# INTRODUCTION

- **Tree resource abundance influences diversity and population size of organisms dependent on resources.**
- **This study looked at which tree parameters best estimate resource abundance for five tree species.**

**Tree species investigated:**

- *Acacia caffra* (AC)
- *Combretum apiculatum* (CA)
- *Dichrostachys cinerea* (DC)
- *Protea caffra* (PC)
- *Ziziphus mucronata* (ZM)

**Parameters investigated:**

- Height of first leaves (HFL)
- Diameter at height of first leaves (DHFL)
- Height of maximum canopy diameter (HMCD)
- Maximum canopy diameter (MCD)
- Overall tree height (TH).

# METHODS

- **Trees randomly selected (n=126).**
- **Two height classes 1 - 3m & > 3m**
- **No trees < 1m (inconsistent growth patterns).**
- **Monthly resource counts in $1m^3$ on each tree.**
- **Zero-Inflated Poisson regression models (n=75).**
- **Resources:**

Pods/fruits.

Leaves.

Flowers.

# RESULTS

**Table 1.** *Zero-inflated Poisson regression results showing tree parameters that have the largest effect on resource abundance for the tree species sampled.*

| Species | Resource item (RI) | Parameter/Response (P/R) that best estimates an increase in (RI) * | Expected log-count increase per parameter unit increase | Std. error | Confidence interval | P |
|---|---|---|---|---|---|---|
| AC | Flowers | DHFL | 5.98 | 1.88 | 2.29:9.67 | 0.002 |
|  | Fruits | TH | 0.41 | 0.13 | 0.16:0.66 | 0.001 |
|  | Leaves | DHFL | 0.32 | 0.04 | 0.23:0.40 | < 0.001 |
| CA | Flowers | DHFL | 1.27 | 0.32 | 0.65:1.89 | < 0.001 |
|  | Fruits | DHFL | 2.61 | 0.44 | 1.75:3.47 | < 0.001 |
|  | Leaves | DHFL | 0.73 | 0.05 | 0.64:0.83 | < 0.001 |
| DC | Flowers | DHFL | 1.67 | 0.58 | 0.53:2.81 | < 0.001 |
|  | Fruits | MCD | 0.60 | 0.34 | -0.07:1.27 | 0.078 |
|  | Leaves | DHFL | 0.88 | 0.15 | 0.58:1.18 | < 0.001 |
| PC | Flowers | TH | 4.63 | 1.85 | 1.01:8.26 | 0.012 |
|  | Fruits | HFL | * | * | * | * |
|  | Leaves | DHFL | 0.55 | 0.07 | 0.42:0.68 | < 0.001 |
| ZM | Flowers | MCD | 0.16 | 0.10 | -0.05:0.36 | 0.129 |
|  | Fruits | HMCD | 2.10 | 0.17 | 1.76:2.43 | < 0.001 |
|  | Leaves | MCD | 0.13 | 0.01 | 0.11:0.15 | < 0.001 |

\* = NA – no fruits observed

- **According to the first data row in the table, for each unit increase in DHFL for AC, the expected log count of flowers increases by 5.98 ($\beta$=5.978, *CI*[2.29:9.67], *P*=0.002)…**

# DISCUSSION

- **DHFL - influenced <u>eight</u> out of 15 resource items for the five tree species selected.**
- **MCD - influenced <u>three</u> out of 15 resource items.**
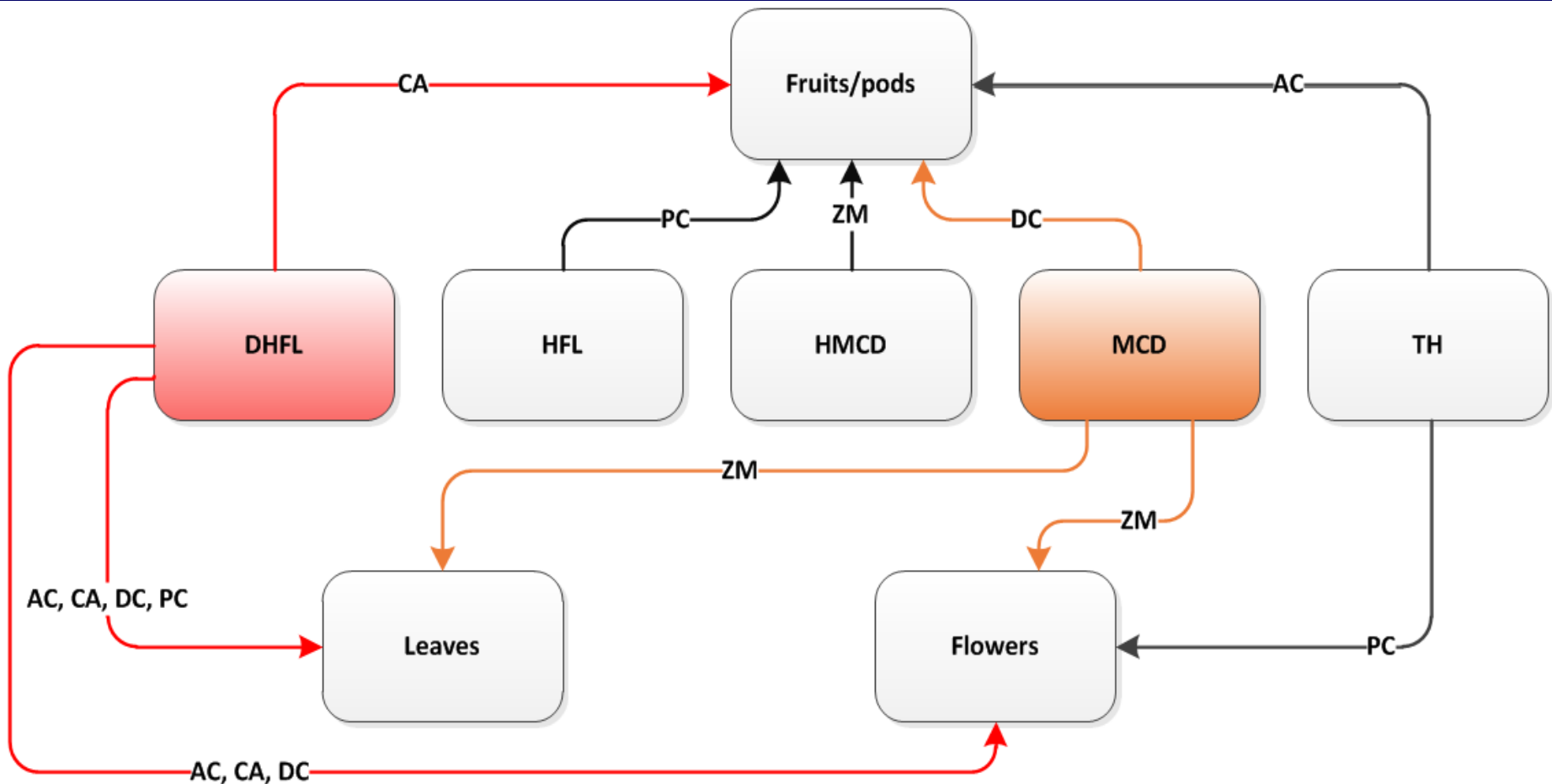
# CONCLUSION

- **DHFL = largest coefficient for estimating change in numbers of leaves and flowers for five species investigated.**
- **No predominant parameter for estimating change in numbers of fruit.**

# RECOMMENDATIONS

- **Increase sample size to a min of n=30 per species sampled.**
- **Test interactions between parameters using GLM's to see if a combination of parameters has a more noticeable influence on resources compared to single parameters.**

**Thank you!**