

Sample Vegetation Densities and Point Systems for the Protected Shoreland in New Hampshire
Woodland Buffer Committee
Comprehensive Shoreland Protection Act Commission
11/14/06

1. SITE SELECTION: A survey of over 100 waterfront sites in New Hampshire was conducted from May to September, 2006. Land uses on the sites were natural and managed woodlands; lake, pond, and river edges; residential, commercial, and recreational uses; and highways and bridges. Only those sites which were naturally occurring, or appeared to have been cleared to comply with the 50% tree clearing provisions of the Comprehensive Shoreland Protection Act (CSPA) were selected. On the larger lakes with intense development, a majority of the sites had little or no trees and shrubs, with lawns mowed to the water. Most residential sites had trees, but typically the shrub and sapling layers were cleared for views and a manicured landscape.

2. METHODOLOGY: A sample plot size of 50 feet by 50 feet was selected. This was easily observed, and matched the depth of the proposed 50-foot Waterfront Buffer. Also, most lots were 100 or 150 feet wide. Shrubs and saplings were counted from 1-6 inches diameter at 4.5 feet or breast height (dbh). This is basically “thumb size” to “hand size”. Trees were counted from 6 to 12 inches dbh (“hand size” to “foot size”); and then trees greater than 12 inches. Most of the counts were done from the landward side or from roads. The field counts were entered into a database. Vegetation densities and point counts were analyzed using simplified calculations.

3. POINT SYSTEMS: Three point systems were tested:

The Maine Moultonborough (M/M) systems use a 25' x 25' grid with 12 total points, with vegetation counted as follows: saplings 2”-4” (Maine) or 4”-6” (Moultonborough) = 1 point; trees 4”-12” (Maine) or 6”-12” (Moultonborough) = 2 points; trees >12” = 4 points. Statistical comparisons used 4 times the 25 x 25 grid, with 48 total points. Neither system used saplings less than 2” or 4” dbh, therefore this layer was conservatively calculated at 0.5 times the counted number of saplings. These systems produced point counts that were consistently 50% of the 1-5-10 system, and 50% of natural and CSPA-managed sites. Therefore, the M/M system would require twice as much vegetation as the 1-5-10 system.

The 1-3-6 system counted vegetation as follows: saplings 1” to 6” = 1 point, trees 6-12” = 3 points, Trees >12” = 6 points. The 1-3-6 system was tested since it was a step up from the M/M system, was roughly equivalent to one-half the size of the trees, and it approximated the basal area approach. The point counts from this system were approximately 150% the M/M system, and 75% of the 1-5-10 system.

The 1-5-10 system counted vegetation as follows: saplings 1” to 6” = 1 point, trees 6-12” = 5 points, Trees >12” = 10 points. The 1-5-10 system was proposed for several reasons. It approximated the natural woodland conditions at 100 points, and CSPA-managed landscapes at 50 points. It gives some value to more saplings and large shrubs. It also gives more weight to large trees. Coincidentally, the 50 points was alliterative with the 50 by 50 area, and a 50% cut.

4. CONCLUSION: The 1-5-10 system is recommended for the proposed 50-foot Waterfront Buffer. It is relatively simple to use, places greater value on large trees, and approximates the original intent of the CSPA for a 50% managed cut.

SiteType	Water_Body	Site Description	Vegetation Description	Sapl 1-6"	Trees 6-12"	Trees >12"	ME/MB Points	1-3-6 Points	1-5-10 Points
0-50 Points									
Recreation	Ossipee River	boat launch site, asphalt, concrete, grass	none	0	0	0	0	0	0
Dense Residential	Goose Pond	large house site, lawn, retaining wall, dock	large house site, lawn, retaining wall,	0	0	1	1	1	1
Moderate Residential	Lake Kanasatka	small camp, boat ramp	partially mowed lawn, low trees		2	4	6	10	14
Light Residential	Connecticut River	eroding riverbank, 25' wide	no trees, invasive shrubs			15	8	15	15
Highway Bridge	Ossipee River	rip-rap with new plants	new shrubs	0	3	2	7	11	17
Dense Residential	Mascoma Lake	Large residence, garage & guest house, new	center of lot with dock, new lawn to lake	2	0	0	8	12	20
Light Residential	Connecticut River	restored bank, new shrubs	new native shrubs % 50% coverage			25	13	25	25
Marsh and Pond Border	Post Pond	boat launch edge	tall marsh grass, shrubs	0	1	20	12	23	25
Marsh and Pond Border	Post Pond	boat launch edge	few shrubs, tall grass	0	3	10	11	19	25
Highway	Post Pond	narrow shrub buffer - 20'	shrubs, saplings	0	2	17	13	23	27
Commercial (nursery)	Connecticut River	lawn to 25' shrubby riverbank	natural riverbank, narrow	0	2	20	14	26	30
Light Residential	Goose Pond	camp with dock	hemlocks, ferns	0	7	0	14	21	35
Light Residential	Goose Pond	camp with dock	some trees, lawn to dock	1	5	0	14	21	35
Light Residential	Connecticut River	lawn to 25' shrubby riverbank	existing shrubs, trees on steep, narrow		2	30	19	36	40
Moderate Development	Post Pond	heavy view cut	moderate slope, hemlocks	2	2	10	17	28	40
Agricultural	Connecticut River	Hay meadow, shrubby river bank, beaver	natural riverbank, narrow	1	0	35	22	41	45
Light Residential	Goose Pond	camp with dock	some trees, lawn to dock	2	4	5	19	29	45
Dense Residential	Goose Pond	lawn, retaining wall, saved trees	lawn, retaining wall, saved trees	1	6	5	19	29	45
Light Development	Baptist Pond	medium camp with good maintenance	lawn to dock	2	5	2	19	29	47
Light Development	Mascoma Lake	small residence, garage, small dock	well-maintained shady lawn, some trees	2	4	8	20	32	48
50-100 Points									
Managed Woodland	Connecticut River	steep river bank after clearing	50%± cleared	2	4	10	21	34	50
Moderate Residential	Crystal Lake	Medium -sized residence, set back from	dock section - high use	2	6	2	21	32	52
Managed Woodland	Slate Pond	Partially cleared shrub wetland	Red maple/alder, many small shrubs,	1	7	9	23	36	54
Light Residential	Goose Pond	small camp, 50% clearing	after clearing	0	7	20	24	41	55
Light Development	Mascoma Lake	small residence, garage, small dock	well-maintained shady lawn, some trees	3	5	0	22	33	55
Moderate Residential	Ossipee Lake	Medium -sized residence, garage, dock	center of lot with trees, lawn	2	5	10	23	37	55
Light Residential	Goose Pond	camp with lawn to dock	lawn to dock	1	7	10	23	37	55
Light Residential	Goose Pond	camp with dock	house site	1	7	10	23	37	55
Light Residential	Goose Pond	dock area	some trees, lawn to dock	3	5	0	22	33	55
Natural Woodland	Mascoma River	50' railroad bank with shrubs	maple/basswood floodplain	2	4	15	24	39	55
Commercial (garage)	Mascoma River	25' bank with woods	maple/basswood floodplain	2	6	7	24	37	57
Dense Residential	Goose Pond	septic site with saved trees on bank	septic site with saved trees on bank	1	6	20	26	44	60
Moderate Development	Connecticut River	partial clearing for view, dock, lawn	moderate view cut in wooded site	2	4	20	26	44	60

All tree counts are for a 50-foot x 50-foot plot, from the Reference line to the 50-foot Primary Building Setback.

ME/MB - Maine or Moultonborough systems: Saplings 4" to 6" (calculated at 0.5 actual count to compensate for 1-4" in other systems)= 1 point, Trees 6-12" = 2 points; Trees >12" = 4 points

1-3-6 - Test system with points 0.5 of tree size , approximating basal area approach: Saplings 1"-6" = 1 point, Trees 6-12" = 3 points; Trees >12" = 6 points

1-5-10 - Recommended system with emphasis on larger trees: Saplings 1"-6" = 1 point, Trees 6-12" = 5 points; Trees >12" = 10 points

SiteType	Water_Body	Site Description	Vegetation Description	Sapl 1-6"	Trees 6-12"	Trees >12"	ME/MB Points	1-3-6 Points	1-5-10 Points
Light Development	Ossipee River	partially wooded, developed	oak pine on high bank	2	7	8	26	41	63
Light Development	Baptist Pond	medium camp with good maintenance	large trees, lawns, ferns, good bank	4	4	4	26	40	64
Managed Woodland	Connecticut River	steep river bank after clearing	50%± cleared	4	4	5	27	41	65
Moderate Development	Post Pond	moderate view cut	moderate slope, hemlocks	3	4	15	28	45	65
Commercial (garage)	Mascoma River	25' bank, gravel service area	maple/basswood floodplain	2	7	10	27	43	65
Light Development	Mascoma Lake	small residence, garage, small dock	well-maintained shady lawn, some trees	2	8	8	28	44	68
Highway Bridge	Ossipee River	new bridge project pine with meadow	north side - 25' with meadow	1	10	8	28	44	68
Road	Baptist Pond	30' wide bank next to road	no recent clearing	1	7	25	31	52	70
Natural Woodland	Mascoma River	bridge embankment	maple/basswood floodplain	0	10	20	30	50	70
Recreation	Ossipee River	scattered trees, sand, grass on high bank	partially cleared, grassed	1	10	15	32	51	75
Highway	Ossipee River	25' deep low river bank	25' bank, 25' grass, 25' gravel road edge	0	7	40	34	61	75
Highway Managed	Post Pond	dense shrub buffer	shrubs, saplings recent cut	0	5	50	35	65	75
Commercial (garage)	Mascoma River	50' bank with woods	maple/basswood floodplain	3	4	25	33	55	75
Moderate Development	Squam Lake	5 cottages, main house	well-maintained shady lawn, shrubs	2	10	6	31	48	76
Light Residential	Goose Pond	small camp, 50% clearing, access path	north side (access)	2	10	10	33	52	80
Dense Residential	Mascoma Lake	Large residence, garage & guest house, new	thin side with lawn	4	7	5	33	50	80
Dense Residential	Mascoma Lake	Large residence, garage & guest house, new	thick side with septic set back	2	8	20	34	56	80
Commercial (nursery)	Connecticut River	wooded area, steep bank	wooded, hardwoods no clearing	2	10	10	33	52	80
Natural Woodland	Ossipee River	maple floodplain	undisturbed natural floodplain forest	1	10	20	34	56	80
Light Residential	Goose Pond	small camp, 50% clearing	before clearing	0	9	40	38	67	85
Recreation	Bearcamp River	rest area - some maintenance	oak-pine managed forest	2	5	40	38	67	85
Light Residential	Goose Pond	trailer campsite next to shore	hemlock-pine on bank	1	12	16	36	58	86
Natural Woodland	Baptist Pond	medium camp with good maintenance	woods to north, some clearing	4	9	5	37	56	90
Recreation	Ossipee River	partially wooded, natural looking	natural oak pine on high bank	5	7	6	37	57	91
Road	Goose Pond	25' wide bank next to road	no recent clearing, sunny site	2	8	33	41	69	93
Light Residential	Goose Pond	small camp, 50% clearing for view	hemlock-hardwoods, ferns, blueberries	4	7	20	40	65	95
Light Residential	Connecticut River	lawn to top of bank, view clearing	50% trees, shrubs cleared	6	3	20	40	65	95
Commercial (nursery)	Connecticut River	wooded area	wooded hemlocks, no clearing	2	10	25	41	67	95
Natural Woodland	Ossipee River	natural forest	oak/pine forest	1	15	13	41	64	98
Over 100 Points									
Natural Woodland	Slate Pond	Secondary growth on gentle sloping rich	Mixed hardwoods -, ferns, leaf litter	1	12	30	43	72	100
Managed Woodland	Slate Brook Upland	managed shrub-saplings	thick alder/birch regeneration, thin ferns,	0	0	100	50	100	100
Managed Woodland	Ammonoosuc River	50-foot highway & river edge	spruce fir forest	0	10	50	45	80	100
Natural Woodland	Connecticut River	steep river bank before clearing	hemlock pine forest	5	5	25	43	70	100
Marsh and Pond Border	Post Pond	Boat launch road	many shrubs, some trees	0	5	75	48	90	100

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SiteType	Water_Body	Site Description	Vegetation Description	Sapl 1-6"	Trees 6-12"	Trees >12"	ME/MB Points	1-3-6 Points	1-5-10 Points
Natural Woodland	Connecticut River	hemlock-sugar maple forest on steep slope	wooded, mature	4	6	30	43	72	100
Managed Woodland	Slate Brook Upland	managed woodland on good soil	White pine, white birch, pine needles,	6	6	15	44	69	105
Natural Woodland	Ossipee River	partially wooded, developed	oak pine on high bank	0	16	25	45	73	105
Recreation	Ossipee River	partially wooded, natural looking	natural oak pine on high bank	2	9	40	46	79	105
Recreation	Baker River	rest area lawn to bank - 35' deep	wooded, partially mowed at top	1	15	20	44	71	105
Marsh and Pond Border	Post Pond	boat launch edge	many shrubs, some tall grass	0	1	100	52	103	105
Natural Woodland	Connecticut River	hemlock-sugar maple forest on steep slope	wooded, mature	4	8	25	45	73	105
Light Residential	Goose Pond	tent site, some clearing	hemlock-pine medium forest	5	6	26	45	74	106
Moderate Residential	Crystal Lake	Medium -sized residence, set back from	north section - low use	3	13	15	46	72	110
Agricultural	Stocker Pond	old field, pine shore	pinus along shore, meadow	6	7	15	46	72	110
Natural Woodland	Baptist Pond	medium camp with good maintenance	woods to north, no clearing	3	12	20	46	74	110
Natural Woodland	Connecticut River	steep river bank before clearing	oak, basswood, boxelder forest	4	8	30	47	78	110
Highway Managed	Post Pond	dense forest	wooded, mature	5	5	40	50	85	115
Moderate Development	Post Pond	partial view cut	steep slope, hemlocks	3	12	25	49	79	115
Maine/Moultonborough	any	theoretical conditions	large trees only	12			48	72	120
Maine/Moultonborough	any	theoretical conditions	small trees only		24		48	72	120
Maine/Moultonborough	any	theoretical conditions	large & small trees	8	8		48	72	120
Agricultural	Connecticut River	Hay meadow, shrubby river bank, no beaver	natural riverbank, narrow	4	8	40	52	88	120
Recreation	Ossipee River	rest area-oak pine on high bank	natural oak pine on high bank	3	12	30	51	84	120
Managed Woodland	Ammonoosuc River	bridge abutments	cherry/alder slope	0	18	30	51	84	120
Managed Woodland	Bearcamp River	rest area - some maintenance	oak-pine managed forest	2	15	25	51	82	120
Natural Woodland	Slate Pond	ledgy sloping pond shore	Pine/hemlock, thin shrubs, pine needles	2	18	16	52	82	126
Recreation	Saco River	rest area oak pine shore	wooded, understory partially cleared	3	18	8	52	80	128
Light Residential	Goose Pond	paths, outhouse clearing	hemlock-pine light forest	4	13	25	55	88	130
Managed Woodland	Ammonoosuc River	100-foot highway & river edge	spruce fir forest	5	8	40	56	94	130
Maine/Moultonborough	any	theoretical conditions	mixed growth	1	10	72	60	108	132
Maine/Moultonborough	any	theoretical conditions	small trees & saplings	1	16	48	60	102	138
Recreation	Ossipee River	rest area-oak pine on high bank	partially cleared, grassed	6	13	15	58	90	140
Managed Woodland	Ammonoosuc River	150-foot highway & river edge	spruce fir forest, hardwoods	5	14	20	58	92	140
Maine/Moultonborough	any	theoretical conditions	4-6" saplings only (33% of plot)			144	72	144	144
Moderate Development	Post Pond	natural pond slope	steep slope, hemlocks	3	18	25	61	97	145
Agricultural	Stocker Pond	old field, pine shore	old field, pine shore, more woods	2	23	20	64	101	155
Natural Woodland	Baker River	rest area wooded bank - 100' deep	oak pine high bank	4	20	30	71	114	170
Natural Woodland	Goose Pond	hemlock forest on rocky shore	Natural pine/hemlock ledgy shore	1	30	20	74	116	180

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