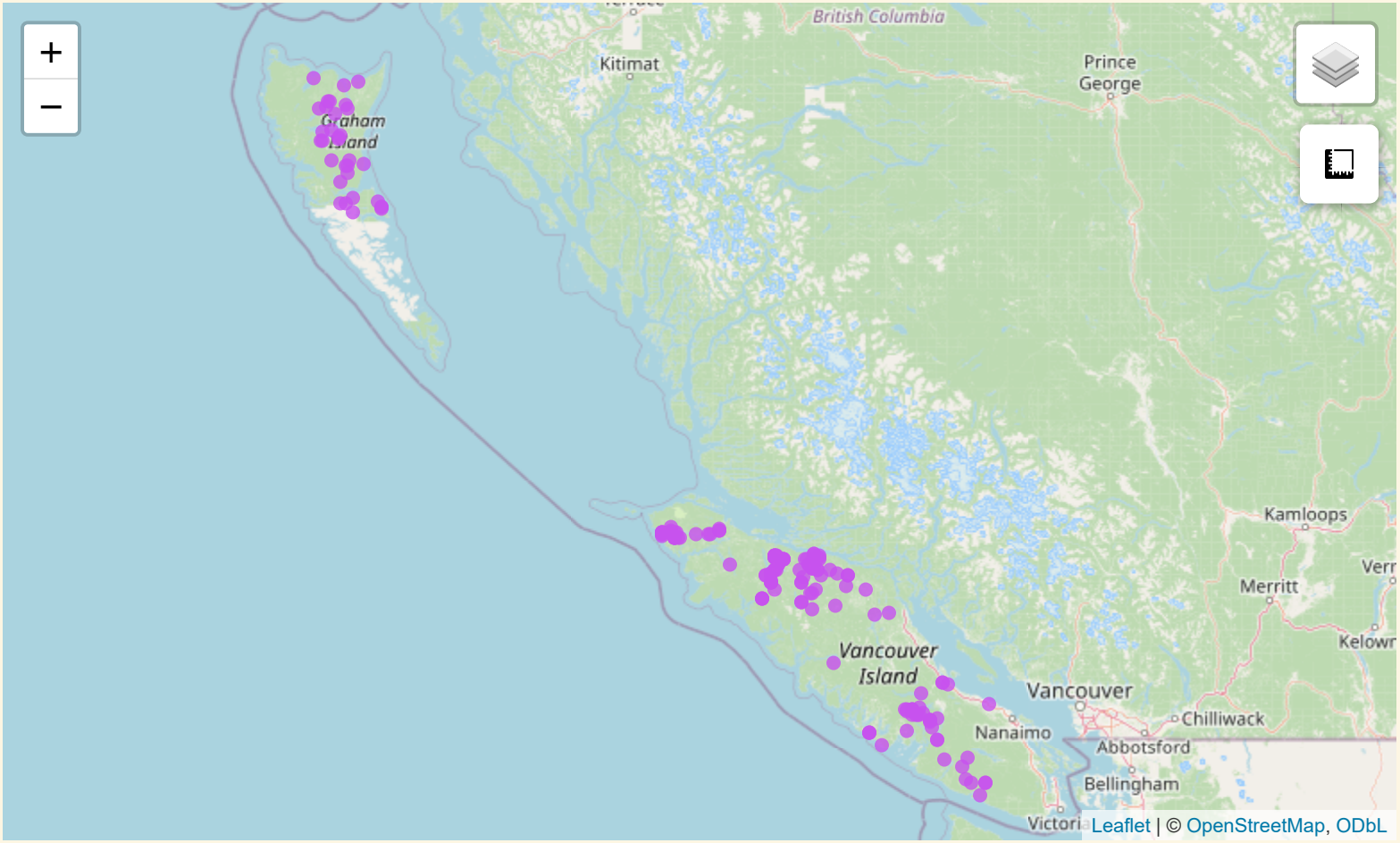
Bear Den Data Summary

2024-12-03

There are currently **172** dens being tracked, and a total of **526** field visits completed to date (**2024-12-03**).



Use the menus on the top-right to change the basemap or perform measurements.

Explore categorical variables

District

```
knitr::kable(table(dens$district), col.names = c("District", "N"))
```

District	N
Campbell River	38
Haida Gwaii	33
North Island and Central Coast	64
South Island	37

Explore categorical variables

Den Tree Species

```
knitr::kable(table(dens$den_tree_species), col.names = c("Den Tree Spec
```

Den Tree Species	N
Cw	99
Fd	3
Hm	3
Hw	16
Ss	5
Yc	38

Explore categorical variables

Proportion by tree species

```
trees <- table(dens$den_tree_species)
(trees/sum(trees))*100
```

```
##
##         Cw         Fd         Hm         Hw         Ss         Yc
## 60.365854  1.829268  1.829268  9.756098  3.048780 23.170732
```

Explore categorical variables

Den Type

```
knitr::kable(table(dens$den_type), col.names = c("Den Type", "N"))
```

Den Type	N
hollow stump	8
hollow tree, arboreal entrance	39
hollow tree, ground entrance	107
log (hollow or under in comments)	6
other including artificial (type in comments)	3
root bole, downed tree	1
root bole/root wad	3
root structure, standing tree, standing tree	1

Explore categorical variables

Age Class

```
knitr::kable(table(dens$age_class), col.names = c("Age Class", "N"))
```

Age Class	N
1: 0-20	24
3: 41-60	6
4: 61-80	7
6: 101-120	2
7: 121-140	9
8: 141-250	11
9: >250	87
Unknown	8

Explore categorical variables

Den State (initial visit)

```
knitr::kable(table(dens$den_state), col.names = c("Den State", "N"))
```

Den State	N
Altered (unsure if obsolete)	2
Confirmed (functional den)	117
Obsolete (no longer functional)	9
Unsure (needs more monitoring)	36

Den Status

Rates of Re-Use

Den Status	N
Active in last denning season	48
Active recently (0-4 seasons)	11
Active recently (0-4 years)	67
Currently Active	1
Defunct	1
No evidence of use at all, suitable structure	2
No recent evidence of use (>4 seasons)	15
No recent evidence of use (>4 years)	54
Not a suitable den structure	2
Not active in last season	79
Not active in last season, no recent use (>4 Seasons)	34
Not active last year, but active recently (1-4 years ago)	21
Not active last year, nor recently (>4 years)	43
Not Not active in last season, but recent use (1-4 Seasons)active in last season, but recent use (1-4 Seasons)	65
Unknown	81

"Active"

Den Status	N
Active in last denning season	**48**
Active recently (0-4 seasons)	**11**
Active recently (0-4 years)	**67**
Currently Active	**1**
Defunct	1
No evidence of use at all, suitable structure	2
No recent evidence of use (>4 seasons)	15
No recent evidence of use (>4 years)	54
Not a suitable den structure	2
Not active in last season	79
Not active in last season, no recent use (>4 Seasons)	34
Not active last year, but active recently (1-4 years ago)	21
Not active last year, nor recently (>4 years)	43
Not Not active in last season, but recent use (1-4 Seasons)active in last season, but recent use (1-4 Seasons)	65
Unknown	81

"Non-Active"

Den Status	N
Active in last denning season	48
Active recently (0-4 seasons)	11
Active recently (0-4 years)	67
Currently Active	1
Defunct	**1**
No evidence of use at all, suitable structure	**2**
No recent evidence of use (>4 seasons)	**15**
No recent evidence of use (>4 years)	**54**
Not a suitable den structure	**2**
Not active in last season	**79**
Not active in last season, no recent use (>4 Seasons)	**34**
Not active last year, but active recently (1-4 years ago)	**21**
Not active last year, nor recently (>4 years)	**43**
Not Not active in last season, but recent use (1-4 Seasons)active in last season, but recent use (1-4 Seasons)	**65**
Unknown	81

"Unknown"

Den Status	N
Active in last denning season	48
Active recently (0-4 seasons)	11
Active recently (0-4 years)	67
Currently Active	1
Defunct	1
No evidence of use at all, suitable structure	2
No recent evidence of use (>4 seasons)	15
No recent evidence of use (>4 years)	54
Not a suitable den structure	2
Not active in last season	79
Not active in last season, no recent use (>4 Seasons)	34
Not active last year, but active recently (1-4 years ago)	21
Not active last year, nor recently (>4 years)	43
Not Not active in last season, but recent use (1-4 Seasons)active in last season, but recent use (1-4 Seasons)	65
Unknown	**81**

Rates of re-use

First need to categorize dens into `Active`, `Not Active`, or `Unknown`. Based on the highlighted rows in the tables of the previous slides, we have:

```
f$active_yn <- dplyr::case_when(f$den_status %in% c("Active in last denn
                                f$den_status == "Unknown" ~ "Unknown",
                                TRUE ~ "Not Active")
plyr::count(f$active_yn) |>
  knitr::kable(col.names = c("Den Status", "N"))
```

Den Status	N
Active	127
Not Active	318
Unknown	81

Total number of visits = **526**

Rates of re-use

First need to categorize dens into `Active`, `Not Active`, or `Unknown`. Based on the highlighted rows in the tables of the previous slides, we have:

```
f$active_yn <- dplyr::case_when(f$den_status %in% c("Active in last denn
                                f$den_status == "Unknown" ~ "Unknown",
                                TRUE ~ "Not Active")
plyr::count(f$active_yn) |>
  dplyr::mutate(freq = round(freq/nrow(f) * 100)) |>
  knitr::kable(col.names = c("Den Status", "%"))
```

Den Status	%
Active	24
Not Active	60
Unknown	15

Total number of visits = **526**

Rates of re-use

For now, I'm counting `Unknowns` the same as `Not Active`.

This is a quick and dirty assignment of 're-use' - it doesn't take into account if there's been a large temporal gap (e.g., years) between visits.

```
# Arrange table by den_id and date_inspected
f <- f[order(f$den_id, f$date_inspected),]
# Add in a cumulative visit col by each den - i.e. the Nth field visit
f <- f |>
  dplyr::group_by(den_id) |>
  dplyr::mutate(cumulative_visit = cumsum(!is.na(den_id)))
# Create `reuse_yn` col
f <- f |>
  dplyr::group_by(den_id) |>
  dplyr::mutate(reuse_yn = ifelse(cumulative_visit == 1,
                                  # If it's the first visit to the den,
                                  NA,
                                  # Else if it's NOT the first visit, a
                                  (dplyr::lag(active_yn) == "Active" & a
                  )
```

Rates of re-use

Show 8 entries Search:

	den_id	sample_id	date_inspected	cumulative_visit	active_yn	reuse_yn
1	ADA_EveRiver_1	ADA_EveRiver_1_20201001	2020-10-01T07:00:00Z	1	Not Active	
2	ADA_EveRiver_1	ADA_EveRiver_1_20210916	2021-09-17T01:26:57Z	2	Not Active	false
3	ADA_EveRiver_1	ADA_EveRiver_1_20220922	2022-09-23T03:00:02Z	3	Not Active	false
4	ADA_EveRiver_1	ADA_EveRiver_1_20230829	2023-08-30T04:21:08Z	4	Not Active	false
5	ADA_EveRiver_1	ADA_EveRiver_1_20240816	2024-08-17T03:53:12Z	5	Not Active	false
6	ADA_EveRiver_1	ADA_EveRiver_1_20240816	2024-08-17T03:53:12Z	6	Not Active	false
7	ADA_EveRiver_2	ADA_EveRiver_2_20161102	2016-11-02T07:00:00Z	1	Not Active	
8	ADA_EveRiver_2	ADA_EveRiver_2_20201001	2020-10-01T07:00:00Z	2	Not Active	false

Showing 1 to 8 of 526 entries

Previous 1 2 3 4 5 ... 66 Next

Rates of re-use

Count of re-use

```
knitr::kable(plyr::count(f$reuse_yn), col.names = c("Re-Used (T/F)", "N"
```

Re-Used (T/F)	N
FALSE	324
TRUE	34
NA	168

Note that `NA` signifies the first visit to a den - we don't know if `reuse_yn == TRUE` or `FALSE` bc it's the first visit

Rates of re-use

Percent of re-use

```
knitr::kable(plyr::count(f$reuse_yn) |> dplyr::mutate(freq = round(freq/
```

Re-Used (T/F)	%
FALSE	62
TRUE	6
NA	32

Note that `NA` signifies the first visit to a den - we don't know if `reuse_yn == TRUE` or `FALSE` bc it's the first visit

Rates of re-use

ADA_EveRiver_1

den_id	sample_id	date_inspected	cumulative_visit	active_yn	reuse_yn
ADA_EveRiver_1	ADA_EveRiver_1_20201001	2020-10-01 00:00:00	1	Not Active	NA
ADA_EveRiver_1	ADA_EveRiver_1_20210916	2021-09-16 18:26:57	2	Not Active	FALSE
ADA_EveRiver_1	ADA_EveRiver_1_20220922	2022-09-22 20:00:02	3	Not Active	FALSE
ADA_EveRiver_1	ADA_EveRiver_1_20230829	2023-08-29 21:21:08	4	Not Active	FALSE
ADA_EveRiver_1	ADA_EveRiver_1_20240816	2024-08-16 20:53:12	5	Not Active	FALSE
ADA_EveRiver_1	ADA_EveRiver_1_20240816	2024-08-16 20:53:12	6	Not Active	FALSE

Rates of re-use

COU_CousCreek_2

den_id	sample_id	date_inspected	cumulative_visit	active_yn	reuse_yn
COU_CousCreek_2	COU_CousCreek_2_20170912	2017-09-12 00:00:00	1	Active	NA
COU_CousCreek_2	COU_CousCreek_2_20200929	2020-09-29 00:00:00	2	Active	TRUE
COU_CousCreek_2	COU_CousCreek_2_20210901	2021-09-01 18:54:03	3	Not Active	FALSE
COU_CousCreek_2	COU_CousCreek_2_20220901	2022-09-01 17:48:04	4	Active	FALSE
COU_CousCreek_2	COU_CousCreek_2_20230905	2023-09-05 21:11:11	5	Not Active	FALSE

Rates of re-use

LOW_FlorenceCreek_1

den_id	sample_id	date_inspected	cumulative_visit	active_yn	reuse_yn
LOW_FlorenceCreek_1	LOW_FlorenceCreek_1_20220907	2022-09-07 18:02:42	1	Active	NA
LOW_FlorenceCreek_1	LOW_FlorenceCreek_1_20230821	2023-08-21 19:29:14	2	Active	TRUE
LOW_FlorenceCreek_1	LOW_FlorenceCreek_1_20240906	2024-09-06 18:13:59	3	Active	TRUE

Rates of re-use

NAK_JohnstoneStrait_3

den_id	sample_id	date_inspected	cumulative_visit	active_yn	reuse_yn
NAK_JohnstoneStrait_3	NAK_JohnstoneStrait_3_20160725	2016-07-25 00:00:00	1	Not Active	NA
NAK_JohnstoneStrait_3	NAK_JohnstoneStrait_3_20201001	2020-10-01 00:00:00	2	Not Active	FALSE
NAK_JohnstoneStrait_3	NAK_JohnstoneStrait_3_20210707	2021-07-07 19:00:54	3	Not Active	FALSE
NAK_JohnstoneStrait_3	NAK_JohnstoneStrait_3_20220922	2022-09-22 17:17:04	4	Not Active	FALSE
NAK_JohnstoneStrait_3	NAK_JohnstoneStrait_3_20230918	2023-09-18 17:47:10	5	Active	FALSE
NAK_JohnstoneStrait_3	NAK_JohnstoneStrait_3_20240829	2024-08-29 22:27:41	6	Active	TRUE

Rates of re-use

SAN_PalmerstonRiver_2

den_id	sample_id	date_inspected	cumulative_visit	active_yn	reuse_yn
SAN_PalmerstonRiver_2	SAN_PalmerstonRiver_2_20201009	2020-10-09 00:00:00	1	Active	NA
SAN_PalmerstonRiver_2	SAN_PalmerstonRiver_2_20210720	2021-07-20 19:49:36	2	Active	TRUE
SAN_PalmerstonRiver_2	SAN_PalmerstonRiver_2_20231011	2023-10-11 20:42:50	3	Unknown	FALSE
SAN_PalmerstonRiver_2	SAN_PalmerstonRiver_2_20240919	2024-09-19 21:02:45	4	Not Active	FALSE

Forestry summary data

Using the latest verifications (with the caveat that they themselves haven't been fully verified yet)!

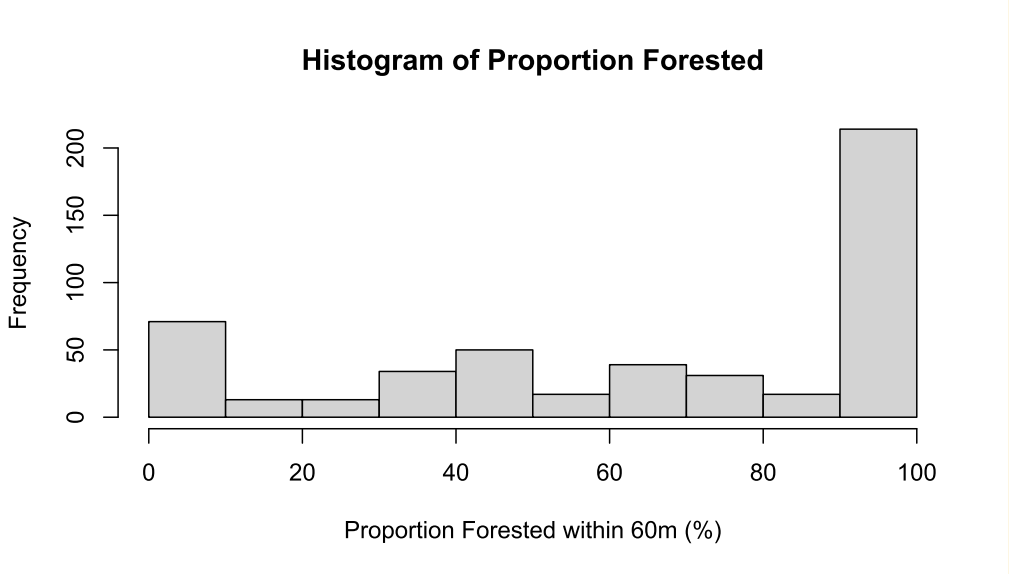
Proportion forested within 60m

Note this includes all field visits, including dens with repeated visits.

```
summary(v_f$new_prop_forest_60m)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##     0.0    39.0    75.0    65.2   100.0   100.0       4
```

```
hist(v_f$new_prop_forest_60m, main = "Histogram of Proportion Forested"
```



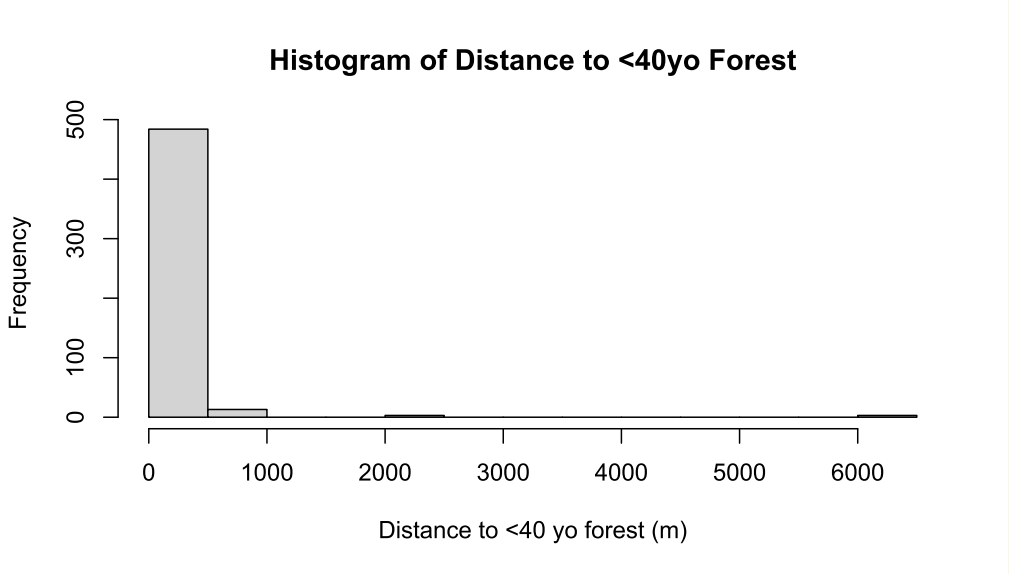
Distance to <40 yo forest

Note this includes all field visits, including dens with repeated visits.

```
summary(v_f$new_dist_lt40)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     0.0     5.0    27.0   141.2   117.5  6313.0
```

```
hist(v_f$new_dist_lt40, main = "Histogram of Distance to <40yo Forest",
```



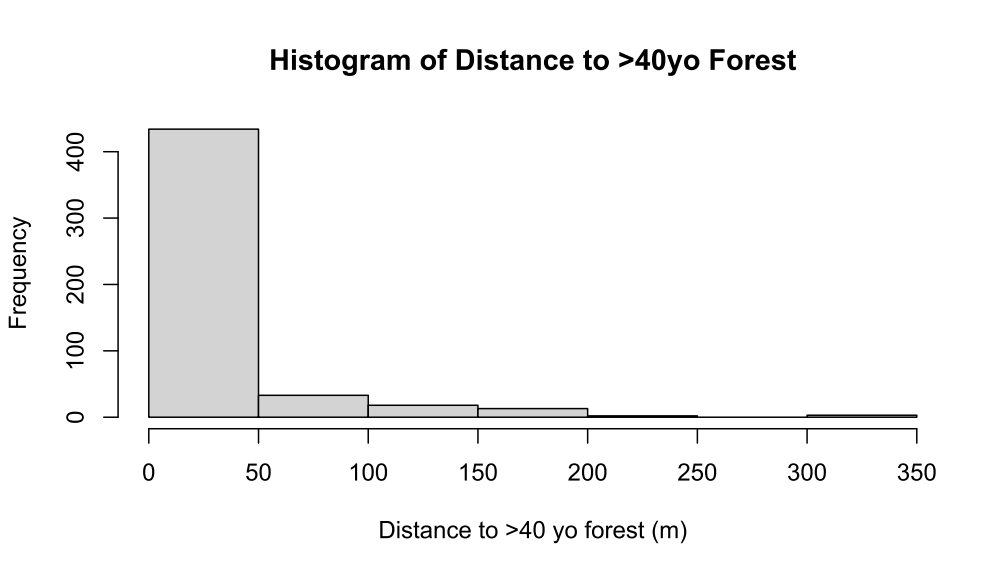
Distance to <40 yo forest

Note this includes all field visits, including dens with repeated visits.

```
summary(v_f$new_dist_gt40)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.00    0.00    0.00   18.25    0.50  315.00
```

```
hist(v_f$new_dist_gt40, main = "Histogram of Distance to >40yo Forest",
```



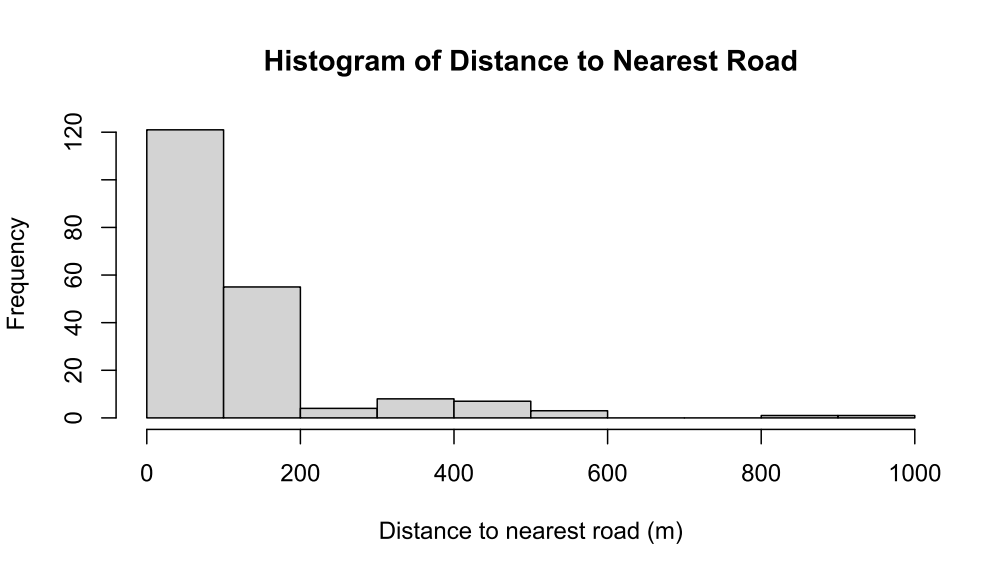
Distance to nearest road

Note this includes all field visits, including dens with repeated visits (also this one uses historical data).

```
summary(f$v_distance_nearest_road)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##    2.00   35.00   76.75  120.03  140.00  999.00     326
```

```
hist(f$v_distance_nearest_road, main = "Histogram of Distance to Nearest
```



Proportion forested within 1.5 km

Note this includes all field visits, including dens with repeated visits

```
round((colSums(prop_1km[,-1]) / sum(prop_1km$total)) * 100) |>
  knitr::kable(col.names = c("Stand Age Class", "Percentage"))
```

Stand Age Class	Percentage
age_class_1	12
age_class_2	21
age_class_3	12
age_class_4	4
age_class_5	3
age_class_6	1
age_class_7	1
age_class_8	13
age_class_9	33
total	100

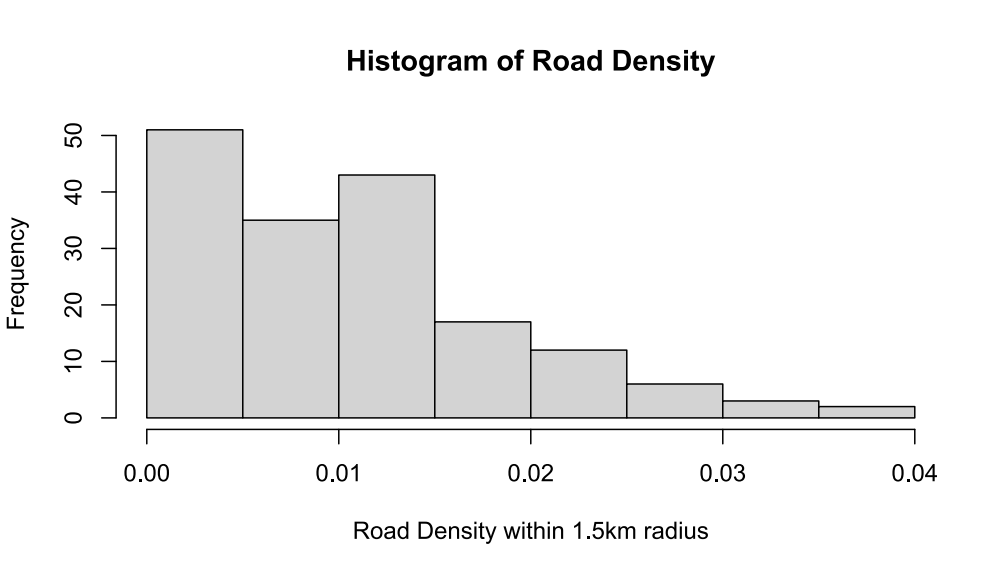
Road density within 1.5 km

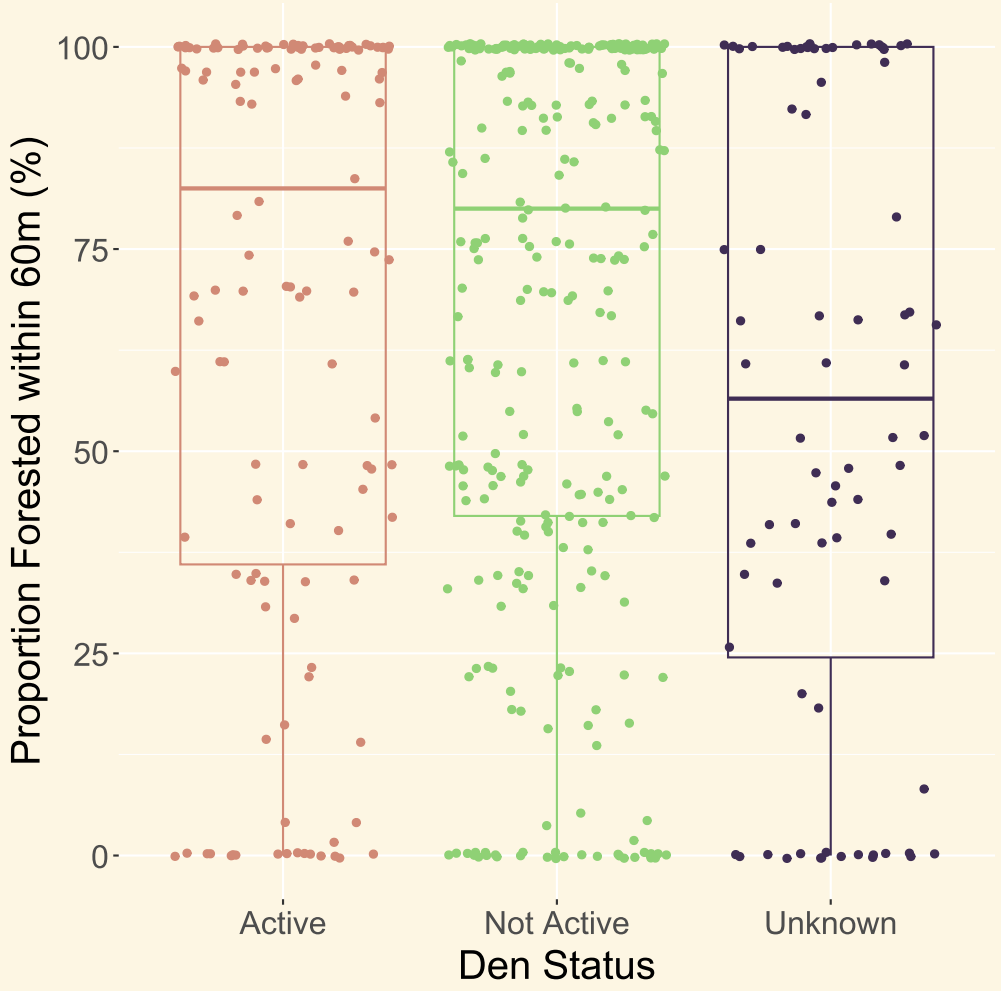
Note this includes all field visits, including dens with repeated visits (these numbers will probably be recalculated)

```
summary(road_density$road_density_m2)
```

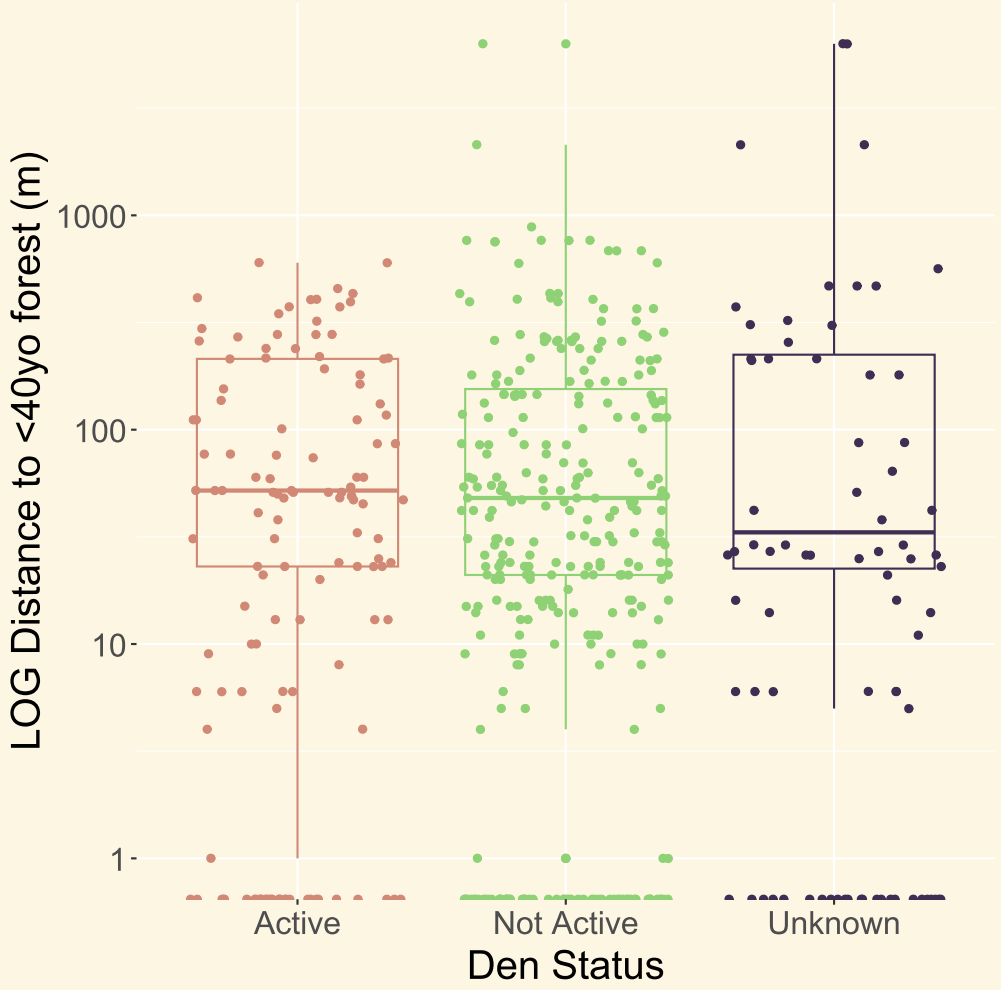
```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## 0.000000 0.004147 0.009768 0.010320 0.014891 0.038688
```

```
hist(road_density$road_density_m2, main = "Histogram of Road Density", x
```

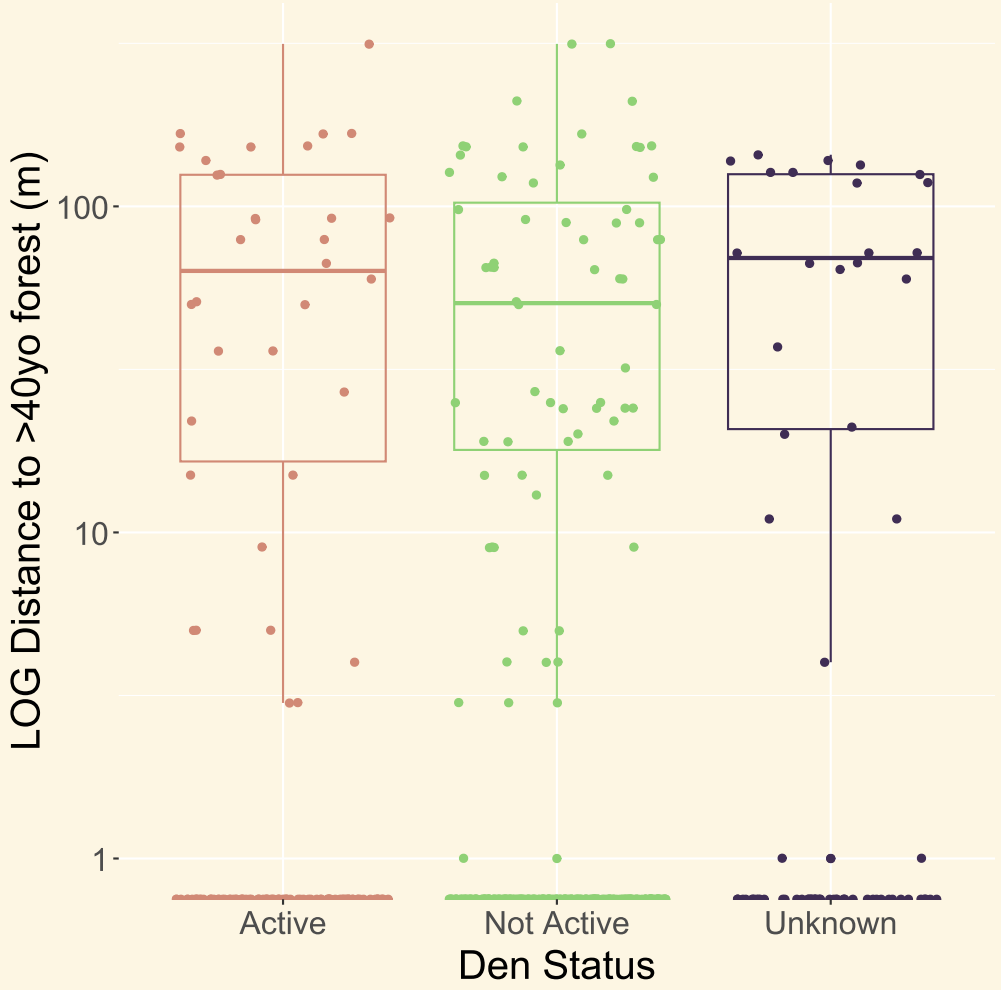




Note the following are still duplicated: ADA_EveRiver_1_20240816, OTU_Hancockriver_6_20230816, SKI_SouthBay_1_20220812, TLE_FeatherLake_3_20220809



Note the following are still duplicated: ADA_EveRiver_1_20240816, OTU_Hancockriver_6_20230816, SKI_SouthBay_1_20220812, TLE_FeatherLake_3_20220809



Note the following are still duplicated: ADA_EveRiver_1_20240816, OTU_Hancockriver_6_20230816, SKI_SouthBay_1_20220812, TLE_FeatherLake_3_20220809