G06.000-vegetation-survey-field-trip-report.R

justin.mccann

2024-01-19

# Title: G06.000 vegetation survey field trip report  
# Author details: Justin McCann  
# Script and data info: This script loads, pre-processes, and visualises data for the vegetation survey group of methods  
# Data obtained from Sharepoint exports out of Echo

list datasets

All data

all.echo.data %>% select(sessionID, method\_code) %>% group\_by(sessionID) %>% distinct(method\_code) %>% arrange(sessionID) %>% print\_as\_table\_for\_word()

| sessionID | method\_code |
| --- | --- |
| 2007\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2008\_Spring |
| 2009\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| 2010\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2011\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2011\_Summer | m06\_050\_recruitment |
| 2015\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2016\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_050\_recruitment |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2016\_Summer | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2020\_Summer | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2022\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_071\_tree\_health\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2022\_Summer | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_071\_tree\_health\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2023\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_071\_tree\_health\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |

This session

session.data %>% select(sessionID, method\_code) %>% group\_by(sessionID) %>% distinct(method\_code) %>% arrange(sessionID) %>% print\_as\_table\_for\_word()

| sessionID | method\_code |
| --- | --- |
| 2022\_Spring | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_071\_tree\_health\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |
| 2022\_Summer | m04\_020\_soil\_surface\_quadrat |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_071\_tree\_health\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |

check all transect lengths

session.data %>%   
 group\_by(method\_code) %>%  
 distinct(length\_m) %>%   
 print\_as\_table\_for\_word()

| method\_code | length\_m |
| --- | --- |
| m04\_020\_soil\_surface\_quadrat | 50 |
| m06\_040\_photo\_points |
| m06\_050\_recruitment |
| m06\_071\_tree\_health\_quadrat |
| m06\_080\_vegetation\_quadrat\_species |
| m06\_090\_vegetation\_intercept |

# Make a field trip summary ####

Summary variables

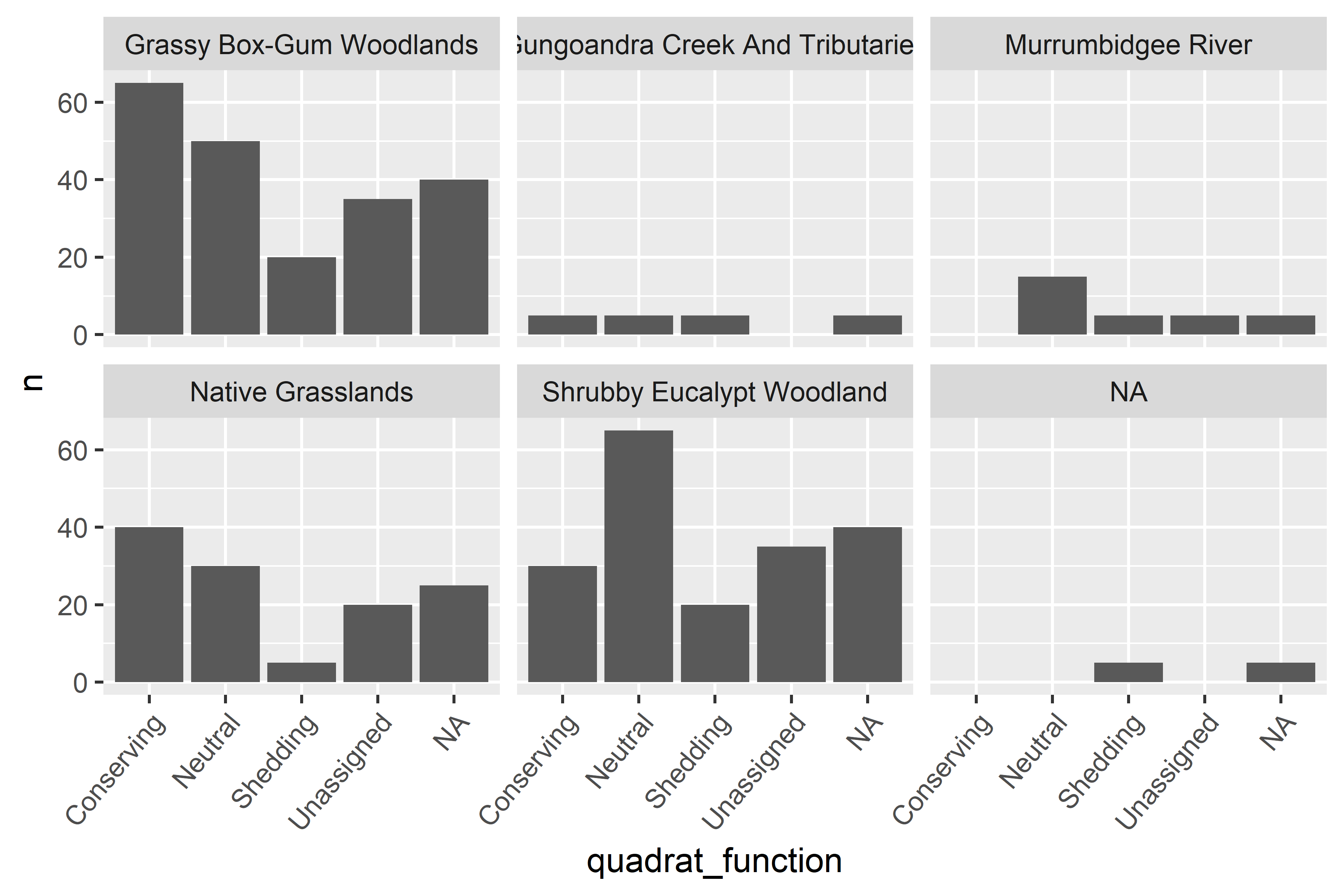
## The c("2022\_Summer", "2022\_Spring") vegetation monitoring session at Scottsdale Reserve ran from 2022-11-14 to 2022-12-14

## We undertook a total of 6 vegetation survey methods during this time, at 22 sites

## The vegetation survey methods used were c("m04\_020\_soil\_surface\_quadrat", "m06\_040\_photo\_points", "m06\_050\_recruitment", "m06\_071\_tree\_health\_quadrat", "m06\_080\_vegetation\_quadrat\_species", "m06\_090\_vegetation\_intercept")

Soil surface summary ##### Count of quadrat function grouped by target

m04\_020\_soil\_surface\_quadrat\_analysis\_join\_parent\_child %>%   
 group\_by(site\_target\_name) %>%   
 count(quadrat\_function) %>%   
 ggplot(aes(x = quadrat\_function, y = n)) +  
 facet\_wrap(~site\_target\_name) +  
 geom\_col() +  
 theme(axis.text.x = element\_text(angle = 50, hjust = 1, vjust = 1))

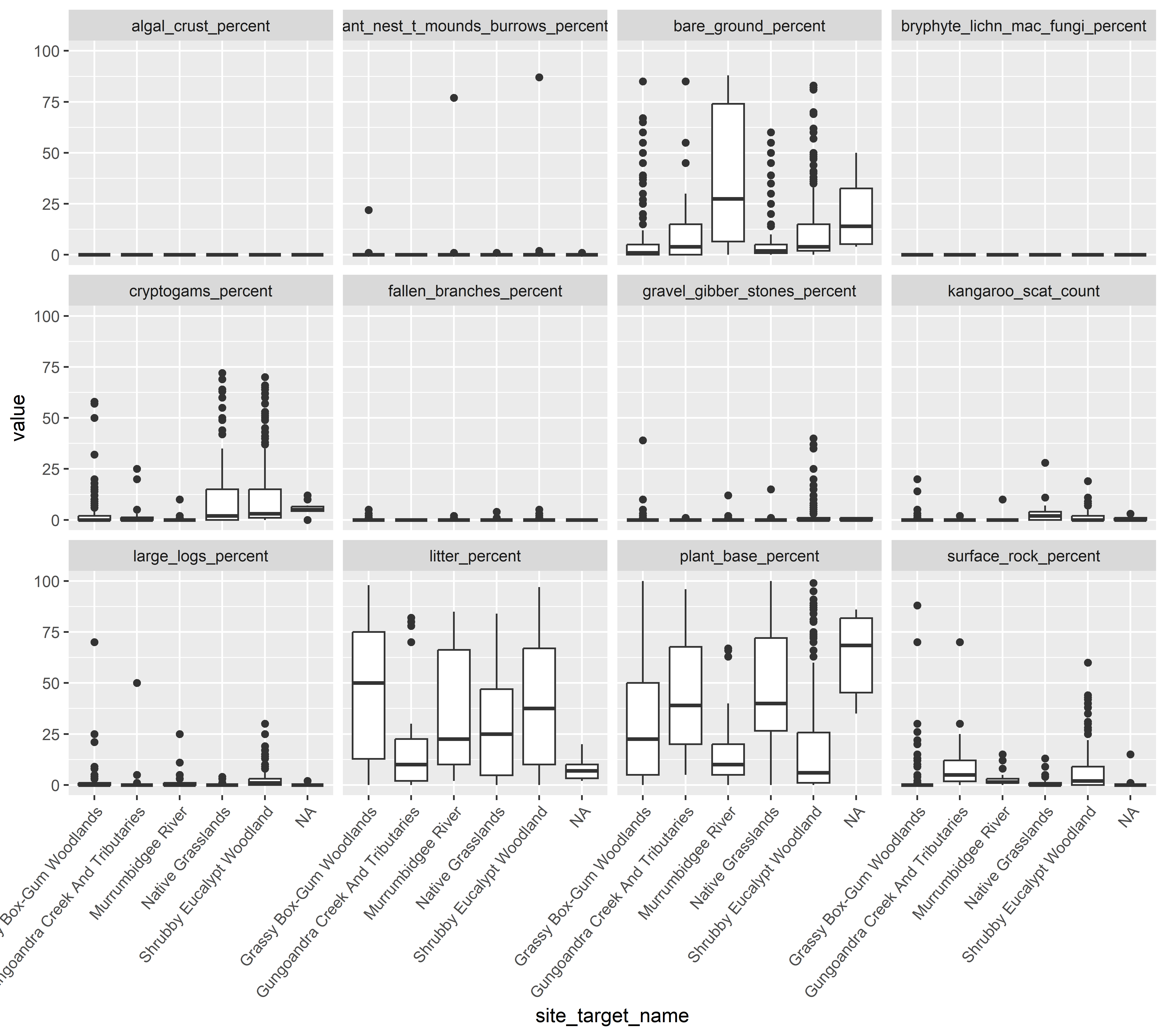


boxplots of soil data

Standard soil metrics

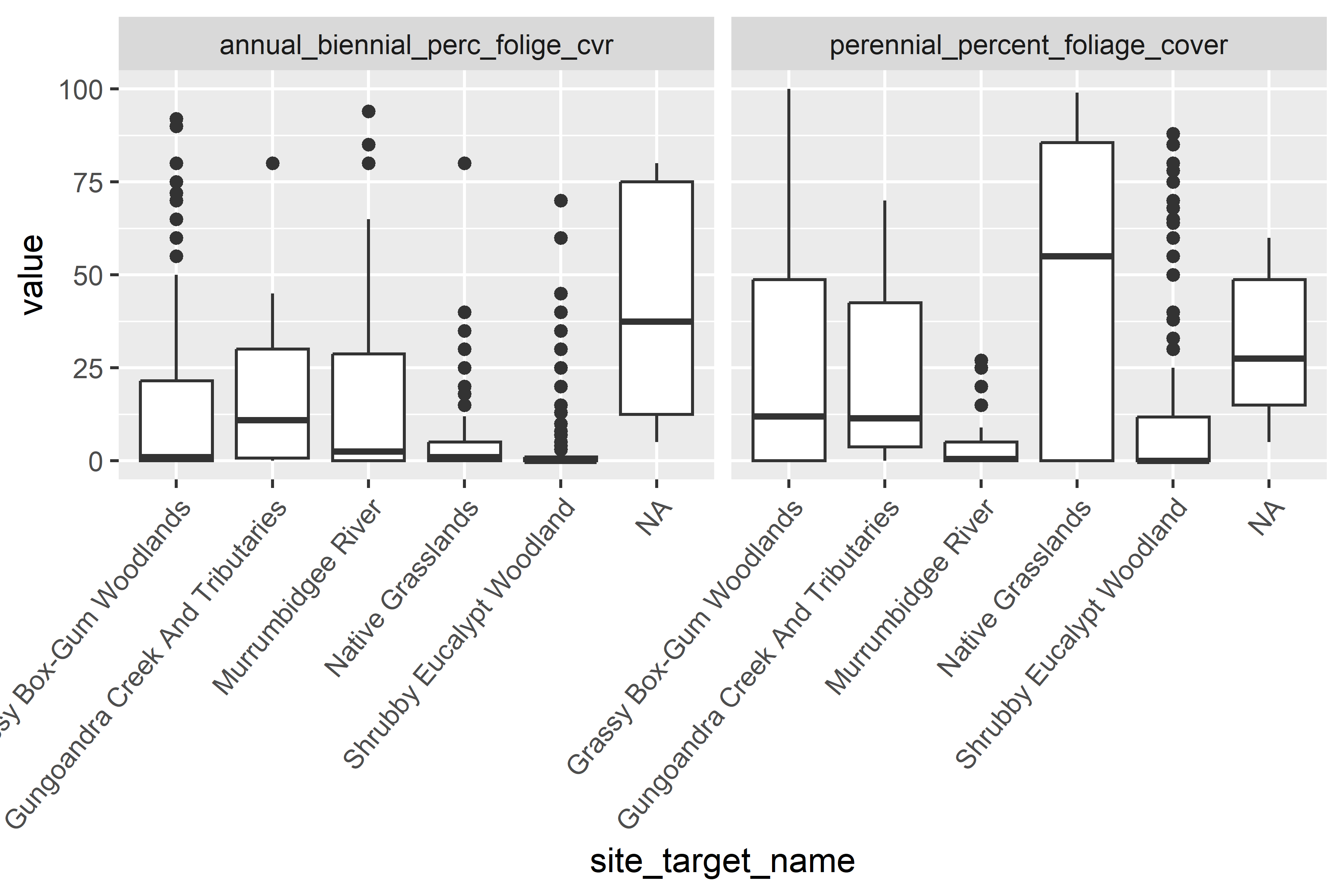
soil\_surface\_data\_for\_plot %>%   
 filter(!str\_detect(name, groups\_2\_3)) %>%   
 veg\_plot()

## Warning: Removed 1380 rows containing non-finite values (`stat\_boxplot()`).



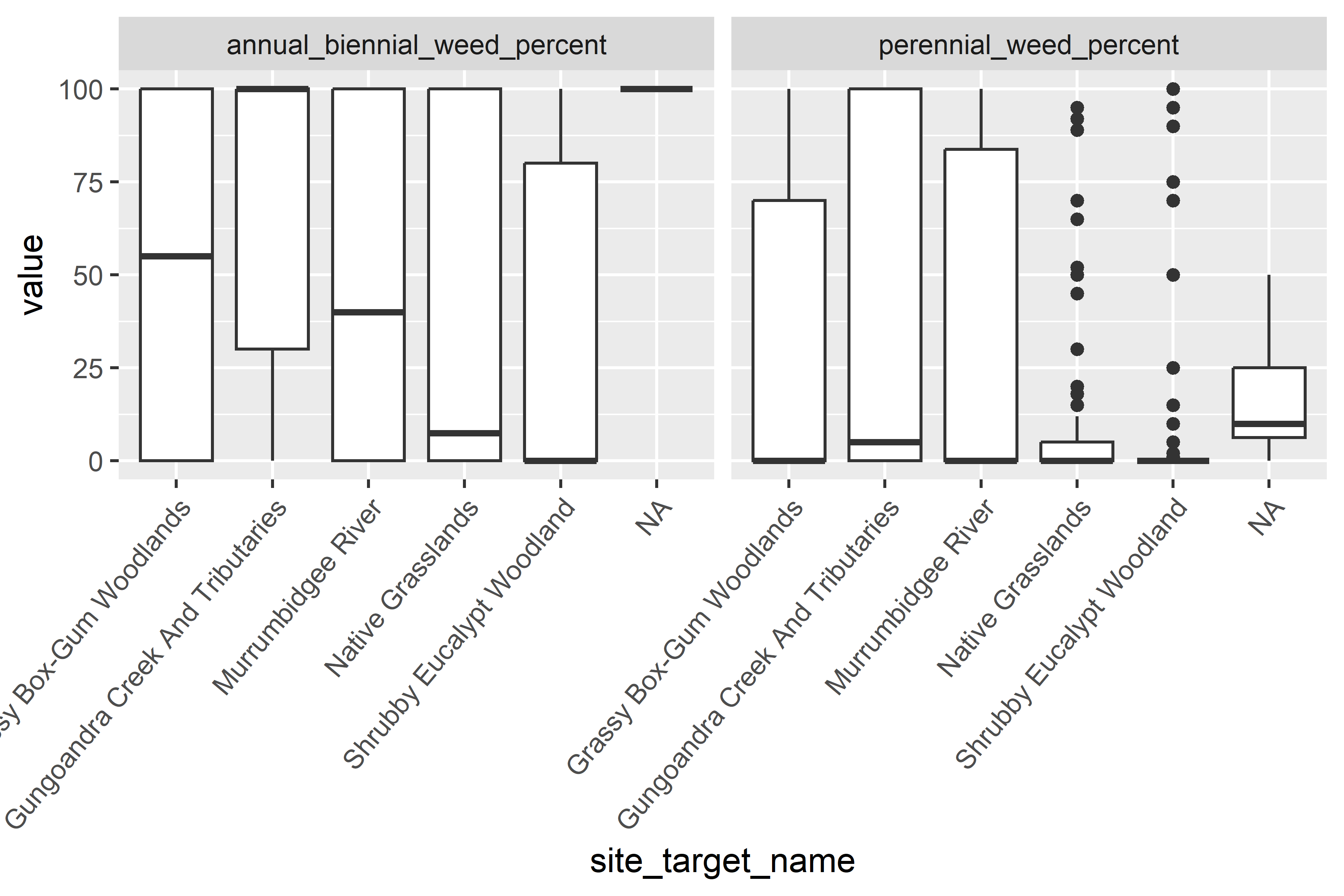
Cover life history

soil\_surface\_data\_for\_plot %>%   
 filter(str\_detect(name, groups\_2\_3),  
 !str\_detect(name, group\_3)) %>%   
 veg\_plot()



Cover weediness

soil\_surface\_data\_for\_plot %>%   
 filter(str\_detect(name, groups\_2\_3),  
 str\_detect(name, group\_3)) %>%   
 veg\_plot()



Recruitment species list - Count of species grouped by site

Below is a table of recruitment observed at each site

| site\_target\_name | site\_id | scientific\_name | english\_name | n |
| --- | --- | --- | --- | --- |
| Gungoandra Creek And Tributaries | SCT018 | Bursaria spinosa | Sweet Bursaria | 1 |
| Native Grasslands | SCT020 | Callitris endlicheri |  |
| Eucalyptus bridgesiana | Apple Gum, Apple Box (ex E. saxicola) |
| Shrubby Eucalypt Woodland | SCT003 | Callitris endlicheri |  |
| Cassinia longifolia | Shiny Cassinia, Dogwood, Cauliflower Bush |
| Cassinia quinquefaria |  |
| Eucalyptus bridgesiana | Apple Gum, Apple Box (ex E. saxicola) |
| Eucalyptus rossii | Scribbly gum |
| Kunzea ericoides | Burgan |
| SCT004 | Cassinia longifolia | Shiny Cassinia, Dogwood, Cauliflower Bush |
| SCT005 | Callitris endlicheri |  |
| Cassinia longifolia | Shiny Cassinia, Dogwood, Cauliflower Bush |
| SCT006 |
| Eucalyptus bridgesiana | Apple Gum, Apple Box (ex E. saxicola) |
| Lissanthe strigosa subsp. subulata | Peach Heath |
| Pultenaea procumbens | Healthy bush-pea |
| SCT007 | Acacia doratoxylon | Currawang |
| SCT008 | Bursaria spinosa | Sweet Bursaria |
| Callitris endlicheri |  |
| Eucalyptus bridgesiana | Apple Gum, Apple Box (ex E. saxicola) |
| SCT014 | Callitris endlicheri |  |
| Cassinia quinquefaria |
| SCT030 | Done by FOG volunteers - on paper |

The following sites have no species listed, and are assumed to have no recruitment.

session.data.na <- session.data %>%  
 filter(str\_detect(method\_code, "m06\_050\_recruitment")) %>%   
 filter(is.na(scientific\_name)) %>% # assess records without a species record  
 group\_by(site\_target\_name, site\_id) %>%  
 relocate(site\_target\_name) %>%   
 distinct(observation\_status)

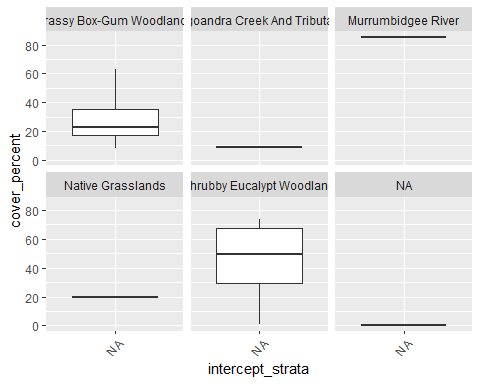
| site\_target\_name | site\_id | observation\_status |
| --- | --- | --- |
| Grassy Box-Gum Woodlands | SCT001 | Observation recorded |
| Native Grasslands | SCT002 |
| Grassy Box-Gum Woodlands | SCT009 |
| SCT010 |
| SCT012 |
| Native Grasslands | SCT015 |
| Murrumbidgee River | SCT017 |
| Native Grasslands | SCT019 |

The following is an analysis of vegetation transects: Richness (total number of species across all sites)

| site\_target\_name | Count of species scientific names (richness) |
| --- | --- |
| Grassy Box-Gum Woodlands | 4 |
| Gungoandra Creek And Tributaries | 3 |
| Murrumbidgee River | 6 |
| Native Grasslands | 3 |
| Shrubby Eucalypt Woodland | 21 |
|  | 2 |

Cover per site (not accounting for overlap)

| site\_target\_name | intercept\_strata | site\_id | sum\_of\_cover | cover\_percent |
| --- | --- | --- | --- | --- |
| Grassy Box-Gum Woodlands |  | SCT009 | 4.29 | 8.58 |
| SCT011 | 31.39 | 62.78 |
| SCT012 | 13.10 | 26.20 |
| SCT013 | 9.90 | 19.80 |
| Gungoandra Creek And Tributaries | SCT018 | 4.36 | 8.72 |
| Murrumbidgee River | SCT017 | 42.56 | 85.12 |
| Native Grasslands | SCT020 | 9.82 | 19.64 |
| Shrubby Eucalypt Woodland | SCT003 | 16.58 | 33.16 |
| SCT004 | 0.50 | 1.00 |
| SCT005 | 26.40 | 52.80 |
| SCT006 | 37.01 | 74.02 |
| SCT007 | 34.29 | 68.58 |
| SCT008 | 23.31 | 46.62 |
| SCT014 | 8.90 | 17.80 |
| SCT030 | 33.78 | 67.56 |
|  | Other | 0.32 | 0.64 |



Average cover per target

| site\_target\_name | intercept\_strata | mean\_percent |
| --- | --- | --- |
| Grassy Box-Gum Woodlands |  | 29 |
| Gungoandra Creek And Tributaries | 9 |
| Murrumbidgee River | 85 |
| Native Grasslands | 20 |
| Shrubby Eucalypt Woodland | 45 |
|  | 1 |

mean height

session.data %>%  
 filter(str\_detect(method\_code, "m06\_090")) %>%   
 # remove\_empty(which = "cols") %>% # Scottsdale data did not record intercept\_strata  
 group\_by(site\_target\_name, intercept\_strata) %>%   
 summarise(min\_height = round(min(height)),  
 mean\_height = round(mean(height)),  
 max\_height = round(max(height))) %>%   
 print\_as\_table\_for\_word()

## `summarise()` has grouped output by 'site\_target\_name'. You can override using  
## the `.groups` argument.

| site\_target\_name | intercept\_strata | min\_height | mean\_height | max\_height |
| --- | --- | --- | --- | --- |
| Grassy Box-Gum Woodlands |  | 1 | 12 | 18 |
| Gungoandra Creek And Tributaries | 3 | 4 |
| Murrumbidgee River | 15 |
| Native Grasslands | 0 | 5 | 12 |
| Shrubby Eucalypt Woodland | 3 | 15 |
|  | 0 | 0 |

Species diversity table all veg methods ##### Number of unique species names grouped by method and target

| method\_code | site\_target\_name | n |
| --- | --- | --- |
| m06\_040\_photo\_points | Grassy Box-Gum Woodlands | 1 |
| Gungoandra Creek And Tributaries |
| Murrumbidgee River |
| Native Grasslands |
| Shrubby Eucalypt Woodland |
|  |
| m06\_050\_recruitment | Grassy Box-Gum Woodlands |
| Gungoandra Creek And Tributaries |
| Murrumbidgee River |
| Native Grasslands | 3 |
| Shrubby Eucalypt Woodland | 11 |
| m06\_071\_tree\_health\_quadrat | Grassy Box-Gum Woodlands | 3 |
| Murrumbidgee River | 2 |
| Native Grasslands | 1 |
| Shrubby Eucalypt Woodland | 7 |
| m06\_080\_vegetation\_quadrat\_species | Grassy Box-Gum Woodlands | 82 |
| Gungoandra Creek And Tributaries | 38 |
| Murrumbidgee River | 28 |
| Native Grasslands | 77 |
| Shrubby Eucalypt Woodland | 114 |
|  | 31 |
| m06\_090\_vegetation\_intercept | Grassy Box-Gum Woodlands | 4 |
| Gungoandra Creek And Tributaries | 3 |
| Murrumbidgee River | 6 |
| Native Grasslands | 3 |
| Shrubby Eucalypt Woodland | 21 |
|  | 2 |

Number of unique species names grouped by method and target for all years

species\_count\_veg\_methods\_all\_echo\_data %>%   
 ggplot(aes(x = survey\_year, y = unique\_species, colour = method\_code)) +  
 geom\_line() +  
 geom\_point() +  
 facet\_wrap(~ site\_target\_name) +  
 theme\_bw() +  
 theme(legend.position = "bottom") +  
 guides(colour = guide\_legend(nrow = 3))

