

Assessing Plant Structure

Cover Boards, Robel Poles & Densiometers

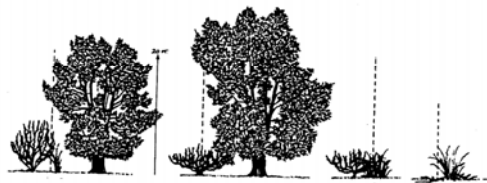
Plant Structure =

- The way in which vegetation is arranged in 3-dimensional space.
 - “Structure” usually refers to *vertical structure*.
 - Structure is measured as vegetation layers on vertical plains.
 - Measurement are usually based on:
 - Height of vegetation
 - Cover of vertical plots

Canopy Layers (Short 1986)

- **Tree canopy** - vegetation structure is 8 m or more above the terrestrial or aquatic surface and provides at least 5% cover when projected to the surface.
- **Tree bole** - Tree trunks have a DBH 20 cm and occur at a density of 12/ha.
- **Shrub midstory** - vegetation height from 50 cm up to 8 m, which provides at least 5% cover when projected to the surface.
- **Understory** - layer extends from 10 cm below the apparent surface up to, but not including, 50cm above the apparent surface and provides at least 5% cover when projected to the surface.
- **Terrestrial subsurface** - extends from more than 10 cm below the apparent surface down.
- **Surface water layer** - land surface-water interface and shallow water up to 25 cm deep

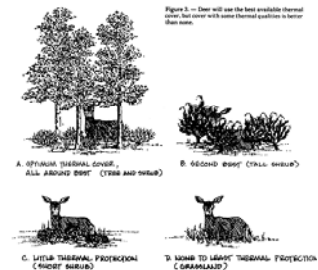
Canopy Layers



When to Measure Structure?

- To estimate value of habitat for wildlife.
- To more carefully characterized ecosystems to assess community change.
- Could have some value in watershed assessment.

Estimating Thermal Cover



Estimating Hiding Cover



Estimating Nesting Cover



Robel Pole is often used

Pros/Cons

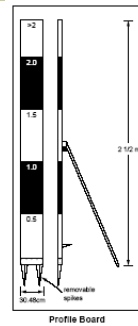
Advantages

- Most techniques are quick and easy to estimate.
- Can be used to estimate distribution of biomass in the environment.

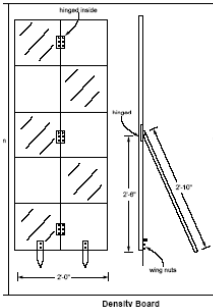
Disadvantages:

- Usually takes 2 people to efficiently measure cover (one to hold the board or pole and one to estimate height or cover).
- Most techniques are just estimates with little opportunity to determine accuracy.

Profile and Cover Boards



Cover Board



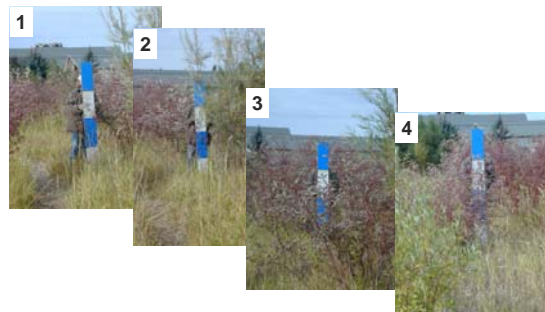
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**Cover Board Method
Density Board**

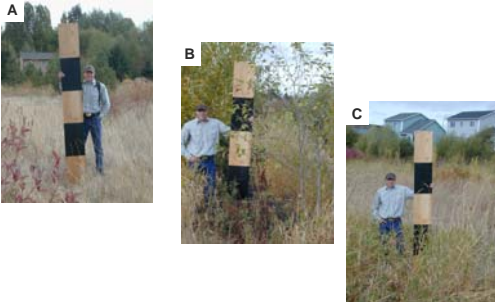
Study Number: *David Basler #1* Date: *7/22/95* Estimator: *Chris Magee*
 Absolute Name & Number: *Shank Basin 2555* Region: *Red River*
 Density Board Location: *50 paces west of Countyline Road on left side of stream. Readings are taken at 18", 19", 22", and 36".*

	Percent Cover								
	P1	P2	P3	P4	P5	P6	P7	P8	Avg. Cover
6	0	0	25	25	0	25	50	50	22
1	10	10	20	25	20	50	50	50	27
3	20	30	25	25	30	50	50	75	38
2	50	100	100	100	75	75	75	75	81
1	100	100	75	100	100	75	75	100	91
Total Average Cover:									52

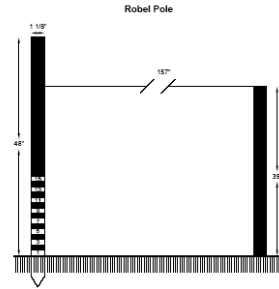
Cover Board Examples (4 sections)



Cover Board Examples (5 sections)



Robel Pole -- Visual Obstruction



- Use a sighting pole 1-m tall & 4-m from Robel pole
- Records the highest band on the Robel pole that is completely obscured by vegetation

Robel Pole



Record highest band that is completely (or mostly) obscured



Robel Pole



Station	VO	VO
1	1	3
2	2	4
3	1	1
4	2	1
5	3	1
6	1	2
7	3	4
8	3	3
9	4	4
10	1	2
11	2	3
12	1	1
13	2	1
14	3	2
15	2	3
16	1	2
17	2	2
18	3	3
19	2	4
20	3	3
21	3	2
22	1	3
23	2	2
24	3	1
25	2	2
Total	59	59
Grand Total	112	
Average	2.24	

Robel Pole - modified



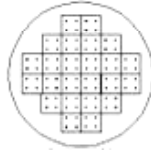
Visual Obstruction



- Can be related to biomass....
- especially if someone else clips the plot**

[Densiometers - Canopy Overhead]

- Concave or convex mirrors with a grid
- Hold the densiometer 12" to 18" in front of body at elbow height and count the number of points on the grid that are reflecting vegetation.
- Number of points intersected divided by total number of points on the grid can yield estimate of % overhead cover.



[Densiometers]

- Easier said than done

