Unpostering 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 MJ, Paulgaard SD, Sweder JD - University of Alberta, Augustana CampusScience Dept – Augustana Campus, Camrose, Alberta Canada . Contact Dr. McIntosh at: amcintos@ualberta.ca

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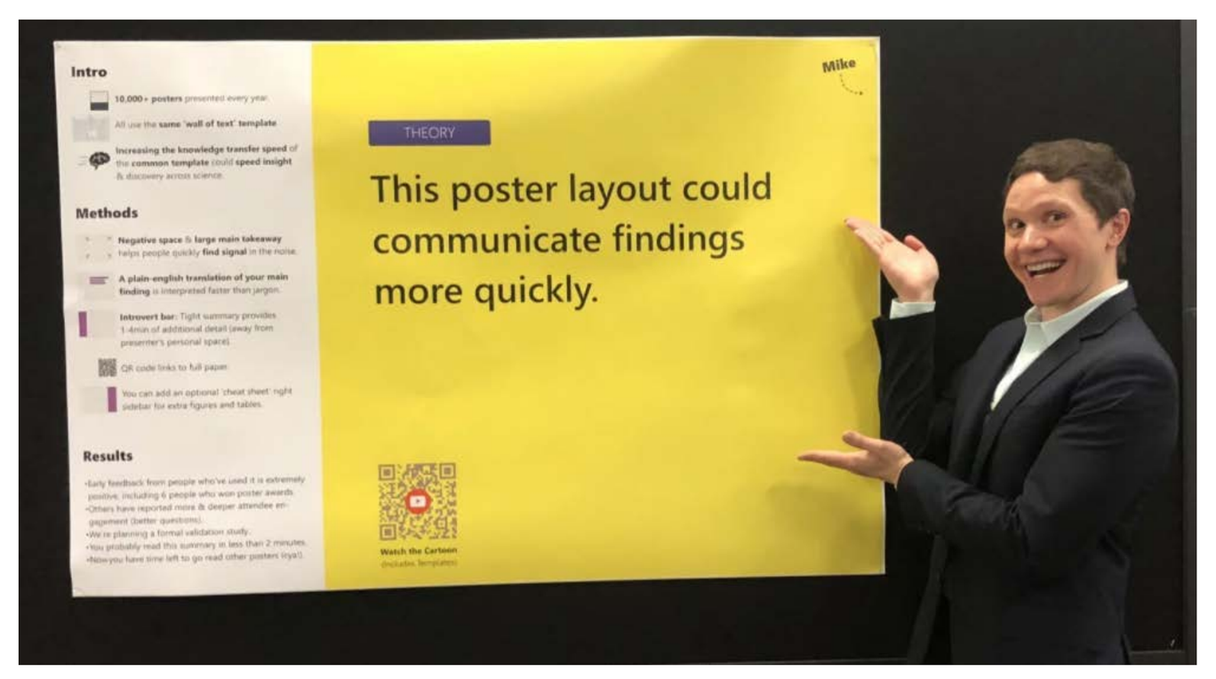
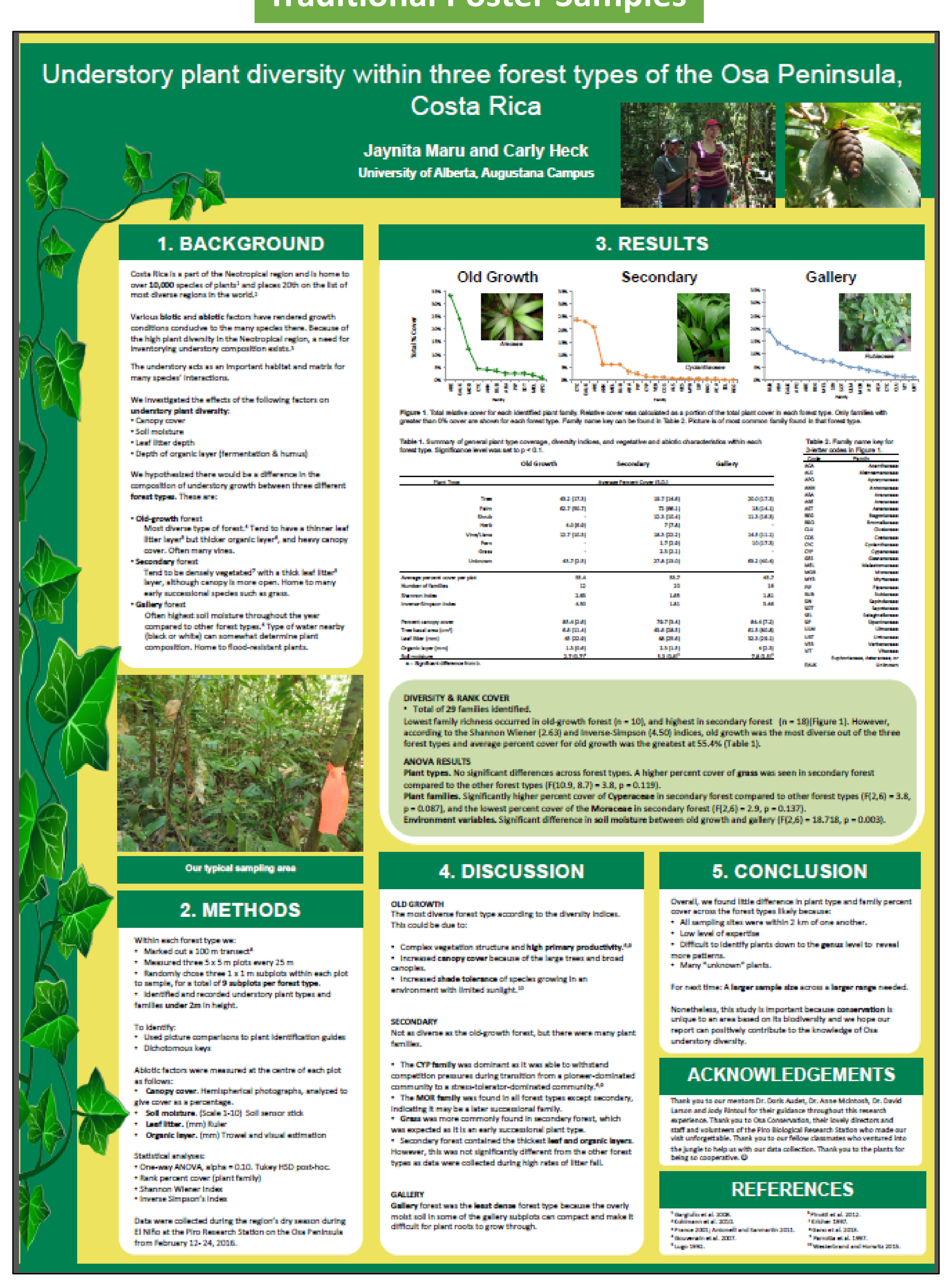
The Augustana Campus of the University of Alberta is located at ᐊᓯᓂᐢᑲᐤ ᓰᐱᓰᐢ (asiniskaw sipisis - Stoney Creek) in Treaty 6 territory. This territory provided a travelling route and home to the Maskwacîs Nêhiyawak, Niitsitapi, Nakoda, and Tsuut'ina Nations, the Métis, and other Indigenous peoples.

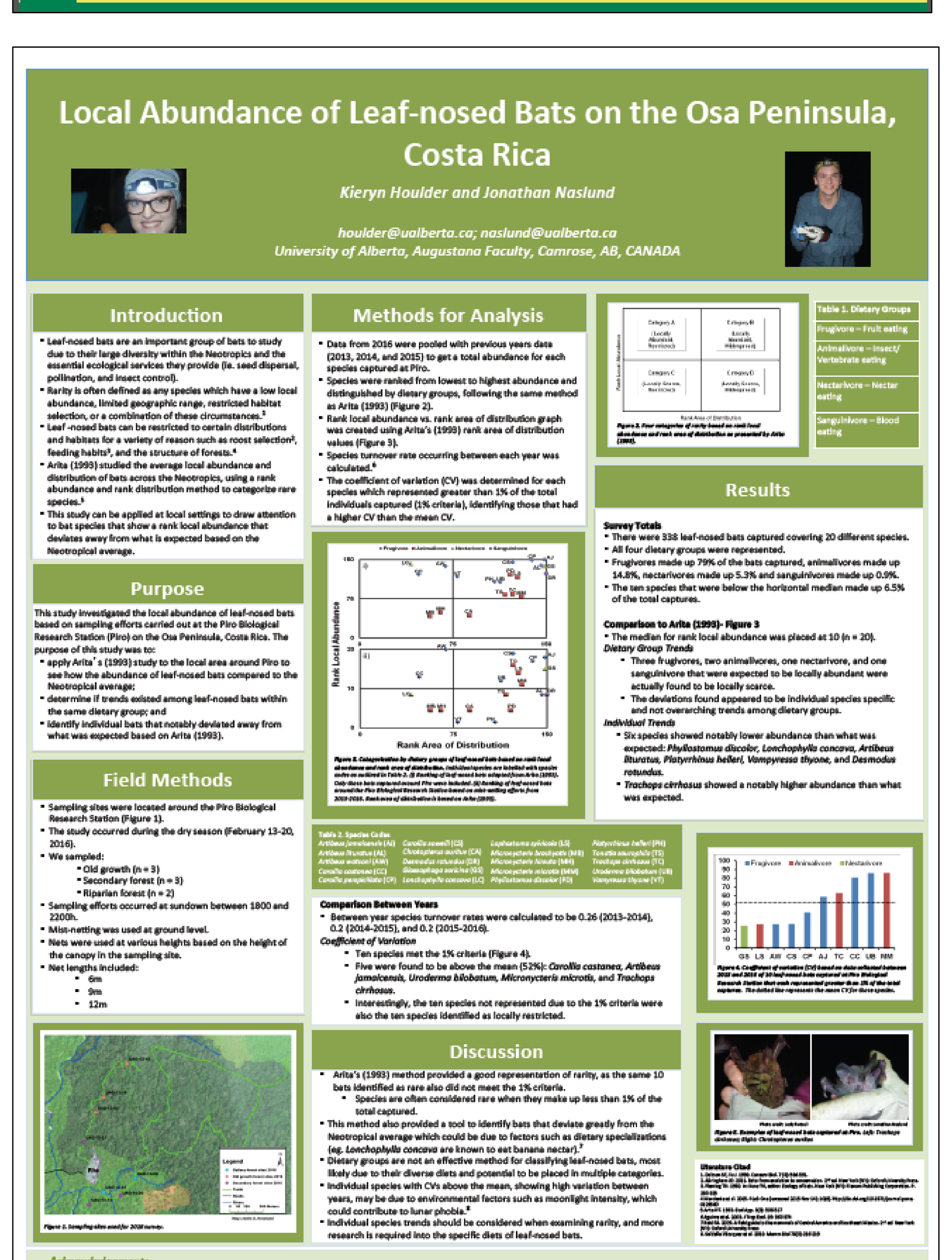
Introduction

- 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.



Traditional Poster Samples



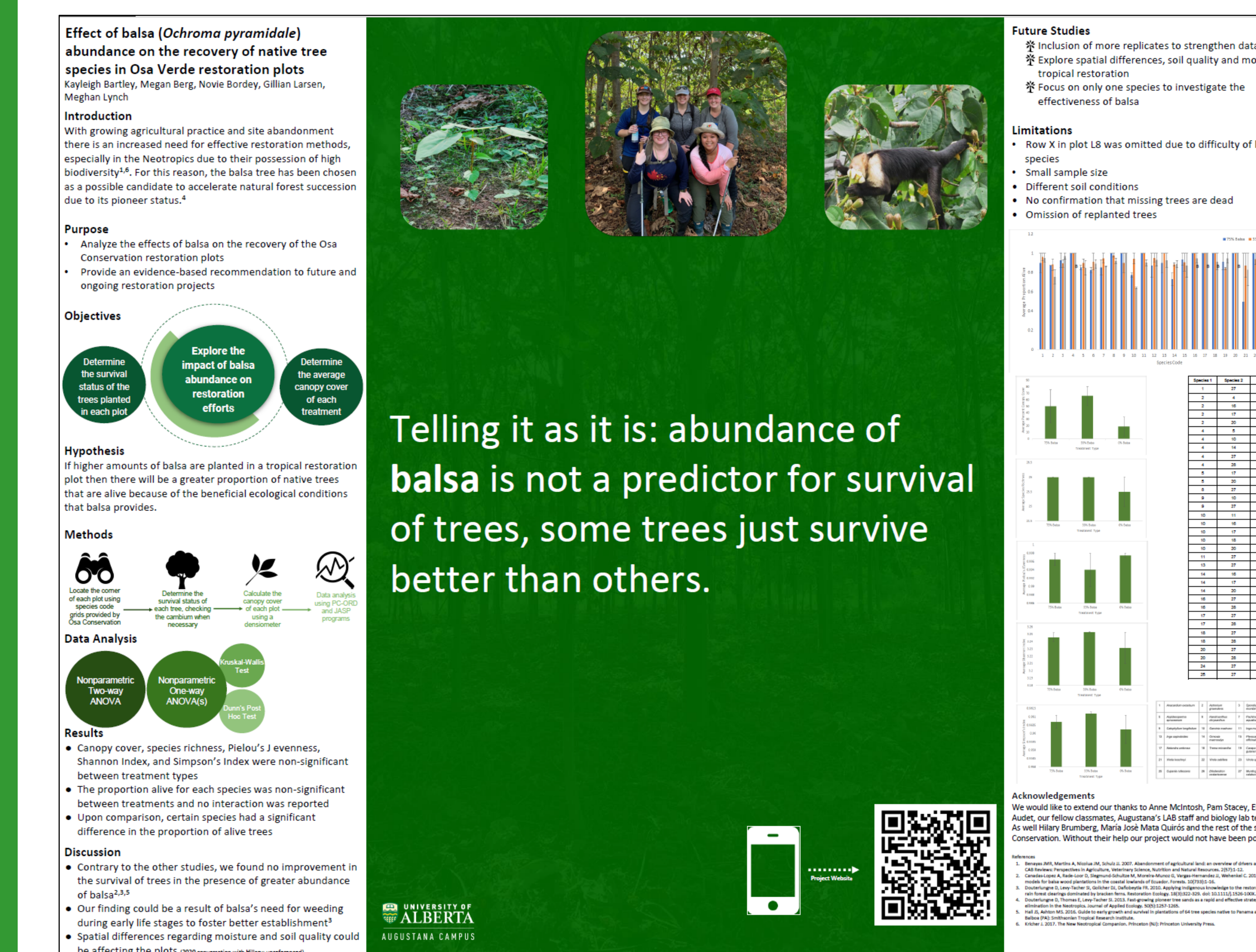


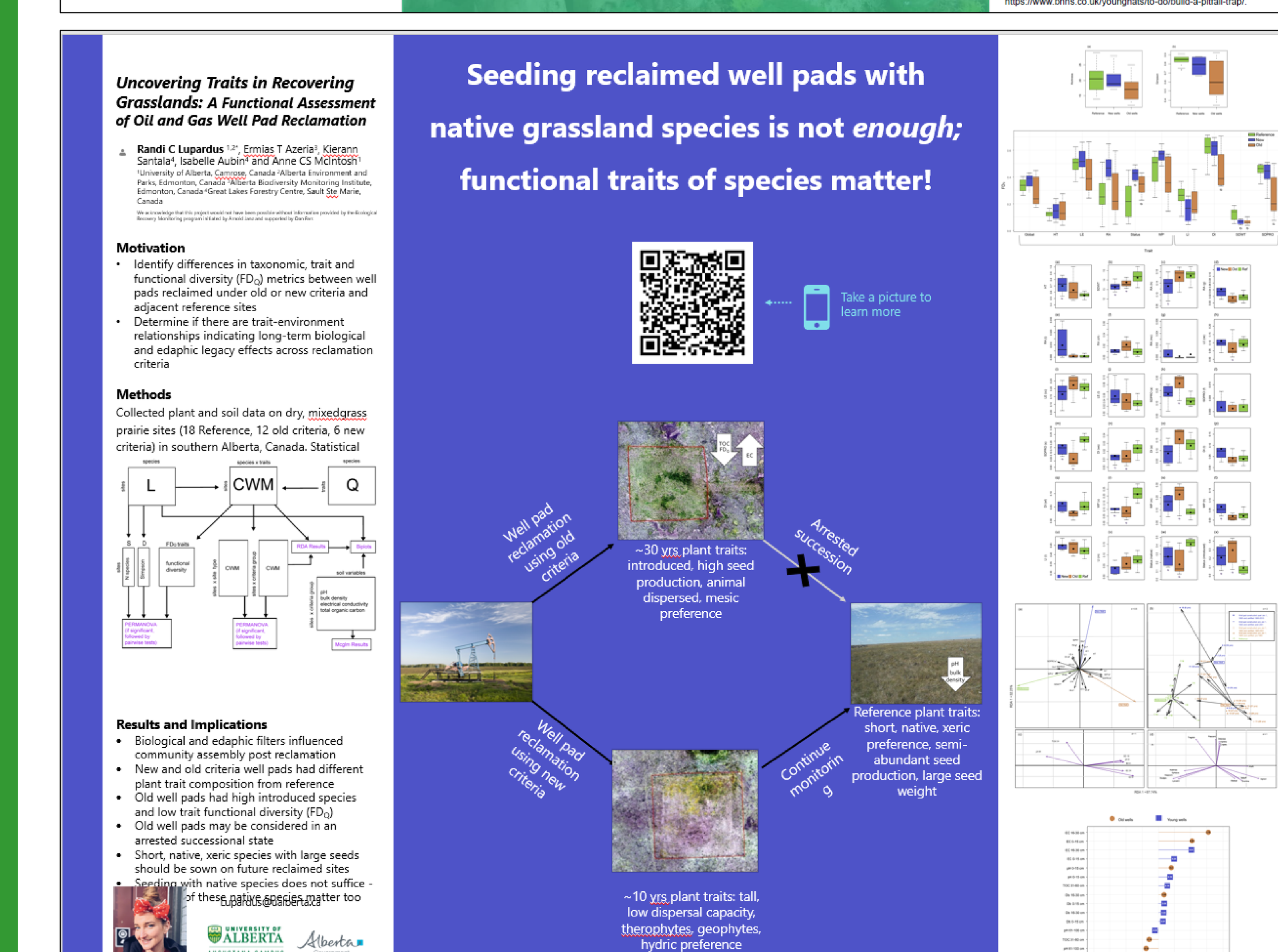
GOOD-BYE WALL OF TEXT!

Read this section and get the main take-home message!

Click here to access more detailed information

Sample Unpostered Posters





Take-home Message

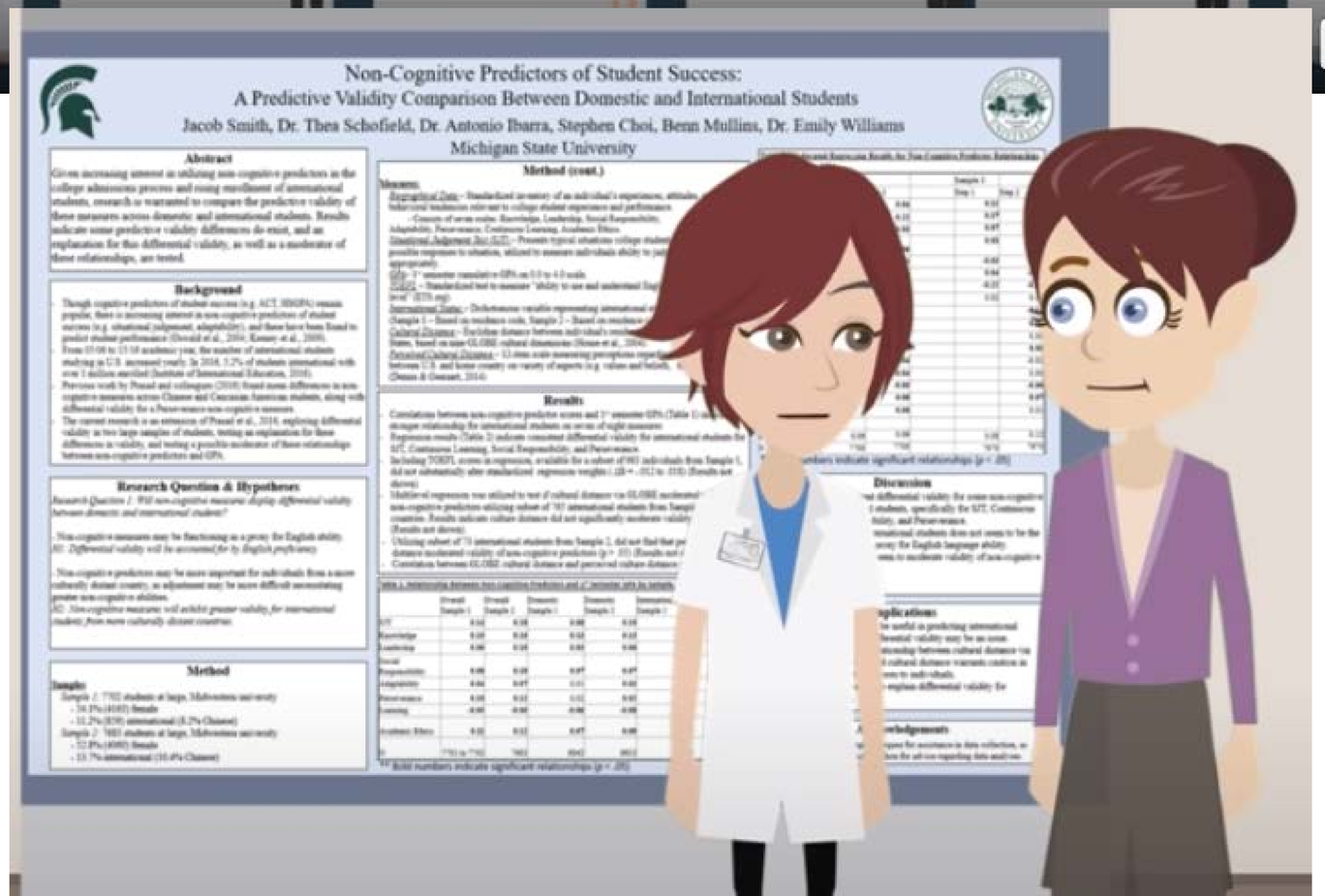
Can you appreciate the difference that this new poster format could potentially provide to your future students – perhaps making it more fun and engaging for your students to make and present their poster in your next class.

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 unpostered templates can be found here: https://osf.io/ef53g/**
- **Purrington's Advice on designing scientific posters available at http://www.swarthmore.edu/NatSci/cpurrin1/posteradvice.htm**

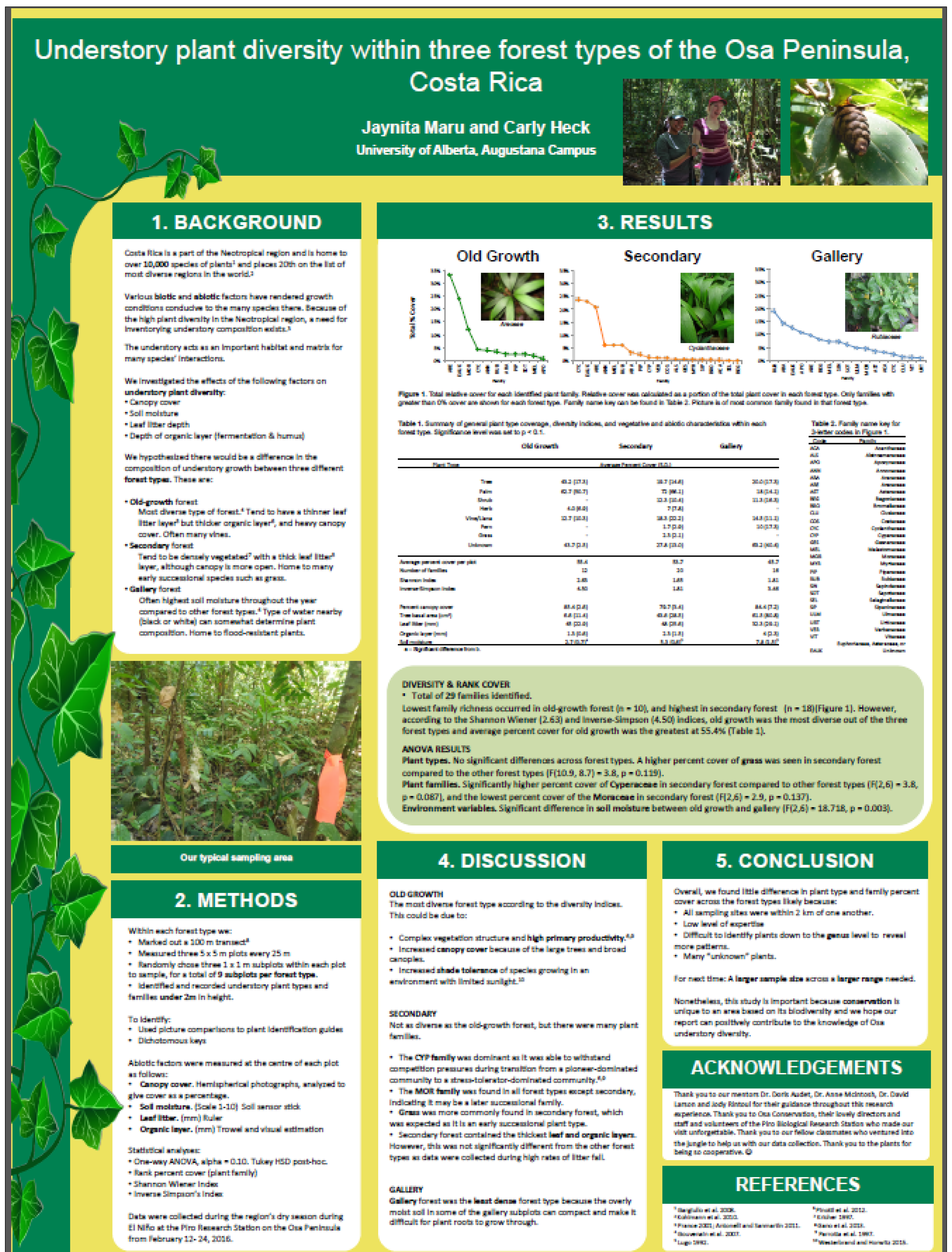
Acknowledgements

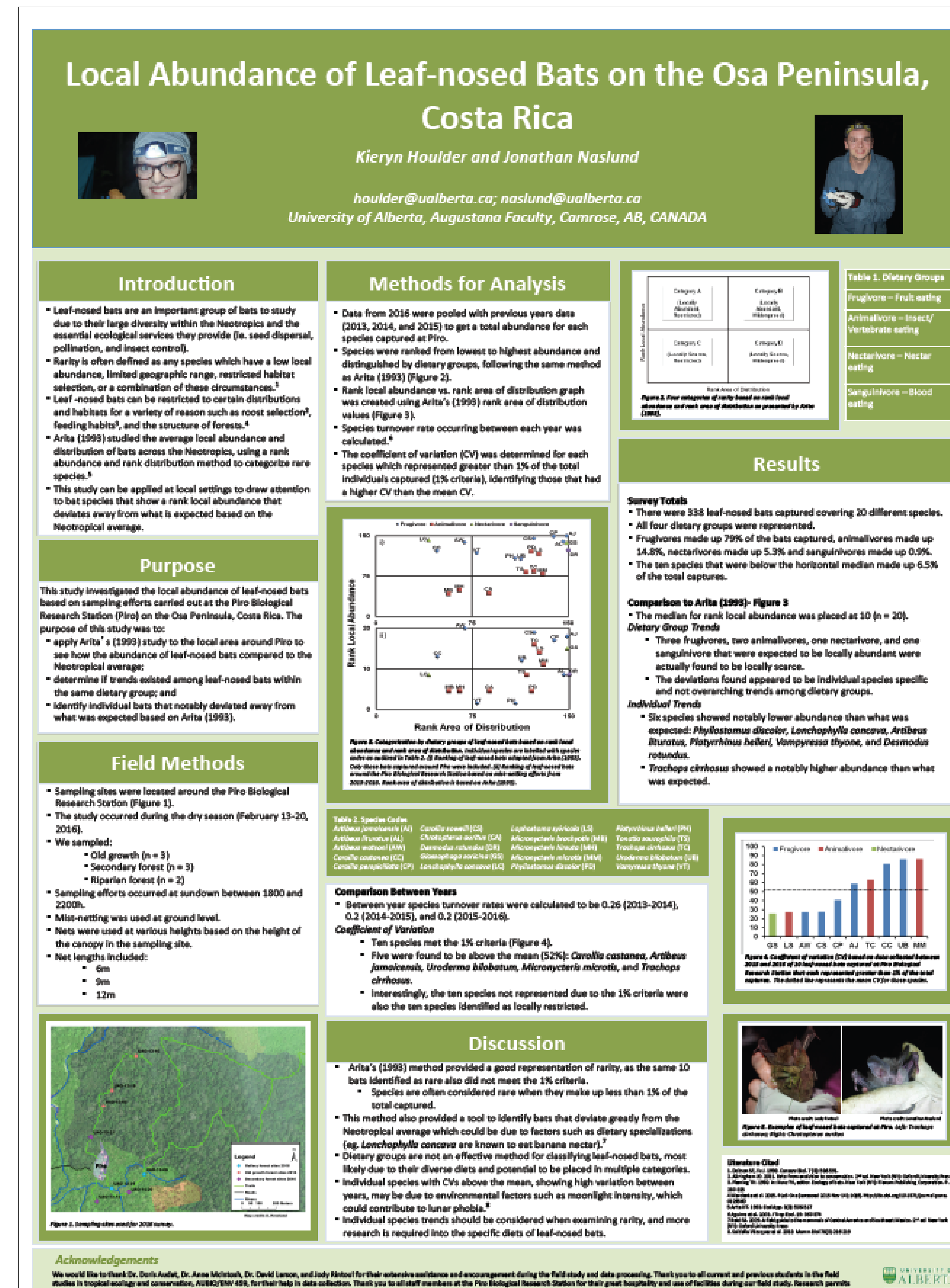
Thanks to the members of the 2015/16 Costa Rica Field Studies Course and Randi Lupardus who shared their traditional posters to compare with the 'Unpostered' posters.



https://www.youtube.com/watch?v=1RwJbhkCA58&t=21s

‘Traditional’ Posters:
Costa Rica Field Studies Course





Poster ‘2.0’ (Mike Morrison)

https://www.npr.org/sections/health-shots/2019/06/11/729314248/to-save-the-science-poster-researchers-want-to-kill-it-and-start-over

https://psychology.msu.edu/directory/morrison-mike.html

Title:
Subtitle

PRESENTER:
Leeroy Jenkins

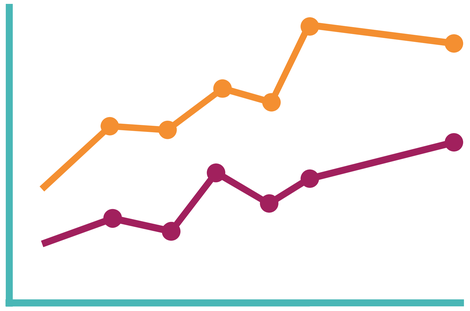
BACKGROUND: Who cares? Explain why your study matters in the fastest, most brutal way possible (feel free to add graphics!).

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.

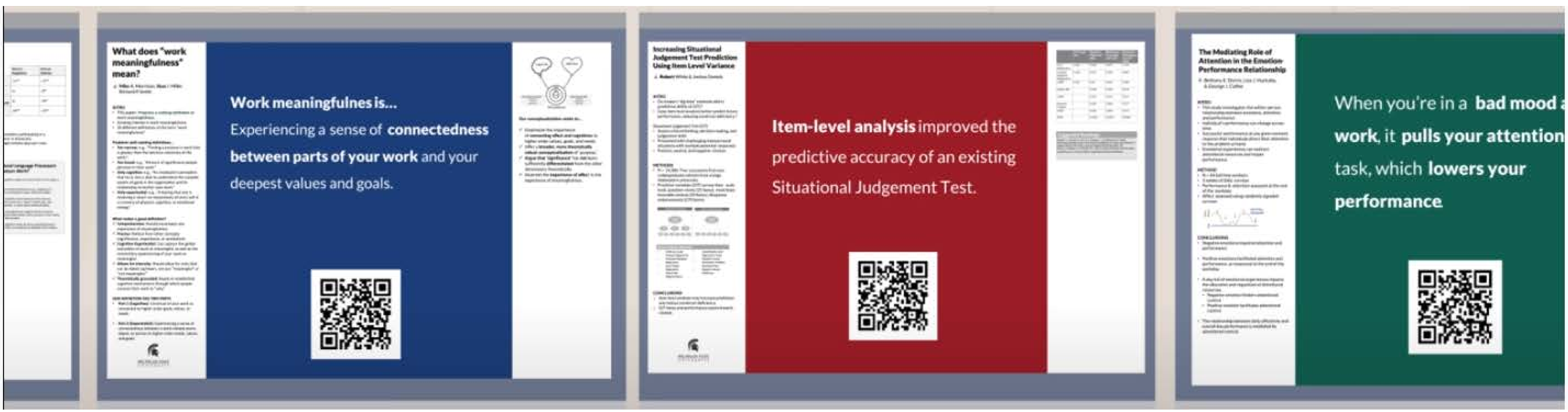
Take a picture to download the full paper

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.

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



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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

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-ORD and JASP programs

Data Analysis

Nonparametric Two-way ANOVA

Nonparametric One-way ANOVA(s)

Kruskal-Wallis Test

Dunn'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 establishment[3]
- Spatial differences regarding moisture and soil quality could be affecting the plots (2020 conversation with Hillary; unreferenced)

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

Project Website

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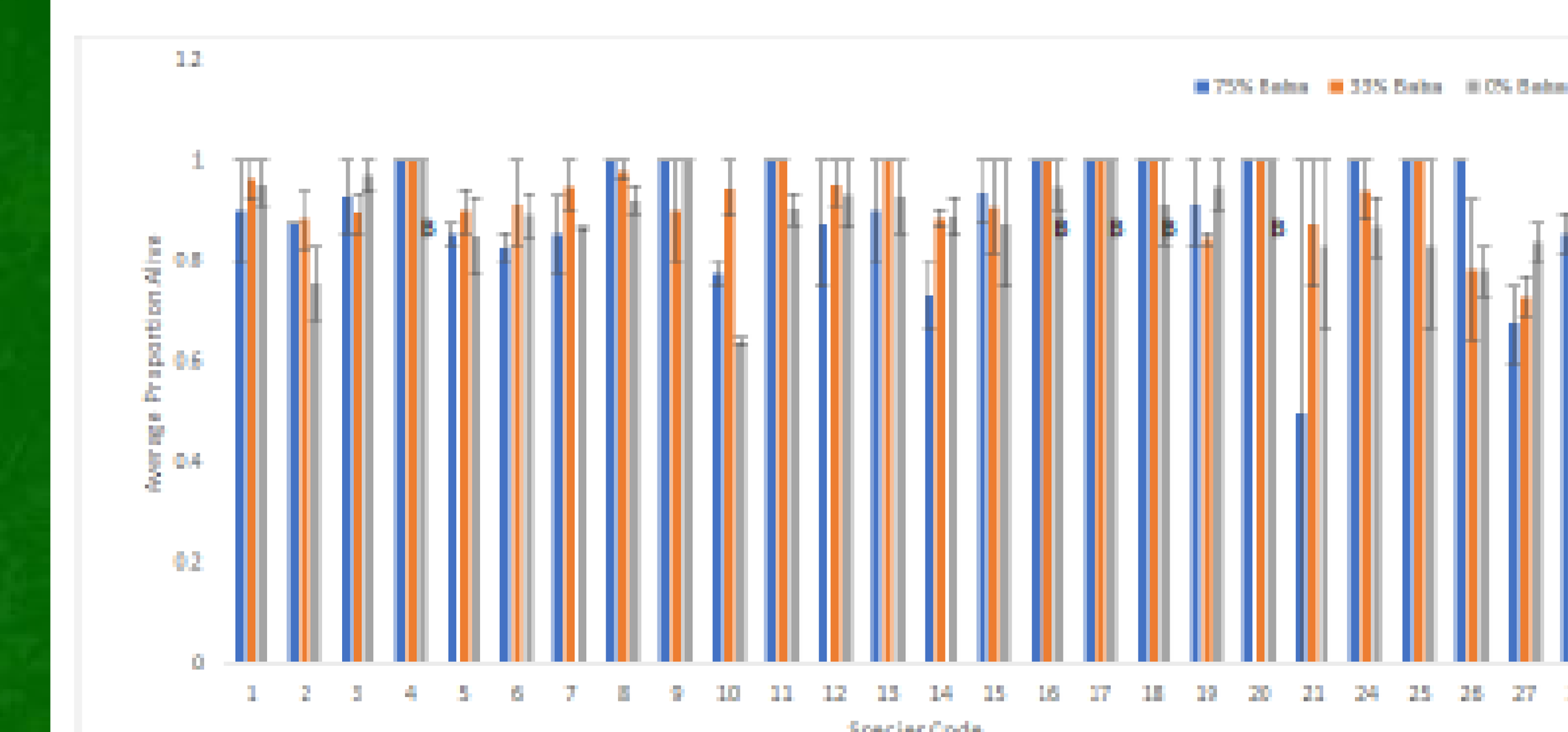
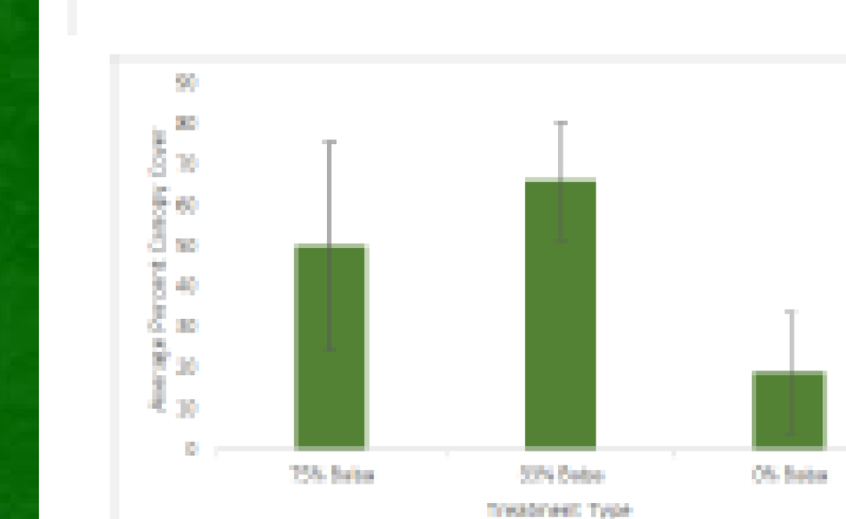
Future Studies

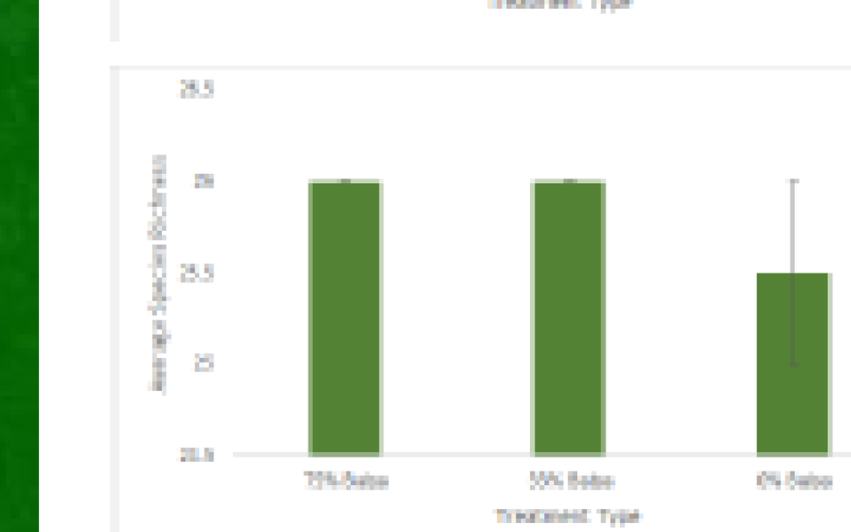
- Inclusion of more replicates to strengthen data
- Explore spatial differences, soil quality and moisture on tropical restoration
- Focus on only one species to investigate the effectiveness of balsa

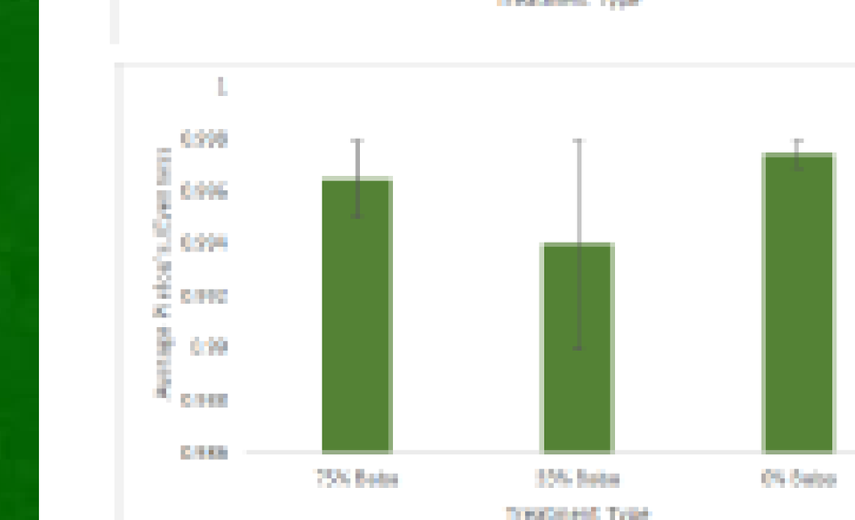
Limitations

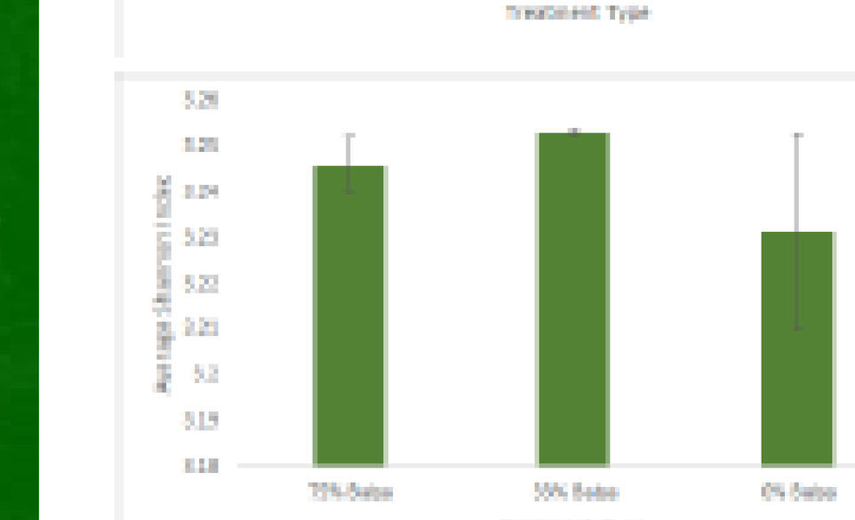
- Row X in plot L8 was omitted due to difficulty of locating species
- Small sample size
- Different soil conditions
- No confirmation that missing trees are dead
- Omission of replanted trees

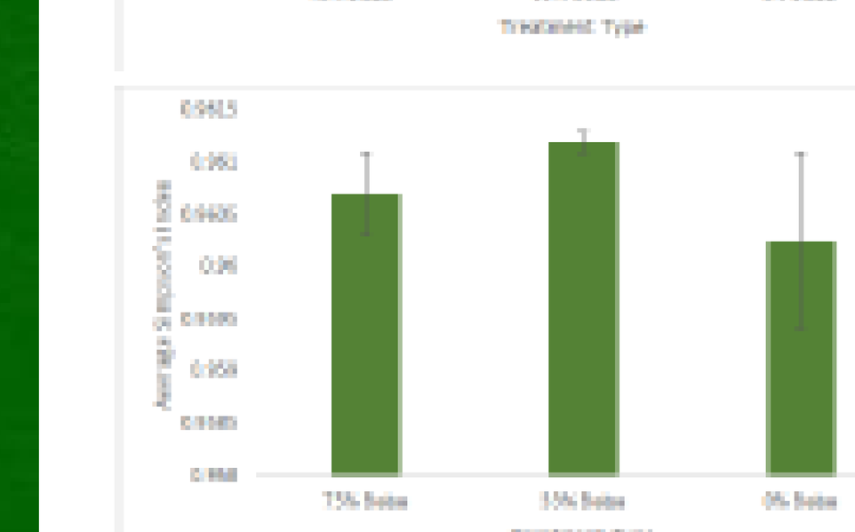












Species 1	Species 2	P-value
1	27	0.004
2	4	0.001
2	16	0.004
2	17	0.001
2	20	0.001
4	5	0.003
4	10	<0.001
4	14	0.001
4	27	<0.001
4	28	<0.001
5	17	0.003
5	20	0.003
8	27	0.001
9	10	0.004
9	27	<0.001
10	11	0.005
10	16	0.002
10	17	<0.001
10	18	0.003
10	20	<0.001
11	27	<0.001
13	27	0.002
14	16	0.004
14	17	0.001
14	20	0.001
16	27	<0.001
16	28	0.003
17	27	<0.001
17	28	<0.001
18	27	<0.001
18	28	0.005
20	27	<0.001
20	28	<0.001
24	27	0.004
25	27	<0.001

1	Anacardium excelsum	2	Astronium graveolens	3	Spondias mombin	4	Tapirira guianensis
5	[illegible]	6	Handroanthus chrysanthus	7	Pachira aquatica	8	[illegible]
9	Calophyllum longifolium	10	Garcinia madruno	11	[illegible]	12	Inga alba
13	Inga sapindoides	14	Ormosia macrocalyx	15	Pterocarpus officinalis	16	[illegible]
17	[illegible]	18	Trema micrantha	19	Carapa guianensis	20	[illegible]
21	Virola koschnyi	22	Virola sebifera	23	Virola sp. A	24	Genipa americana
25	[illegible]	26	[illegible]	27	Muntingia calabura	28	Ochroma pyramidale

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, María Josè Mata Quirós and the rest of the staff at Osa Conservation. Without their help our project would not have been possible.

References

1. Benayas JMR, Martins A, Nicolau JM, Schulz JJ. 2007. Abandonment of agricultural land: an overview of drivers and consequences. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources. 2(57):1-12.
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3. Douterlungne D, Levy-Tacher SI, Golicher DJ, Dañobeytia 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.1526-100X.2008.00459.x.
4. Douterlungne D, Thomas E, Levy-Tacher SI. 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.
5. 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.
6. Kricher J. 2017. The New Neotropical Companion. Princeton (NJ): Princeton University Press.

Poster 2.0 Costa Rica Field Studies Course

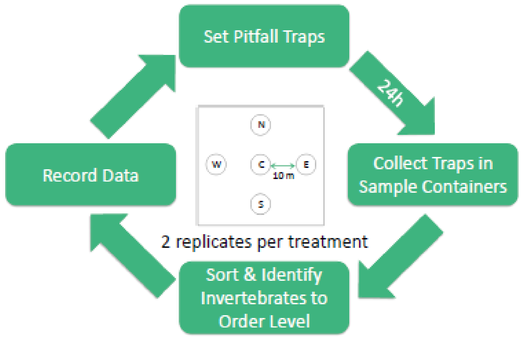
Influence of balsa (*Ochroma pyramidale*) on invertebrate diversity in Osa Peninsula restoration plots

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

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More Pictures & Info Here!

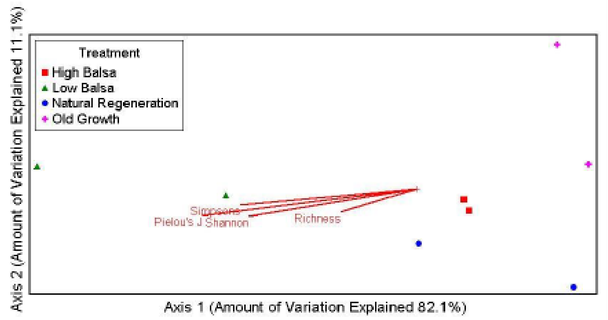


Figure 1. Invertebrate diversity of various restoration plots located at Osa Biological Station (Piro), Costa Rica. Samples from pitfall traps were collected following a 24 hour interval over a seven day period in January 2020. Identification of samples were done to order level and were used to determine 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.

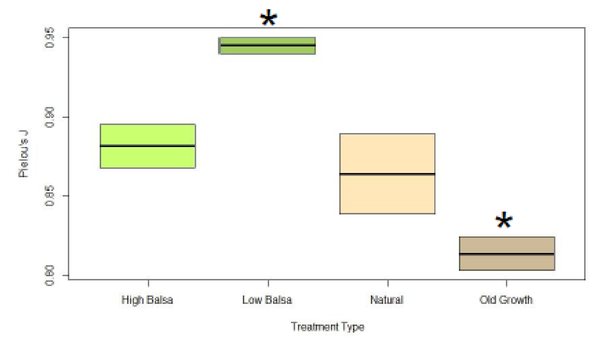


Figure 2. Measure of evenness between high, low, natural, and old growth plots using Pielou's J evenness index at Osa Biological Station (Piro), Costa Rica. Asterisks refer to significant differences between balsa treatments ($p<0.05$). Pitfall trap samples were collected following a 24 hour interval 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.

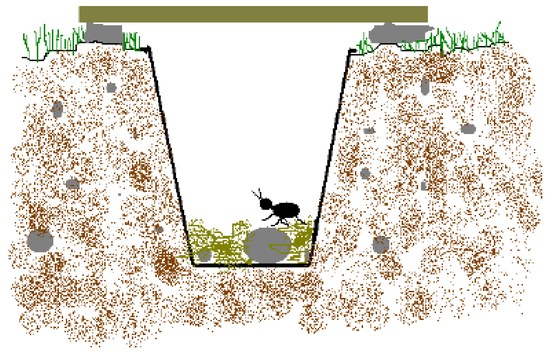


Figure 3. Example of a pitfall trap used to collect samples. A hole was dug large enough so the rim of a 8cm wide plastic cup was flush or slightly below the soil surface. Soil was infilled around the cup and sticks were pushed into the soil to hold a plastic lid 1inch over the cup. The cup was filled 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 Azeria[3], Kierann Santala[4], Isabelle Aubin[4] and Anne CS McIntosh[1]

[1]University of Alberta, Camrose, Canada [2]Alberta Environment and Parks, Edmonton, Canada [3]Alberta Biodiversity Monitoring Institute, Edmonton, Canada [4]Great Lakes Forestry Centre, Sault Ste Marie, Canada

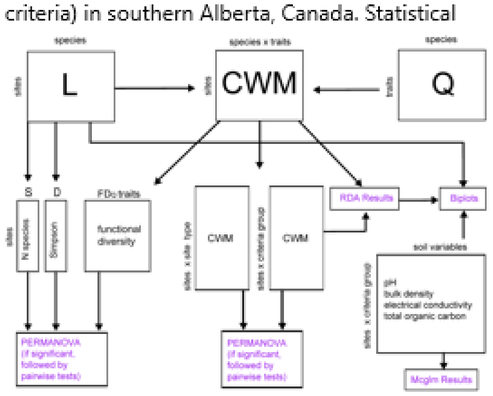
We acknowledge that this project would not have been possible without information provided by the Ecological Recovery Monitoring program initiated by Arnold Janz and supported by Dan Farr.

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

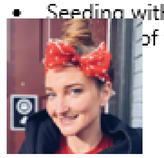
Methods

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

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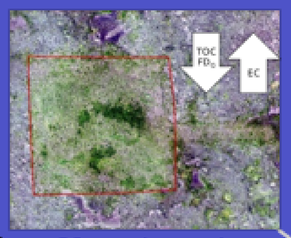
Alberta Government

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

Take a picture to learn more



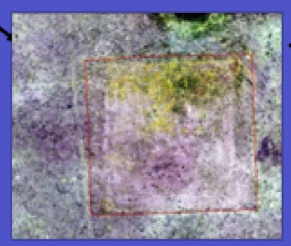
Well pad reclamation using old criteria

~30 yrs plant traits: introduced, high seed production, animal dispersed, mesic preference

Arrested succession

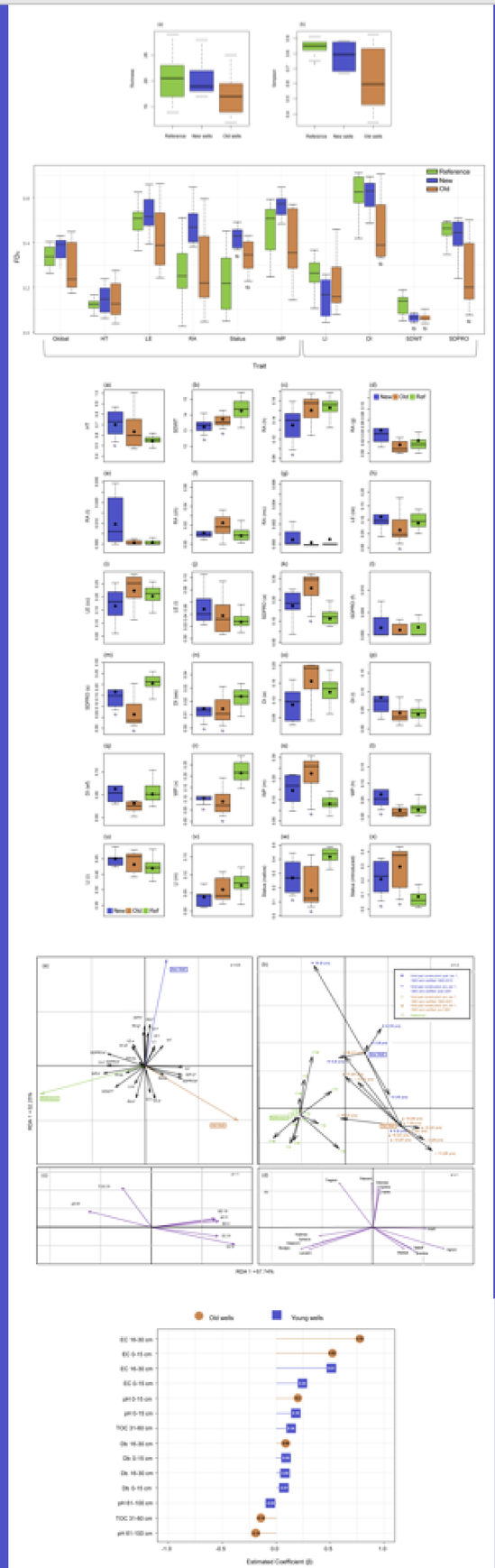
Reference plant traits: short, native, xeric preference, semi-abundant seed production, large seed weight

Well pad reclamation using new criteria



Continue monitoring

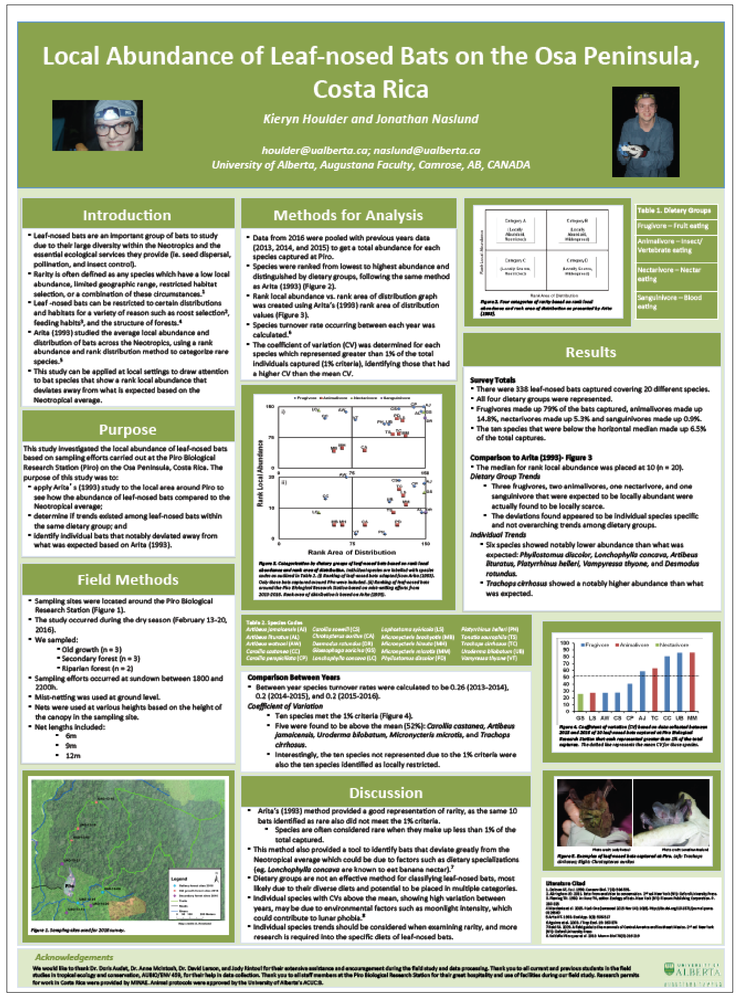
~10 yrs plant traits: tall, low dispersal capacity, therophytes, geophytes, hydric preference



https://www.npr.org/sections/health-shots/2019/06/11/729314248/to-save-the-science-poster-researchers-want-to-kill-it-and-start-over

Try It?

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



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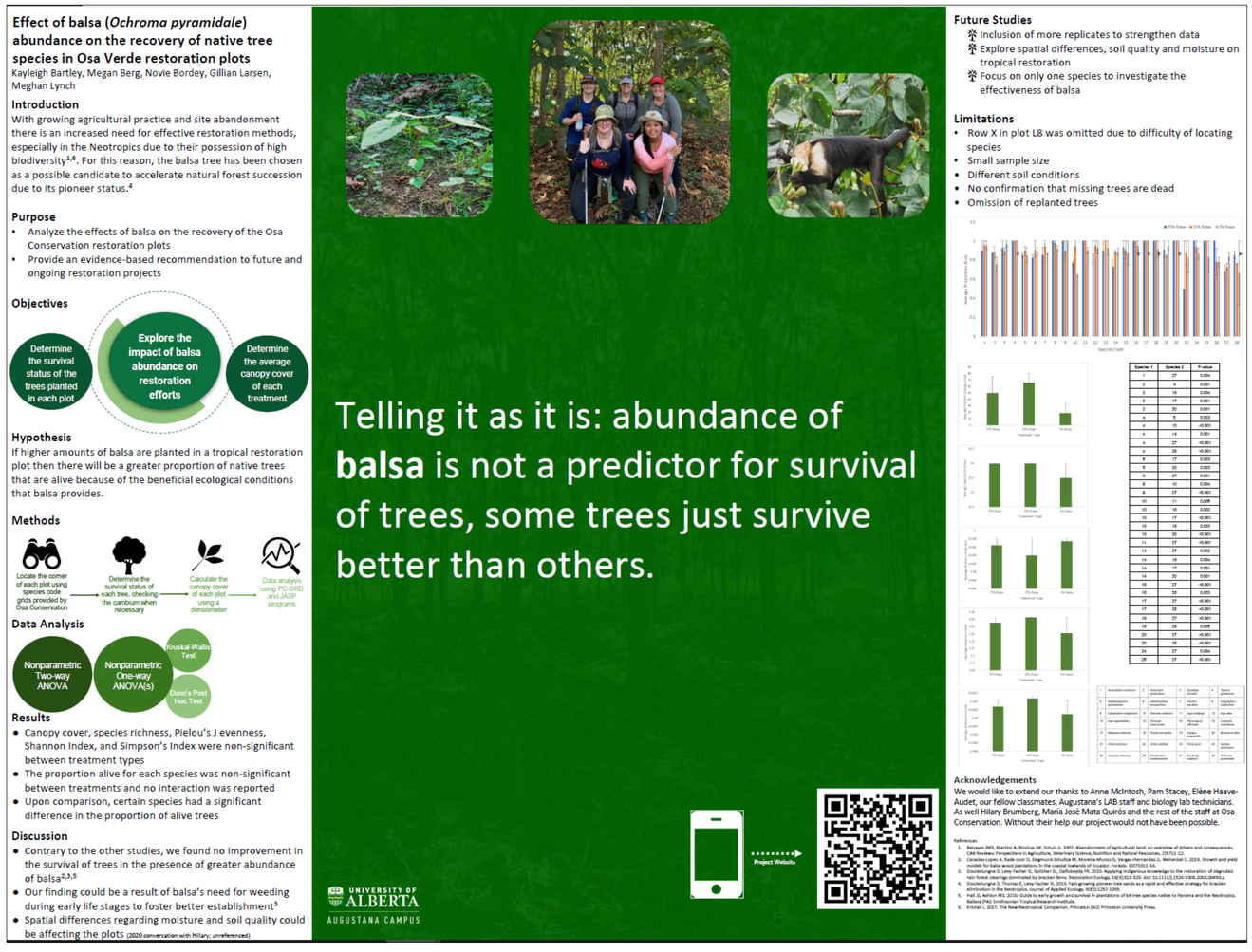

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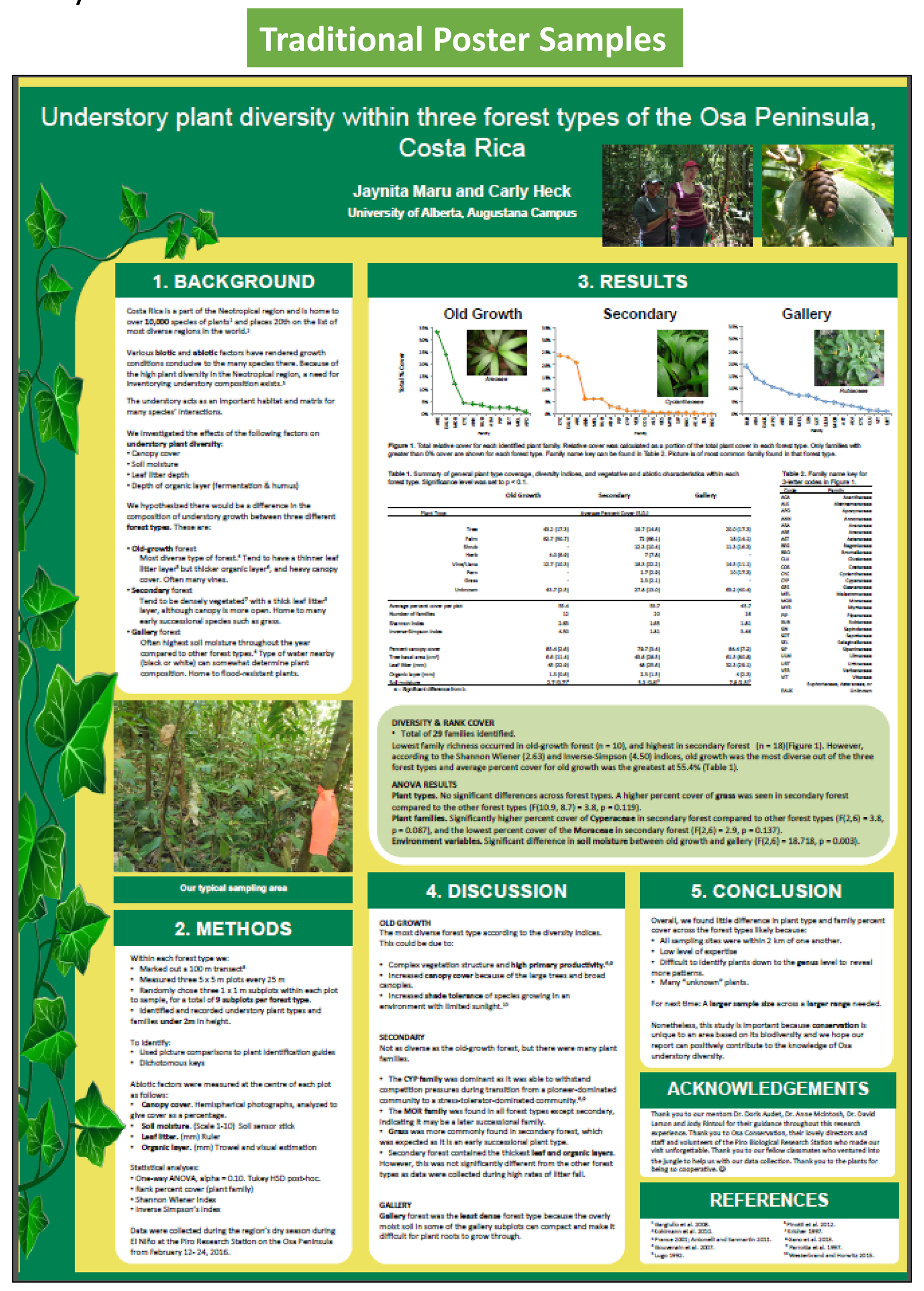
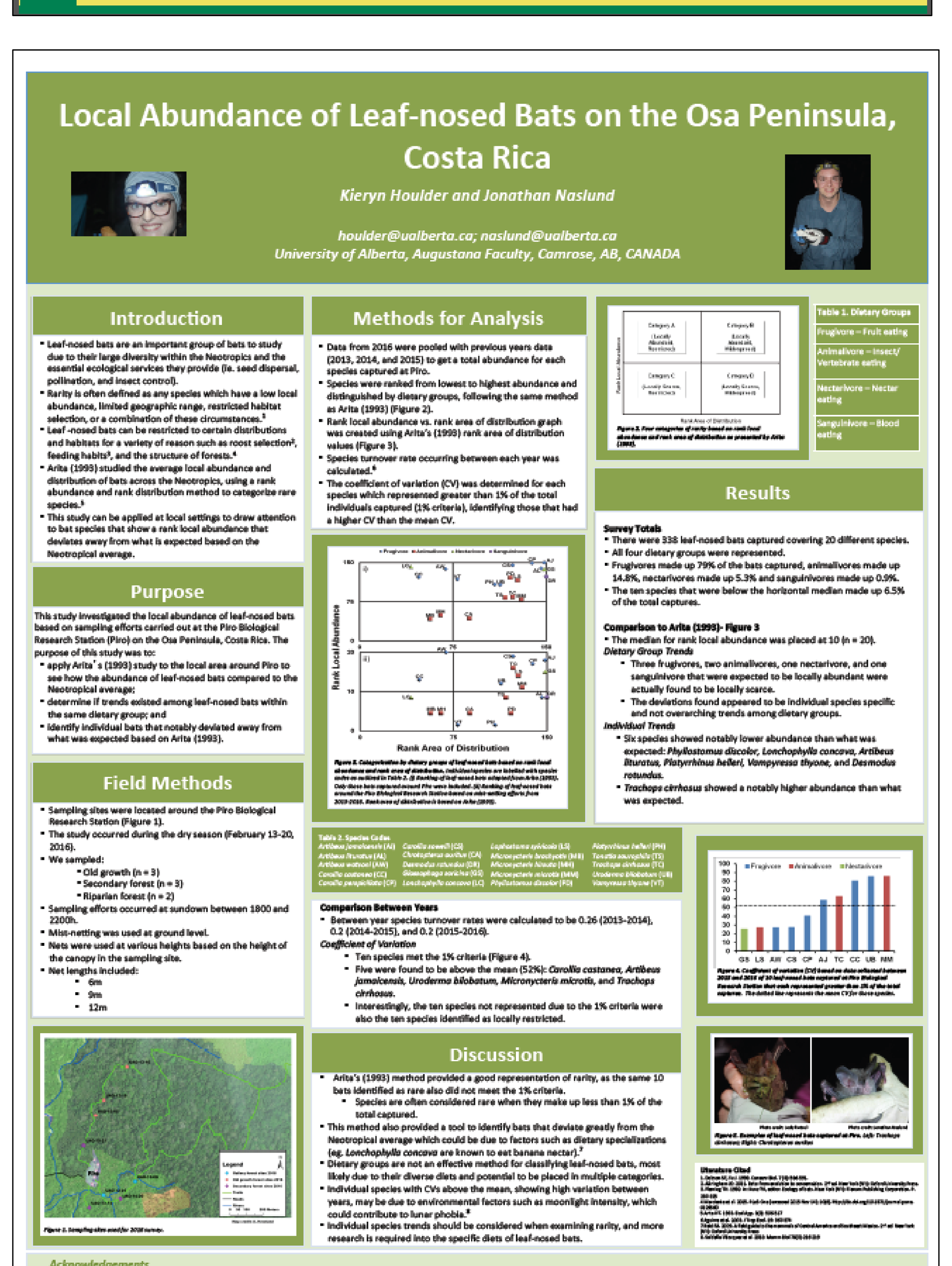
Traditional Poster Samples



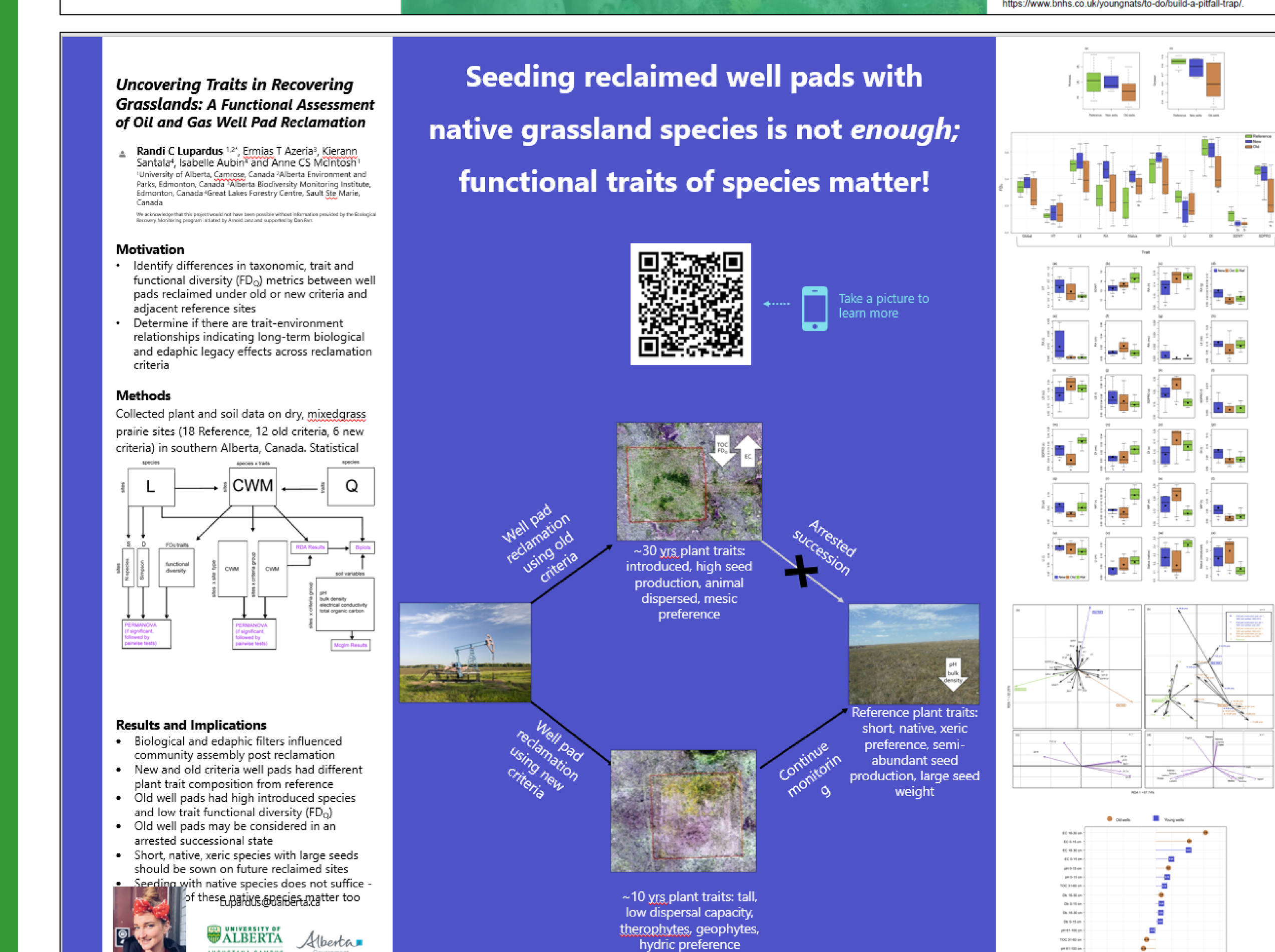


GOOD-BYE WALL OF TEXT!

Read this layout section and get the main take-home message!

Click here to access more detailed information

Sample Unpostered Posters



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 unpostered templates can be found here: https://osf.io/ef53g/
- Purrington's Advice on designing scientific posters available at http://www.swarthmore.edu/NatSci/cpurrin1/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 'Unpostered' posters.