

Trash Guard, Inc.

Stormdrain Populations Showing Debris, Nutrients & Metals Removed

When we started our prototype experiment questions arose about how we could determine stormdrain populations in all cities. We found that most cities do not have an inventory of stormdrain populations at this time. There were a few exceptions where cities with populations of 50,000 or less knew approximately what their stormdrain populations were. When we compared their stormwater populations with resident populations, we found all were relatively close to 250 stormdrains per 1,000 residents.

We carried this assumption further by comparing cities across the USA with similar resident population ranges, comparing their populations with square miles defining the incorporated areas of the cities, using US Census Bureau statistics. This allowed us to compute the density per square mile. The square miles defining cities incorporated areas vary within the same resident population ranges. However, when average square miles and average density per square mile are computed for each resident population range, a pattern develops showing how stormdrain populations would decline with larger resident populations. One can assume that as city populations increase, more residents will live in apartments and condominiums, increasing the density per square mile. As population ranges continue increasing more residents will reside in high-rise apartments, condominiums and town houses, increasing the density per square mile even more.

Our stormdrain population research is not an exact science and will not hold true in every situation. However, we feel these calculations are good “rule of thumb” estimates and can be used to estimate stormdrain populations until more accurate data can be used. Data used to compute our assumptions can be found on our web site under “Downloadable Documents”.

Based on data furnished showing average weight of 800 lbs. removed per catch basin and data showing average nitrogen, phosphorus and regulated metals retained from trash and debris removed, spreadsheets are attached showing total amounts of trash, nitrogen, phosphorus and regulated metals that could enter our waterways annually per cities populations. As stated, these are averages based on calculated numbers, but they show large amounts of trash, nutrients and metals are entering our waterways annually. Once we have proven data on stormdrain populations, we can adjust the breaking points of our stormdrains per 1,000 populations to reflect the correct city populations to the correct stormdrains per 1,000 populations. Also, data on trash & debris collected from cities with populations of one million or more and very high density per square mile could show average weight of more than 800 lbs per catch basin annually. Either way the final results will be unbelievably high.

**Estimated Trash, Nutrients & Metals Captured Per Population Annually
Areas With High Leaf Litter**

City Population	Stormdrains Per 1000 Population	Number Stormdrains Per City	Avg Lbs Received Per Stormdrain Per Data Collected	Total Lbs Received Annually	Tons Received Annually	Lbs Nitrogen Avg 14.5 Lbs Per Ton	Lbs Phosphorus Avg 1.25 Lbs Per Ton	Lbs Metals Avg 1/3 Lb Per ton
10,000	250	2,500	800	2,000,000	1,000	14,500	1,250	330
20,000	250	5,000	800	4,000,000	2,000	29,000	2,500	660
25,000	250	6,250	800	5,000,000	2,500	36,250	3,125	825
50,000	250	12,500	800	10,000,000	5,000	72,500	6,250	1,650
75,000	250	18,750	800	15,000,000	7,500	108,750	9,375	2,475
100,000	225	22,500	800	18,000,000	9,000	130,500	11,250	2,970
125,000	225	28,125	800	22,500,000	11,250	163,125	14,063	3,713
150,000	225	33,750	800	27,000,000	13,500	195,750	16,875	4,455
175,000	225	39,375	800	31,500,000	15,750	228,375	19,688	5,198
200,000	225	45,000	800	36,000,000	18,000	261,000	22,500	5,940
225,000	225	50,625	800	40,500,000	20,250	293,625	25,313	6,683
250,000	225	56,250	800	45,000,000	22,500	326,250	28,125	7,425
275,000	225	61,875	800	49,500,000	24,750	358,875	30,938	8,168
300,000	225	67,500	800	54,000,000	27,000	391,500	33,750	8,910
325,000	225	73,125	800	58,500,000	29,250	424,125	36,563	9,653
350,000	225	78,750	800	63,000,000	31,500	456,750	39,375	10,395
375,000	225	84,375	800	67,500,000	33,750	489,375	42,188	11,138
400,000	225	90,000	800	72,000,000	36,000	522,000	45,000	11,880
425,000	225	95,625	800	76,500,000	38,250	554,625	47,813	12,623
450,000	225	101,250	800	81,000,000	40,500	587,250	50,625	13,365
475,000	225	106,875	800	85,500,000	42,750	619,875	53,538	14,108
500,000	225	112,500	800	90,000,000	45,000	652,500	56,250	14,850
525,000	225	118,125	800	94,500,000	47,250	685,125	59,063	15,593
550,000	225	123,750	800	99,000,000	49,500	717,750	61,875	16,335
575,000	225	129,375	800	103,500,000	51,750	750,375	64,688	17,078
600,000	225	135,000	800	108,000,000	54,000	783,000	67,500	17,820
650,000	225	146,250	800	117,000,000	58,500	848,250	73,125	19,305
700,000	200	140,000	800	112,000,000	56,000	812,000	70,000	18,480
750,000	200	150,000	800	120,000,000	60,000	870,000	75,000	19,800
800,000	200	160,000	800	128,000,000	64,000	928,000	80,000	21,120
850,000	200	170,000	800	136,000,000	68,000	986,000	85,000	22,440
900,000	200	180,000	800	144,000,000	72,000	1,040,000	90,000	23,760
950,000	200	190,000	800	152,000,000	76,000	1,102,000	95,000	25,080
1,000,000	200	200,000	800	160,000,000	80,000	1,160,000	100,000	26,400
1,500,000	200	300,000	800	240,000,000	120,000	1,740,000	150,000	39,600
2,000,000	175	350,000	800	280,000,000	140,000	2,030,000	175,000	46,200
2,500,000	175	437,500	800	350,000,000	175,000	2,537,500	218,750	57,750
3,000,000	175	525,000	800	420,000,000	210,000	3,045,000	262,500	69,300
3,500,000	175	612,500	800	490,000,000	245,000	3,552,500	306,250	80,850
4,000,000	150	600,000	800	480,000,000	240,000	3,480,000	300,000	79,200
5,000,000	125	625,000	800	500,000,000	250,000	3,625,000	312,500	82,500
6,000,000	100	600,000	800	480,000,000	240,000	3,480,000	300,000	79,200
7,000,000	75	525,000	800	420,000,000	210,000	3,045,000	262,500	69,300
8,000,000	50	400,000	800	320,000,000	160,000	2,320,000	200,000	52,800

Metals Include: Lead, Copper, Zinc, Nickel & Cadmium

We also capture large amounts of petroleum-based compounds, such as oils and diesel organics in areas where petroleum compounds are prevalent.

**Estimated Trash, Nutrients & Metals Captured Per Population Annually
Areas With Sediment The Major Contaminant**

City Population	Stormdrains Per 1000 Population	Number Stormdrains Per City	Avg Lbs Received Per Stormdrain Per Data Collected	Total Lbs Received Annually	Tons Received Annually	Lbs Nitrogen Avg 3.5 Lbs Per Ton	Lbs Phosphorus Avg 1/2 Lbs Per Ton	Lbs Metals Avg 1.5 Lb Per ton
10,000	250	2,500	800	2,000,000	1,000	3,500	500	1,500
20,000	250	5,000	800	4,000,000	2,000	7,000	1,000	3,000
25,000	250	6,250	800	5,000,000	2,500	8,750	1,250	3,750
50,000	250	12,500	800	10,000,000	5,000	17,500	2,500	7,500
75,000	250	18,750	800	15,000,000	7,500	26,250	3,750	11,250
100,000	225	22,500	800	18,000,000	9,000	31,500	4,500	13,500
125,000	225	28,125	800	22,500,000	11,250	39,375	5,625	16,875
150,000	225	33,750	800	27,000,000	13,500	47,250	6,750	20,250
175,000	225	39,375	800	31,500,000	15,750	55,125	7,875	23,625
200,000	225	45,000	800	36,000,000	18,000	63,000	9,000	27,000
225,000	225	50,625	800	40,500,000	20,250	70,875	10,125	30,375
250,000	225	56,250	800	45,000,000	22,500	78,750	11,250	33,750
275,000	225	61,875	800	49,500,000	24,750	86,625	12,375	37,125
300,000	225	67,500	800	54,000,000	27,000	94,500	13,500	40,500
325,000	225	73,125	800	58,500,000	29,250	102,375	14,625	43,875
350,000	225	78,750	800	63,000,000	31,500	110,250	15,750	47,250
375,000	225	84,375	800	67,500,000	33,750	118,125	16,875	50,625
400,000	225	90,000	800	72,000,000	36,000	126,000	18,000	54,000
425,000	225	95,625	800	76,500,000	38,250	133,875	19,125	57,375
450,000	225	101,250	800	81,000,000	40,500	141,750	20,250	60,750
475,000	225	106,875	800	85,500,000	42,750	149,625	21,375	64,125
500,000	225	112,500	800	90,000,000	45,000	157,500	22,500	67,500
525,000	225	118,125	800	94,500,000	47,250	165,375	23,625	70,875
550,000	225	123,750	800	99,000,000	49,500	173,250	24,750	74,250
575,000	225	129,375	800	103,500,000	51,750	181,125	25,875	77,625
600,000	225	135,000	800	108,000,000	54,000	189,000	27,000	81,000
650,000	225	146,250	800	117,000,000	58,500	204,750	29,250	87,750
700,000	200	140,000	800	112,000,000	56,000	196,000	28,000	84,000
750,000	200	150,000	800	120,000,000	60,000	210,000	30,000	90,000
800,000	200	160,000	800	128,000,000	64,000	224,000	32,000	96,000
850,000	200	170,000	800	136,000,000	68,000	238,000	34,000	102,000
900,000	200	180,000	800	144,000,000	72,000	252,000	36,000	108,000
950,000	200	190,000	800	152,000,000	76,000	266,000	38,000	114,000
1,000,000	200	200,000	800	160,000,000	80,000	280,000	40,000	120,000
1,500,000	200	300,000	800	240,000,000	120,000	420,000	60,000	180,000
2,000,000	175	350,000	800	280,000,000	140,000	490,000	70,000	210,000
2,500,000	175	437,500	800	350,000,000	175,000	612,500	87,500	262,500
3,000,000	175	525,000	800	420,000,000	210,000	735,000	105,000	315,000
3,500,000	175	612,500	800	490,000,000	245,000	857,500	122,500	367,500
4,000,000	150	600,000	800	480,000,000	240,000	840,000	120,000	360,000
5,000,000	125	625,000	800	500,000,000	250,000	875,000	125,000	375,000
6,000,000	100	600,000	800	480,000,000	240,000	840,000	120,000	360,000
7,000,000	75	525,000	800	420,000,000	210,000	735,000	105,000	315,000
8,000,000	50	400,000	800	320,000,000	160,000	560,000	80,000	240,000

Metals Include: Lead, Copper, Zinc, Nickel & Cadmium

We also capture large amounts of petroleum-based compounds, such as oils and diesel organics in areas where petroleum compounds are prevalent.