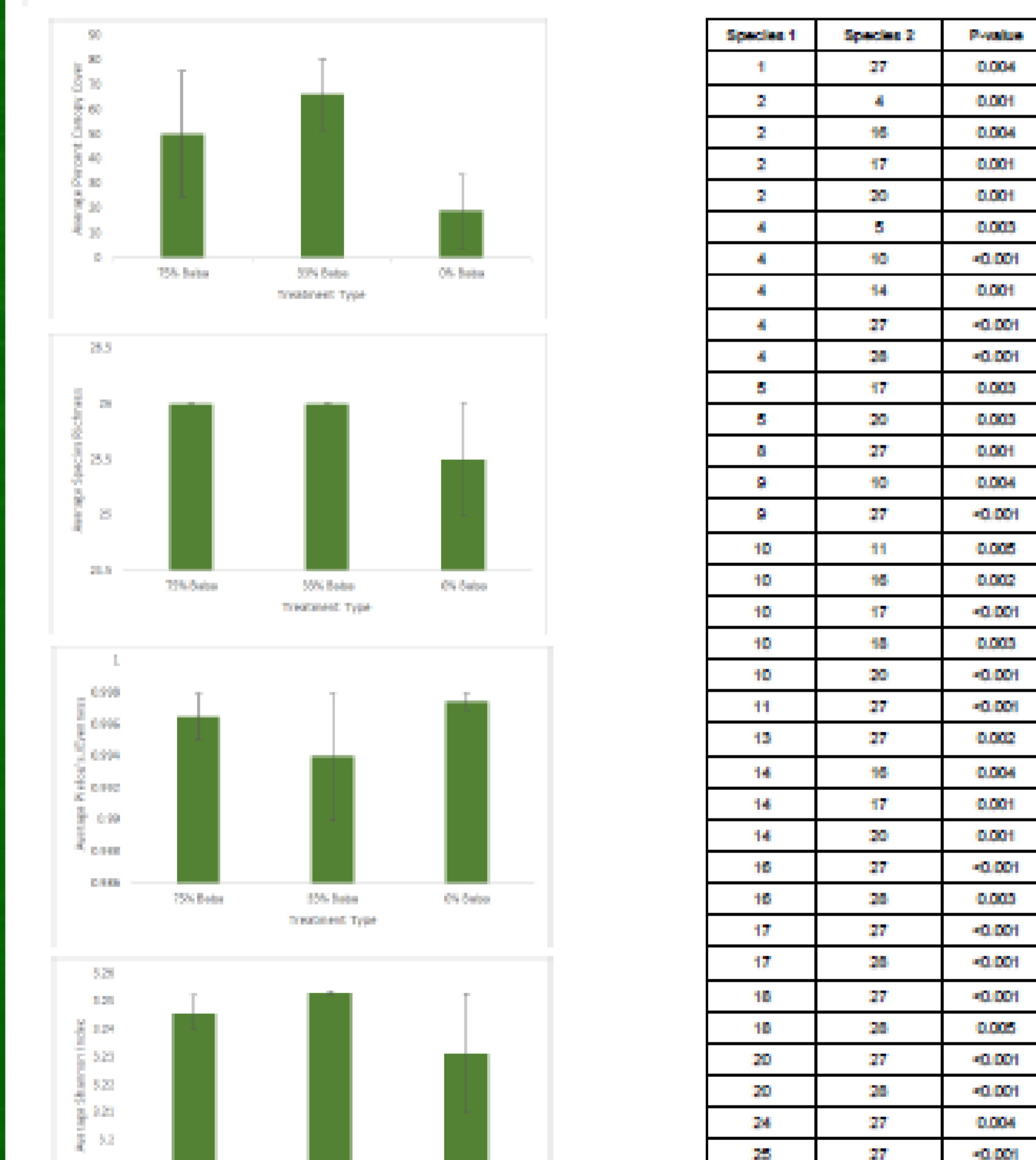
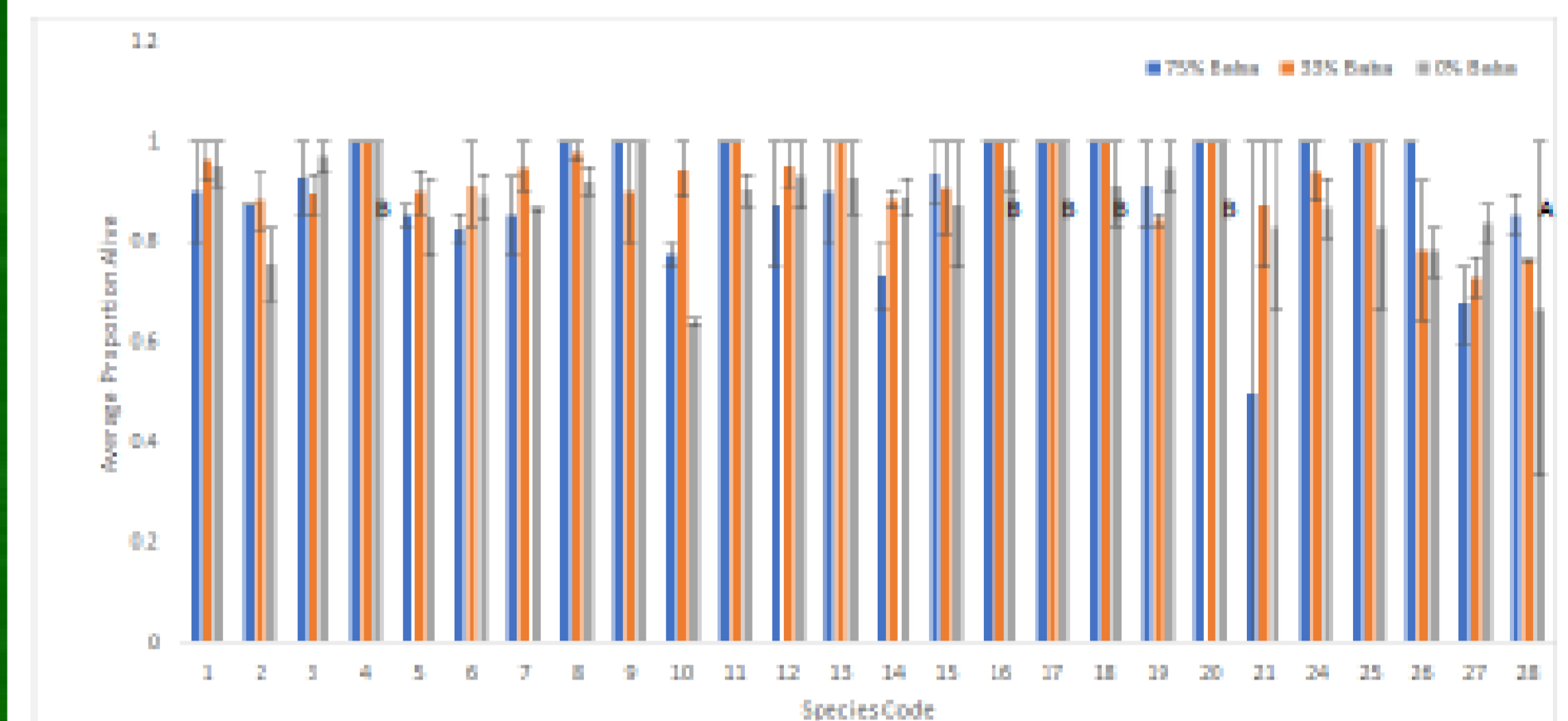
Telling it as it is: abundance of balsa is not a predictor for survival of trees, some trees just survive better than others.

Future Studies

- Inclusion of more replicates to strengthen data
- Explore spatial differences, soil quality and moisture on tropical restoration
- Focus on only one species to investigate the effectiveness of balsa

Limitations

- Row X in plot L8 was omitted due to difficulty of locating species
- Small sample size
- Different soil conditions
- No confirmation that missing trees are dead
- Omission of replanted trees



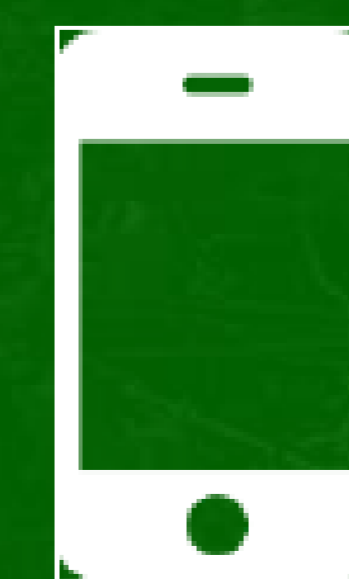
1	2	3	4
<i>Alseodermis excelsa</i>	<i>Coccoloba</i>	<i>Guadua</i>	<i>Agave</i>
<i>Alseodermis excelsa</i>	<i>Alseodermis excelsa</i>	<i>Alseodermis excelsa</i>	<i>Alseodermis excelsa</i>
<i>Alseodermis excelsa</i>	<i>Alseodermis excelsa</i>	<i>Alseodermis excelsa</i>	<i>Alseodermis excelsa</i>
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Acknowledgements

We would like to extend our thanks to Anne McIntosh, Pam Stacey, Elène Haave-Audet, our fellow classmates, Augustana's LAB staff and biology lab technicians. As well Hilary Brumberg, Maria José Mata Quirós and the rest of the staff at Osa Conservation. Without their help our project would not have been possible.

References

- Berayas JM, Martins A, Nicolau JM, Schulz JI. 2007. Abandonment of agricultural land: an overview of drivers and consequences. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources*. 2(17):1-12.
- Canales-Lopez A, Rade-Lopez D, Siegmund-Schulze M, Moreira-Munoz G, Vargas-Hernandez J, Wehenkel C. 2019. Growth and yield models for balsa wood plantations in the coastal lowlands of Ecuador. *Forests*. 10(733):1-16.
- Doutterlungre D, Levy-Tacher S, Gollcher DJ, Defobeylla FR. 2010. Applying indigenous knowledge to the restoration of degraded rain forest clearings dominated by bracken ferns. *Restoration Ecology*. 18(3):322-329. doi: 10.1111/j.1526-1008.2009.00459.x.
- Doutterlungre D, Thomas E, Levy-Tacher S. 2013. Fast-growing pioneer tree sands as a rapid and effective strategy for bracken elimination in the Neotropics. *Journal of Applied Ecology*. 50(5):1257-1265.
- Hall JS, Ashton MS. 2016. Guide to early growth and survival in plantations of 64 tree species native to Panama and the Neotropics. Balboa (PA): Smithsonian Tropical Research Institute.
- Kitcher G. 2017. The New Neotropical Companion. Princeton (NJ): Princeton University Press.



Project Website



Poster 2.0 Costa Rica Field Studies Course

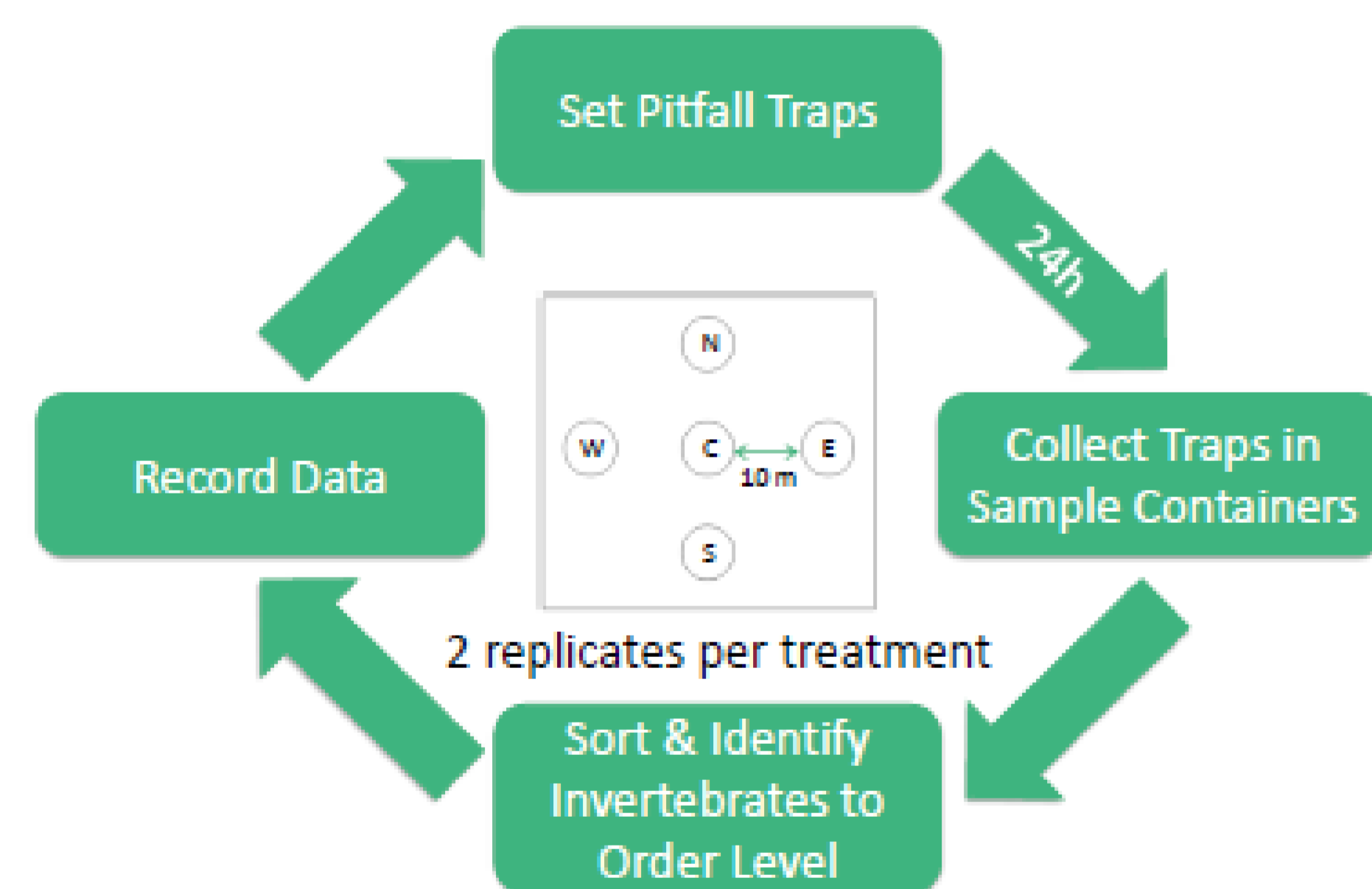
Influence of balsa (*Ochroma pyramidale*) on invertebrate diversity in Osa Peninsula restoration plots

Carolyn Cook, Gabriel Godziuk, Makenzee Kruger, Sara Paulgaard, Jackson Sweder.

Background

- Balsa trees can be used as an effective tool in Neotropical forest restoration, due to being:
 - Strong pioneer species
 - Native
 - Providers of shade, habitat and nutrients
- Osa Conservation has created four different rewilding restoration treatments:
 - High balsa (75%)
 - Medium balsa (33%)
 - Low balsa (0%)
 - Natural regeneration
- Using invertebrate diversity, we hope to provide a method for measuring the trajectory of the high, low, and natural regeneration plots in relation to old growth forest.

Methods



Results

- Statistical analysis of our descriptive variables found a significant difference in evenness (Pielou's J, Tukey HSD) between low balsa treatment and the old growth forest (Figure 2).
- Analysis of the data using an ordination plot (Figure 1) showed:
 - High balsa plots are most similar to old growth forest plots
 - Low balsa plots are least similar to old growth forest plots

Discussion

- Significance in the evenness between treatments may be the result of high Hymenoptera counts
 - Invertebrate diversity can indicate the success of restoration projects
- Balsa facilitates invertebrate community structure that is more similar to old growth forest
 - Planting balsa is an effective treatment to increase succession rates of Neotropical forests
- Our methods could be used in future studies



Invertebrate communities indicate balsa effectiveness in Neotropical forest restoration.



High (75%)

Low (0%)

Natural

Old Growth



More Pictures & Info Here!

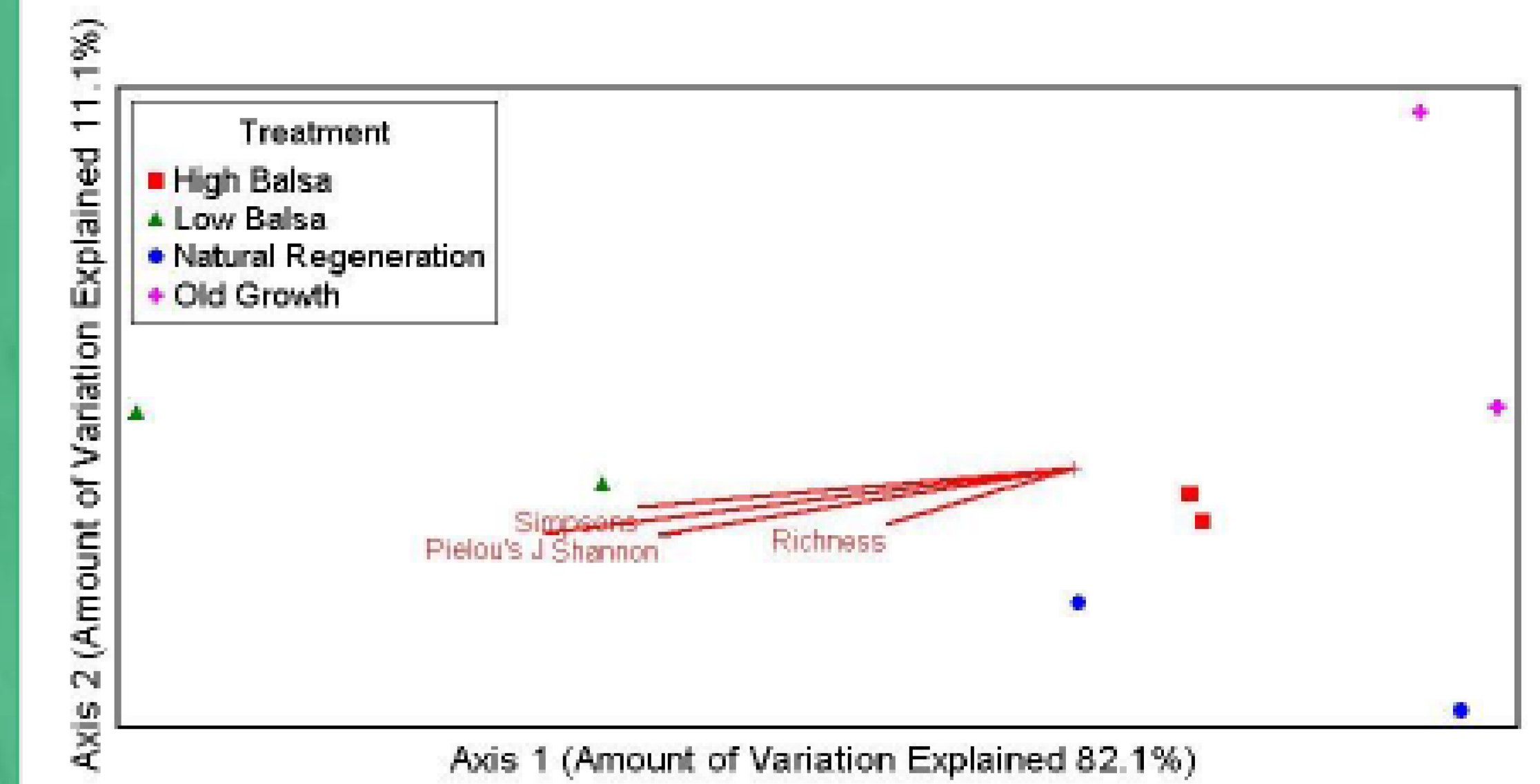


Figure 1. Invertebrate diversity of various restoration plots located at Osa Biological Station (Piro), Costa Rica. Samples from pitfall traps were collected following a 24 hour interval over a seven day period in January 2020. Identification of samples were done to order level and were used to determine diversity similarity between balsa treatments. Ordination plot data excluded orders with less than two invertebrates. Simpson's refers to the Simpson's Diversity Index, Pielou's J refers to Pielou's evenness index, Shannon refers to Shannon's Diversity Index and richness refers to the number of orders.

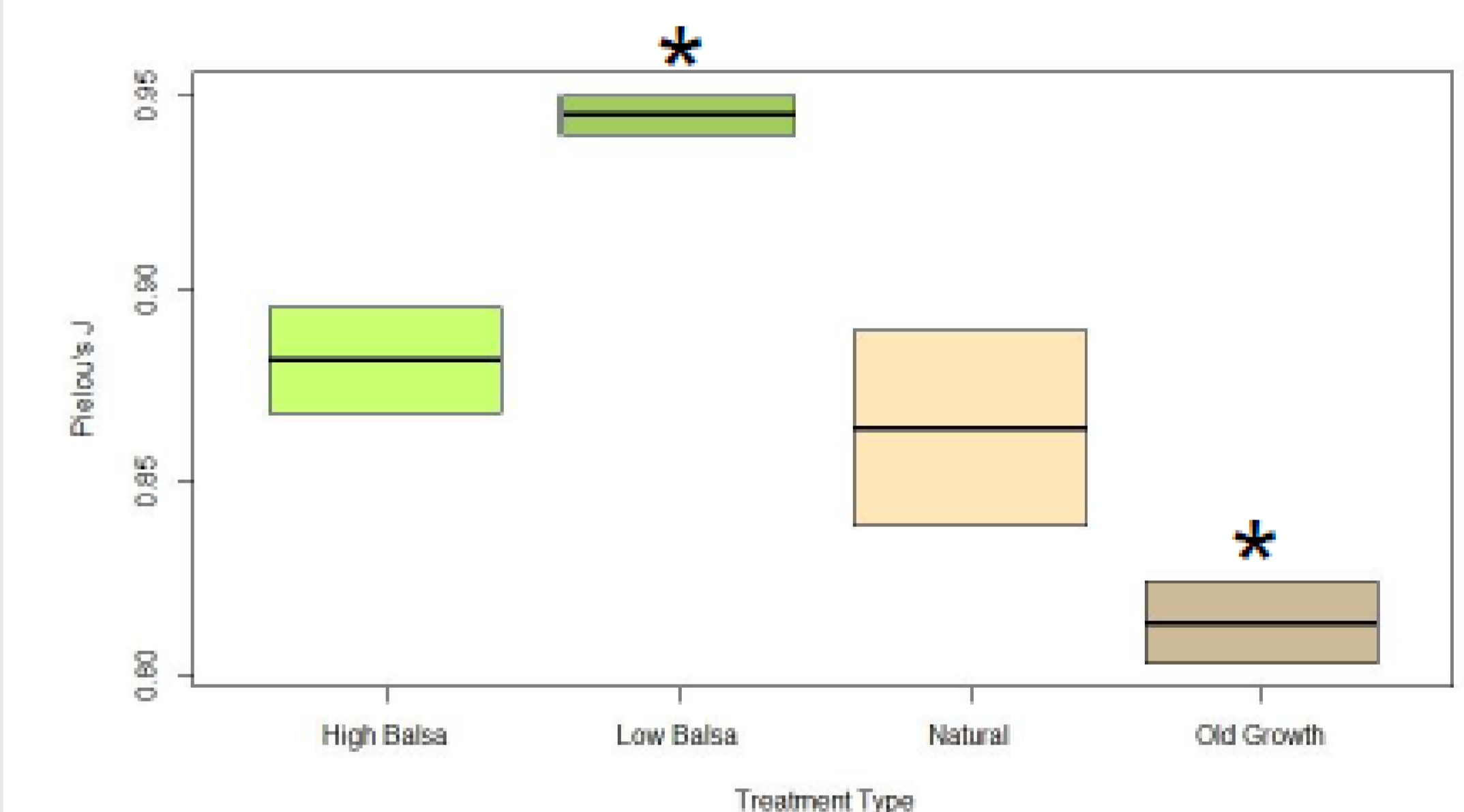


Figure 2. Measure of evenness between high, low, natural, and old growth plots using Pielou's J evenness index at Osa Biological Station (Piro), Costa Rica. Asterisks refer to significant differences between balsa treatments ($p < 0.05$). Pitfall trap samples were collected following a 24 hour interval over a seven day period in January 2020. Data excluded orders with less than two invertebrates. Identification of samples were done to order level and were used to determine diversity similarity between balsa treatments.

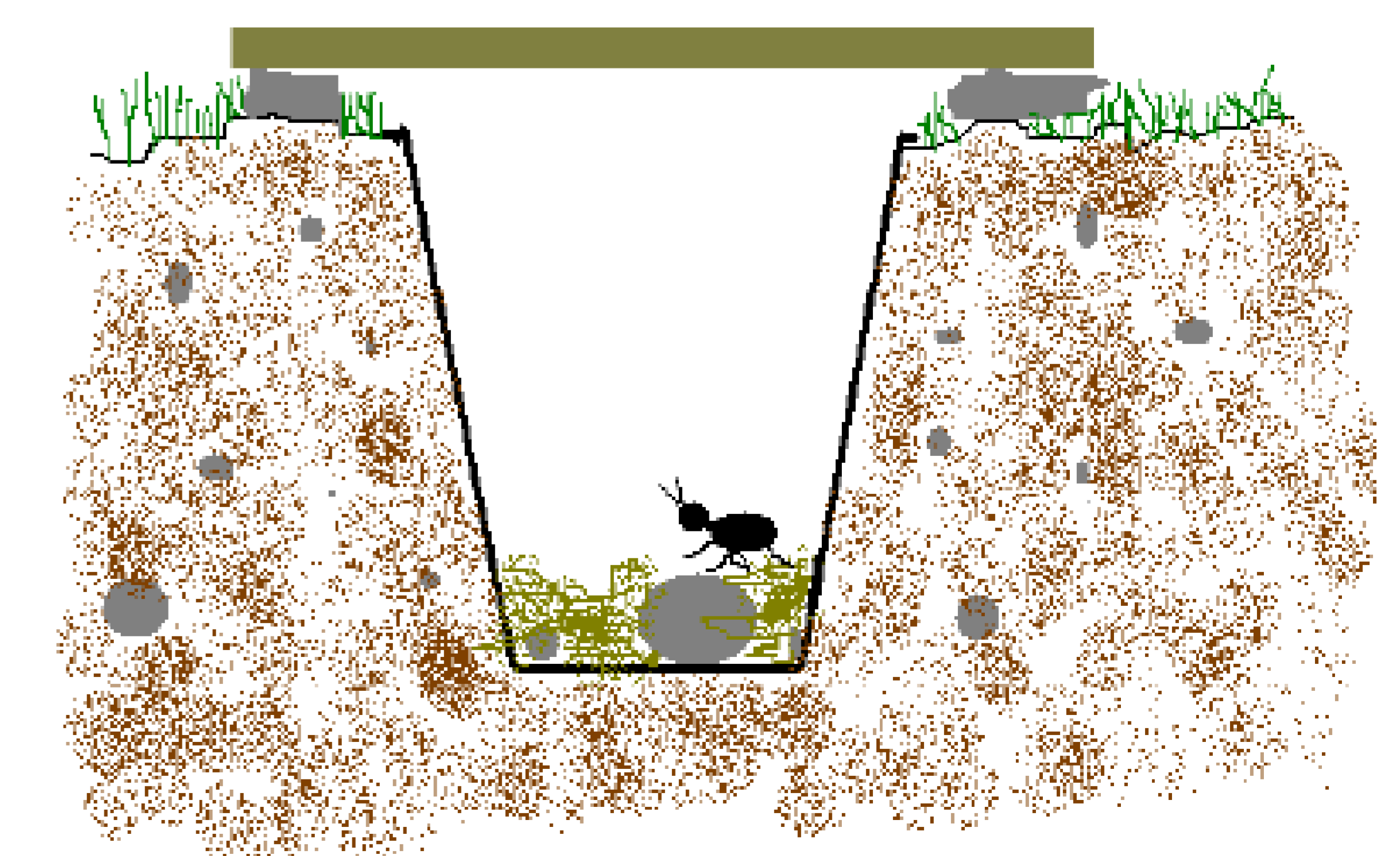


Figure 3. Example of a pitfall trap used to collect samples. A hole was dug large enough so the rim of a 8cm wide plastic cup was flush or slightly below the soil surface. Soil was infilled around the cup and sticks were pushed into the soil to hold a plastic lid 1inch over the cup. The cup was filled with approximately 100 mL of 70% alcohol. A plastic lid was placed over the cup and leaf litter was scattered over to camouflage the trap. The samples and traps were removed after 24 hours. Retrieved from <https://www.bnhs.co.uk/youngnats/to-do/build-a-pitfall-trap/>.

Poster 2.0: Society for Range Management Conference (Format Required)

Uncovering Traits in Recovering Grasslands: A Functional Assessment of Oil and Gas Well Pad Reclamation

Randi C Lupardus^{1,2*}, Ermias T Azeria³, Kierann Santala⁴, Isabelle Aubin⁴ and Anne CS McIntosh¹
¹University of Alberta, Camrose, Canada ²Alberta Environment and Parks, Edmonton, Canada ³Alberta Biodiversity Monitoring Institute, Edmonton, Canada ⁴Great Lakes Forestry Centre, Sault Ste Marie, Canada

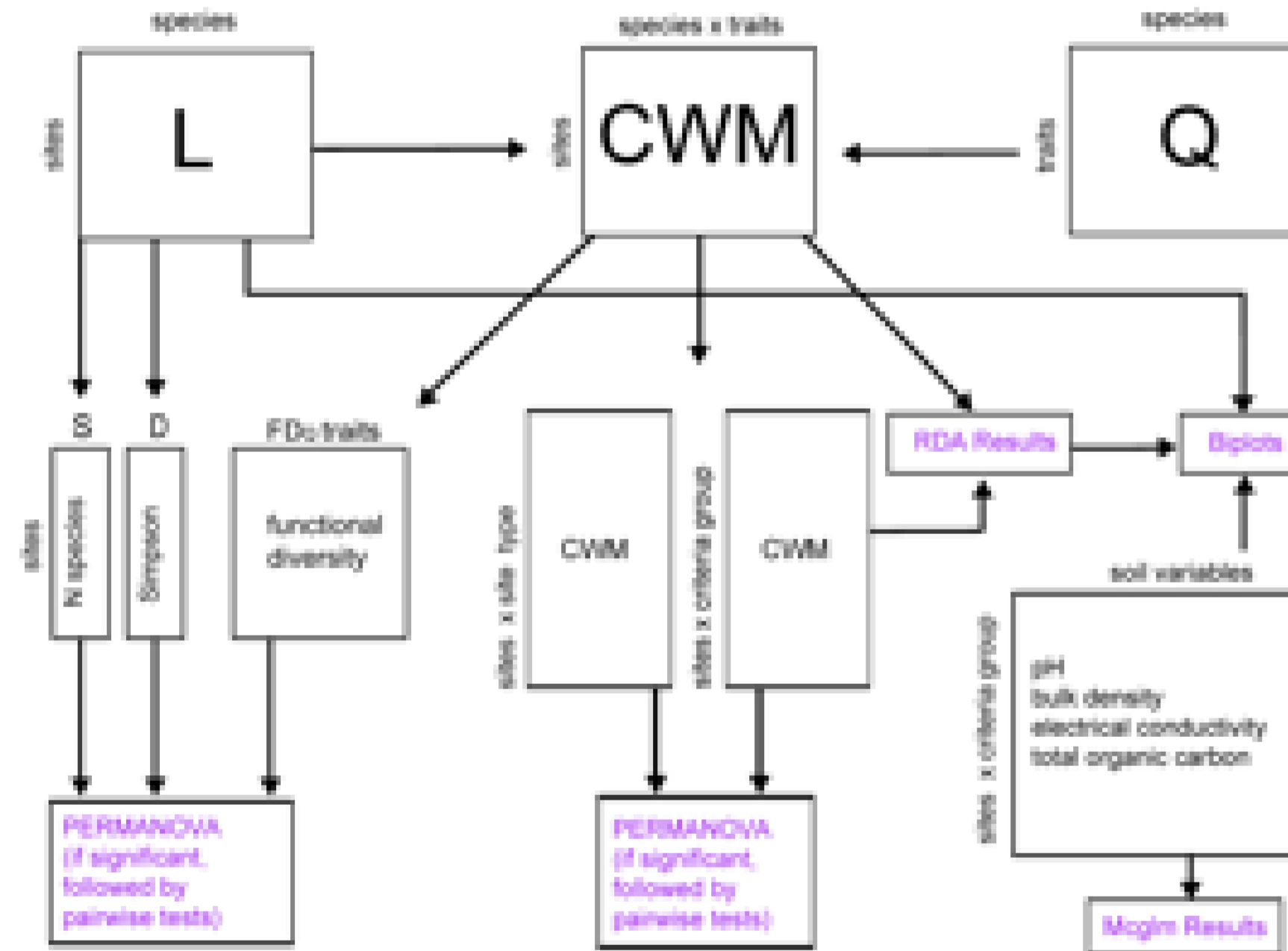
We acknowledge that this project would not have been possible without information provided by the Ecological Recovery Monitoring program initiated by Arnold Jensen and supported by Dan Parr.

Motivation

- Identify differences in taxonomic, trait and functional diversity (FD_Q) metrics between well pads reclaimed under old or new criteria and adjacent reference sites
- Determine if there are trait-environment relationships indicating long-term biological and edaphic legacy effects across reclamation criteria

Methods

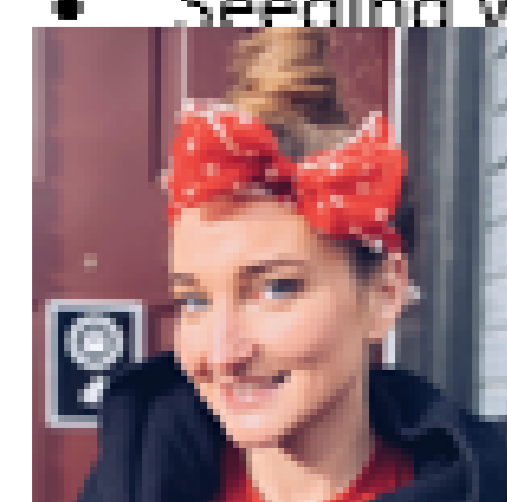
Collected plant and soil data on dry, mixedgrass prairie sites (18 Reference, 12 old criteria, 6 new criteria) in southern Alberta, Canada. Statistical



Results and Implications

- Biological and edaphic filters influenced community assembly post reclamation
- New and old criteria well pads had different plant trait composition from reference
- Old well pads had high introduced species and low trait functional diversity (FD_Q)
- Old well pads may be considered in an arrested successional state
- Short, native, xeric species with large seeds should be sown on future reclaimed sites
- Seeding with native species does not suffice -

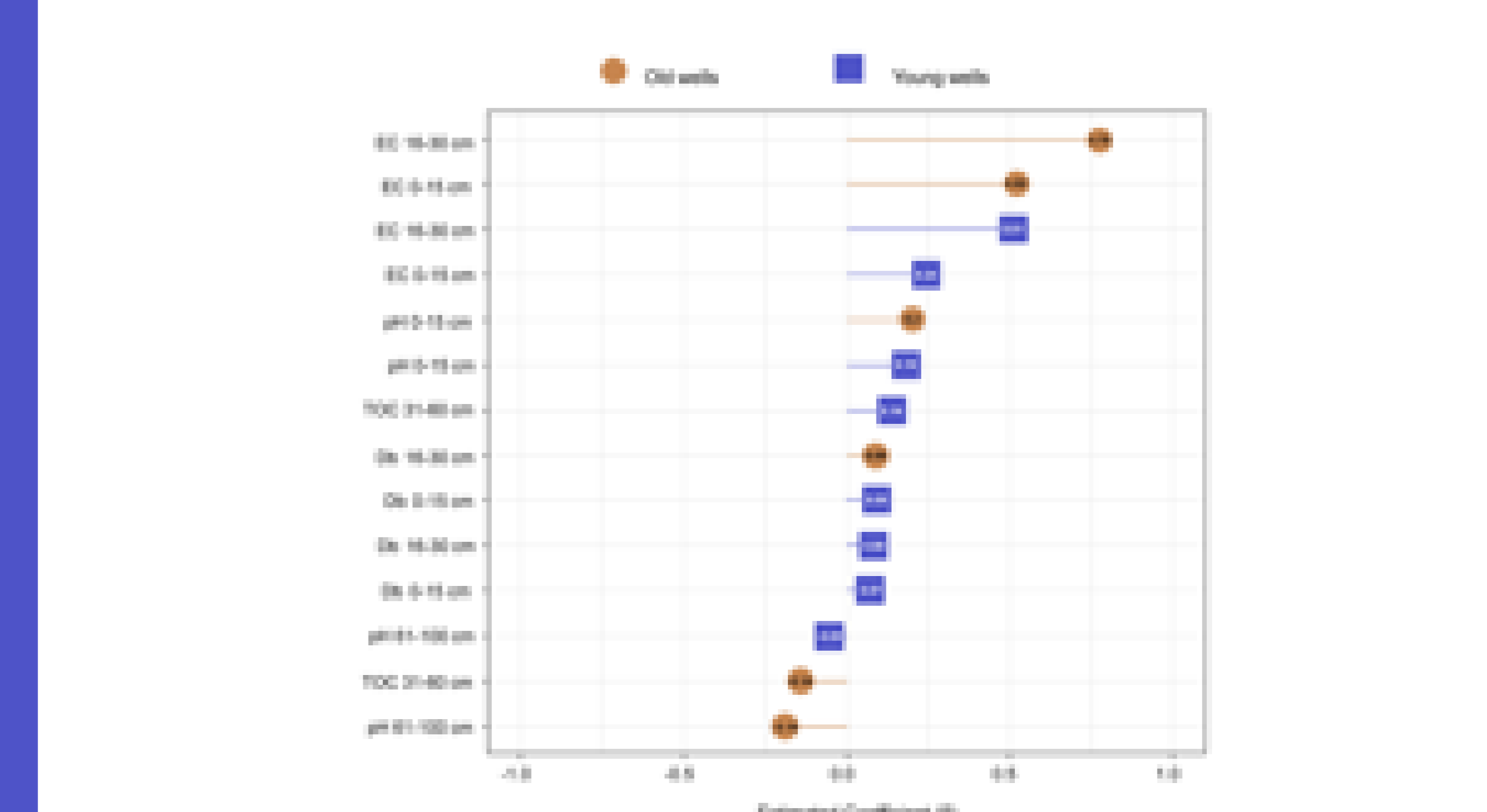
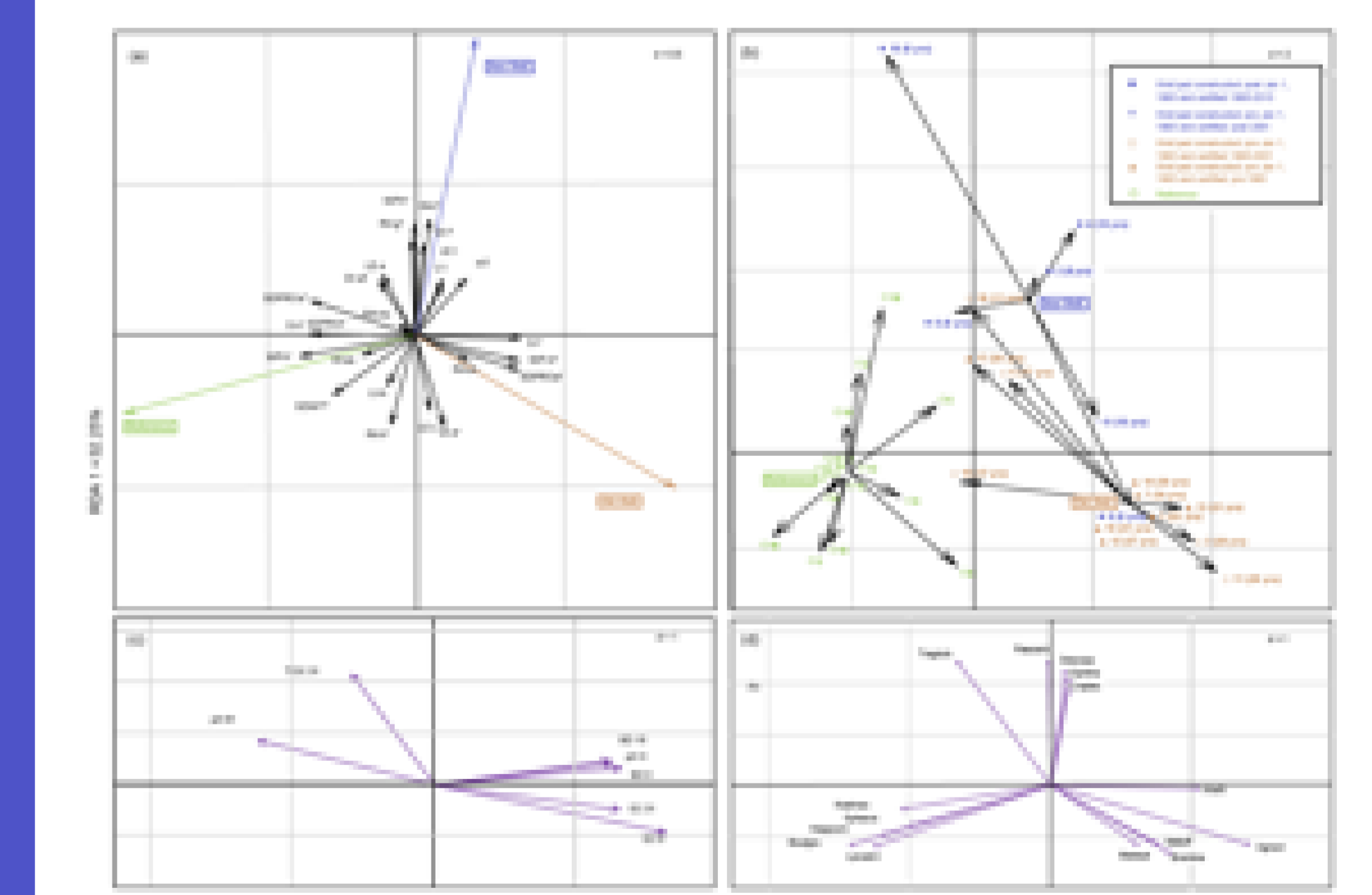
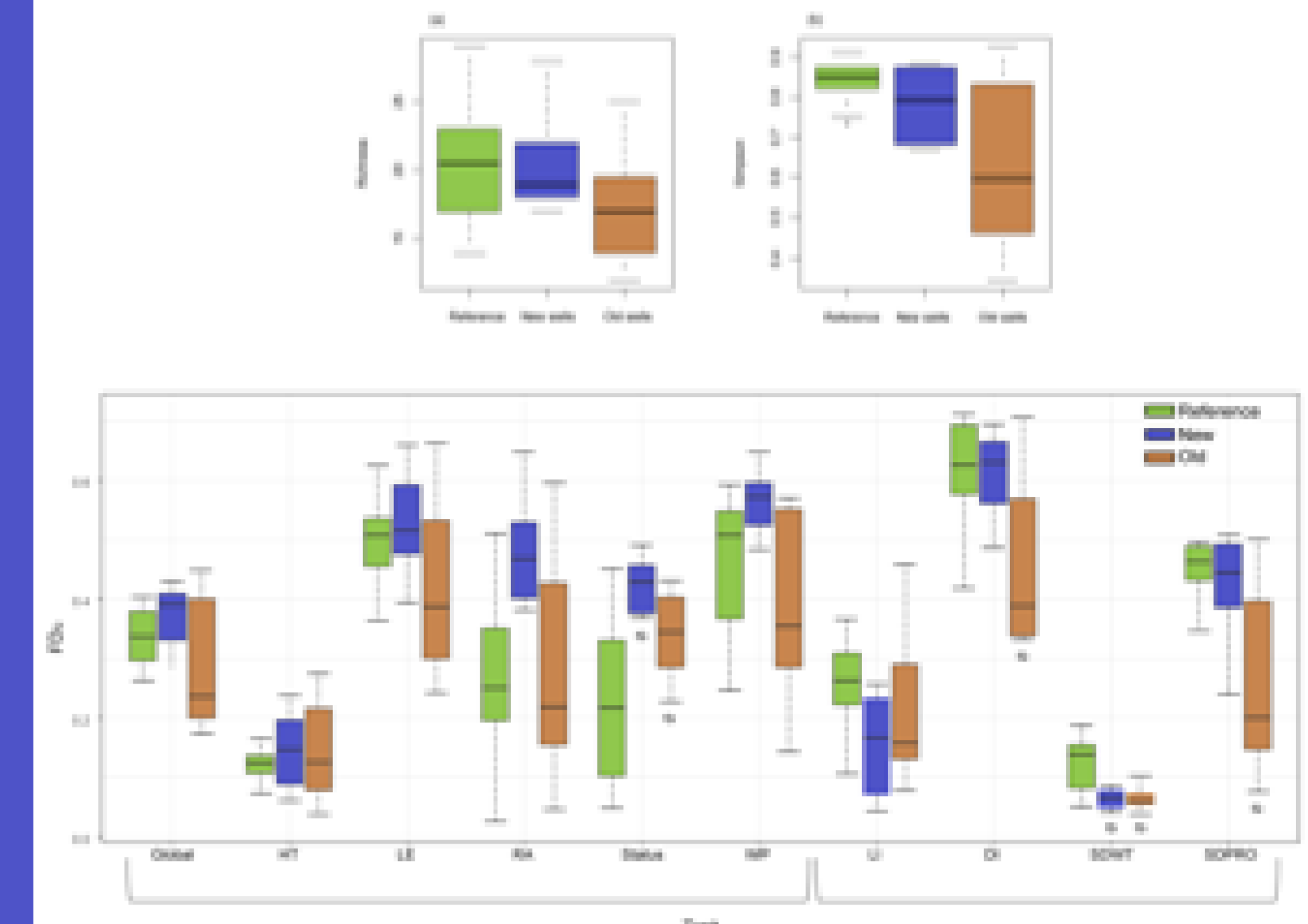
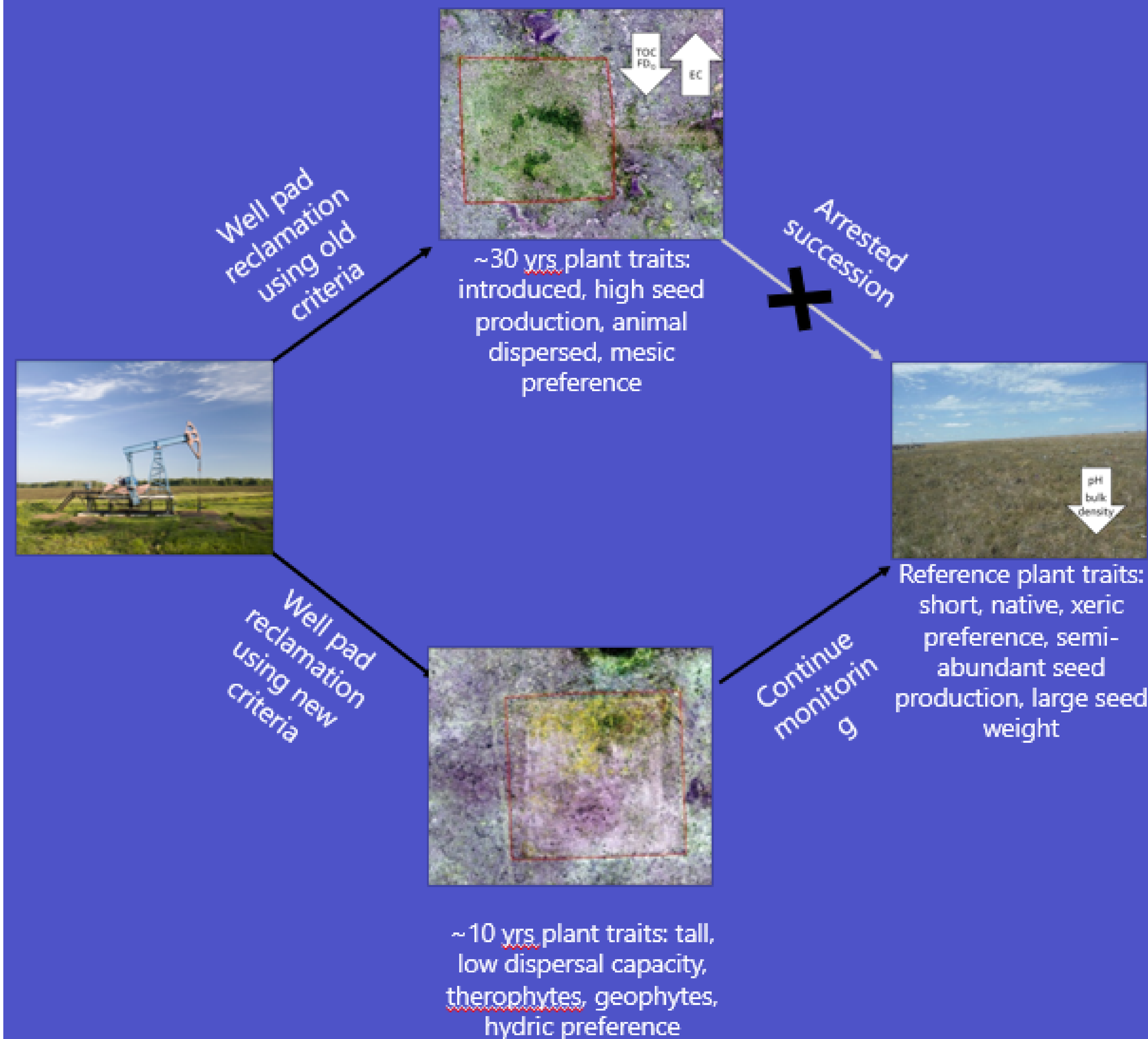
of these native species matter too
 Lupardus@ualberta.ca



Seeding reclaimed well pads with native grassland species is not enough; functional traits of species matter!



Take a picture to learn more





Afternoon Urine Osmolality is Equivalent to 24-h in Healthy 3-13 y Children

Hyunghye Suh¹, Lynette G. Summers¹, Adam D. Seal¹, Andy Mastroianni¹, Jeanne H. Bollen¹, Erica T. Ferrer², Shawn A. Kossuth¹

¹Arizona State University, Tempe, AZ; ²University of Arizona, Tucson, AZ



Afternoon (4-8 pm) spot urine osmolality is equivalent to 24-h value for hydration assessment in children

METHODS

1. 111 940 (age 3-13 y; female 49%), 98% (173,642) in 1
2. Equivalent body composition (BMI) at each time intervals to 24-h urine sample
3. Determination of the equivalence: the mean difference and the confidence interval between the spot and 24-h urine osmolality from the hour of 40 morning
4. Receiver operating characteristic (ROC) analysis to assess the overall diagnostic utility of spot urine osmolality from morning to afternoon (mean difference 1000 mOsm/kg morning)



Figure 1. Spot and 24-h urine osmolality

RESULTS

- 1. Lower afternoon (10:00-11:00) spot urine osmolality was equivalent to the 24-h urine osmolality in children
- 2. The overall diagnostic utility of spot urine osmolality increased in the afternoon (10:00-11:00) to degree elevated urine osmolality (1000 mOsm/kg) from the 24-h urine osmolality

CONCLUSION

- 1. These data suggest that in free-living healthy children, 24-h urine osmolality can be replaced with a spot afternoon spot urine sample.



More content is available for you. [View full abstract](#)

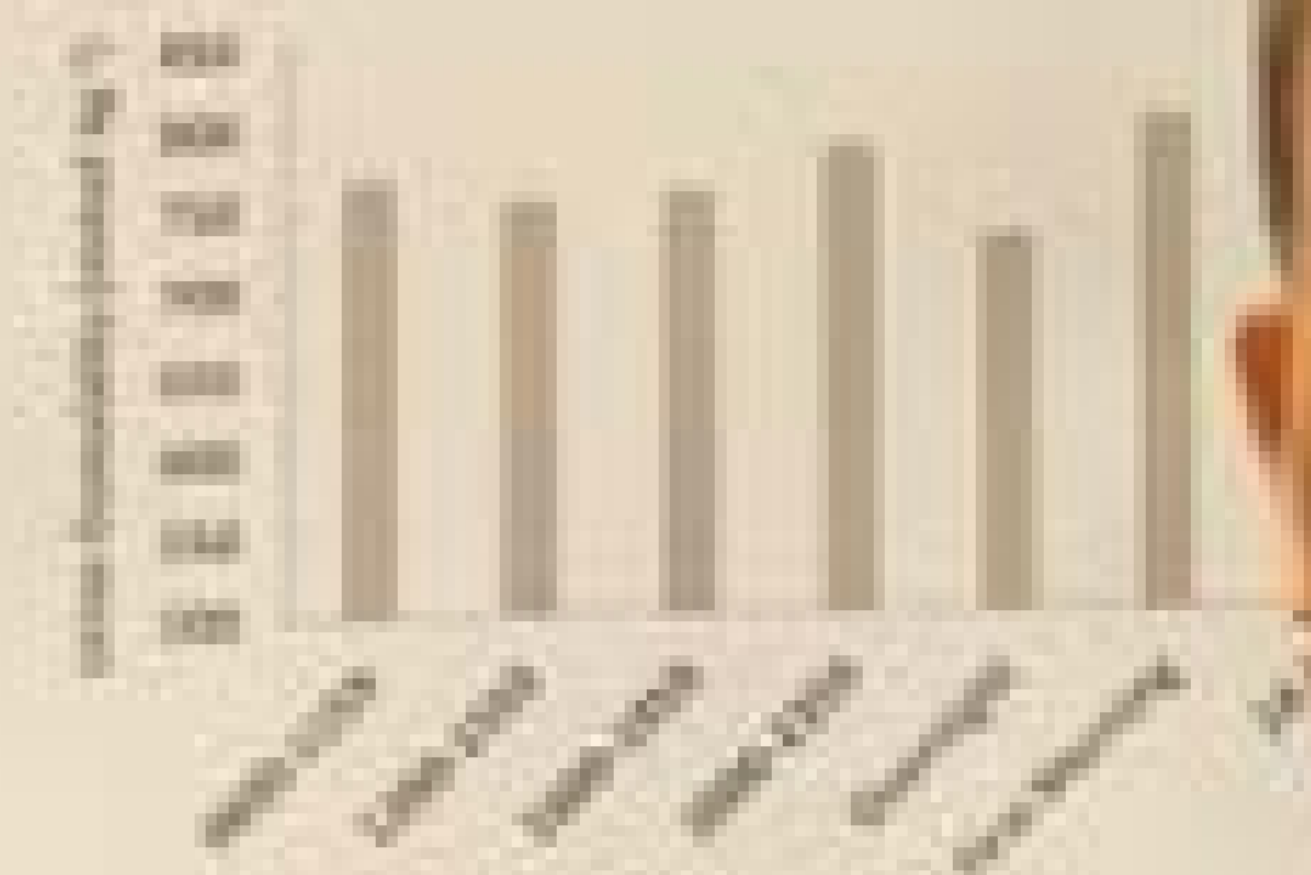


Figure 2. Mean urine osmolality at each time interval and 24-h

Table 1. Equivalence test of urine osmolality at different intervals with 24-h urine osmolality using ROC analysis

Time Interval	Area Under the Curve	95% CI
40-50	0.75	0.70-0.80
50-60	0.75	0.70-0.80
60-70	0.75	0.70-0.80
70-80	0.75	0.70-0.80
80-90	0.75	0.70-0.80
90-100	0.75	0.70-0.80
100-110	0.75	0.70-0.80
110-120	0.75	0.70-0.80
24-h	0.75	0.70-0.80

Table 2. ROC analysis of urine osmolality at different intervals with 24-h urine osmolality

Time Interval	AUC	95% CI
40-50	0.75	0.70-0.80
50-60	0.75	0.70-0.80
60-70	0.75	0.70-0.80
70-80	0.75	0.70-0.80
80-90	0.75	0.70-0.80
90-100	0.75	0.70-0.80
100-110	0.75	0.70-0.80
110-120	0.75	0.70-0.80
24-h	0.75	0.70-0.80

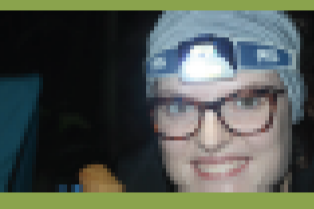
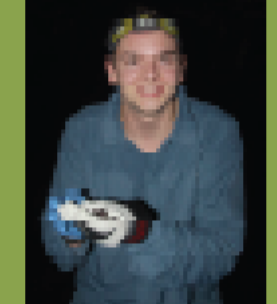
ASU
 HYUNGYU
 Hyunghye Suh
 Arizona State University
 Phoenix, AZ
 ATTENDEE
 #ElevateACSM

Try It?

- Could this new poster format could provide a more engaging way to present information for your future students (and their audience)?

Local Abundance of Leaf-nosed Bats on the Osa Peninsula, Costa Rica

Kieryn Houlder and Jonathan Naslund
houlder@ualberta.ca; naslund@ualberta.ca
 University of Alberta, Augustana Faculty, Camrose, AB, CANADA

Introduction

- Leaf-nosed bats are an important group of bats to study due to their large diversity within the Neotropics and the essential ecological services they provide (i.e. seed dispersal, pollination, and insect control).
- Rarity is often defined as any species which have a low local abundance, limited geographic range, restricted habitat selection, or a combination of these circumstances.¹
- Leaf-nosed bats can be restricted to certain distributions and habitats for a variety of reasons such as roost selection, feeding habits², and the structure of forests.⁴
- Arts (1993) studied the average local abundance and distribution of bats across the Neotropics, using a rank abundance and rank distribution method to categorize rare species.³
- This study can be applied at local settings to draw attention to bat species that show a rank local abundance that deviates away from what is expected based on the Neotropical average.

Methods for Analysis

- Data from 2016 were pooled with previous years data (2013, 2014, and 2015) to get a total abundance for each species captured at Piro.
- Species were ranked from lowest to highest abundance and distinguished by dietary groups, following the same method as Arts (1993) (Figure 3).
- Rank local abundance vs. rank area of distribution graph was created using Arts's (1993) rank area of distribution values (Figure 3).
- Species turnover rate occurring between each year was calculated.⁵
- The coefficient of variation (CV) was determined for each species which represented greater than 1% of the total individuals captured (1% criteria), identifying those that had a higher CV than the mean CV.

Table 1. Dietary Groups

Frugivore - Fruit eating
Animalivore - Insect/Vertebrate eating
Nectarivore - Nectar eating
Sanguivore - Blood eating

Results

Survey Totals

- There were 338 leaf-nosed bats captured covering 20 different species.
- All four dietary groups were represented.
- Frugivores made up 79% of the bats captured, animalivores made up 14.8%, nectarivores made up 5.3% and sanguivores made up 0.9%.
- The ten species that were below the horizontal median made up 6.5% of the total captures.

Comparison to Arts (1993) - Figure 3

- The median for rank local abundance was placed at 10 (n = 20).
- Dietary Group Trends
 - Three frugivores, two animalivores, one nectarivore, and one sanguivore that were expected to be locally abundant were actually found to be locally scarce.
 - The deviations found appeared to be individual species specific and not overarching trends among dietary groups.
- Individual Trends
 - Six species showed notably lower abundance than what was expected: *Phyllostomus discolor*, *Lepidonyx coarctatus*, *Artibeus lituratus*, *Platyrrhinus helleri*, *Vampyressa thuyana*, and *Desmodus rotundus*.
 - Trachops cirrhosus* showed a notably higher abundance than what was expected.

Purpose

This study investigated the local abundance of leaf-nosed bats based on sampling efforts carried out at the Piro Biological Research Station (Piro) on the Osa Peninsula, Costa Rica. The purpose of this study was to:

- apply Arts's (1993) study to the local area around Piro to see how the abundance of leaf-nosed bats compared to the Neotropical average;
- determine if trends existed among leaf-nosed bats within the same dietary group; and
- identify individual bats that notably deviated away from what was expected based on Arts (1993).

Field Methods

- Sampling sites were located around the Piro Biological Research Station (Figure 1).
- The study occurred during the dry season (February 13-20, 2016).
- We sampled:
 - Old growth (n = 3)
 - Secondary forest (n = 3)
 - Riparian forest (n = 2)
- Sampling efforts occurred at sundown between 1800 and 2200h.
- Miss-netting was used at ground level.
- Nets were used at various heights based on the height of the canopy in the sampling site.
- Nets lengths included:
 - 5m
 - 9m
 - 12m

Figure 1. Comparison of rank abundance of leaf-nosed bats based on rank local abundance and rank area of distribution.

Table 2. Species Codes

<i>Artibeus lituratus</i> (AL)	<i>Corynorhinus mexicanus</i> (CM)	<i>Lepidonyx coarctatus</i> (LC)	<i>Myotis torquatus</i> (MT)
<i>Desmodus rotundus</i> (DR)	<i>Chiropteropus aurifer</i> (CA)	<i>Phyllostomus discolor</i> (PD)	<i>Artibeus helleri</i> (AH)
<i>Carollia castaneiventris</i> (CC)	<i>Chiropteropus aurifer</i> (CA)	<i>Phyllostomus discolor</i> (PD)	<i>Artibeus helleri</i> (AH)
<i>Carollia castaneiventris</i> (CC)	<i>Chiropteropus aurifer</i> (CA)	<i>Phyllostomus discolor</i> (PD)	<i>Artibeus helleri</i> (AH)

Discussion

- Arts's (1993) method provided a good representation of rarity, as the same 10 bats identified as rare also did not meet the 1% criteria.
- Species are often considered rare when they make up less than 1% of the total captured.
- This method also provided a tool to identify bats that deviate greatly from the Neotropical average which could be due to factors such as dietary specializations (e.g. *Lepidonyx coarctatus* are known to eat banana nectar).⁷
- Dietary groups are not an effective method for classifying leaf-nosed bats, most likely due to their diverse diets and potential to be placed in multiple categories.
- Individual species with CVs above the mean, showing high variation between years, may be due to environmental factors such as moonlight intensity, which could contribute to lunar phobia.⁸
- Individual species trends should be considered when examining rarity, and more research is required into the specific diets of leaf-nosed bats.

Acknowledgements

We would like to thank Dr. Darin Austin, Dr. Anne McIntosh, Dr. David Leman, and Judy Hinton for their generous assistance and encouragement during the PhD study and data processing. Thank you to all current and previous students in the Field Methods in Neotropical Ecology and Conservation (MNEC) 504, for their help in data collection. Thank you to the staff members at the Piro Biological Research Station for their great hospitality and use of facilities during our field study. Research permits for work in Costa Rica were provided by ANECA. Animal protocols were approved by the University of Alberta's AGSCE.

VS

Effect of balsa (*Ochroma pyramidale*) abundance on the recovery of native tree species in Osa Verde restoration plots

Kayleigh Bartley, Megan Berg, Novie Bordey, Gillian Larsen, Meghan Lynch

Introduction

With growing agricultural practice and site abandonment there is an increased need for effective restoration methods, especially in the Neotropics due to their possession of high biodiversity^{1,6}. For this reason, the balsa tree has been chosen as a possible candidate to accelerate natural forest succession due to its pioneer status.⁴

Purpose

- Analyze the effects of balsa on the recovery of the Osa Conservation restoration plots
- Provide an evidence-based recommendation to future and ongoing restoration projects

Objectives

- Determine the survival status of the trees planted in each plot
- Explore the impact of balsa abundance on restoration efforts
- Determine the average canopy cover of each treatment

Hypothesis

If higher amounts of balsa are planted in a tropical restoration plot then there will be a greater proportion of native trees that are alive because of the beneficial ecological conditions that balsa provides.

Methods

- Locate the corner of each plot using species code grids provided by Osa Conservation
- Determine the survival status of each tree, checking the cambium when necessary
- Calculate the canopy cover of each plot using a densiometer
- Data analysis using PC-DTD and JASP programs

Data Analysis



- Nonparametric Two-way ANOVA
- Nonparametric One-way ANOVA(s)
- Mann-Whitney U Test
- Don't's Post Hoc Test

Results

- Canopy cover, species richness, Pielou's J evenness, Shannon Index, and Simpson's Index were non-significant between treatment types
- The proportion alive for each species was non-significant between treatments and no interaction was reported
- Upon comparison, certain species had a significant difference in the proportion of alive trees

Discussion

- Contrary to the other studies, we found no improvement in the survival of trees in the presence of greater abundance of balsa^{2,3,5}
- Our finding could be a result of balsa's need for weeding during early life stages to foster better establishment³
- Spatial differences regarding moisture and soil quality could be affecting the plots (2020 conversation with Hilary, unreferenceed)

Telling it as it is: abundance of balsa is not a predictor for survival of trees, some trees just survive better than others.

Future Studies

- Inclusion of more replicates to strengthen data
- Explore spatial differences, soil quality and moisture on tropical restoration
- Focus on only one species to investigate the effectiveness of balsa

Limitations

- Row X in plot 18 was omitted due to difficulty of locating species
- Small sample size
- Different soil conditions
- No confirmation that missing trees are dead
- Omission of replanted trees

Species	Species 1	Species 2	Species 3
1	17	17	17
2	10	10	10
3	10	10	10
4	10	10	10
5	10	10	10
6	10	10	10
7	10	10	10
8	10	10	10
9	10	10	10
10	10	10	10
11	10	10	10
12	10	10	10
13	10	10	10
14	10	10	10
15	10	10	10
16	10	10	10
17	10	10	10
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24	10	10	10
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27	10	10	10
28	10	10	10
29	10	10	10
30	10	10	10

Acknowledgements

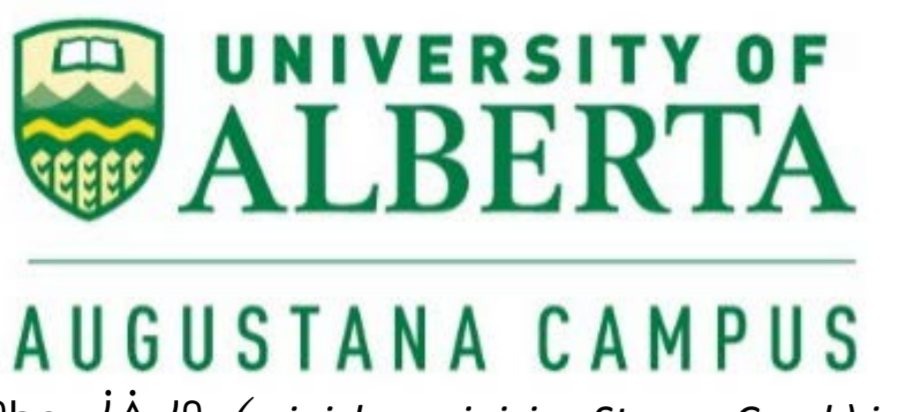
We would like to extend our thanks to Anne McIntosh, Pam Stacey, Elène Haave-Audet, our fellow classmates, Augustana's LAB staff and biology lab technicians. As well Hilary Brumberg, Maria José Maria Quirós and the rest of the staff at Osa Conservation. Without their help our project would not have been possible.

References

1. Bensch, A.P., Martin, A., & Schulz, M. (2007). Abandonment of agricultural land: an overview of drivers and consequences.
2. Chazdon, R.L., & Wright, S.J. (2005). Neotropical secondary forest succession: towards an integration of population biology and ecological dynamics.
3. Chazdon, R.L., & Wright, S.J. (2005). Neotropical secondary forest succession: towards an integration of population biology and ecological dynamics.
4. Chazdon, R.L., & Wright, S.J. (2005). Neotropical secondary forest succession: towards an integration of population biology and ecological dynamics.
5. Chazdon, R.L., & Wright, S.J. (2005). Neotropical secondary forest succession: towards an integration of population biology and ecological dynamics.
6. Chazdon, R.L., & Wright, S.J. (2005). Neotropical secondary forest succession: towards an integration of population biology and ecological dynamics.

Unposting the Scientific Poster: Demonstrating a New Format “Poster 2.0” for Communicating Student (and Faculty) Research Findings

Anne CS McIntosh, Stacey P, Bartley KI, Berg ML, Bordey N, Cook CA, Godziuk GW, Kruger MT, Larsen GE, Lynch MI, Paulgaard SD, Sweder JD - University of Alberta, Augustana Campus
CampusScience Dept – Augustana Campus, Camrose, Alberta
Canada . Contact Dr. McIntosh at: amcintos@ualberta.ca
The Augustana Campus of the University of Alberta is located at ᑭᓱᓪᓂᑦᐅᓪᓱᓪᐅᓪᓱ (asiniskaw sipsis - Stoney Creek) in Treaty 6 territory. This territory provided a travelling route and home to the Maskwacis Nehiyawak, Niitsitapi, Nakoda, and Tsuu't'ina Nations, the Métis, and other Indigenous peoples.



GOOD-BYE WALL OF TEXT! Read this layout section and get the main take-home message!

- Posters are a standard presentation format both in the classroom and at conferences, including the poster session here at UBEA (even virtually)!
- Posters have the power to be effective at communicating research findings
- They often are INFORMATION OVERLOAD!
- As instructors, we tell our students to use techniques such as bulleted lists, photos, figures and tables in order to have their poster be an engaging medium to translate their research.
- REALITY: CLUTTER!!!! “Wall of Text”.
- A new poster design format “Poster 2.0” envisioned by Michigan State University doctoral student Mike Morrison is aiming to change the way in which we create posters
- Towards achieving goal of clearly and concisely communicating research findings.
- In this presentation, I will highlight examples of this new poster format taken from a Tropical Ecology Field Studies Course that I co-taught in January 2020.



Traditional Poster Samples

Take-home Message

Can you appreciate the difference that this new poster format could potentially provide to your future students – perhaps making it more fun and engaging for your students to make and present their poster in your next class.

- References
- <https://www.npr.org/sections/health-shots/2019/06/11/729314248/to-save-the-science-poster-researchers-want-to-kill-it-and-start-over>
 - How to create a better research poster in less time (including templates) <https://www.youtube.com/watch?v=1RwjBhkCA58>
 - Poster unposted templates can be found here: <https://osf.io/ef53g/>
 - Purrington's Advice on designing scientific posters available at <http://www.swarthmore.edu/NatSci/cpurrrin1/posteradvice.htm>

Acknowledgements

Thanks to the members of the 2015/16 Costa Rica Field Studies Course and Randi Lupardus who shared their traditional posters to compare with the ‘Unposted’ posters.



←.....



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