

A scanning electron micrograph (SEM) showing a dense network of soil microorganisms. Long, thin, filamentous structures, likely bacteria or fungi, are prominent throughout the image. Interspersed among these are numerous smaller, more rounded or spherical structures, possibly representing spores, yeast cells, or other microbial forms. The overall texture is highly complex and three-dimensional.

The Invisible Life of Soil and Urban Stream Restoration

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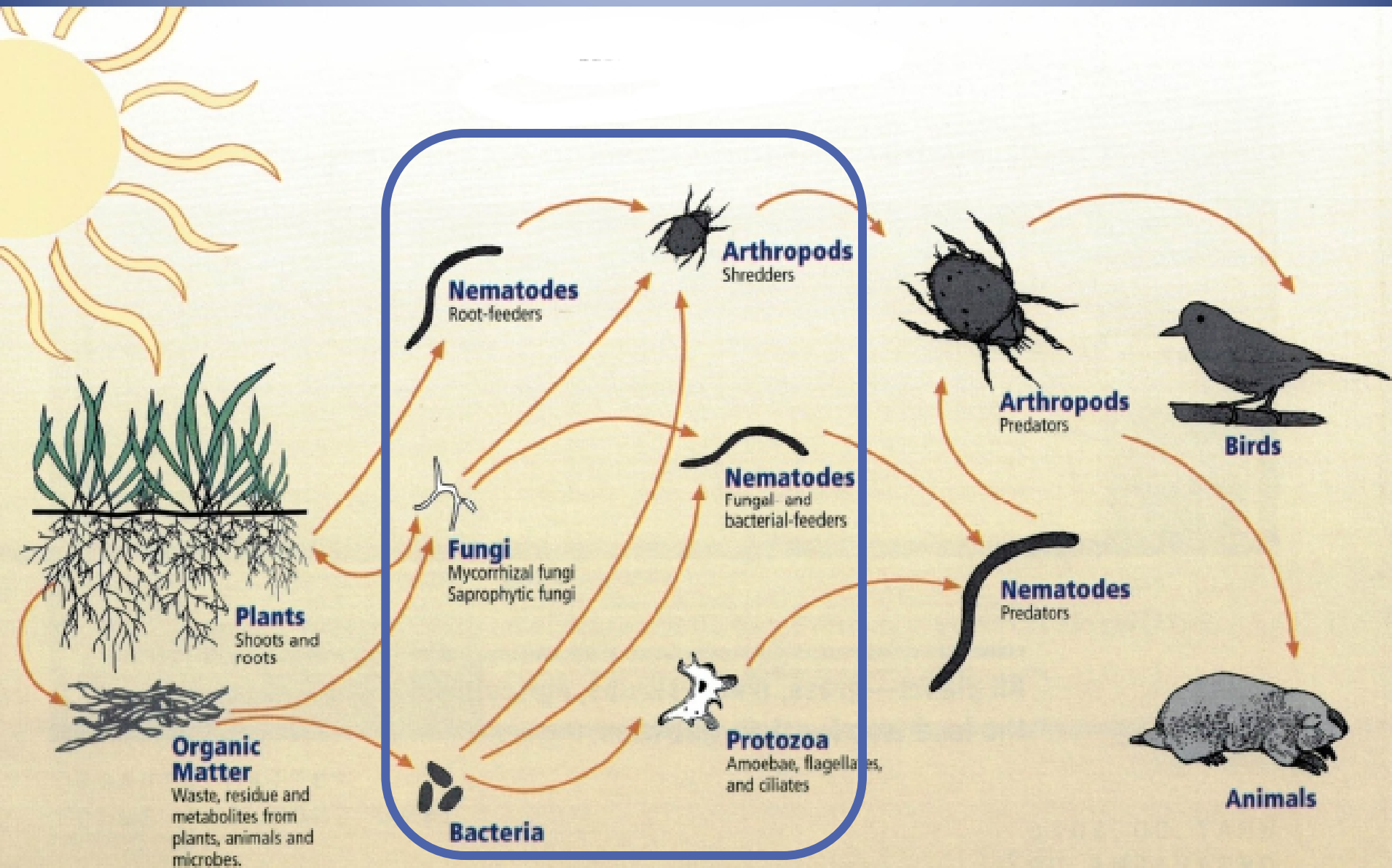
glenrose.com

Magn
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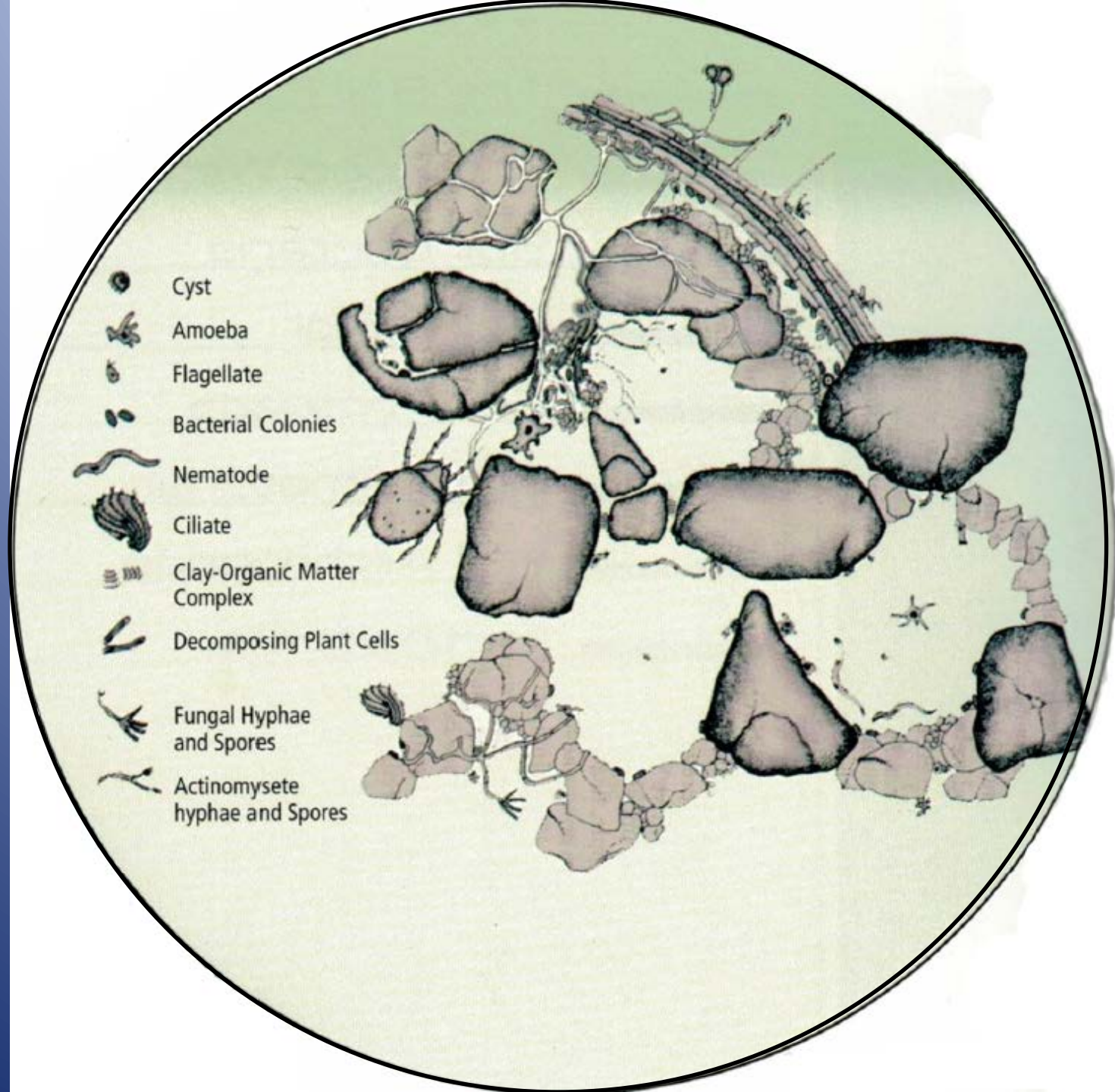
Exp
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5 μ m
Compost 01-12-17

The Central Role of Soil Biology in the Web of Life



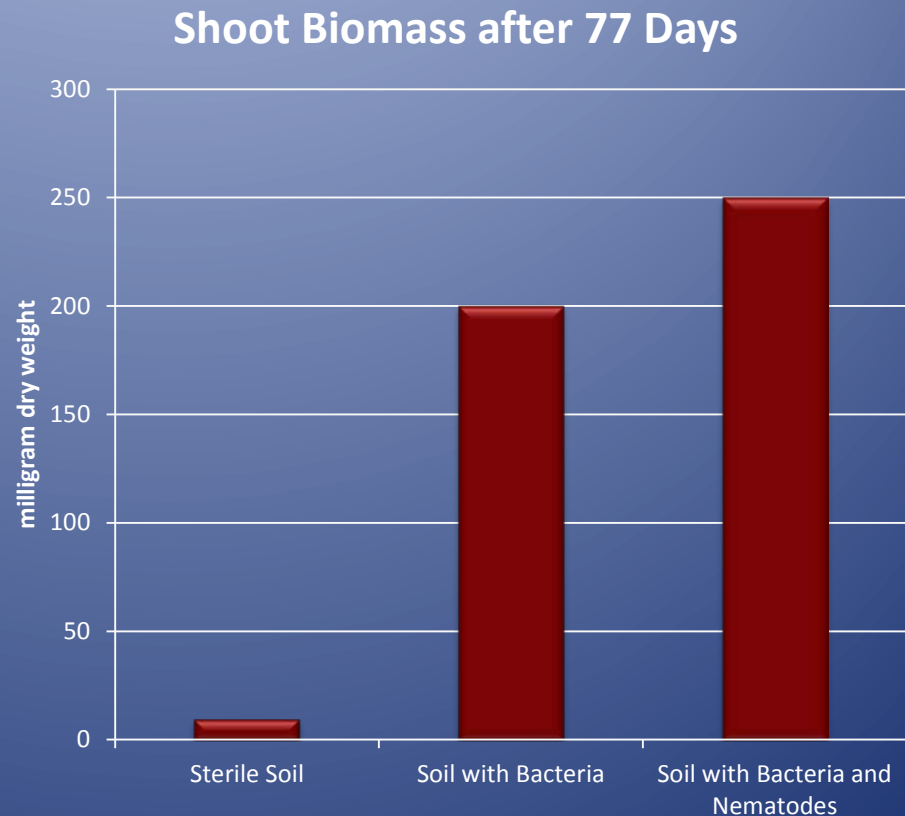
Soil Organic Material





Soil Biology Function in Riparian Zones

Holding and Cycling Nutrients



Soil Biology Function in Riparian Zones

Improved Soil
Structure:
Infiltration and
Water-Holding
Capacity



Soil Biology Function in Riparian Zones

Disease
Suppression

For example:
Earthworm
produce an
enzyme in their
digestive tracts
that kill
Escherichia coli.



Soil Biology Function in Riparian Zones

Pollution
Degradation



Preserving Soil Biology During Riparian Restoration

Limit Soil Compaction

- Tight Limits of Construction
- Restrict The use of Heavy Equipment



Preserving Soil Biology During Riparian Restoration

Maintain Optimum Soil Moisture

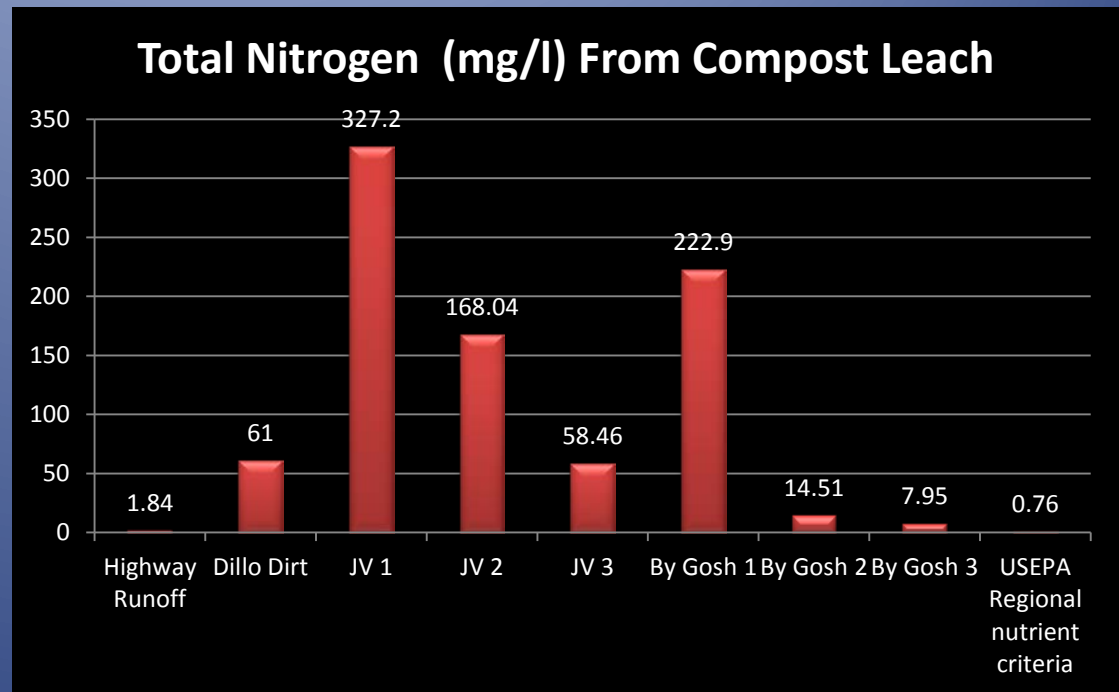
- Good Drainage
- Limit Stock-Piling
- Use De-Chlorinated Water



Preserving Soil Biology During Riparian Restoration

Appropriate Soil Amendments

- Finely-Ground Carbon
- Well-Aged Compost



Preserving Soil Biology During Riparian Restoration

Biological Inoculants

- Should be tuned to riparian ecology
- Most research is in agricultural applications



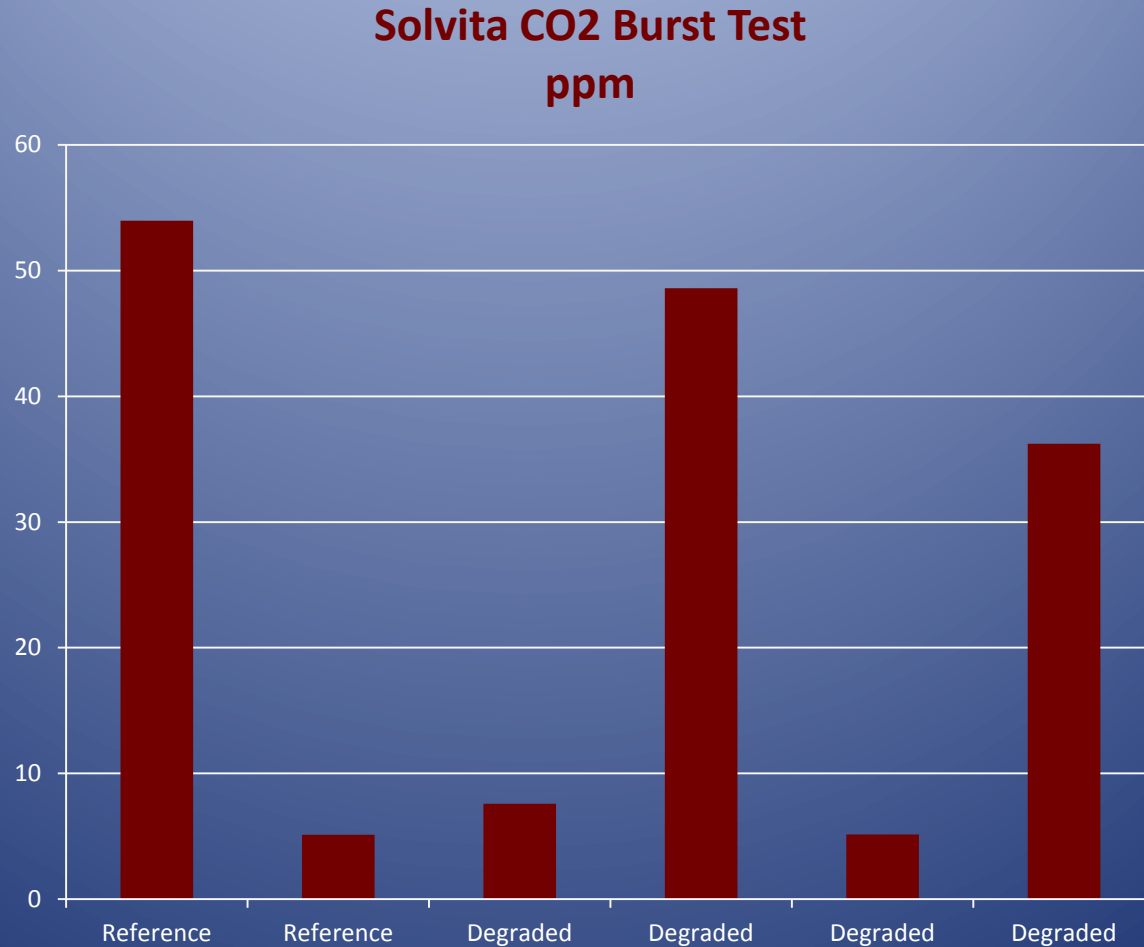
Soil Measures of Riparian Biological Function

Description	Character	Texture	Solvita ppm	%OM Humus	pH	EC mmhos/cm	NO3 lbs/acre	NO3 mg/kg	P2O5 lbs/acre	P2O5 mg/kg	K (H2O) ppm	K (CO2) ppm	Na (H2O) ppm	Na (CO2) ppm	Ca (H2O) ppm	Ca (CO2) ppm	Mg (H2O) ppm	Mg (CO2) ppm	Zn ppm	Fe ppm	Mn ppm	Cu ppm	Total Bacteria ug/g	Total Fungi ug/g	Hyphal Diameter um	TF/TB	Actino Bacteria ug/g
Woodland	Reference	5-	53.95	5.20	7.8	0.73	26	13	6	3	8	25	16	54	140	1376	5	48	1.31	4.73	6.18	0.2	713	976	2.85	1.37	6.59
Wildflower	Reference	5+	5.13	0.30	7.7	7.21	5	2.5	4	2	51	62	31	104	579	1357	25	69	0.32	4.42	2.36	0.31	694	591	2.75	0.85	4.44
Area 9	Degraded	5+	7.6	1.55	7.77	1.91	9	4.5	5	2.5	21	41	26	68	216	1358	7	43	0.52	6.03	5.47	0.47	641	440	2.7	0.69	6.59
Custer's	Degraded	5-	48.59	4.30	7.6	0.79	26	13	25	12.5	61	166	20	55	63	1307	8	67	4.51	11.49	6.03	0.76	625	622	2.75	1.00	9.77
N of 24th	Degraded	5+	5.14	0.80	8	0.75	7	3.5	54	27	6	25	30	67	116	1682	6	78	0.13	7.32	4.44	0.55	503	288	2.85	0.57	2.58
Under Oak	Degraded	2-	36.23	1.00	7.6	0.76	15	7.5	40	20	49	102	22	64	106	1066	9	74	1.93	5.13	2.67	0.43	554	491	2.85	0.89	0

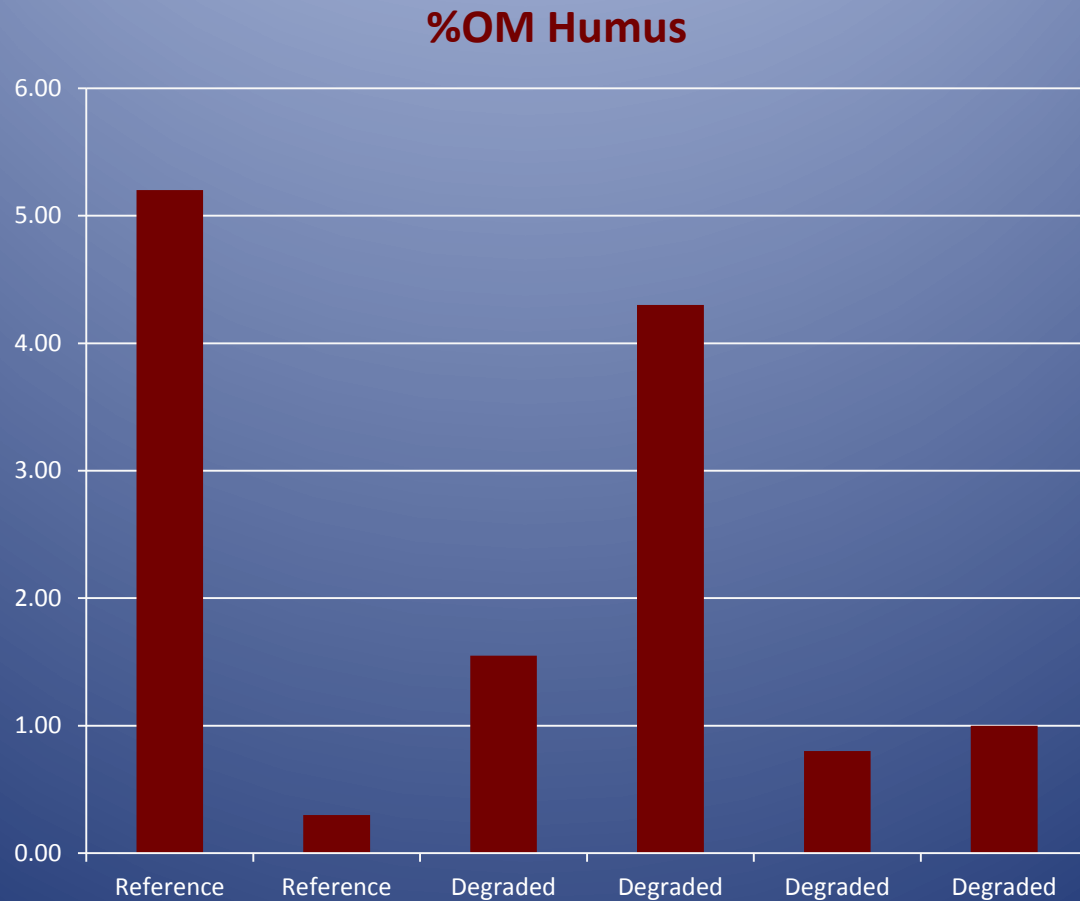
Soil Measures of Riparian Biological Function

Description	Character	Solvita CO2 Burst Test ppm	%OM Humus	Total Bacteria ug/g	Total Fungi ug/g	TF/TB
Woodland	Reference	53.95	5.20	713	976	1.37
Wildflower	Reference	5.13	0.30	694	591	0.85
Area 9	Degraded	7.6	1.55	641	440	0.69
Custer's	Degraded	48.59	4.30	625	622	1.00
N of 24th	Degraded	5.14	0.80	503	288	0.57
Under Oak	Degraded	36.23	1.00	554	491	0.89

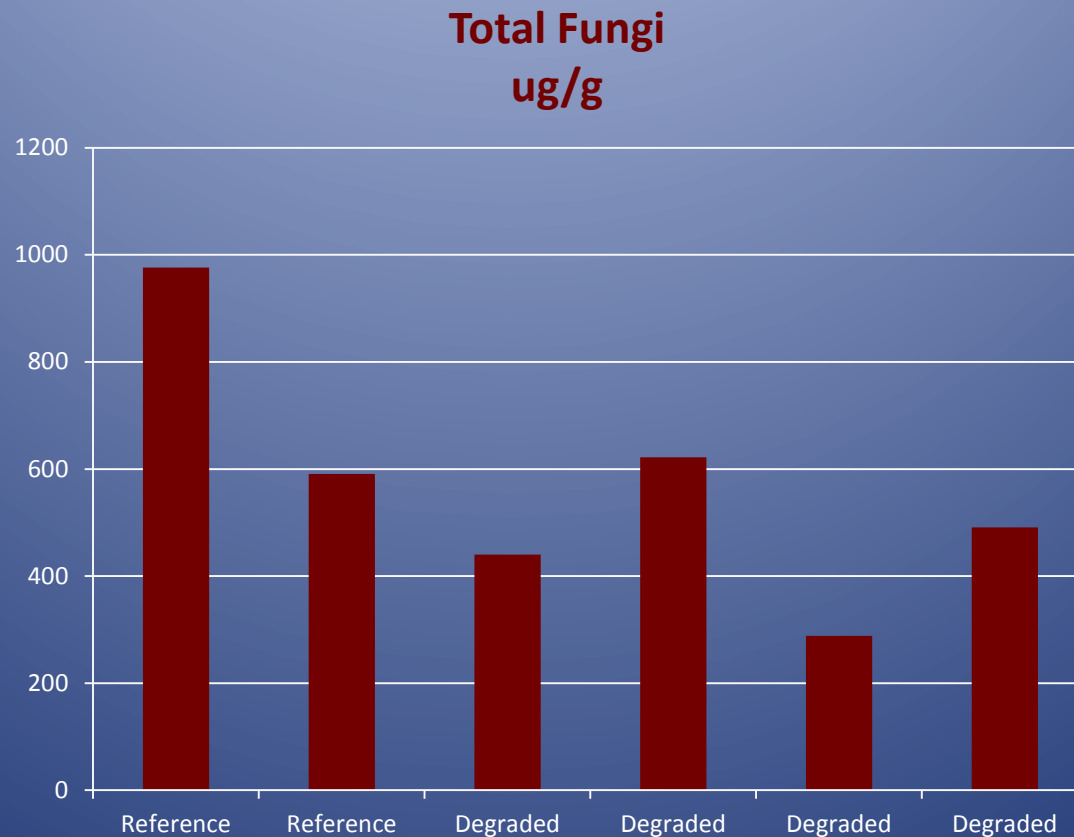
Soil Measures of Riparian Biological Function



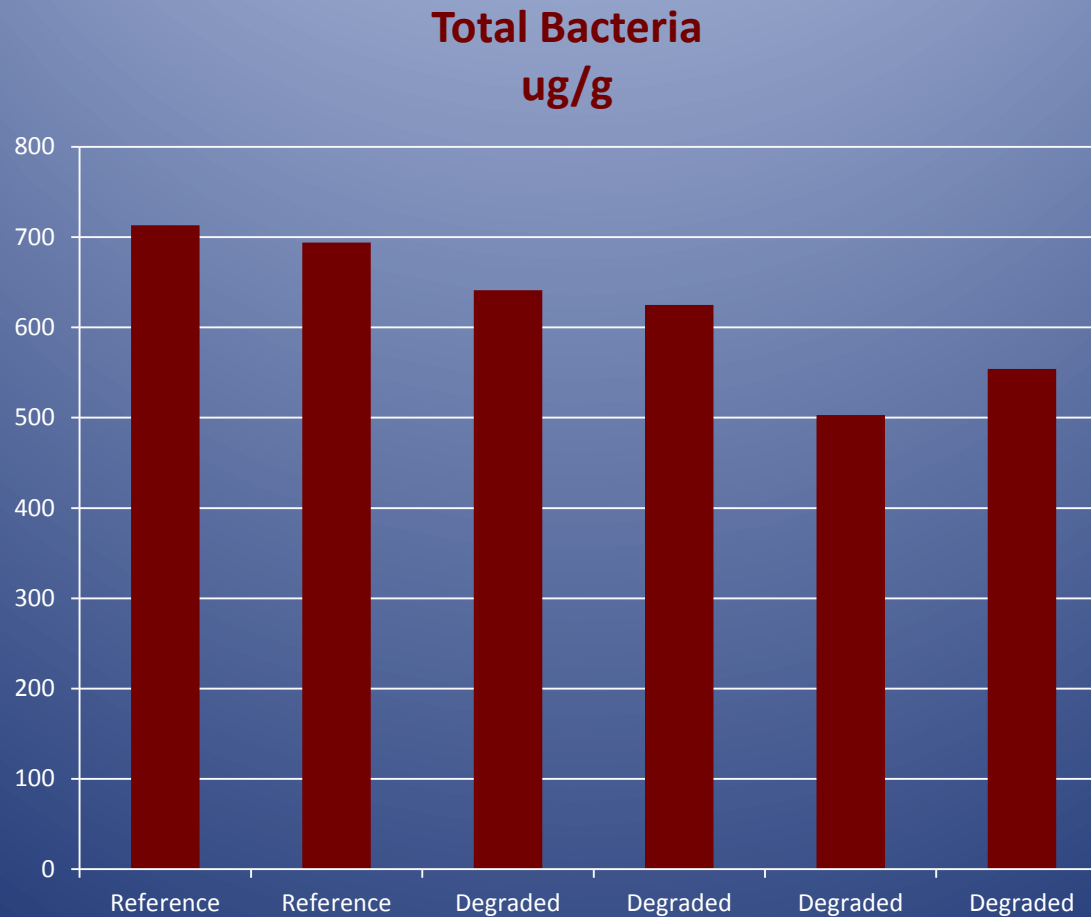
Soil Measures of Riparian Biological Function



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