

# Field Application of Laser Point Device for Line and Point Intercept Method

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## ABSTRACT

In an effort to increase speed, efficiency, and repeatability of point intercept and line intercept monitoring, Synergy Resource Solutions, Inc., developed a device that projects a 3-mm laser point on the vertical dimension. We have found it to increase efficiency and repeatability and to decrease observer bias. The Laser Point Device speeds the alignment portion of the process by using a single leg with leveling done by the observer. The device consists of a custom aluminum plate to hold a high-quality laser module with switch that is supported by a modified collapsible photography monopod and includes a bubble level as reference to maintain the laser at plumb. Additionally, data recording was customized to streamline data collection. This poster presents the Laser Point Device, sample data collection sheets, and suggests a protocol to increase efficiency.



Figure 1. Field use of the Laser Point Device.

## INTRODUCTION

The laser point sampler is a small, accurate, easy to use, and affordable laser device for point intercept monitoring, line intercept monitoring, and any monitoring protocol that requires a repeatable, plumb/vertical line.

Point intercept and line intercept are commonly used methods for quantifying vegetation coverage. However, existing sighting devices are heavy, slow to use, and expensive. When observers attempt sighting a plumb line without a sighting aid, the selection of the monitoring points is often biased and sampling imprecise. Synergy's Laser Point Device produces a fine laser beam (3mm) that provides a precise, unbiased, plumb measurement point for basal and/or foliar cover monitoring. Moving vegetation in upper layers does not disturb the laser point, sampling multiple layers of foliar canopy and measuring both foliar and basal cover are made simpler and more repeatable.

## TIPS and TRICKS

- Find the balance point for the device in your hand and you will find that you can position the laser in the plumb position with high frequency, eliminating time for alignment.
- The procedure is generally most efficient with 2 observers, one to position the laser and another to determine the "hit" and record.
- Extending the monopod to a length where the device can be placed with the elbow locked against the hip increases stability and speed.
- Because the laser projects a plumb line regardless of height, it is often more desirable to run the tape across the tops of shrubs rather than create damage to foliage working the tape all the way to the ground.
- The tape can be at different heights along the line. Align the tape with the same flat edge along any of the monopod sections.
- The trigger can be pushed with a thumb on top of the plate or with a knuckle of the first finger below the plate.

## KEY FEATURES

- Lightweight (1 pound)
- Rapid application and alignment- each point takes 5 seconds or less (with practice alignment can come in 1 to 2 seconds on 80% or more of sample points)
- Increased precision- especially when compared to traditional methods (eyeball, dropped pin)
- Facilitates sampling of multiple canopy layers
- Eliminates the need for a plumb-bob or other device to determine foliar cover
- No plumb-bob string to handle in thorny vegetation (No sticking your hands where you don't want them to go)



Figure 2. Side View of the Laser Point Device.



Figure 3. Close-up of the Laser Point Device with Laser Beam.

## LINE INTERCEPT PROTOCOL

- Lay out tape.
- Determine the minimum size that will be measured as a "gap".
- Start at the "zero" end of the tape and move the laser beam along the tape until the beam hits the first plant.
- Align the laser pointer above the tape so that half of the laser beam is on the tape and the other half on the ground (Figure 6).
- For each plant hit by the laser beam, record the starting and ending measurement on the data sheet (Figure 4).
- Line intercept is easier with the laser beam constantly lit.
- With practice line intercept can be run with just the "head" of the device, i.e. without the monopod.

Red Rock Ranch					
Allocation:	3	Date:	16-Jun-03	Time:	16:20
Path(s):	Dry Creek	Study Site:	DC 7	Observer:	JGA, JK
Comments:	GPS Point @ ft: DC7S 100 ft: DC7E				
Species:	AR12W	Species:	AR12W	Species:	AR12W
Begin (ft)	End (ft)	Begin (ft)	End (ft)	Begin (ft)	End (ft)
20.00	21.50	21.50	23.00	23.00	24.50
21.50	23.00	23.00	24.50	24.50	26.00
23.00	24.50	24.50	26.00	26.00	27.50
24.50	26.00	26.00	27.50	27.50	29.00
26.00	27.50	27.50	29.00	29.00	30.50
27.50	29.00	29.00	30.50	30.50	32.00
29.00	30.50	30.50	32.00	32.00	33.50
30.50	32.00	32.00	33.50	33.50	35.00
32.00	33.50	33.50	35.00	35.00	36.50
33.50	35.00	35.00	36.50	36.50	38.00
35.00	36.50	36.50	38.00	38.00	39.50
36.50	38.00	38.00	39.50	39.50	41.00
38.00	39.50	39.50	41.00	41.00	42.50
39.50	41.00	41.00	42.50	42.50	44.00
41.00	42.50	42.50	44.00	44.00	45.50
42.50	44.00	44.00	45.50	45.50	47.00
44.00	45.50	45.50	47.00	47.00	48.50
45.50	47.00	47.00	48.50	48.50	50.00
47.00	48.50	48.50	50.00	50.00	51.50
48.50	50.00	50.00	51.50	51.50	53.00
50.00	51.50	51.50	53.00	53.00	54.50
51.50	53.00	53.00	54.50	54.50	56.00
53.00	54.50	54.50	56.00	56.00	57.50
54.50	56.00	56.00	57.50	57.50	59.00
56.00	57.50	57.50	59.00	59.00	60.50
57.50	59.00	59.00	60.50	60.50	62.00
59.00	60.50	60.50	62.00	62.00	63.50
60.50	62.00	62.00	63.50	63.50	65.00
62.00	63.50	63.50	65.00	65.00	66.50
63.50	65.00	65.00	66.50	66.50	68.00
65.00	66.50	66.50	68.00	68.00	69.50
66.50	68.00	68.00	69.50	69.50	71.00
68.00	69.50	69.50	71.00	71.00	72.50
69.50	71.00	71.00	72.50	72.50	74.00
71.00	72.50	72.50	74.00	74.00	75.50
72.50	74.00	74.00	75.50	75.50	77.00
74.00	75.50	75.50	77.00	77.00	78.50
75.50	77.00	77.00	78.50	78.50	80.00
77.00	78.50	78.50	80.00	80.00	81.50
78.50	80.00	80.00	81.50	81.50	83.00
80.00	81.50	81.50	83.00	83.00	84.50
81.50	83.00	83.00	84.50	84.50	86.00
83.00	84.50	84.50	86.00	86.00	87.50
84.50	86.00	86.00	87.50	87.50	89.00
86.00	87.50	87.50	89.00	89.00	90.50
87.50	89.00	89.00	90.50	90.50	92.00
89.00	90.50	90.50	92.00	92.00	93.50
90.50	92.00	92.00	93.50	93.50	95.00
92.00	93.50	93.50	95.00	95.00	96.50
93.50	95.00	95.00	96.50	96.50	98.00
95.00	96.50	96.50	98.00	98.00	99.50
96.50	98.00	98.00	99.50	99.50	101.00
98.00	99.50	99.50	101.00	101.00	102.50
99.50	101.00	101.00	102.50	102.50	104.00
101.00	102.50	102.50	104.00	104.00	105.50
102.50	104.00	104.00	105.50	105.50	107.00
104.00	105.50	105.50	107.00	107.00	108.50
105.50	107.00	107.00	108.50	108.50	110.00
107.00	108.50	108.50	110.00	110.00	111.50
108.50	110.00	110.00	111.50	111.50	113.00
110.00	111.50	111.50	113.00	113.00	114.50
111.50	113.00	113.00	114.50	114.50	116.00
113.00	114.50	114.50	116.00	116.00	117.50
114.50	116.00	116.00	117.50	117.50	119.00
116.00	117.50	117.50	119.00	119.00	120.50
117.50	119.00	119.00	120.50	120.50	122.00
119.00	120.50	120.50	122.00	122.00	123.50
120.50	122.00	122.00	123.50	123.50	125.00
122.00	123.50	123.50	125.00	125.00	126.50
123.50	125.00	125.00	126.50	126.50	128.00
125.00	126.50	126.50	128.00	128.00	129.50
126.50	128.00	128.00	129.50	129.50	131.00
128.00	129.50	129.50	131.00	131.00	132.50
129.50	131.00	131.00	132.50	132.50	134.00
131.00	132.50	132.50	134.00	134.00	135.50
132.50	134.00	134.00	135.50	135.50	137.00
134.00	135.50	135.50	137.00	137.00	138.50
135.50	137.00	137.00	138.50	138.50	140.00
137.00	138.50	138.50	140.00	140.00	141.50
138.50	140.00	140.00	141.50	141.50	143.00
140.00	141.50	141.50	143.00	143.00	144.50
141.50	143.00	143.00	144.50	144.50	146.00
143.00	144.50	144.50	146.00	146.00	147.50
144.50	146.00	146.00	147.50	147.50	149.00
146.00	147.50	147.50	149.00	149.00	150.50
147.50	149.00	149.00	150.50	150.50	152.00
149.00	150.50	150.50	152.00	152.00	153.50
150.50	152.00	152.00	153.50	153.50	155.00
152.00	153.50	153.50	155.00	155.00	156.50
153.50	155.00	155.00	156.50	156.50	158.00
155.00	156.50	156.50	158.00	158.00	159.50
156.50	158.00	158.00	159.50	159.50	161.00
158.00	159.50	159.50	161.00	161.00	162.50
159.50	161.00	161.00	162.50	162.50	164.00
161.00	162.50	162.50	164.00	164.00	165.50
162.50	164.00	164.00	165.50	165.50	167.00
164.00	165.50	165.50	167.00	167.00	168.50
165.50	167.00	167.00	168.50	168.50	170.00
167.00	168.50	168.50	170.00	170.00	171.50
168.50	170.00	170.00	171.50	171.50	173.00
170.00	171.50	171.50	173.00	173.00	174.50
171.50	173.00	173.00	174.50	174.50	176.00
173.00	174.50	174.50	176.00	176.00	177.50
174.50	176.00	176.00	177.50	177.50	179.00
176.00	177.50	177.50	179.00	179.00	180.50
177.50	179.00	179.00	180.50	180.50	182.00
179.00	180.50	180.50	182.00	182.00	183.50
180.50	182.00	182.00	183.50	183.50	185.00
182.00	183.50	183.50	185.00	185.00	186.50
183.50	185.00	185.00	186.50	186.50	188.00
185.00	186.50	186.50	188.00	188.00	189.50
186.50	188.00	188.00	189.50	189.50	191.00
188.00	189.50	189.50	191.00	191.00	192.50
189.50	191.00	191.00	192.50	192.50	194.00
191.00	192.50	192.50	194.00	194.00	195.50
192.50	194.00	194.00	195.50	195.50	197.00
194.00	195.50	195.50	197.00	197.00	198.50
195.50	197.00	197.00	198.50	198.50	200.00
197.00	198.50	198.50	200.00	200.00	201.50
198.50	200.00	200.00	201.50	201.50	203.00
199.50	201.50	201.50	203.00	203.00	204.50
201.50	203.00	203.00	204.50	204.50	206.00
203.00	204.50	204.50	206.00	206.00	207.50
204.50	206.00	206.00	207.50	207.50	209.00
206.00	207.50	207.50	209.00	209.00	210.50
207.50	209.00	209.00	210.50	210.50	212.00
209.00	210.50	210.50	212.00	212.00	213.50
210.50	212.00	212.00	213.50	213.50	215.00
212.00	213.50	213.50	215.00	215.00	216.50
213.50	215.00	215.00	216.50	216.50	218.00
215.00	216.50	216.50	218.00	218.00	219.50
216.50	218.00	218.00	219.50	219.50	221.00
218.00	219.50	219.50	221.00	221.00	222.50
219.50	221.00	221.00	222.50	222.50	224.00