



Litter Strategy Monitoring Wave 53 – May 2011 Report

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On behalf of: KESAB Environmental Solutions

Project No: 7239

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For enquiries on this report please contact David O’Dea.

Section 1

Introduction

This document has been prepared by McGregor Tan Research to report on Wave 53 of the quarterly KESAB Litter Monitor. Surveys for the current Wave were conducted in South Australia during May 2011.

Background

Regular monitoring of the litter stream is necessary in order to maintain a clear picture of its components, such as the various material types that contribute to the litter stream as well as the distribution of litter across different area types. Keep South Australia Beautiful (KESAB) had been monitoring the State's litter stream for many years, but the level of detail required during the South Australian Government's moratorium on changes to Container Deposit Legislation was considerably greater than previously recorded.

An expanded monitoring program commenced in February 1998, and McGregor Tan Research was commissioned at that time to undertake the actual count and to report regularly on the outcomes. This expanded program was continued throughout 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 and is planned to continue.

With the exception of August 2002, counts have been conducted quarterly, carried out in February, May, August and November of each year. Throughout the Monitor, care has been taken to maintain the data in a form compatible with KESAB's requirements.

During each Wave of the survey, litter counts are undertaken at 151 sites across South Australia. In conjunction with the national litter count, a review of all South Australian sites showed that 11 of the sites surveyed were disproportionately represented in the data. These original sites were found to be unusual in nature, and were replaced with 11 revised sites.

The data collection form utilised for the count was jointly developed by McGregor Tan Research and KESAB. A copy of this form is provided in Appendix 2.

In January 2003, Container Deposit Legislation (CDL) was extended to cover most beverages under 1 litre, such as juice cartons, fruit boxes, flavoured milk cartons, etc. As a result, a new method of analysing the data had to be adopted so that the changes to the CDL, and the effect on the total litter stream could be evaluated.

Prior to the August 2004 Litter Count, the data collection form was re-evaluated and re-designed to take into account the changes to the CDL and also to incorporate new categories for litter items that were previously coded as 'other' or in an inappropriate category. The changes that were made to the data collection form include:

- Plastic bags were separated into 3 types of litter:
 - Supermarket type lightweight shopping bags
 - Heavier glossy, typically branded carry bags
 - Sacks, sheeting and other bags
- Bottle and can tops were moved and separated from the Miscellaneous Category into both 'plastic bottle top' and 'metal bottle and can tops'.
- The following four litter types were also added to the Plastic category:
 - Bread bag tags
 - Lollipop sticks
 - Spoons/ cutlery
 - Drink pouches
- The Metal Cans category name was changed to Metal.
- Foil take away was moved from Miscellaneous to Metal.
- Cigarette butts were separated from the Miscellaneous Category.
- Two extra items were added to the Paper/paperboard category:
 - Paper bags
 - Shopper docket & related shopping paper

In previous waves, the data collection form separated each litter type into CDL and non-CDL categories. However, extended Container Deposit Legislation (CDL) has now meant that the litter categories alone (e.g. Flavoured milk, < 1 litre) can be used to establish whether or not beverage containers are covered under CDL or not.

In order to determine the effectiveness of the current CDL (as of January 2003), and for comparative purposes, it was necessary to re-calculate the number of current CDL items from the waves prior to the extension. References to CDL items in Waves prior to Wave 17 (waves 1-16) therefore denote beverage containers that are *currently* covered by CDL – not the items that *were* covered by the legislation prior to this time.

During the Wave 29 Monitor estimates of the volumes for each litter item category were defined. The assignments of volume estimates to each litter item category were based on actual measurements of containers/ items, the condition that these items were most commonly found (which was based on the audits of at least three Waves), and the most common or average size of the items that were found within each category.

The auditors were an important part of the volume formulation process, and these persons were able to record the number, size and type of different items within each category over a number of waves. Volumes ascribed to each item represented the average size for that category across all site types.

The final volume attributed to each litter item category furthermore took into account the fact that some items were often found crushed and weathered. For example, some drink cans and cartons are often crushed and/ or weathered when they are identified by the auditors and counted. The same volume measurements have been used for all subsequent Waves.

Two noteworthy events that have taken place since the beginning of this longitudinal study include:

- The deposit on drink containers was increased from 5 cents to 10 cents in September 2008.
- The ban on thin plastic shopping bags came into affect in May 2009.

This document reports on Wave 53 of the longitudinal study. The litter count was conducted during May 2011. Section 2 of this report outlines the litter characteristics of the 151 sites, which include 11 revised sites (replacing 11 of the original 151). Appendix 1 contains charts tracking results back across all prior Monitors, and includes weighted results to facilitate meaningful comparison of results established at the 151 original sites with results derived from the 151 revised sites.

Section 2

Wave 53

Executive Summary

The following Executive Summary covers the findings of the May 2011 (Wave 53) KESAB Litter Monitor. Where possible, results have been tracked against those derived from any previous Waves which incorporated revised sites. All 151 sites were counted during the May 2011 count.

Items Counted

A total of 13,021 litter items were counted across the 151 South Australian sites during Wave 53. These figures are below those from the previous monitors in February (14,026), November 2010 (13,913), August 2010 (15,694) and the May 2010 (14,159) from the same time last year.

Cigarette butts remained the main contributor (44%) to the litter count with 5,715 butts counted in Wave 53, up from 5,446 butts in Wave 52, but down from 5,786 in Wave 51 and 5,927 butts counted at the same time last year in May 2010 in Wave 49.

The increase in items counted in Wave 53 is demonstrated most strongly amongst the following litter items:

- CIGARETTE BUTTS – 5,715 butts, up from 5,446 butts in Wave 52 (5% increase)
- PLASTIC - Snack bags & confectionery wrappers – 460 items, up from 351 items in Wave 52 (31% increase)
- PLASTIC - Take away & cups - 310 items, up from 250 items in Wave 52 (24% increase)
- PAPER/PAPERBOARD - Cups/take away containers - 208 items, up from 176 items in Wave 52 (18% increase)
- GLASS - Beer, all colours of glass, <750ml - 79 items, up from 51 items in Wave 52 (55% increase)
- MISCELLANEOUS - Clothing & materials – 197 items, up from 173 items in Wave 52 (14% increase)
- PLASTIC - Sacks - sheeting - other bags - 119 items, up from 97 items in Wave 52 (23% increase)

Conversely, there was a decrease in several litter items, these included:

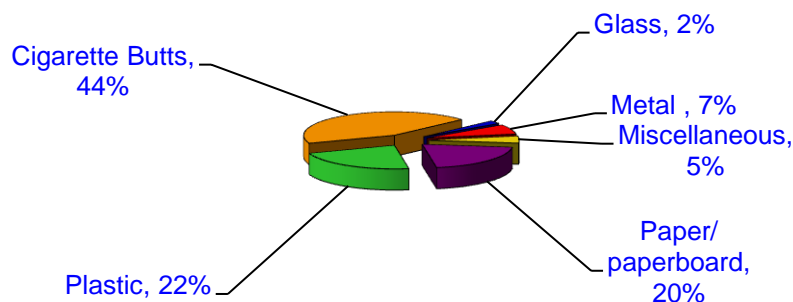
- PAPER/PAPERBOARD - Other paper (including tissues) – 1,706 items, down from 2,295 items in Wave 52 (26% decrease)
- PLASTIC - Other plastic – 909 items, down from 1,175 items in Wave 52 (23% decrease)
- PLASTIC - Straws – 230 items, down from 359 items in Wave 52 (36% decrease)
- METAL - Metal bottle tops and can pull rings – 300 items, down from 384 items in Wave 52 (22% decrease)
- PLASTIC - Plastic bottle tops – 280 items, down from 345 items in Wave 52 (19% decrease)
- PLASTIC - Styrene foam boxes, sheets, etc – 82 items, down from 147 items in Wave 52 (44% decrease)

- PLASTIC - Lollipop sticks – 86 items, down from 145 items in Wave 52 (41% decrease)
- PLASTIC - Packing tape & straps – 90 items, down from 138 items in Wave 52 (35% decrease)
- MISCELLANEOUS - Rubber pieces (not tyres) – 113 items, down from 155 items in Wave 52 (27% decrease)
- PAPER/PAPERBOARD - Packages & boxes - 156 items, down from 191 items in wave 52 (18% decrease)
- PLASTIC - Spoons/cutlery - 68 items, down from 101 items in Wave 52 (33% decrease)
- PAPER/PAPERBOARD - Paper bags - 134 items, down from 164 items in Wave 52 (18% decrease)
- METAL - Other foil – 250 items, down from 278 items in Wave52, (10% decrease)
- PAPER/PAPERBOARD - Shopper docket & related shopping paper (eg. lists) - 111 items, down from 139 items in Wave 52 (20% decrease)
- MISCELLANEOUS - Tyres & pieces - 31 items, down from 57 items in Wave 52 (46% decrease)

Cigarette butts accounted for the largest proportion of all litter items counted (44%, up from 39% in Wave 52 and 42% in Wave 49 at the same time in the previous year. Other material types represented the following proportions of the litter items counted:

- Plastic items (22%, down from 24% in Wave 52)
- Paper/ paperboard (20%, down from 24% in Wave 52)
- Metal items (7%, unchanged from Wave 52)
- Miscellaneous items (5%, up from 4% in Wave 52)
- Glass items (2%, unchanged from Wave 52)

Items as Proportions of Total by Material Type



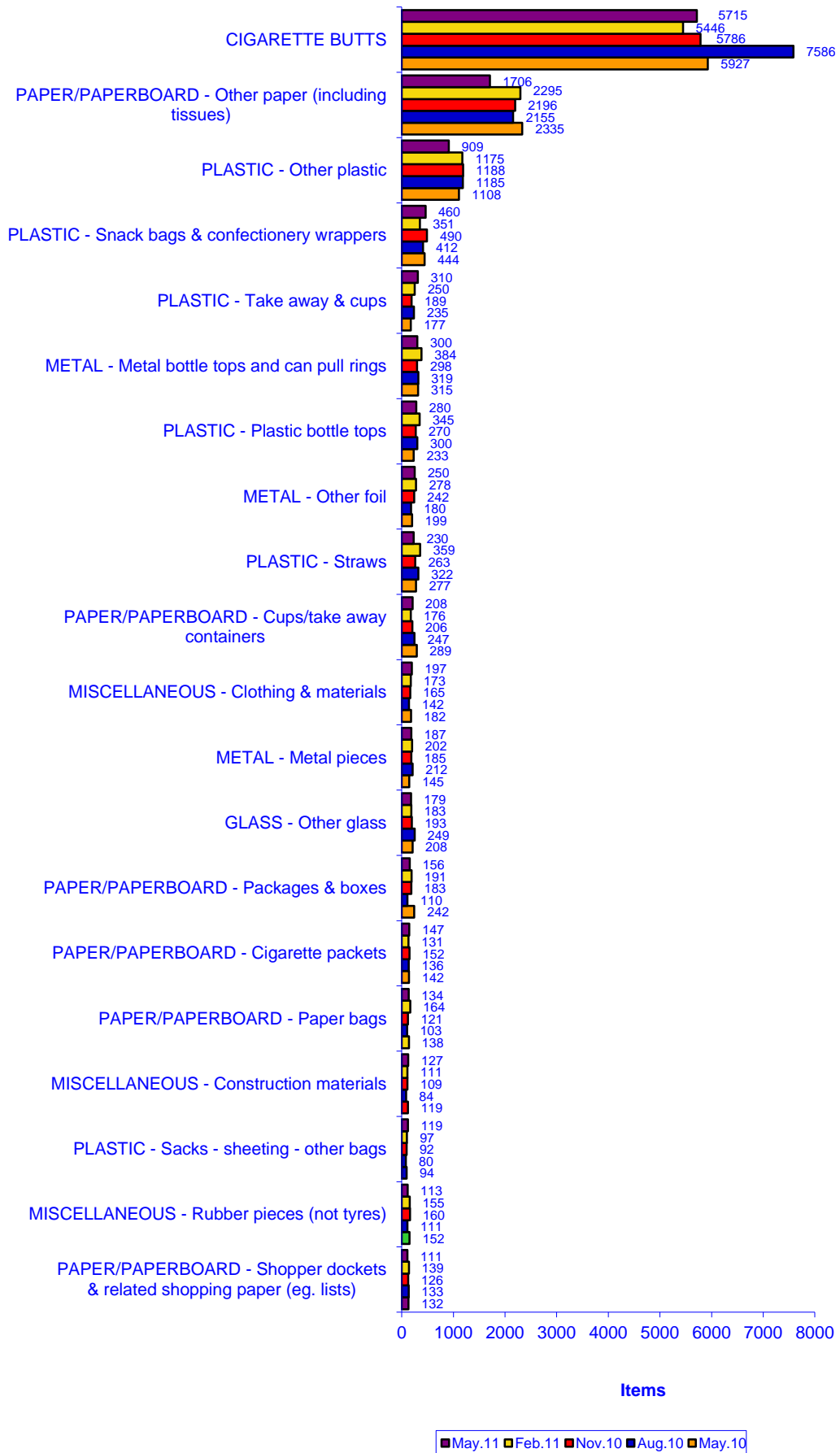
The top 20 ranking of litter items for May 2011 also included the following items not present previously in wave 52:

- PAPER/ PAPERBOARD – Cigarette packets
- MISCELLANEOUS – Construction materials
- PLASTIC – Sacks – sheeting – other bags

The items that exited the top 20 as a result of the new entrants were:

- PLASTIC – Styrene foam boxes, sheets, etc.
- PLASTIC – Lollipop sticks
- PLASTIC – Packaging tape & straps

TOP 20 CATEGORIES - HIGHEST COUNTS



Litter Volume

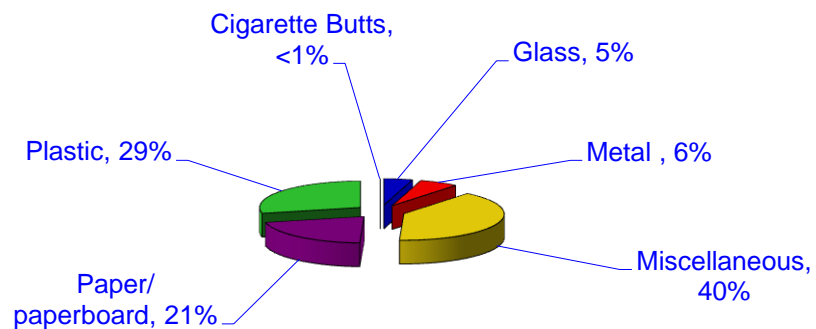
The total volume of litter recorded in May 2011 amounted to 1.317 cubic metres 4% lower than the estimated litter volume established in the February 2011 Monitor (1.376m³) and also lower than the estimated litter volume established during the volume recorded at the same time last year in May 2010 (1.761m³).

The largest proportion of litter volume for Wave 53 was contributed by miscellaneous items (40%, down from 47% in Wave 52), plastic items (29%, up from 21% in Wave 52), and paper/ paperboard items (21%, down from 23% in Wave 52). The most significant contributor to volume among miscellaneous items was illegal dumping, this accounted for more than one third (35%) of the overall total volume of litter.

Other material types represented the following proportions of the total volume of litter items counted:

- Metal (6%, down from 7% in Wave 52)
- Glass (5%, up from 3% in Wave 52)
- Cigarette butts (<1%, unchanged from Wave 52)

Litter Volume as a Proportion of Total Volume



The items associated with the largest estimated litter volumes in Wave 53 included:

- MISCELLANEOUS - Illegal dumping (0.456m³, down from 0.576m³ in Wave 52)
- PAPER/PAPERBOARD - Cups/take away containers (0.152m³, up from 0.128m³ in Wave 52)
- PLASTIC - Containers, domestic type (0.125m³, down from 0.133m³ in Wave 52)
- PLASTIC - Containers, industrial e.g. oil (0.067m³, up from 0.045m³ in Wave 52)
- PLASTIC - Take away & cups (0.064m³, up from 0.052m³ in Wave 52)
- PAPER/PAPERBOARD - Newspapers & magazines (0.048m³, down from 0.077m³ in Wave 52)
- MISCELLANEOUS - Construction materials (0.046m³, down from 0.040m³ in Wave 52)
- GLASS – Beer, all colours of glass, <750ml (0.038m³, up from 0.024m³ in Wave 52)
- PAPER/PAPERBOARD - Cigarette packets (0.032m³, up from 0.029m³ in Wave 52)

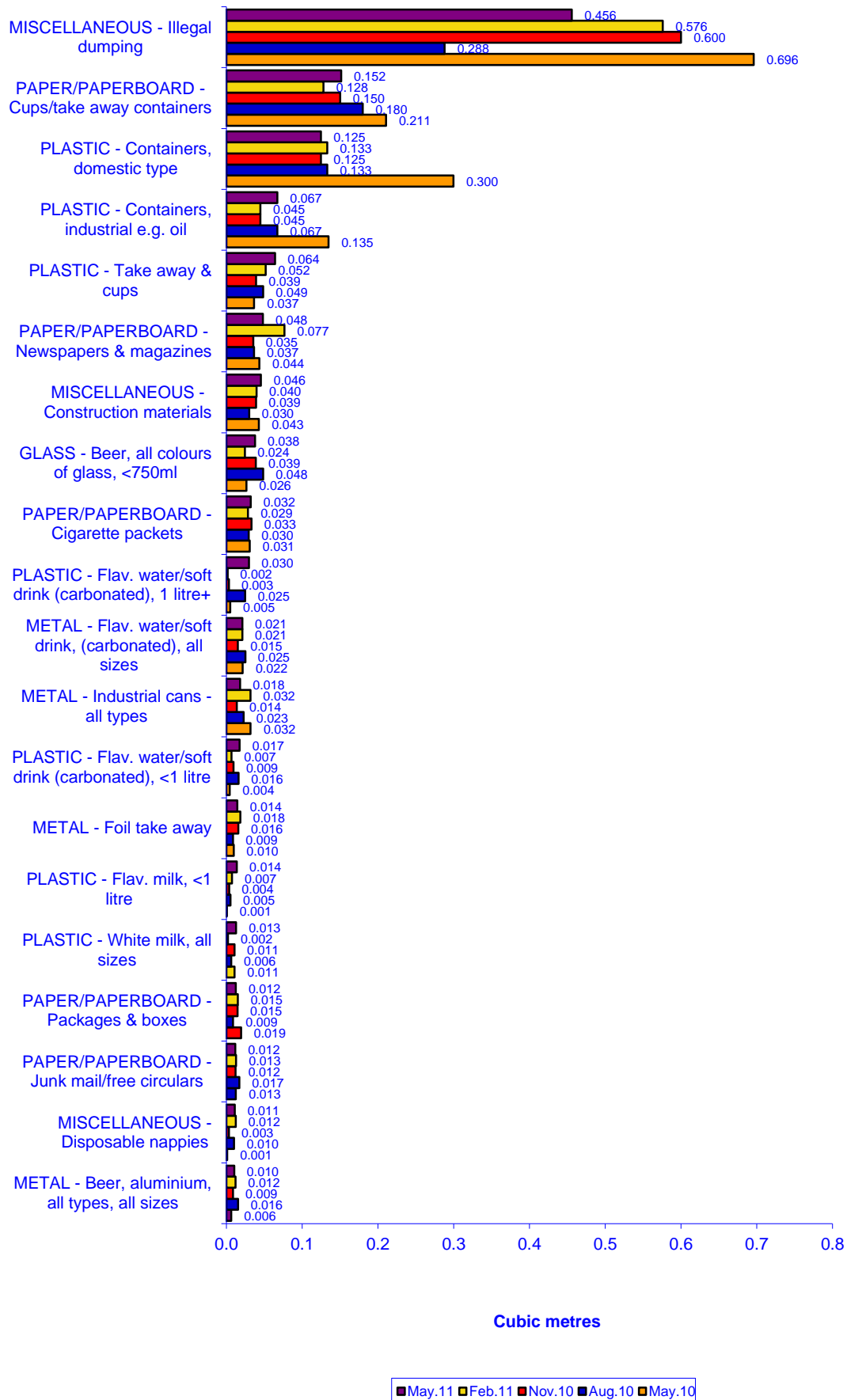
The top 20 ranking of litter items by volume in Wave 53 was similar to the results for previous waves, the new items entering the top 20 however were:

- PLASTIC – Flavoured water/soft drink (carbonated), 1 litre +
- PLASTIC – Flavoured water/soft drink (carbonated), < 1 litre
- PLASTIC – Flavoured milk, < 1 litre
- PLASTIC - White milk, all sizes

With new entrants there are always those items that exit from the top 20 volume list, in Wave 53 they were:

- PAPER/PAPERBOARD – Cartons, Flavoured milk, < 1 litre
- MISCELLANEOUS – Tyres & pieces
- PLASTIC – Fruit juice, 1 litre+
- PAPER/PAPERBOARD – Cartons, Fruit juice, < 1 litre

TOP 20 CATEGORIES - LARGEST VOLUMES

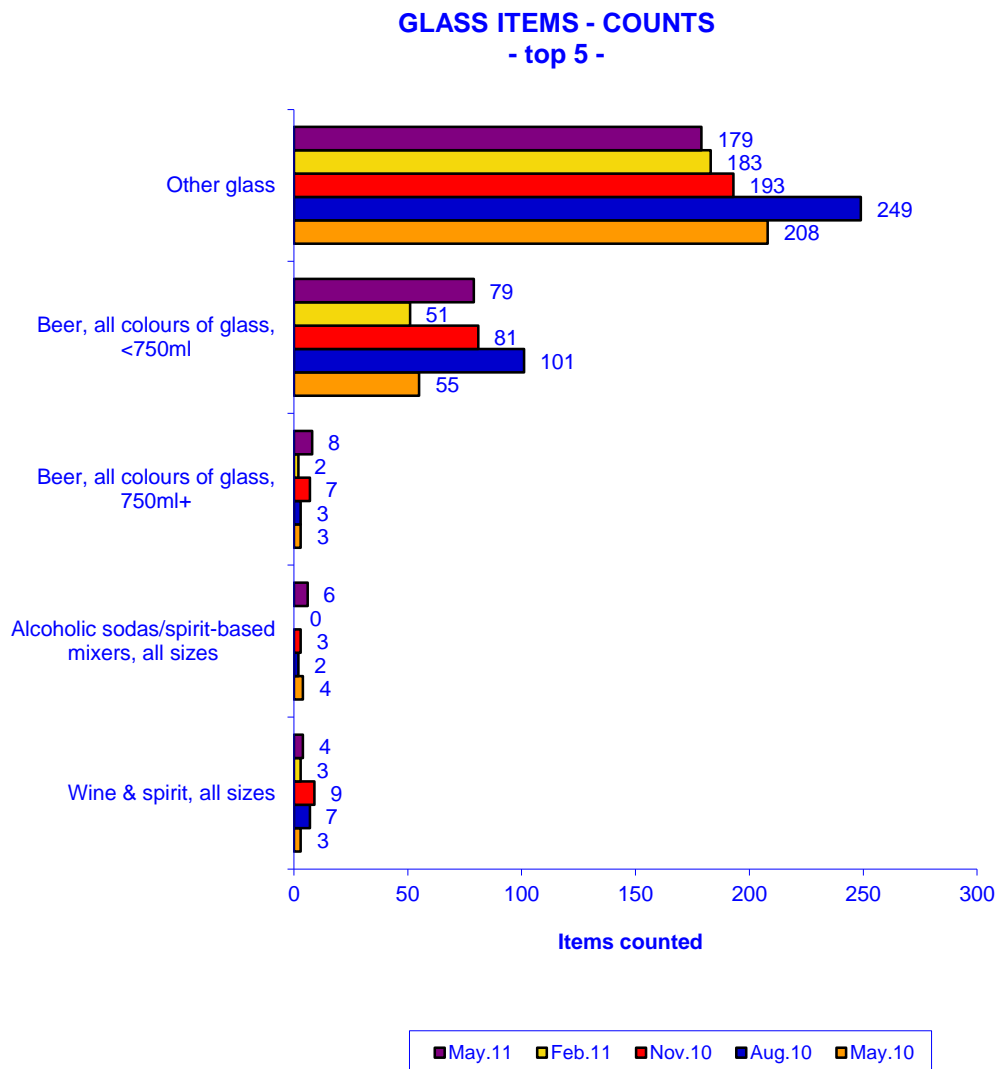


3.1 Glass

Items

A total of 286 items (up from 247 items in Wave 52) glass litter items were counted during Wave 53. The most frequently recorded glass items included:

- Other glass (179 items, down from 183 items in Wave 52)
- Beer, all colours of glass <750ml (79 items, up from 51 items in Wave 52)
- Beer, all colours of glass 750ml+ (8 items, up from 2 items in Wave 52)
- Alcoholic sodas/spirit-based mixers, all sizes (6 items, up from 0 items in Wave 52)
- Wine and spirits, all sizes (4 items, up from 3 items in Wave 52)

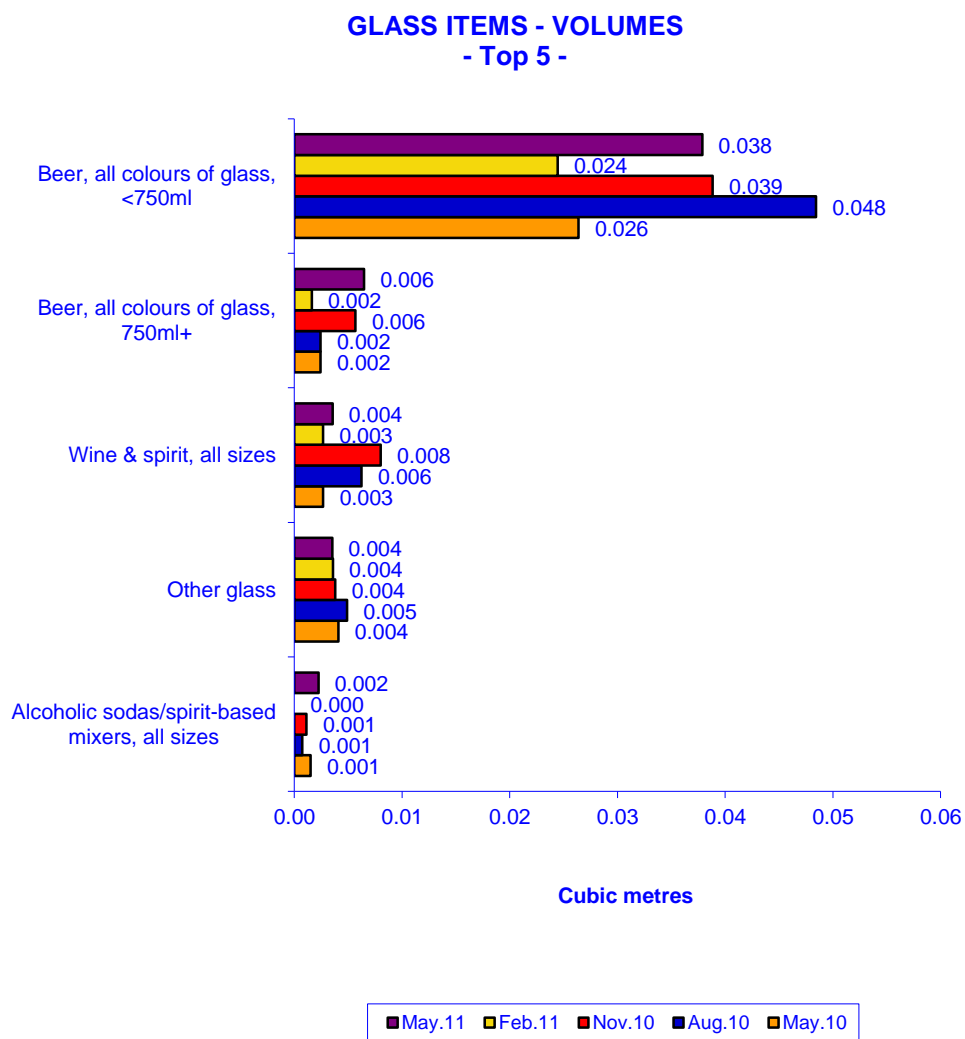


Volume

Glass litter items accounted for 0.061m³ (up from 0.036m³ in Wave 52) in estimated litter volume.

Glass items which contributed the largest volumes to the total included:

- Beer, all colours of glass, <750 ml (0.038m³, up from 0.024m³ in Wave 52)
- Beer, all colours of glass, 750+ ml (0.006m³, up from 0.002m³ in Wave 52)
- Wine and spirits, all sizes (0.004m³, up from 0.003m³ in Wave 52)
- Other glass (0.004m³, unchanged from Wave 52)
- Alcoholic sodas/spirit-based mixers, all sizes (0.002m³, up from nil in Wave 52)



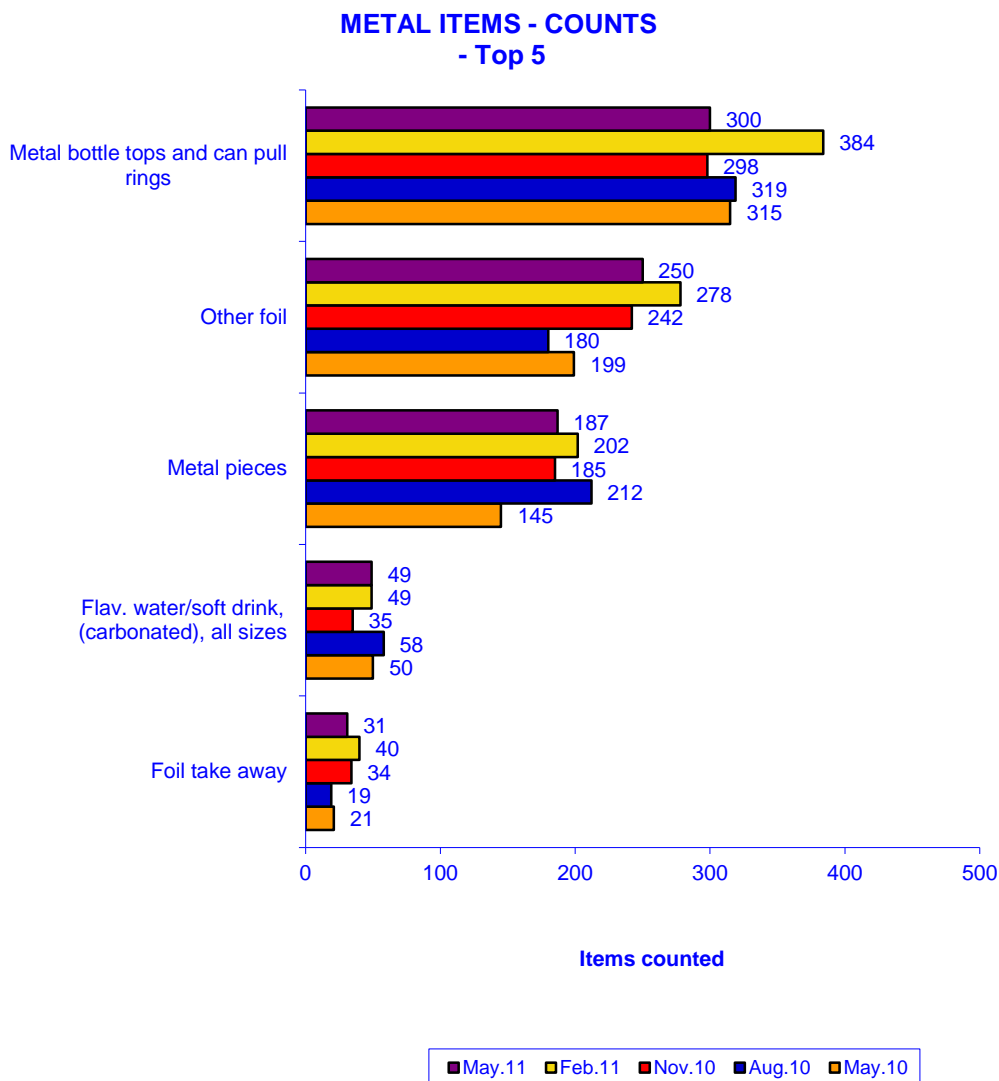
3.2

Metal

Items

A total of 874 (down from 1,010 in Wave 52) metal litter items were counted during May 2011. The most frequently counted metal litter items included:

- Metal bottle tops and can pull rings (300 items, down from 384 items in Wave 52)
- Other foil (250 items, down from 278 items in Wave 52)
- Metal pieces (187 items, down from 202 items in Wave 52)
- Flavoured water/soft drink, (carbonated), all sizes (49 items, unchanged from Wave 52)
- Foil take away (31 items, down from 40 items in Wave 52)

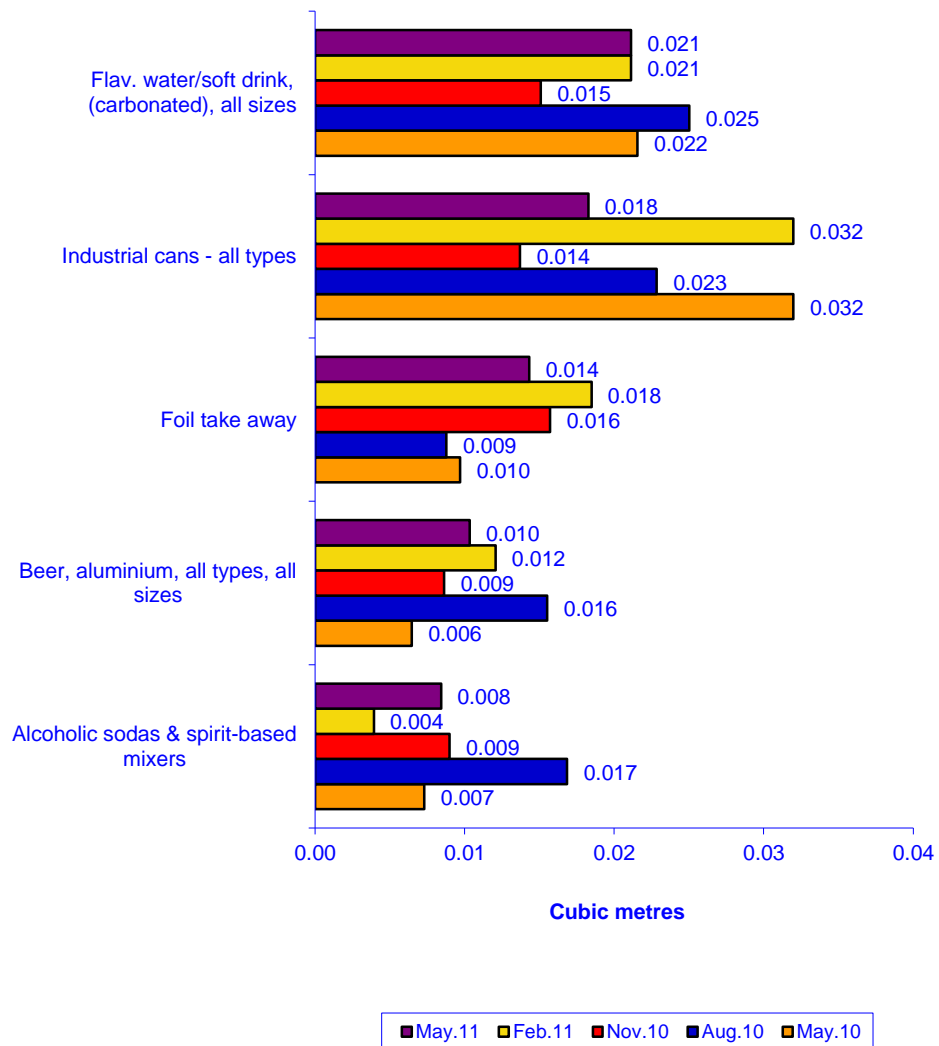


Volume

Metal litter items accounted for a total estimated litter volume of 0.083m³ (down from 0.100m³ in Wave 52). The metal items associated with the largest estimated volumes of litter during Wave 53 included:

- Flavoured water/ soft drink (carbonated), all sizes (0.021m³, unchanged from Wave 52)
- Industrial cans – all types (0.018m³, down from 0.032m³ in Wave 52)
- Foil take away (0.014m³, down from 0.018m³ in Wave 52)
- Beer aluminium, all types, all sizes (0.010m³, down from 0.012m³ in Wave 52)
- Alcoholic sodas & spirit-based mixers (0.008m³, up from 0.004m³ in Wave 52)

METAL ITEMS - VOLUMES - Top 5



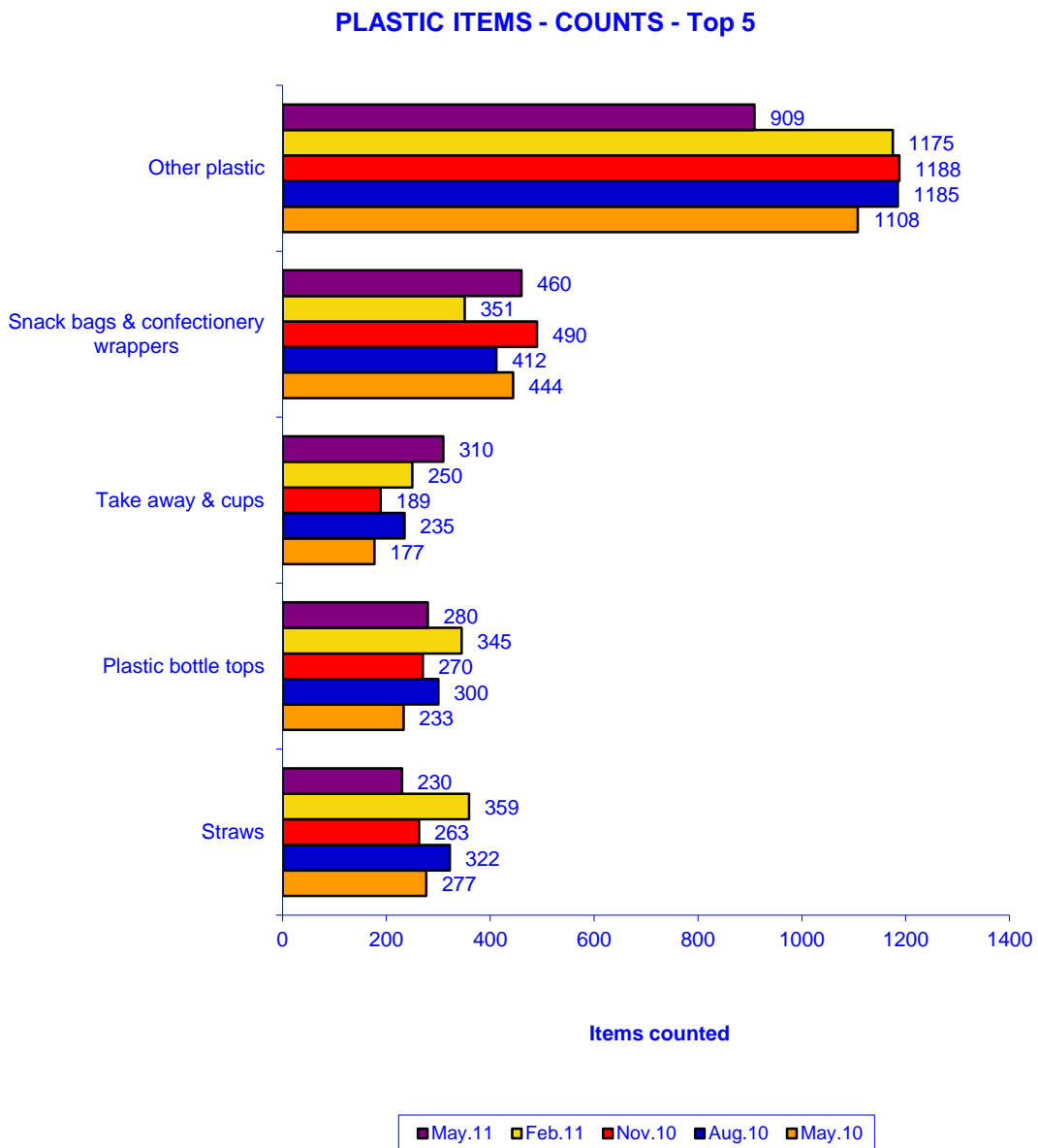
3.3

Plastic

Items

A total of 2,862 (down from 3,309 in Wave 52) plastic litter items were counted during Wave 53. The most frequently counted plastic litter items included:

- Other plastic (909 items, down from 1,175 in Wave 52)
- Snack bags & confectionery wrappers (460 items, up from 351 in Wave 52)
- Take away & cups (310 items, up from 250 in Wave 52)
- Plastic bottle tops (280 items, down from 345 in Wave 52)
- Straws (230 items, down from 359 in Wave 52)

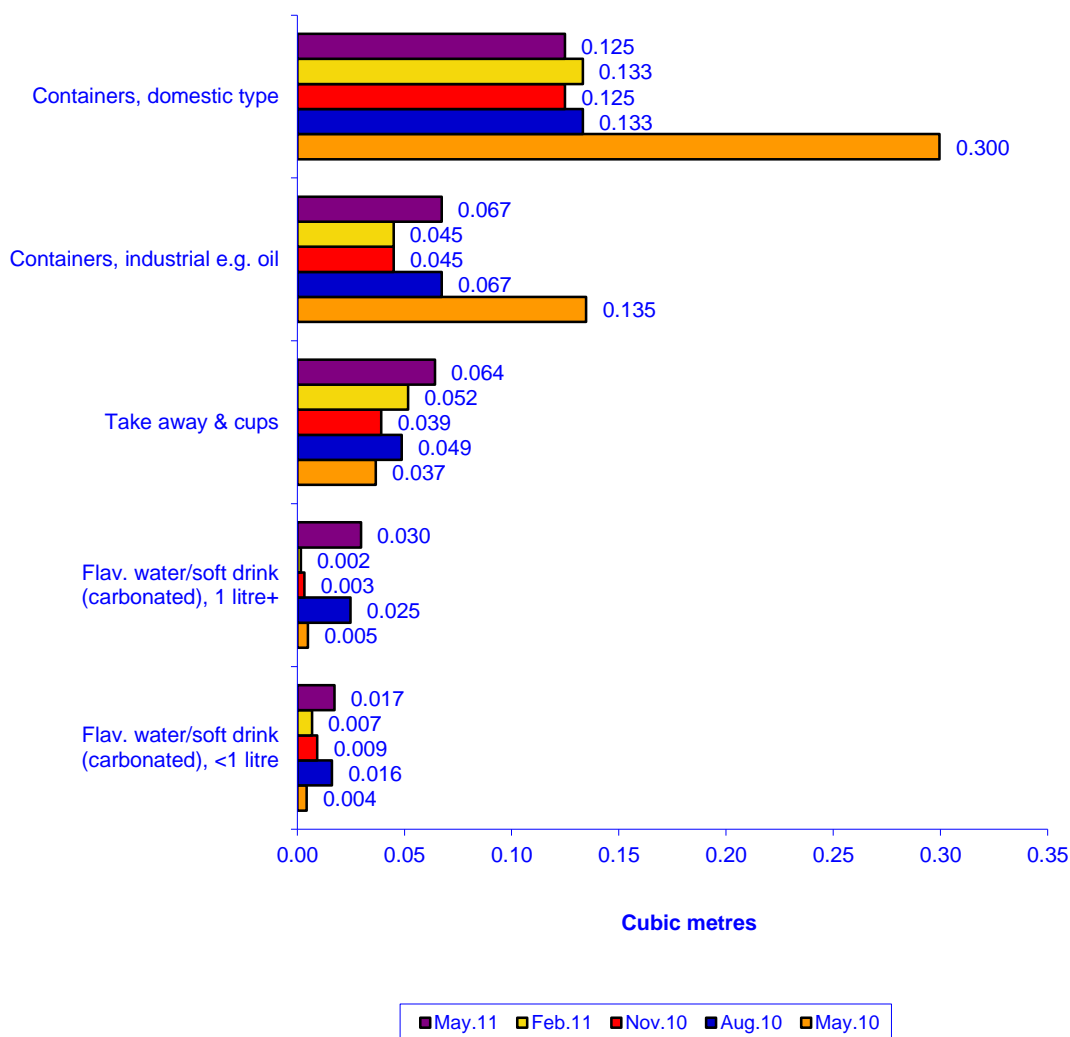


Volume

Plastic items were associated with an estimated litter volume of 0.377m³ (up from 0.285m³ in Wave 52). Items which represented the largest volumes within the Wave 53 litter count included:

- Containers, domestic type (0.125m³, down from 0.133m³ in Wave 52)
- Containers, industrial e.g. oil (0.067m³, up from 0.045m³ in Wave 52)
- Take away & cups (0.064m³, up from 0.052m³ in Wave 52)
- Flavoured water/soft drink (carbonated), 1 litre+ (0.030m³, up from 0.002m³ in Wave 52)
- Flavoured water/soft drink (carbonated), <1 litre (0.017m³, up from 0.007m³ in Wave 52)

PLASTIC ITEMS - VOLUMES - Top 5



3.4 Paper/ Paperboard

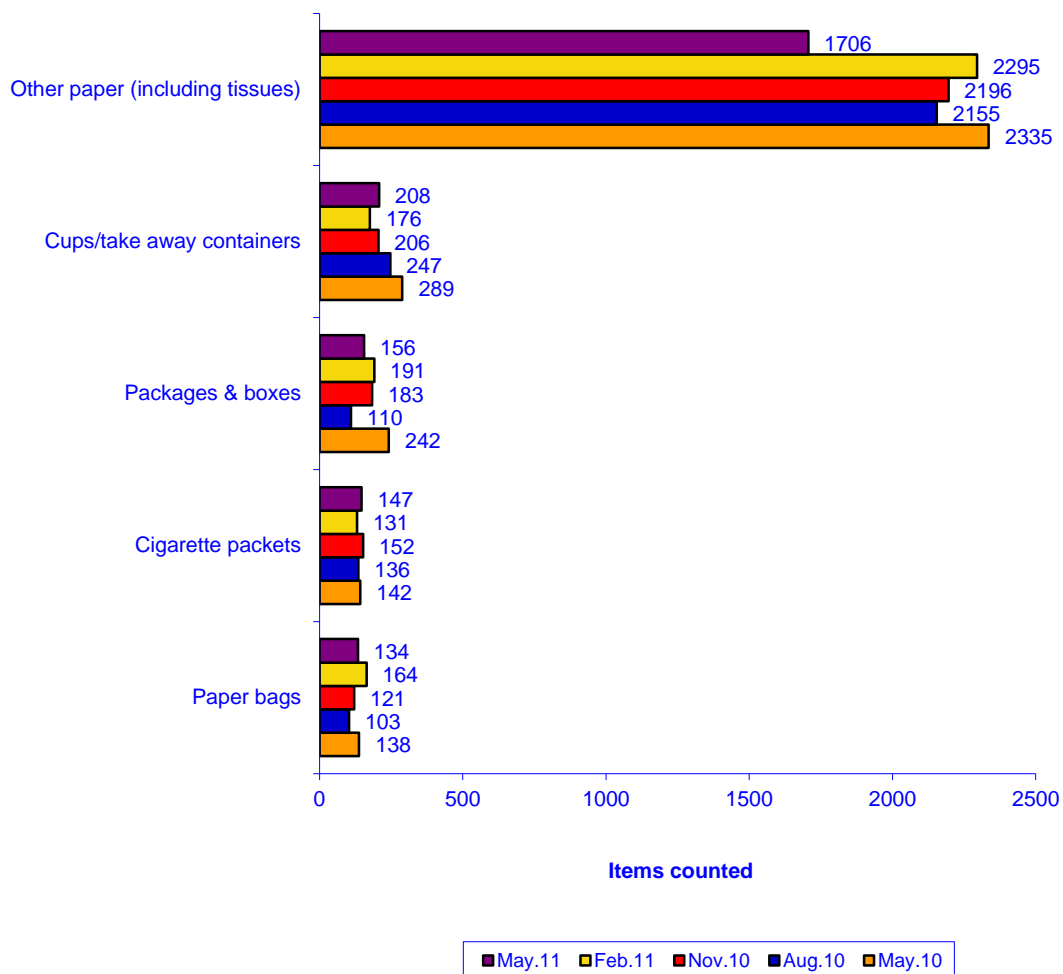
Items

A total of 2,665 (down from 3,391 in Wave 52) paper/ paperboard litter items were recorded during Wave 53.

The most frequently identified items within this material type were:

- Other paper – including tissues (1,706 items, down from 2,295 in Wave 52)
- Cups/ take away containers (208 items, up from 176 in Wave 52)
- Packages & boxes (156 items, down from 191 in Wave 52)
- Cigarette packets (e.g. lists) (147 items, up from 131 in Wave 52)
- Paper bags (134, down from 164 in Wave 52)

PAPER/ PAPERBOARD ITEMS - COUNTS - Top 5



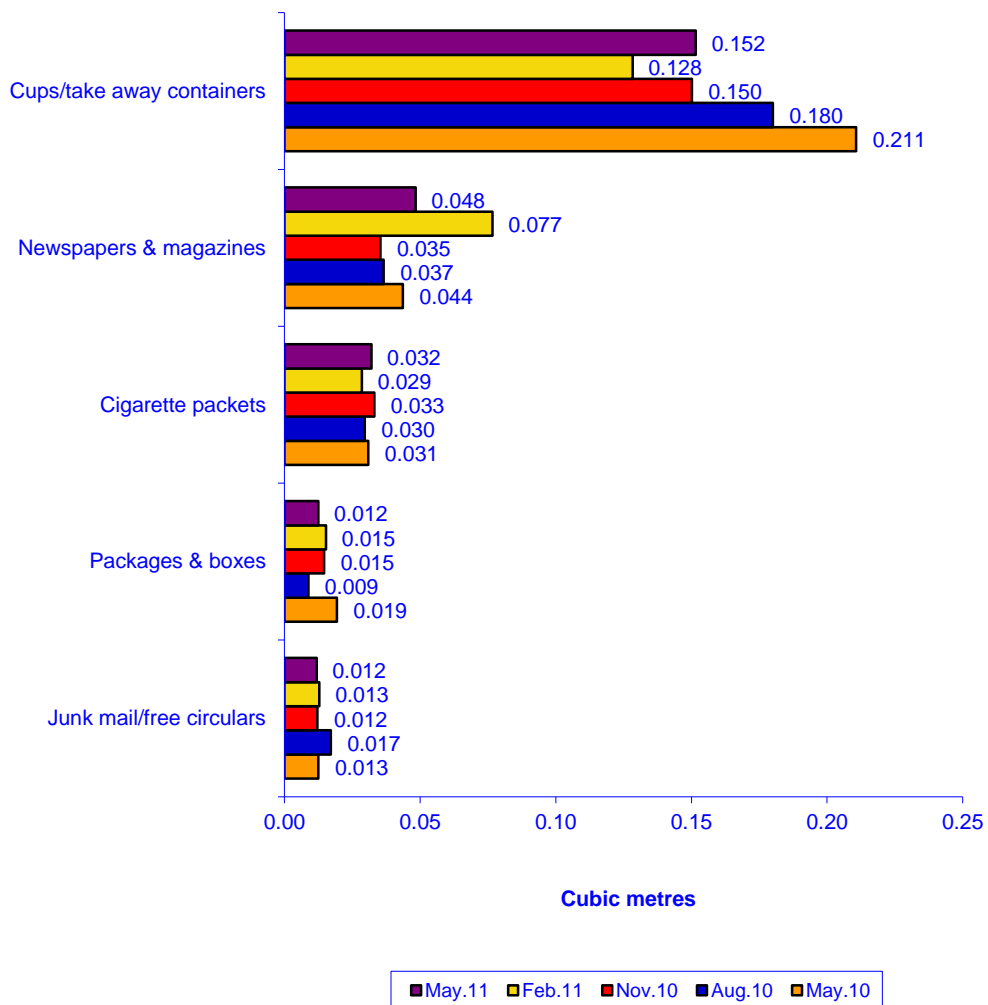
Volume

Paper/ Paperboard items accounted for 0.273m³ in estimated litter volume (down from 0.310m³ in Wave 52).

Paper/ paperboard items which contributed the largest volumes to the total included:

- Cups/take away containers (0.152m³, up from 0.128m³ in Wave 52)
- Newspapers & magazines (0.048m³, down from 0.077m³ in Wave 52)
- Cigarette packets (0.032m³, up from 0.029m³ in Wave 52)
- Packages & boxes (0.012m³, down from 0.015m³ from Wave 52)
- Junk mail/ free circulars (0.012m³, down from 0.013m³ in Wave 52)

PAPER/ PAPERBOARD ITEMS - VOLUMES - Top 5



3.5 *Miscellaneous*

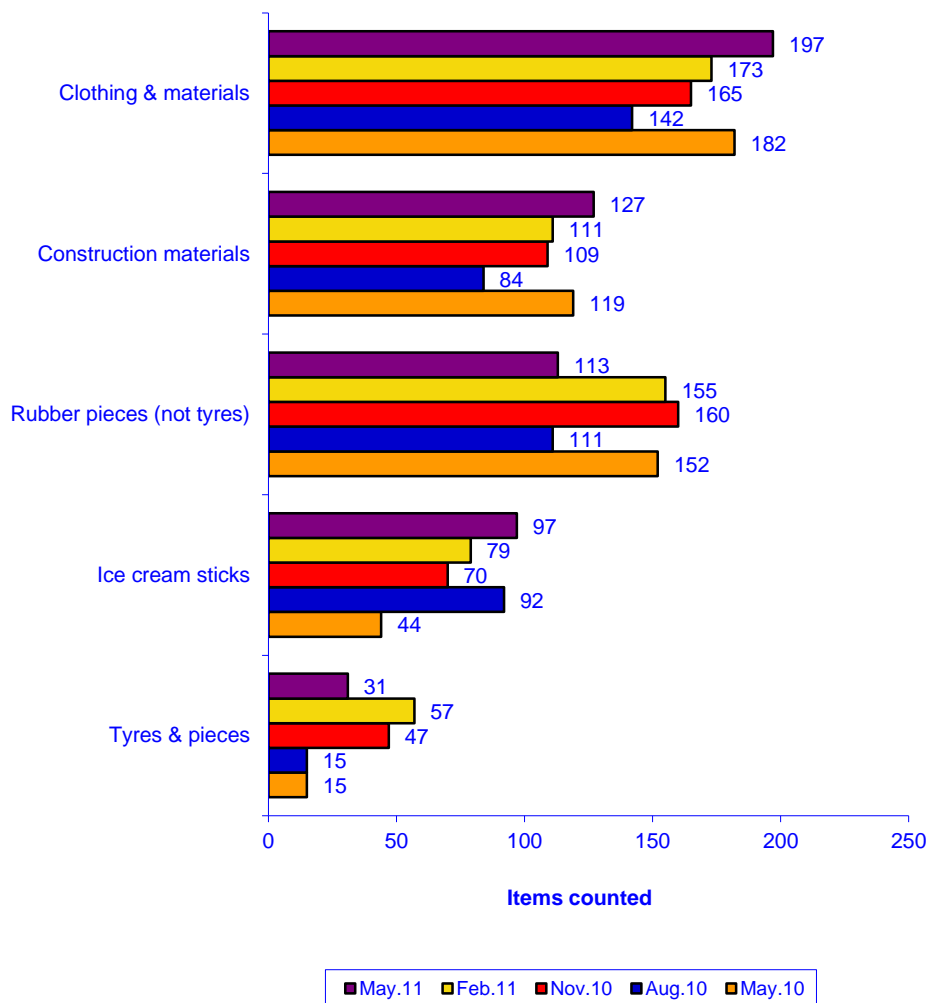
Items

A total of 619 (down from 623 in Wave 52) miscellaneous litter items were counted during Wave 53 in May 2011.

The most frequently recorded items included:

- Clothing & materials (197 items, up from 173 items in Wave 52)
- Construction materials (127 items, up from 111 items in Wave 52)
- Rubber pieces – not tyres (113 items, down from 155 items in Wave 52).
Rubber pieces in this category include vehicle rubber mouldings, hose pipes and tubing, bicycle handle bar grips and casings, pram mouldings and strips.
- Ice cream sticks (97 items, up from 79 items in Wave 52)
- Tyres & pieces (31 items, down from 57 items in Wave 52)

MISCELLANEOUS ITEMS - COUNTS - Top 5



Volume

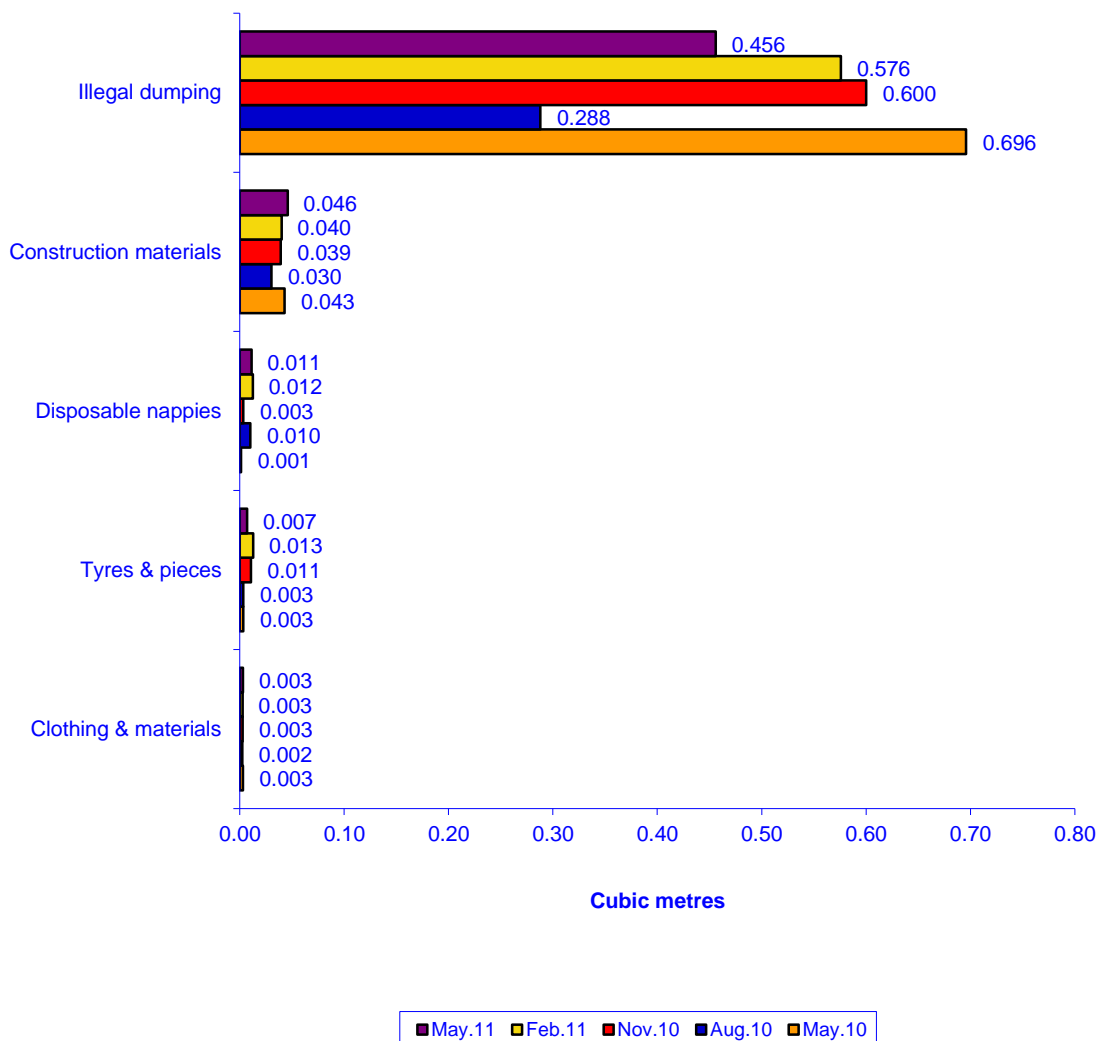
Miscellaneous litter was associated with an estimated litter volume of 0.523m³ (down from 0.644m³ in Wave 52).

Illegal dumping remained the major contributor to the total volume of miscellaneous items, with an estimated total volume of 0.456m³ (down from 0.576m³ in Wave 52).

Other miscellaneous items which contributed to the litter stream volume included:

- Construction materials (0.046m³, up from 0.040m³ in Wave 52)
- Disposable nappies (0.011m³, down from 0.012m³ in Wave 52)
- Tyres & pieces (0.007m³, up from 0.013m³ in Wave 52)
- Clothing and materials (0.003m³, unchanged from Wave 52)

MISCELLANEOUS ITEMS - VOLUMES - Top 5



3.6 Cigarette Butts

Items

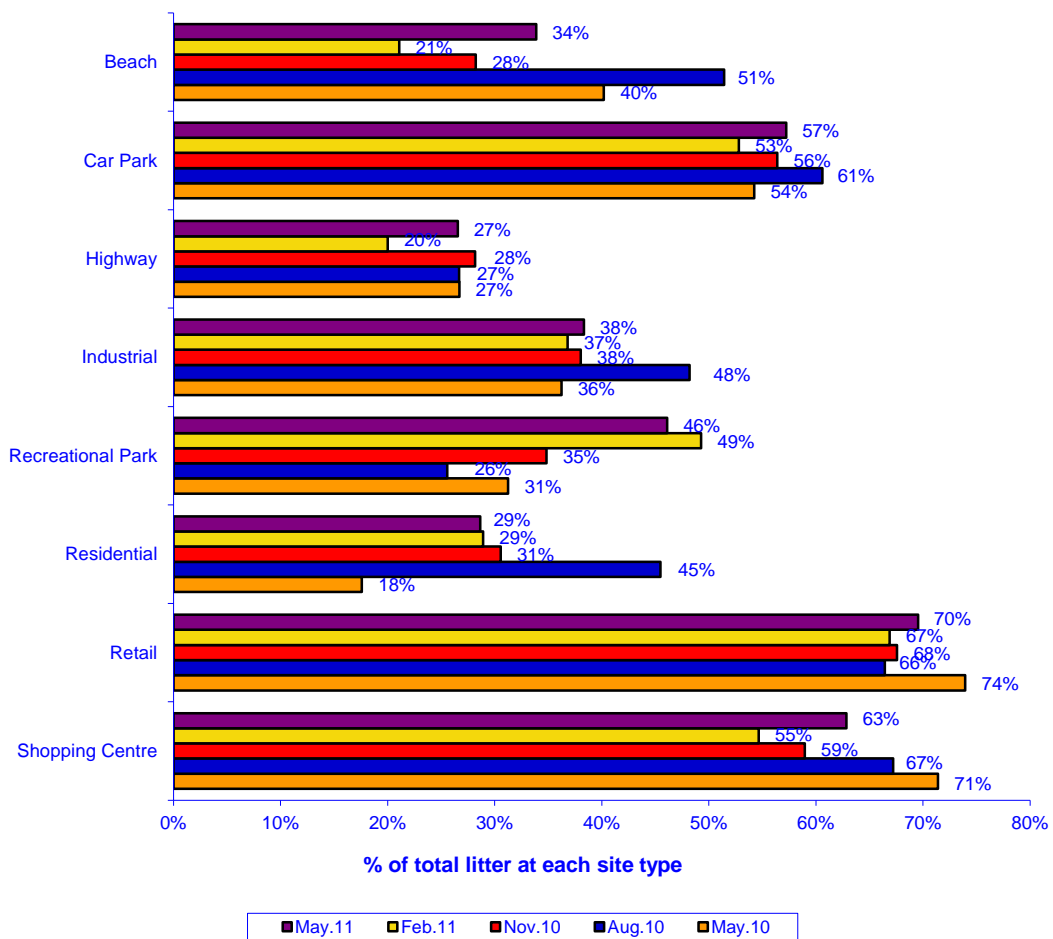
The total number of butts recorded during Wave 53 amounted to 5,715, up from 5,446 in Wave 52 and down from 5,927 counted in Wave 49 at the same time last year.

The proportion of cigarette butts of the total litter items counted increased and remained higher among retail sites (70%, up from 67% in Wave 52), shopping centres (63%, up from 55% in Wave 52) and at car parks (57%, up from 53% in Wave 52).

There was decrease in the cigarette butts counted as a proportion of litter at recreational parks (46%, up from 49% in Wave 51) but was still high in comparison to the remaining site types.

The proportion of cigarette butts of the total litter items was lower at the industrial sites (38%, down up 37% in Wave 52), beaches (34%, up from 21% in Wave 52), residential sites (29%, unchanged from Wave 52) and highways (27%, up from 20% in Wave 52).

CIGARETTE BUTTS AS A PROPORTION OF TOTAL LITTER AT EACH SITE TYPE



Volume

Despite cigarette butts being the most numerous litter item, they accounted for less than 1% of the total volume of litter recorded during the current Wave.

3.7 *Dispersion of Litter by Site Type*

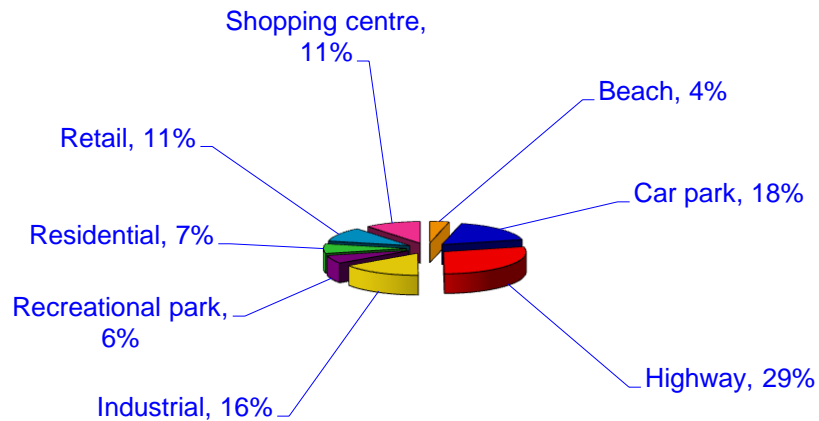
Items

Highways remained the most significant contributor to the total number of litter items counted in May 2011 with almost one third (29%, down from 31% in Wave 52) of the total litter items counted at highway locations.

Other sites contributed the following proportions of the total number of litter items counted during Wave 53:

- Car Park (18%, down from 20% in Wave 52)
- Industrial (16%, up from 14% in Wave 52)
- Retail (11%, up from 10% in Wave 52)
- Shopping Centre (11%, up from 7% in Wave 52)
- Residential (7%, down from 8% in Wave 52)
- Recreational Park (6%, unchanged from Wave 52)
- Beach (4%, unchanged from Wave 52)

PROPORTION OF TOTAL LITTER ITEMS COUNTED WITHIN SITE TYPE



A comparison of the proportions of litter items found at each site type revealed that highway locations contributed large amounts to the total number of litter items counted in the May 2011 Monitor. Although highway sites represented only 18% of the total number of sites surveyed, the sites contributed almost one third (29%, down from 31% in Wave 52) of the total litter items counted during Wave 53.

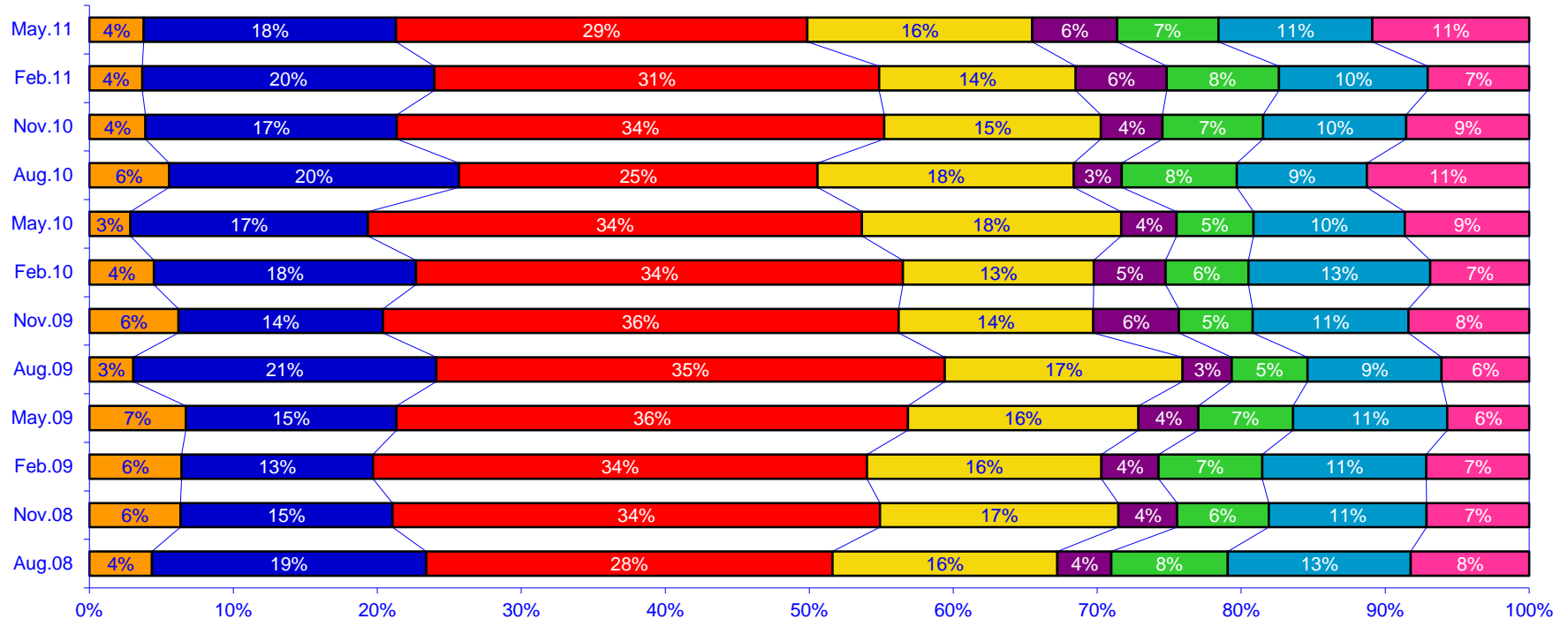
Conversely, residential locations and beaches continued to only contribute smaller proportions of litter items to the total litter count than anticipated based upon the proportion of these sites within the overall sample of locations as outlined below:

- Residential areas - incorporated 17% of the sites surveyed, but contributed only 7% (down from 8% in Wave 51) of the total litter items counted in Wave 53
- Beaches – represented 11% of the sites surveyed, but contributed 4% (unchanged from Wave 52) of the total litter counted in Wave 53

The remaining sites contributed the expected proportions of litter based on the proportion of these sites among the overall number of sites counted during Wave 53, the proportions were:

- Car parks - incorporated 15% of the sites surveyed, and contributed 18% (down from 20% in Wave 52) of the total litter items counted in Wave 53
- Industrial areas - incorporated 11% of the sites surveyed and contributed 16% (up from 14% in Wave 52) of the total litter items counted in Wave 53
- Retail areas - incorporated 10% of the sites surveyed, and contributed 11% (up from 10% in Wave 52) of the total litter items counted in Wave 53
- Shopping centres - incorporated 9% of the sites surveyed and contributed 11% (up from 7% in Wave 52) of the total litter items counted in Wave 53
- Recreational parks – represented 9% of sites surveyed, and contributed 6% (unchanged from Wave 52) of the total litter counted in Wave 53

PROPORTION OF TOTAL LITTER ITEMS COUNTED WITHIN SITE TYPE
- tracking -



% of total



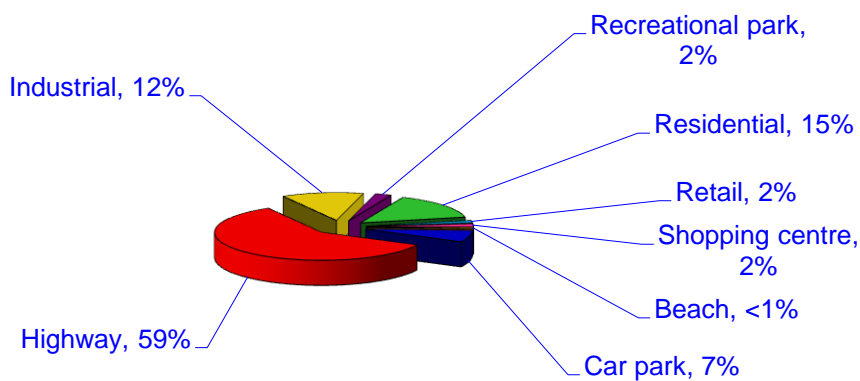
Volume

More than half (59%, up from 54% in Wave 52) of the total volume of litter estimated during Wave 53 was associated with litter items at highway locations.

Moderate volumes of litter were contributed to the overall litter volume by industrial sites (12%, down from 15% in Wave 52) and residential sites (15%, unchanged from Wave 51).

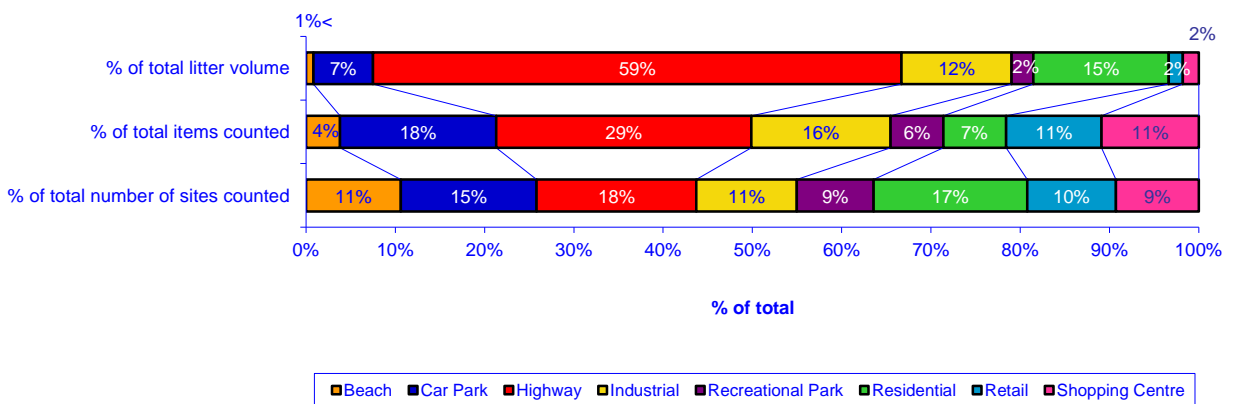
Lower volumes of litter were estimated at car park sites (7%, down from 11% in Wave 52), retail sites (2%, down from 3% in Wave 52), shopping centres (2%, up from 1% in Wave 52), recreational parks (2%, up from 1% in Wave 52) and beaches (< 1%, unchanged from Wave 52) to the total volume of litter recorded during May 2011.

PROPORTION OF TOTAL LITTER VOLUME BY SITE TYPE



A comparison of the litter volume, number of litter items and proportion of sites represented within location types shows that highways contributed a larger number and volume of litter items than would be expected given their representations within the sample.

NUMBER AND VOLUME OF LITTER BY SITE TYPE AS PROPORTIONS OF TOTALS



3.8 *CDL Beverage Containers*

The overwhelming majority (98%, unchanged from Wave 52) of litter items counted in May 2011 were non-beverage items.

The total number of CDL beverage containers counted increased by 24% to 296 items (up from 238 in Wave 52).

CDL beverage containers accounted for 94% (unchanged from Wave 52) of all beverage containers counted during Wave 53.

Data Summary - Items

KESAB - Litter Strategy Monitoring - Wave 53 - May 2011			Items										
			BEACH	CAR PARK	HIGHWAY	INDUSTRIAL	RECREATIONAL PARK	RESIDENTIAL	RETAIL	SHOPPING CENTRE	METROPOLITAN	REGIONAL	TOTAL ITEMS
CIGARETTE BUTTS		NBEV	167	1304	988	779	355	262	968	892	4387	1328	5715
GLASS	Alcoholic sodas/spirit-based mixers, all sizes	CDL		2			4				6		6
	Beer, all colours of glass, <750ml	CDL		8	24	31	4	11		1	67	12	79
	Beer, all colours of glass, 750ml+	CDL			3	1	4				5	3	8
	Cider/fruit based etc.	CDL		1	2						3		3
	Flav. water/fruit j. drink/sports drink (non-carb), <1 litre	CDL					1				1		1
	Flav. water/fruit j. drink/sports drink (non-carb), 1 litre+	CDL											0
	Flav. water/soft drink (carbonated), <1 litre	CDL						2			2		2
	Flav. water/soft drink (carbonated), 1 litre+	CDL					1					1	1
	Fruit juice, <1 litre	CDL											0
	Fruit juice, 1 litre+	BEV											0
	Other glass	NBEV	7	12	63	61	9	20	4	3	144	35	179
	Plain water (carbonated or non-carb), <1 litre	CDL							1			1	1
	Plain water (carbonated or non-carb), 1 litre+	CDL		1	1						2		2
	Wine & spirit, all sizes	BEV		1	2			1			3	1	4
Wine cooler, all sizes	CDL											0	
TOTAL			7	25	95	93	23	34	5	4	233	53	286
METAL	Aerosols - pressure packs	NBEV		1	1			1			3		3
	Alcoholic sodas & spirit-based mixers	CDL		2	11		2				6	9	15
	Beer, aluminium, all types, all sizes	CDL		1	21		1			1	14	10	24
	Cider/fruit based etc.	CDL											0
	Flav. water/soft drink, (carbonated), all sizes	CDL		13	27		8	1			48	1	49
	Flav. water/soft drink, (non-carb), all sizes	CDL											0
	Foil take away	NBEV	2	5	12	3	1	3	5		18	13	31
	Food cans (including pet food)	NBEV		6	2	1		2			11		11
	Industrial cans - all types	NBEV			4						2	2	4
	Metal bottle tops and can pull rings	NBEV	5	70	68	63	16	33	21	24	243	57	300
	Metal pieces	NBEV	1	9	62	76	4	16	15	4	139	48	187
Other foil	NBEV	5	43	73	34	26	16	19	34	193	57	250	
TOTAL			13	150	281	177	58	72	60	63	677	197	874

KESAB - Litter Strategy Monitoring - Wave 53 - May 2011			Items											
			BEACH	CAR PARK	HIGHWAY	INDUSTRIAL	RECREATIONAL PARK	RESIDENTIAL	RETAIL	SHOPPING CENTRE	METROPOLITAN	REGIONAL	TOTAL ITEMS	
MISCELLANEOUS	Clothing & materials	NBEV	12	22	96	26	10	15	9	7	157	40	197	
	Condoms	NBEV											0	
	Construction materials	NBEV	2	10	55	41	1	18			119	8	127	
	Disposable nappies	NBEV	1	3	3	1	1			1	6	4	10	
	Ice cream sticks	NBEV	7	18	20	5	4	10	14	19	77	20	97	
	Illegal dumping	NBEV			10	3		6			19		19	
	Other miscellaneous	NBEV	3	6	5	1	1	8		1	23	2	25	
	Rubber pieces (not tyres)	NBEV	3	5	45	41	3	5	6	5	89	24	113	
	Syringes	NBEV												0
	Tyres & pieces	NBEV		1	26	3		1			10	21	31	
TOTAL			28	65	260	121	20	63	29	33	500	119	619	
PAPER/PAPERBOARD	Cartons, flavoured milk, <1 litre	CDL		1	8						1	8	9	
	Cartons, flavoured milk, 1 litre+	BEV											0	
	Cartons, fruit juice, <1 litre	CDL		1							1		1	
	Cartons, fruit juice, 1 litre+	BEV											0	
	Cartons, milk, plain (white), all sizes	BEV			1						1		1	
	Cigarette packets	NBEV	3	28	56	31	5	10	3	11	124	23	147	
	Cups/take away containers	NBEV	3	33	114	25	8	6	5	14	175	33	208	
	Flav. water/fruit j. drink/sports drink (non-carb), <1 litre	CDL					1				1		1	
	Flav. water/fruit j. drink/sports drink (non-carb), 1 litre+	CDL												0
	Ice cream wrappers	NBEV		5	16	6		1	1	2	18	13	31	
	Junk mail/free circulars	NBEV		8	20	11		22	1	6	64	4	68	
	Newspapers & magazines	NBEV	1	8	17	3		11	1		37	4	41	
	Other paper (including tissues)	NBEV	72	255	489	334	127	169	130	130	1475	231	1706	
	Packages & boxes	NBEV	2	19	82	35	1	7	6	4	138	18	156	
	Paper bags	NBEV	6	14	84	9	1	7	9	4	110	24	134	
Shopper docketts & related shopping paper (eg. lists)	NBEV		38	16	5	1	10	8	33	88	23	111		
Tickets, e.g. bus, ATM, vending machine etc.	NBEV		12	12	2		4	5	16	46	5	51		
TOTAL			87	422	915	461	144	247	169	220	2279	386	2665	

KESAB - Litter Strategy Monitoring - Wave 53 - May 2011			Items										
			BEACH	CAR PARK	HIGHWAY	INDUSTRIAL	RECREATIONAL PARK	RESIDENTIAL	RETAIL	SHOPPING CENTRE	METROPOLITAN	REGIONAL	TOTAL ITEMS
PLASTIC	6 ring can holders	NBEV			2			1	1		1	3	4
	Bags - heavier glossy typically branded carry bags	NBEV			23			2			17	8	25
	Bags - supermarket type light weight carry bags	NBEV	2	4	42		2	3		2	46	9	55
	Bread bag tags	NBEV			7	4	1	1	3	2	7	11	18
	Containers, domestic type	NBEV			12	1		1	1		11	4	15
	Containers, industrial e.g. oil	NBEV			3						2	1	3
	Drink pouches	CDL		1								1	1
	Flav. water/fruit j. drink/sports drink (non-carb), <1 litre	CDL		1	5						3	3	6
	Flav. water/fruit j. drink/sports drink (non-carb), 1 litre+	CDL		1	1						2		2
	Flav. water/soft drink (carbonated), <1 litre	CDL		5	18	1	3	1			23	5	28
	Flav. water/soft drink (carbonated), 1 litre+	CDL			18						18		18
	Flavoured milk, <1 litre	CDL	1	2	20	3					19	7	26
	Flavoured milk, 1 litre+	BEV			2						1	1	2
	Fruit juice, <1 litre	CDL		2	2		1			1	6		6
	Fruit juice, 1 litre+	BEV			3						3		3
	Lollipop sticks	NBEV	10	19	18	2	16	7	8	6	65	21	86
	Other plastic	NBEV	101	101	265	154	37	101	66	84	767	142	909
	Packing tape & straps	NBEV		5	41	25	4	6	6	3	72	18	90
	Plain water (carbonated or non-carb), <1 litre	CDL			1	2					3		3
	Plain water (carbonated or non-carb), 1 litre+	CDL				3	1				3	1	4
	Plastic bottle tops	NBEV	23	30	98	40	16	31	10	32	245	35	280
	Sacks - sheeting - other bags	NBEV		2	87	22	3	4	1		115	4	119
	Snack bags & confectionery wrappers	NBEV	27	70	163	67	46	38	26	23	368	92	460
	Spoons/cutlery	NBEV	2	16	24	2	8	2	8	6	46	22	68
	Straws	NBEV	14	29	93	12	17	21	21	23	181	49	230
	Styrene foam boxes, sheets, etc.	NBEV	2	1	33	40		3	2	1	75	7	82
	Take away & cups	NBEV	9	23	189	27	15	15	8	24	232	78	310
White milk, all sizes	BEV			6						5	1	6	
Wine cask bladders	BEV			2	1					1	2	3	
TOTAL		191	313	1182	401	170	237	161	207	2337	525	2862	
GRAND TOTAL		493	2279	3721	2032	770	915	1392	1419	10413	2608	13021	

Data Summary - Volumes

KESAB - Litter Strategy Monitoring - Wave 53 - May 2011			Volume - Cubic Metres										
			BEACH	CAR PARK	HIGHWAY	INDUSTRIAL	RECREATIONAL PARK	RESIDENTIAL	RETAIL	SHOPPING CENTRE	METROPOLITAN	REGIONAL	TOTAL VOLUME
CIGARETTE BUTTS		NBEV	0.000019	0.000150	0.000114	0.000090	0.000041	0.000030	0.000111	0.000103	0.000505	0.000153	0.000657
GLASS	Alcoholic sodas/spirit-based mixers, all sizes	CDL		0.000749			0.001497				0.002246		0.002246
	Beer, all colours of glass, <750ml	CDL		0.003836	0.011508	0.014865	0.001918	0.005275		0.000480	0.032127	0.005754	0.037881
	Beer, all colours of glass, 750ml+	CDL			0.002431	0.000810	0.003241				0.004052	0.002431	0.006482
	Cider/fruit based etc.	CDL		0.000454	0.000909						0.001363		0.001363
	Flav. water/fruit j. drink/sports drink (non-carb), <1 litre	CDL					0.000810				0.000810		0.000810
	Flav. water/fruit j. drink/sports drink (non-carb), 1 litre+	CDL											0.000000
	Flav. water/soft drink (carbonated), <1 litre	CDL						0.000602			0.000602		0.000602
	Flav. water/soft drink (carbonated), 1 litre+	CDL					0.001654					0.001654	0.001654
	Fruit juice, <1 litre	CDL											0.000000
	Fruit juice, 1 litre+	BEV											0.000000
	Other glass	NBEV	0.000137	0.000236	0.001237	0.001198	0.000177	0.000393	0.000079	0.000059	0.002828	0.000687	0.003516
	Plain water (carbonated or non-carb), <1 litre	CDL							0.000415			0.000415	0.000415
	Plain water (carbonated or non-carb), 1 litre+	CDL		0.001059	0.001059						0.002119		0.002119
	Wine & spirit, all sizes	BEV		0.000891	0.001783			0.000891			0.002674	0.000891	0.003566
	Wine cooler, all sizes	CDL											0.000000
TOTAL		0.000137	0.007225	0.018927	0.016873	0.009297	0.007161	0.000493	0.000538	0.048820	0.011833	0.060653	
METAL	Aerosols - pressure packs	NBEV		0.000684	0.000684			0.000684			0.002053		0.002053
	Alcoholic sodas & spirit-based mixers	CDL		0.001124	0.006181		0.001124				0.003371	0.005057	0.008429
	Beer, aluminium, all types, all sizes	CDL		0.000431	0.009059		0.000431			0.000431	0.006040	0.004314	0.010354
	Cider/fruit based etc.	CDL											0.000000
	Flav. water/soft drink, (carbonated), all sizes	CDL		0.005608	0.011648		0.003451	0.000431			0.020707	0.000431	0.021139
	Flav. water/soft drink, (non-carb), all sizes	CDL											0.000000
	Foil take away	NBEV	0.000925	0.002312	0.005549	0.001387	0.000462	0.001387	0.002312		0.008323	0.006011	0.014334
	Food cans (including pet food)	NBEV		0.002783	0.000928	0.000464		0.000928			0.005102		0.005102
	Industrial cans - all types	NBEV			0.018280						0.009140	0.009140	0.018280
	Metal bottle tops and can pull rings	NBEV	0.000020	0.000280	0.000272	0.000252	0.000064	0.000132	0.000084	0.000096	0.000972	0.000228	0.001200
	Metal pieces	NBEV	0.000011	0.000095	0.000657	0.000806	0.000042	0.000170	0.000159	0.000042	0.001473	0.000509	0.001982
	Other foil	NBEV	0.000008	0.000067	0.000114	0.000053	0.000041	0.000025	0.000030	0.000053	0.000301	0.000089	0.000390
TOTAL		0.000963	0.013385	0.053372	0.002962	0.005616	0.003757	0.002585	0.000623	0.057482	0.025779	0.083261	

KESAB - Litter Strategy Monitoring - Wave 53 - May 2011			Volume - Cubic Metres										
			BEACH	CAR PARK	HIGHWAY	INDUSTRIAL	RECREATIONAL PARK	RESIDENTIAL	RETAIL	SHOPPING CENTRE	METROPOLITAN	REGIONAL	TOTAL VOLUME
MISCELLANEOUS	Clothing & materials	NBEV	0.000184	0.000337	0.001469	0.000398	0.000153	0.000230	0.000138	0.000107	0.002402	0.000612	0.003014
	Condoms	NBEV											0.000000
	Construction materials	NBEV	0.000720	0.003600	0.019800	0.014760	0.000360	0.006480			0.042840	0.002880	0.045720
	Disposable nappies	NBEV	0.001125	0.003375	0.003375	0.001125	0.001125			0.001125	0.006750	0.004500	0.011250
	Ice cream sticks	NBEV	0.000006	0.000017	0.000018	0.000005	0.000004	0.000009	0.000013	0.000017	0.000071	0.000018	0.000089
	Illegal dumping	NBEV			0.240000	0.072000		0.144000			0.456000		0.456000
	Other miscellaneous	NBEV	0.000041	0.000081	0.000068	0.000014	0.000014	0.000108		0.000014	0.000311	0.000027	0.000338
	Rubber pieces (not tyres)	NBEV	0.000000	0.000001	0.000007	0.000007	0.000000	0.000001	0.000001	0.000001	0.000015	0.000004	0.000019
	Syringes	NBEV											0.000000
	Tyres & pieces	NBEV		0.000225	0.005850	0.000675		0.000225			0.002250	0.004725	0.006975
TOTAL			0.002076	0.007635	0.270587	0.088983	0.001656	0.151053	0.000152	0.001264	0.510638	0.012766	0.523404
PAPER/PAPERBOARD	Cartons, flavoured milk, <1 litre	CDL		0.000750	0.005998						0.000750	0.005998	0.006747
	Cartons, flavoured milk, 1 litre+	BEV											0.000000
	Cartons, fruit juice, <1 litre	CDL		0.000625							0.000625		0.000625
	Cartons, fruit juice, 1 litre+	BEV											0.000000
	Cartons, milk, plain (white), all sizes	BEV			0.001013						0.001013		0.001013
	Cigarette packets	NBEV	0.000654	0.006100	0.012201	0.006754	0.001089	0.002179	0.000654	0.002397	0.027016	0.005011	0.032027
	Cups/take away containers	NBEV	0.002187	0.024055	0.083100	0.018224	0.005832	0.004374	0.003645	0.010205	0.127566	0.024055	0.151622
	Flav. water/fruit j. drink/sports drink (non-carb), <1 litre	CDL					0.000262				0.000262		0.000262
	Flav. water/fruit j. drink/sports drink (non-carb), 1 litre+	CDL											0.000000
	Ice cream wrappers	NBEV		0.000012	0.000038	0.000014		0.000002	0.000002	0.000005	0.000043	0.000031	0.000074
	Junk mail/free circulars	NBEV		0.001392	0.003480	0.001914		0.003828	0.000174	0.001044	0.011136	0.000696	0.011832
	Newspapers & magazines	NBEV	0.001180	0.009440	0.020060	0.003540		0.012980	0.001180		0.043660	0.004720	0.048380
	Other paper (including tissues)	NBEV	0.000243	0.000862	0.001653	0.001129	0.000429	0.000571	0.000439	0.000439	0.004986	0.000781	0.005766
	Packages & boxes	NBEV	0.000160	0.001520	0.006560	0.002800	0.000080	0.000560	0.000480	0.000320	0.011040	0.001440	0.012480
	Paper bags	NBEV	0.000063	0.000148	0.000889	0.000095	0.000011	0.000074	0.000095	0.000042	0.001164	0.000254	0.001418
	Shopper docketts & related shopping paper (eg. lists)	NBEV		0.000077	0.000032	0.000010	0.000002	0.000020	0.000016	0.000067	0.000179	0.000047	0.000225
Tickets, e.g. bus, ATM, vending machine etc.	NBEV		0.000011	0.000011	0.000002		0.000004	0.000004	0.000014	0.000040	0.000004	0.000045	
TOTAL			0.004487	0.044992	0.135034	0.034482	0.007705	0.024592	0.006690	0.014533	0.229479	0.043037	0.272516

KESAB - Litter Strategy Monitoring - Wave 53 - May 2011			Volume - Cubic Metres									TOTAL VOLUME	
			BEACH	CAR PARK	HIGHWAY	INDUSTRIAL	RECREATIONAL PARK	RESIDENTIAL	RETAIL	SHOPPING CENTRE	METROPOLITAN		REGIONAL
PLASTIC	6 ring can holders	NBEV			0.000003			0.000002	0.000002		0.000002	0.000005	0.000006
	Bags - heavier glossy typically branded carry bags	NBEV			0.002015			0.000175			0.001489	0.000701	0.002190
	Bags - supermarket type light weight carry bags	NBEV	0.000068	0.000136	0.001425		0.000068	0.000102		0.000068	0.001561	0.000305	0.001867
	Bread bag tags	NBEV			0.000002	0.000001	0.000000	0.000000	0.000001	0.000000	0.000002	0.000003	0.000004
	Containers, domestic type	NBEV			0.099888	0.008324		0.008324	0.008324		0.091564	0.033296	0.124860
	Containers, industrial e.g. oil	NBEV			0.067374						0.044916	0.022458	0.067374
	Drink pouches	CDL		0.000086								0.000086	0.000086
	Flav. water/fruit j. drink/sports drink (non-carb), <1 litre	CDL		0.000556	0.002781						0.001668	0.001668	0.003337
	Flav. water/fruit j. drink/sports drink (non-carb), 1 litre+	CDL		0.001654	0.001654						0.003308		0.003308
	Flav. water/soft drink (carbonated), <1 litre	CDL		0.003111	0.011198	0.000622	0.001866	0.000622			0.014309	0.003111	0.017419
	Flav. water/soft drink (carbonated), 1 litre+	CDL			0.029772						0.029772		0.029772
	Flavoured milk, <1 litre	CDL	0.000533	0.001065	0.010654	0.001598					0.010121	0.003729	0.013850
	Flavoured milk, 1 litre+	BEV			0.004273						0.002137	0.002137	0.004273
	Fruit juice, <1 litre	CDL		0.001065	0.001065		0.000533			0.000533	0.003196		0.003196
	Fruit juice, 1 litre+	BEV			0.006410						0.006410		0.006410
	Lollipop sticks	NBEV	0.000005	0.000010	0.000010	0.000001	0.000008	0.000004	0.000004	0.000003	0.000034	0.000011	0.000046
	Other plastic	NBEV	0.000126	0.000126	0.000331	0.000193	0.000046	0.000126	0.000083	0.000105	0.000959	0.000178	0.001136
	Packing tape & straps	NBEV		0.000001	0.000011	0.000007	0.000001	0.000002	0.000002	0.000001	0.000019	0.000005	0.000024
	Plain water (carbonated or non-carb), <1 litre	CDL		0.000788	0.001576						0.002364		0.002364
	Plain water (carbonated or non-carb), 1 litre+	CDL			0.004625		0.001542				0.004625	0.001542	0.006166
	Plastic bottle tops	NBEV	0.000184	0.000240	0.000784	0.000320	0.000128	0.000248	0.000080	0.000256	0.001961	0.000280	0.002241
	Sacks - sheeting - other bags	NBEV		0.000001	0.000027	0.000007	0.000001	0.000001	0.000000		0.000036	0.000001	0.000037
	Snack bags & confectionery wrappers	NBEV	0.000211	0.000548	0.001276	0.000525	0.000360	0.000298	0.000204	0.000180	0.002881	0.000720	0.003602
	Spoons/cutlery	NBEV	0.000019	0.000154	0.000230	0.000019	0.000077	0.000019	0.000077	0.000058	0.000442	0.000211	0.000653
	Straws	NBEV	0.000058	0.000120	0.000384	0.000050	0.000070	0.000087	0.000087	0.000095	0.000747	0.000202	0.000949
	Styrene foam boxes, sheets, etc.	NBEV	0.000075	0.000038	0.001238	0.001500		0.000113	0.000075	0.000038	0.002813	0.000263	0.003075
	Take away & cups	NBEV	0.001863	0.004761	0.039127	0.005590	0.003105	0.003105	0.001656	0.004968	0.048029	0.016148	0.064176
	White milk, all sizes	BEV			0.012820						0.010683	0.002137	0.012820
Wine cask bladders	BEV			0.000920	0.000460					0.000460	0.000920	0.001380	
TOTAL		0.003143	0.014460	0.301873	0.019215	0.007806	0.013227	0.010593	0.006305	0.286507	0.090115	0.376622	
GRAND TOTAL		0.010826	0.087847	0.779907	0.162604	0.032121	0.199819	0.020624	0.023366	1.133431	0.183683	1.317114	

Appendix 1: Tracking Graphs

Weighting of Previous Results

Since February 2006 (Wave 32), 11 revised sites have been surveyed concurrently with the 151 original sites included within the litter monitor program since its inception in February 1998. The new and old sites were surveyed simultaneously across four Waves of the monitor.

These 11 revised sites have previously been surveyed concurrently with the 151 original sites to replace 11 of the original sites that were found to be unusual in nature, and analyses have typically focused on results for the 151 sites including the 11 *new* sites and the 151 sites including the 11 *old* sites separately.

However, in counts since the February 2007 Monitor only the 151 revised sites (incorporating the 11 new locations) have been surveyed. In order to facilitate tracking comparisons, figures prior to February 2007 have been weighted based upon the variations between results corresponding to the 151 sites including the 11 new sites and the 151 sites including the 11 old sites.

Weighting techniques were based upon comparisons of figures for items and volumes recorded during Waves 32, 33, 34 and 35 across all sites incorporating either the 11 original or 11 revised sites. Differences between such figures provided indices of the degree of consistent variation between original and revised site litter data, and reliable weightings were thereby established.

Figures which have been weighted included:

- **Absolute values (counts and volumes) within material categories and site types**, since the inclusion of the revised sites resulted in differences in nearly all absolute values of counted litter.
- **Comparisons between proportional representation of litter across site types**, due to the fact that site revision altered the proportions of litter contributed to the total litter stream within certain site categories whilst others remained unchanged.

However, preliminary investigations demonstrated that proportional contribution to the total litter stream within material types was consistently similar between the original and revised site sets. This finding supports the assumption that whilst the quantities of litter recorded differed between old and new sites, the types of materials present within such litter were relatively consistent. For this reason, proportional figures within material types did not require weighting.

Items within material categories across all 151 sites including either 11 original or 11 revised sites	Wave 32				Wave 33				Wave 34				Wave 35			
	Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old
Glass	419	311	108	0.74224344	349	293	56	0.83954155	321	281	40	0.87538941	305	249	56	0.81639344
Metal	1505	1218	287	0.80930233	1450	1099	351	0.75793103	1440	1086	354	0.75416667	1517	1183	334	0.77982861
Plastic	5447	3819	1628	0.70111988	5261	3866	1395	0.73484128	5057	3575	1482	0.70694087	5332	3827	1505	0.71774194
Paper/ paperboard	4299	2969	1330	0.69062573	3820	3003	817	0.78612565	4017	2961	1056	0.73711725	3616	2752	864	0.76106195
Miscellaneous	1286	975	311	0.75816485	1057	814	243	0.77010407	1025	815	210	0.79512195	1150	944	206	0.82086957
Cigarette Butts	7600	5744	1856	0.75578947	9606	6814	2792	0.70934832	10950	6959	3991	0.63552511	10875	6474	4401	0.59531034
TOTAL	20556	15036	5520	0.73146527	21543	15889	5654	0.73754816	22810	15677	7133	0.68728628	22795	15429	7366	0.67685896
AVERAGE New as % of Old				0.74124442				0.76220572				0.74164965				0.73829497
OVERALL Mean New as % of Old	0.7458															

Items within site type across all 151 sites including either 11 original or 11 revised sites		Residential	Beach	Industrial	Car Park	Shopping Centre	Retail	Recreational Park	Highway	Metropolitan	Regional	TOTAL
		Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old	Old	New	Diff
Wave 32	Old	1187	1016	2395	2194	1261	1517	617	10369	17020	3536	20556
	New	1187	1016	2196	2064	1292	1517	617	5147	11500	3536	15036
	Diff	0	0	199	130	-31	0	0	5222	5520	0	5520
	New as % of Old	1	1	0.92	0.94	1.02	1	1	0.50	0.68	1	7.3786248
Wave 33	Old	1227	737	2573	3142	2323	1659	590	9292	17788	3755	21543
	New	1227	737	2428	2722	1919	1659	590	4607	12134	3755	15889
	Diff	0	0	145	420	404	0	0	4685	5654	0	5654
	New as % of Old	1	1	0.94	0.87	0.83	1	1	0.50	0.68	1	7.1318625
Wave 34	Old	1185	721	2498	3365	1853	1670	479	11039	18749	4061	22810
	New	1185	721	2077	2724	1155	1670	479	5666	11616	4061	15677
	Diff	0	0	421	641	698	0	0	5373	7133	0	7133
	New as % of Old	1	1	0.83	0.81	0.62	1	1	0.51	0.62	1	6.7775595
Wave 35	Old	1134	728	2705	2601	2232	1801	729	10865	18640	4155	22795
	New	1134	728	2399	2156	1157	1801	729	5325	11274	4155	15429
	Diff	0	0	306	445	1075	0	0	5540	7366	0	7366
	New as % of Old	1	1	0.89	0.83	0.52	1	1	0.49	0.60	1	6.7242631
Average New as % of Old		1	1	0.89	0.86	0.75	1	1	0.50	0.65	1	7.0030775

Proportions of total items within site type across all 151 sites including either 11 original or 11 revised sites		Residential	Beach	Industrial	Car Park	Shopping Centre	Retail	Recreational Park	Highway	Metropolitan	Regional	TOTAL
Wave 32	Old	1187	1016	2395	2194	1261	1517	617	10369	17020	3536	20556
	New	1187	1016	2196	2064	1292	1517	617	5147	11500	3536	15036
	Old % of total items	5.8%	4.9%	11.7%	10.7%	6.1%	7.4%	3.0%	50.4%	82.8%	17.2%	
	New % of total items	7.9%	6.8%	14.6%	13.7%	8.6%	10.1%	4.1%	34.2%	76.5%	23.5%	
	% change from Old to New	2.1%	1.8%	3.0%	3.1%	2.5%	2.7%	1.1%	-16.2%	-6.3%	6.3%	
Wave 33	Old	1227	737	2573	3142	2323	1659	590	9292	17788	3755	21543
	New	1227	737	2428	2722	1919	1659	590	4607	12134	3755	15889
	Old % of total items	5.7%	3.4%	11.9%	14.6%	10.8%	7.7%	2.7%	43.1%	82.6%	17.4%	
	New % of total items	7.7%	4.6%	15.3%	17.1%	12.1%	10.4%	3.7%	29.0%	76.4%	23.6%	
	% change from Old to New	2.0%	1.2%	3.3%	2.5%	1.3%	2.7%	1.0%	-14.1%	-6.2%	6.2%	
Wave 34	Old	1185	721	2498	3365	1853	1670	479	11039	18749	4061	22810
	New	1185	721	2077	2724	1155	1670	479	5666	11616	4061	15677
	Old % of total items	5.2%	3.2%	11.0%	14.8%	8.1%	7.3%	2.1%	48.4%	82.2%	17.8%	
	New % of total items	7.6%	4.6%	13.2%	17.4%	7.4%	10.7%	3.1%	36.1%	74.1%	25.9%	
	% change from Old to New	2.4%	1.4%	2.3%	2.6%	-0.8%	3.3%	1.0%	-12.3%	-8.1%	8.1%	
Wave 35	Old	1134	728	2705	2601	2232	1801	729	10865	18640	4155	22795
	New	1134	728	2399	2156	1157	1801	729	5325	11274	4155	15429
	Old % of total items	5.0%	3.2%	11.9%	11.4%	9.8%	7.9%	3.2%	47.7%	81.8%	18.2%	
	New % of total items	7.3%	4.7%	15.5%	14.0%	7.5%	11.7%	4.7%	34.5%	73.1%	26.9%	
	% change from Old to New	2.4%	1.5%	3.7%	2.6%	-2.3%	3.8%	1.5%	-13.2%	-8.7%	8.7%	
Average % difference from Old to New		2%	1%	3%	3%	0%	3%	1%	-14%	-7%	7%	

Volumes within material categories across all 151 sites including either 11 original or 11 revised sites	Wave 32				Wave 33				Wave 34				Wave 35			
	Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old	Old	New	Diff	New as % of Old
Glass	0.11965	0.09027	0.02939	0.75438	0.08663	0.06859	0.01804	0.79173	0.08559	0.07086	0.01473	0.82789	0.06907	0.05316	0.01591	0.76962
Metal	0.22261	0.19846	0.02415	0.8915	0.15196	0.13181	0.02015	0.86741	0.15085	0.10952	0.04132	0.72605	0.17499	0.15130	0.02369	0.86463
Plastic	1.16278	0.72042	0.44235	0.61957	0.90407	0.71848	0.18559	0.79472	0.93411	0.63312	0.30099	0.67778	0.88814	0.67589	0.21225	0.76102
Paper/ paperboard	0.71375	0.41932	0.29443	0.58749	0.47904	0.36017	0.11888	0.75184	0.54568	0.35535	0.19033	0.6512	0.50410	0.35413	0.14998	0.70249
Miscellaneous	1.11014	0.83415	0.27599	0.75139	0.84900	0.61172	0.23727	0.72052	0.78143	0.71261	0.06882	0.91194	2.14021	1.97182	0.16839	0.92132
Cigarette Butts	0.00009	0.00007	0.00002	0.75515	0.00011	0.00008	0.00003	0.70935	0.00013	0.00008	0.00005	0.63553	0.00013	0.00007	0.00005	0.59531
TOTAL	3.32902	2.26269	1.06633	0.67969	2.47082	1.89085	0.57996	0.76528	2.49778	1.88155	0.61624	0.75329	3.77664	3.20638	0.57026	0.849
AVERAGE New as % of Old				0.71988				0.77155				0.74052				0.78049
OVERALL MEAN DIFFERENCE	0.7531															

Volumes within site type across all 151 sites including either 11 original or 11 revised sites		Residential	Beach	Industrial	Car Park	Shopping Centre	Retail	Recreational Park	Highway	Metropolitan	Regional	TOTAL
Wave 32	Old	0.05441	0.02998	0.57970	0.13090	0.01177	0.01877	0.02922	2.47428	2.54585	0.78318	3.32902
	New	0.05441	0.02998	0.57922	0.17275	0.00965	0.01877	0.02922	1.36868	1.47951	0.78318	2.26269
	Diff			0.00048	-0.04186	0.00212			1.10559	1.06633		
	New as % of Old	1	1	0.99917	1.31979	0.82005	1	1	0.55317	0.58115	1	
Wave 33	Old	0.06600	0.03600	0.54200	0.07100	0.03000	0.02100	0.04100	1.66400	1.85500	0.61500	2.47100
	New	0.06600	0.03600	0.53900	0.07000	0.01000	0.02100	0.04100	1.10700	1.27500	0.61500	1.89000
	Diff			0.00300	0.00100	0.02000			0.55700	0.58000		
	New as % of Old	1	1	0.99446	0.98592	0.33333	1	1	0.66526	0.68733	1	
Wave 34	Old	0.07800	0.06500	0.41100	0.14100	0.05000	0.01200	0.00600	1.73400	1.87300	0.62500	2.49700
	New	0.07800	0.06500	0.40000	0.14000	0.00900	0.01200	0.00600	1.17100	1.25700	0.62500	1.88100
	Diff			0.01100	0.00100	0.04100			0.56300	0.61600		
	New as % of Old	1	1	0.97324	0.99291	0.18000	1	1	0.67532	0.67112	1	
Wave 35	Old	0.17400	0.01700	0.58800	0.13000	0.05300	0.05900	0.01700	2.73700	2.12500	1.65200	3.77500
	New	0.17400	0.01700	0.58600	0.14600	0.03700	0.05900	0.01700	2.16900	1.55500	1.65200	3.20500
	Diff			0.00200	-0.01600	0.01600			0.56800	0.57000		
	New as % of Old	1	1	1.00	1.12	0.70	1	1	0.79	0.73	1	
Average New as % of Old		1	1	0.99	1.11	0.51	1	1	0.67	0.67	1	

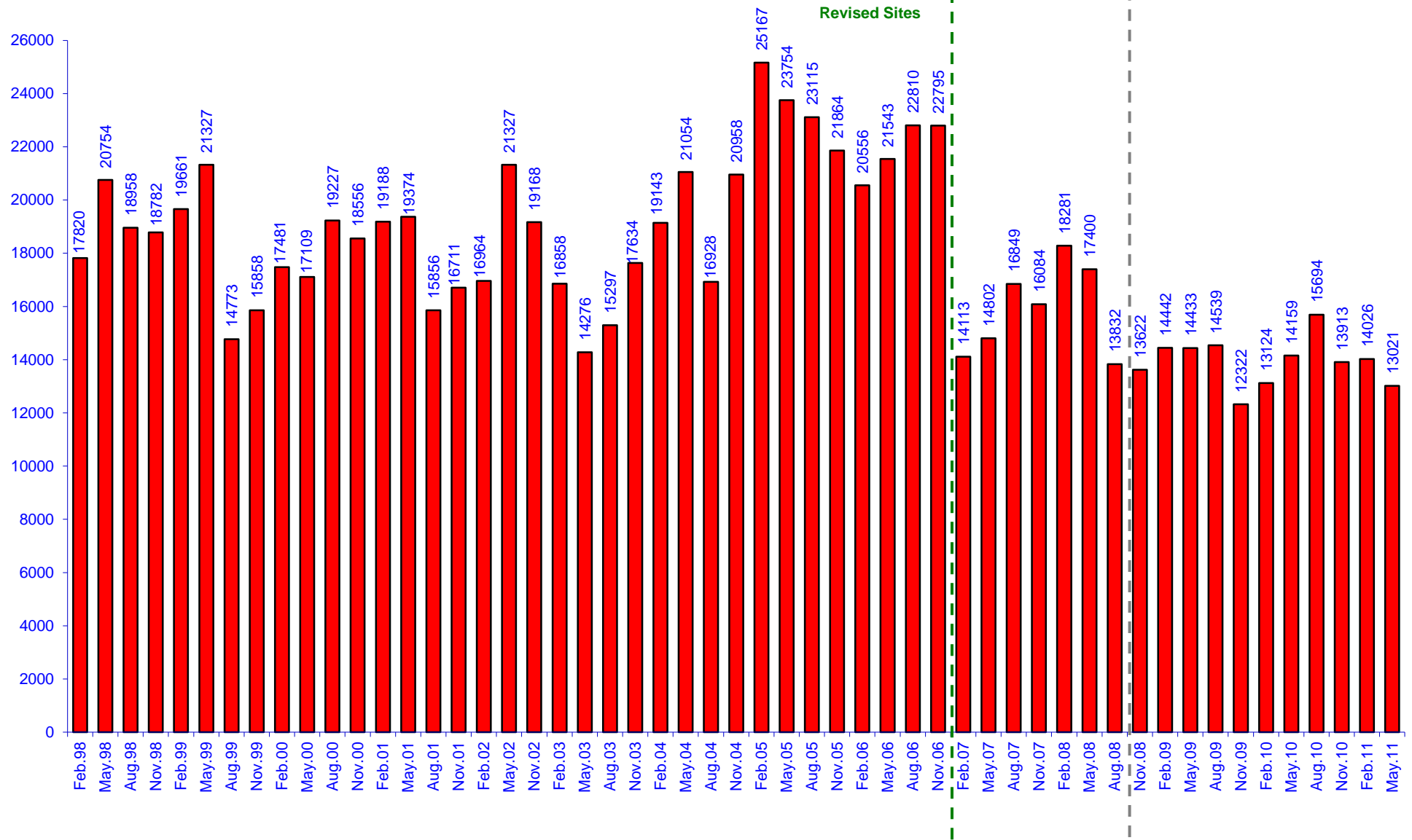
Proportions of total volume within site type across all 151 sites including either 11 original or 11 revised sites		Residential	Beach	Industrial	Car Park	Shopping Centre	Retail	Recreational Park	Highway	Metropolitan	Regional	TOTAL
Wave 32	Old	0.05441	0.02998	0.57970	0.13090	0.01177	0.01877	0.02922	2.47428	2.54585	0.78318	3.32902
	New	0.05441	0.02998	0.57922	0.17275	0.00965	0.01877	0.02922	1.36868	1.47951	0.78318	2.26269
	Old % of total volume	1.6%	0.9%	17.4%	3.9%	0.4%	0.6%	0.9%	74.3%	76.5%	23.5%	
	New % of total volume	2.4%	1.3%	25.6%	7.6%	0.4%	0.8%	1.3%	60.5%	65.4%	34.6%	
	% change from Old to New	0.8%	0.4%	8.2%	3.7%	0.1%	0.3%	0.4%	-13.8%	-11.1%	11.1%	
Wave 33	Old	0.06600	0.03600	0.54200	0.07100	0.03000	0.02100	0.04100	1.66400	1.85500	0.61500	2.47100
	New	0.06600	0.03600	0.53900	0.07000	0.01000	0.02100	0.04100	1.10700	1.27500	0.61500	1.89000
	Old % of total volume	2.7%	1.5%	21.9%	2.9%	1.2%	0.8%	1.7%	67.3%	75.1%	24.9%	
	New % of total volume	3.5%	1.9%	28.5%	3.7%	0.5%	1.1%	2.2%	58.6%	67.5%	32.5%	
	% change from Old to New	0.8%	0.4%	6.6%	0.8%	-0.7%	0.3%	0.5%	-8.8%	-7.6%	7.7%	
Wave 34	Old	0.07800	0.06500	0.41100	0.14100	0.05000	0.01200	0.00600	1.73400	1.87300	0.62500	2.49700
	New	0.07800	0.06500	0.40000	0.14000	0.00900	0.01200	0.00600	1.17100	1.25700	0.62500	1.88100
	Old % of total volume	3.1%	2.6%	16.5%	5.6%	2.0%	0.5%	0.2%	69.4%	75.0%	25.0%	
	New % of total volume	4.1%	3.5%	21.3%	7.4%	0.5%	0.6%	0.3%	62.3%	66.8%	33.2%	
	% change from Old to New	1.0%	0.9%	4.8%	1.8%	-1.5%	0.2%	0.1%	-7.2%	-8.2%	8.2%	
Wave 35	Old	0.17400	0.01700	0.58800	0.13000	0.05300	0.05900	0.01700	2.73700	2.12500	1.65200	3.77500
	New	0.17400	0.01700	0.58600	0.14600	0.03700	0.05900	0.01700	2.16900	1.55500	1.65200	3.20500
	Old % of total volume	4.6%	0.5%	15.6%	3.4%	1.4%	1.6%	0.5%	72.5%	56.3%	43.8%	
	New % of total volume	5.4%	0.5%	18.3%	4.6%	1.2%	1.8%	0.5%	67.7%	48.5%	51.5%	
	% change from Old to New	0.8%	0.1%	2.7%	1.1%	-0.2%	0.3%	0.1%	-4.8%	-7.8%	7.8%	
Average % difference from Old to New		1%	0%	6%	2%	-1%	0%	0%	-9%	-9%	9%	

Unweighted Tracking Graphs

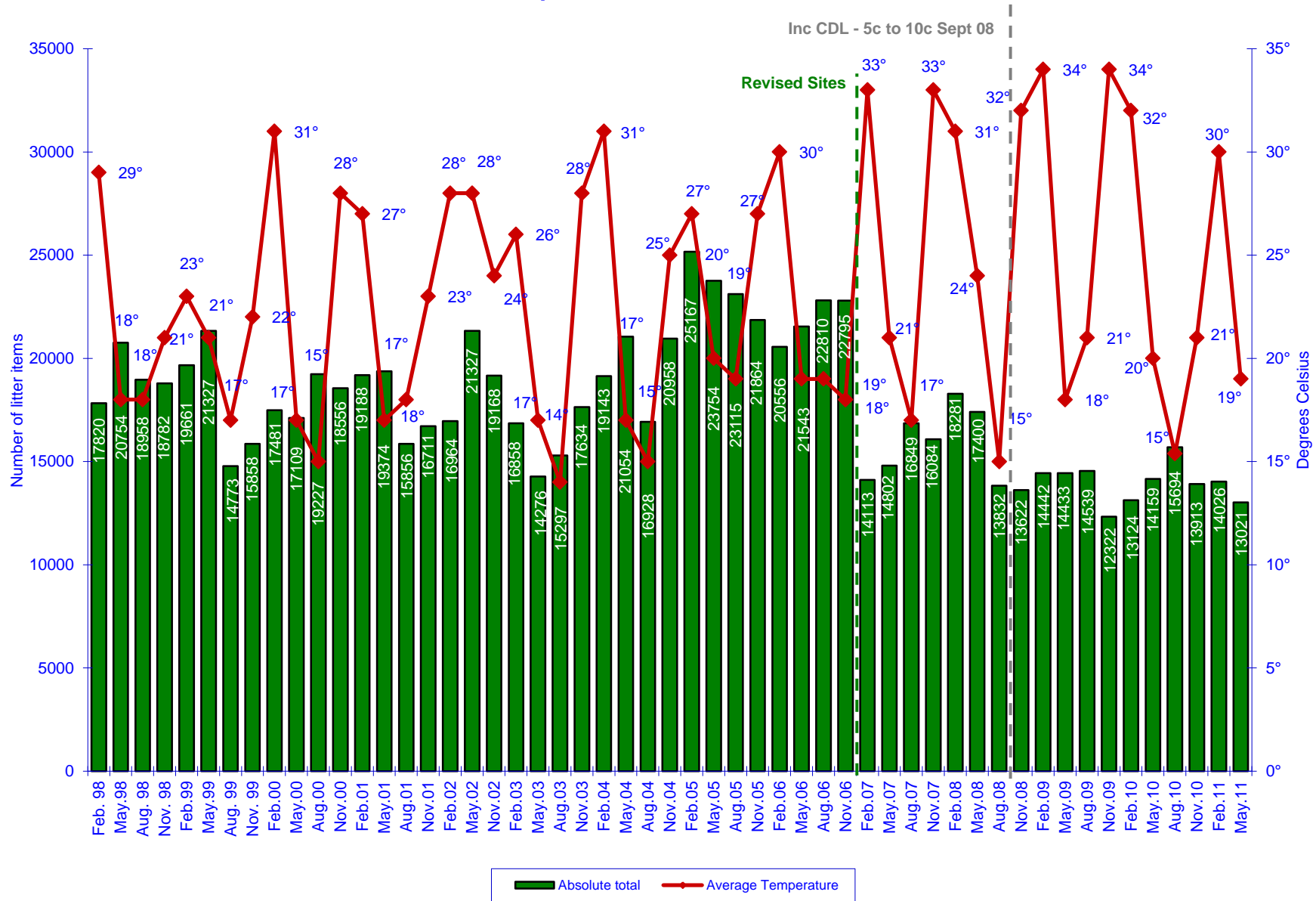
- Items

Total Litter - Number of Items

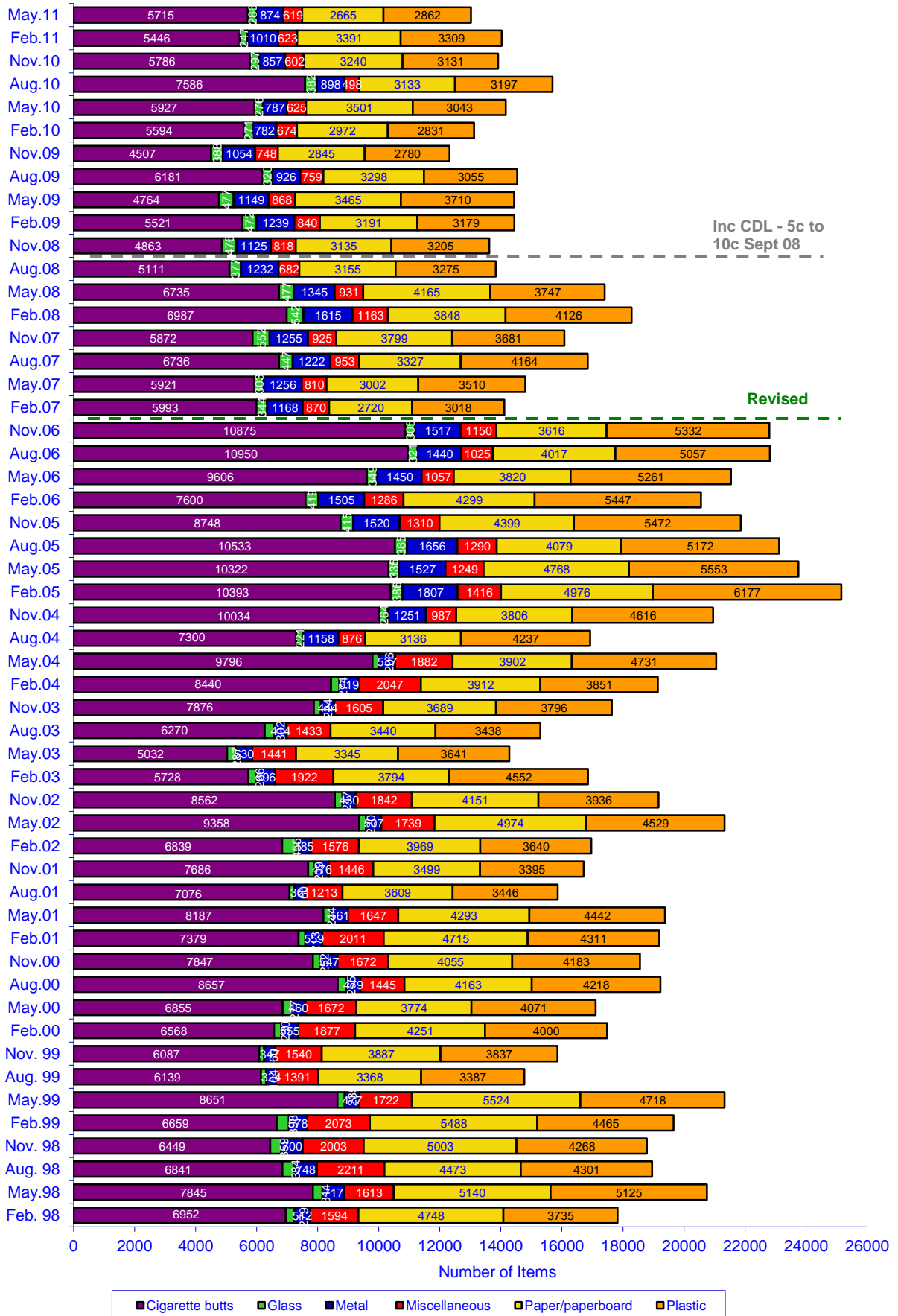
Inc CDL - 5c to 10c Sept 08



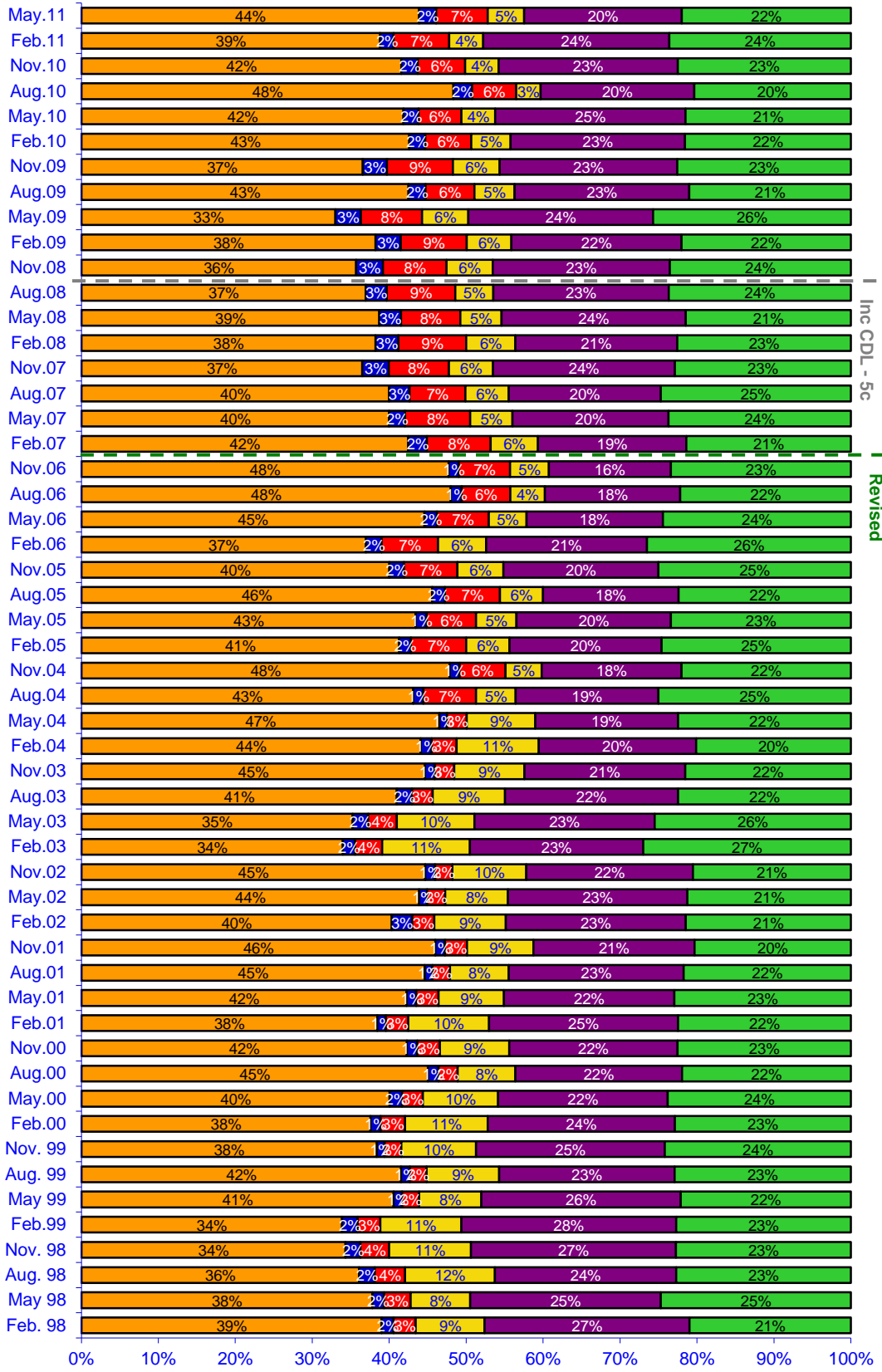
Weather Temperature and Total Number of Litter Items



Number of Litter Items by Material Type



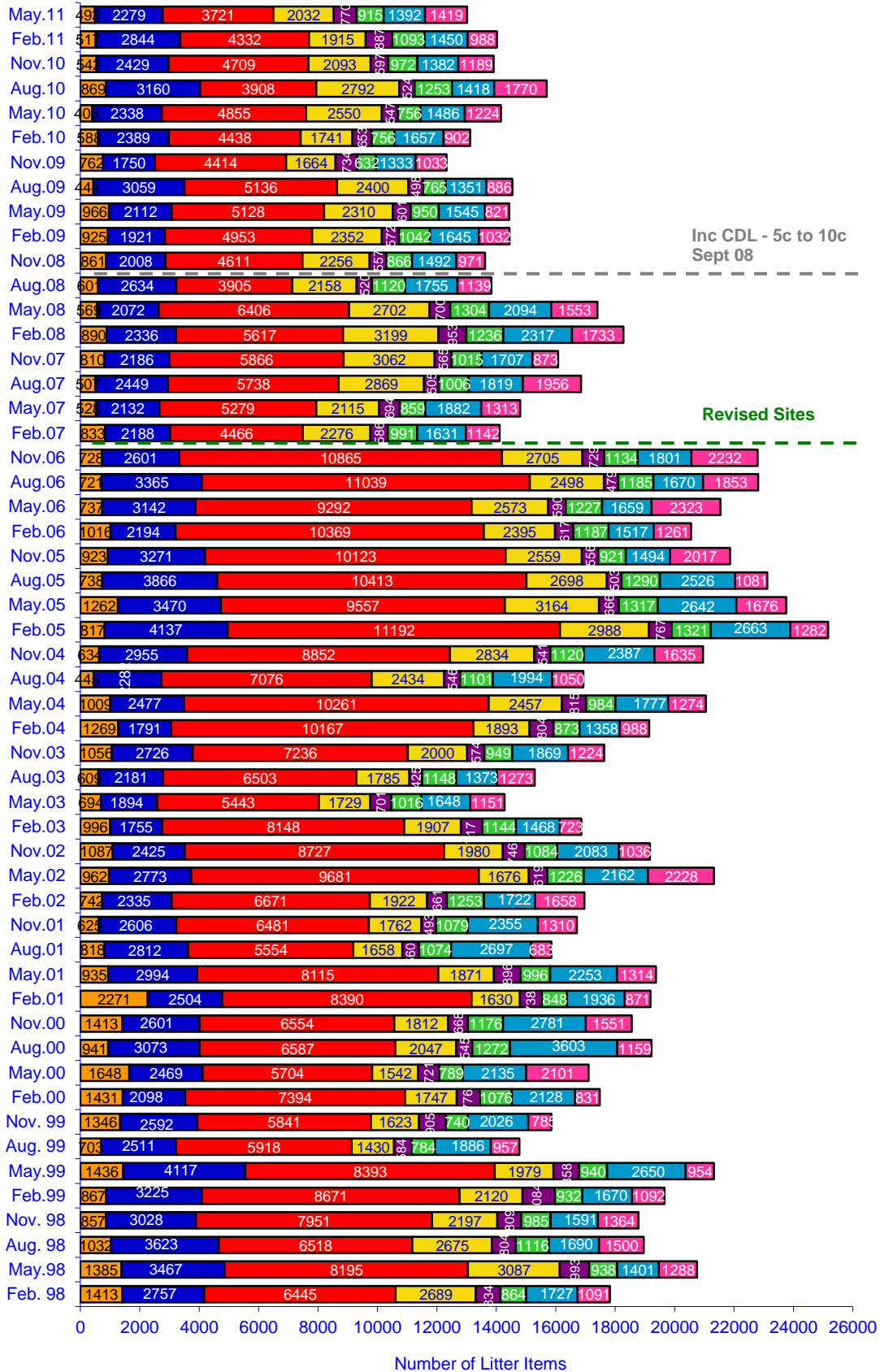
Proportion of Total Litter Stream by Material Type



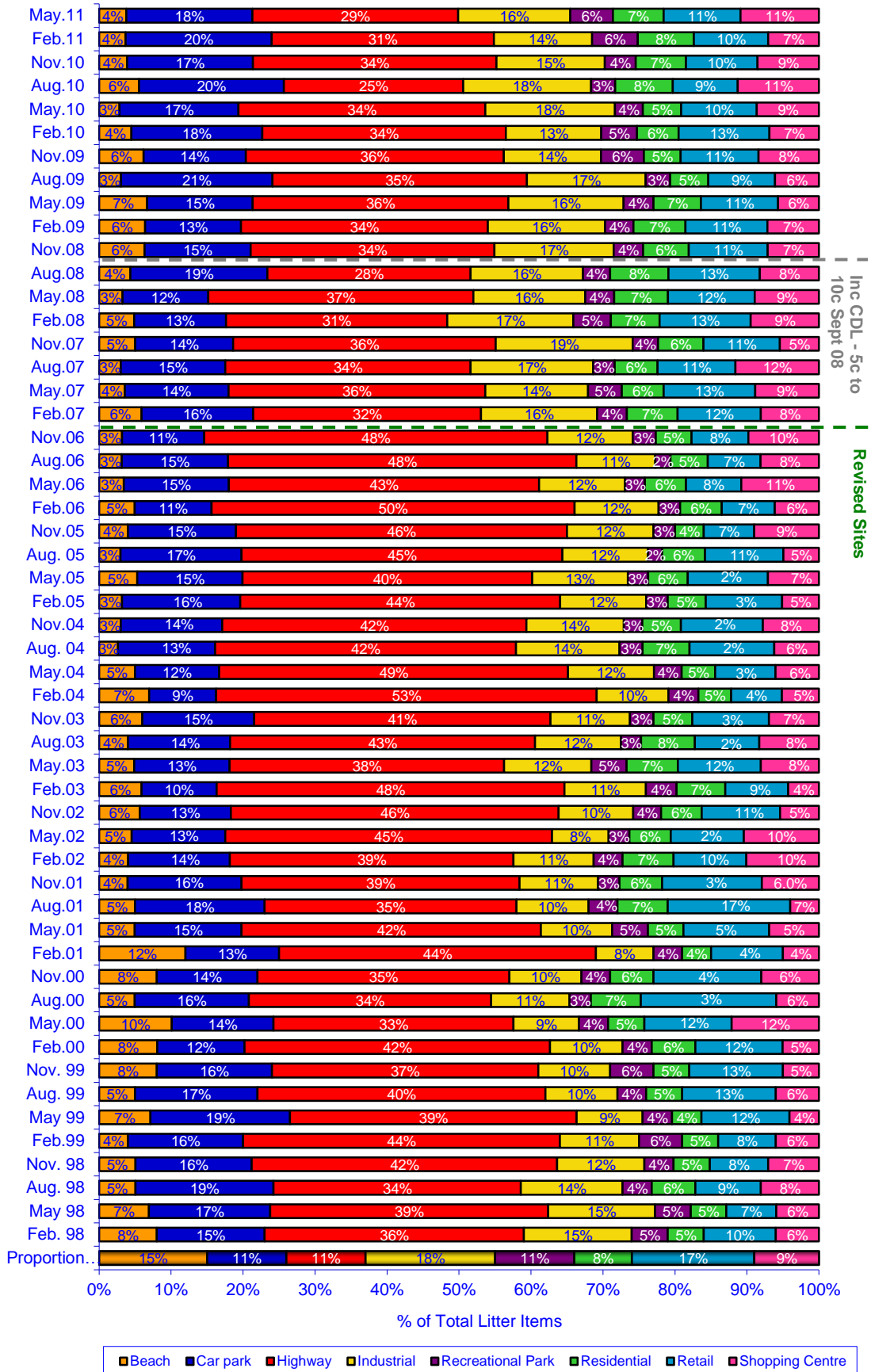
% of litter items



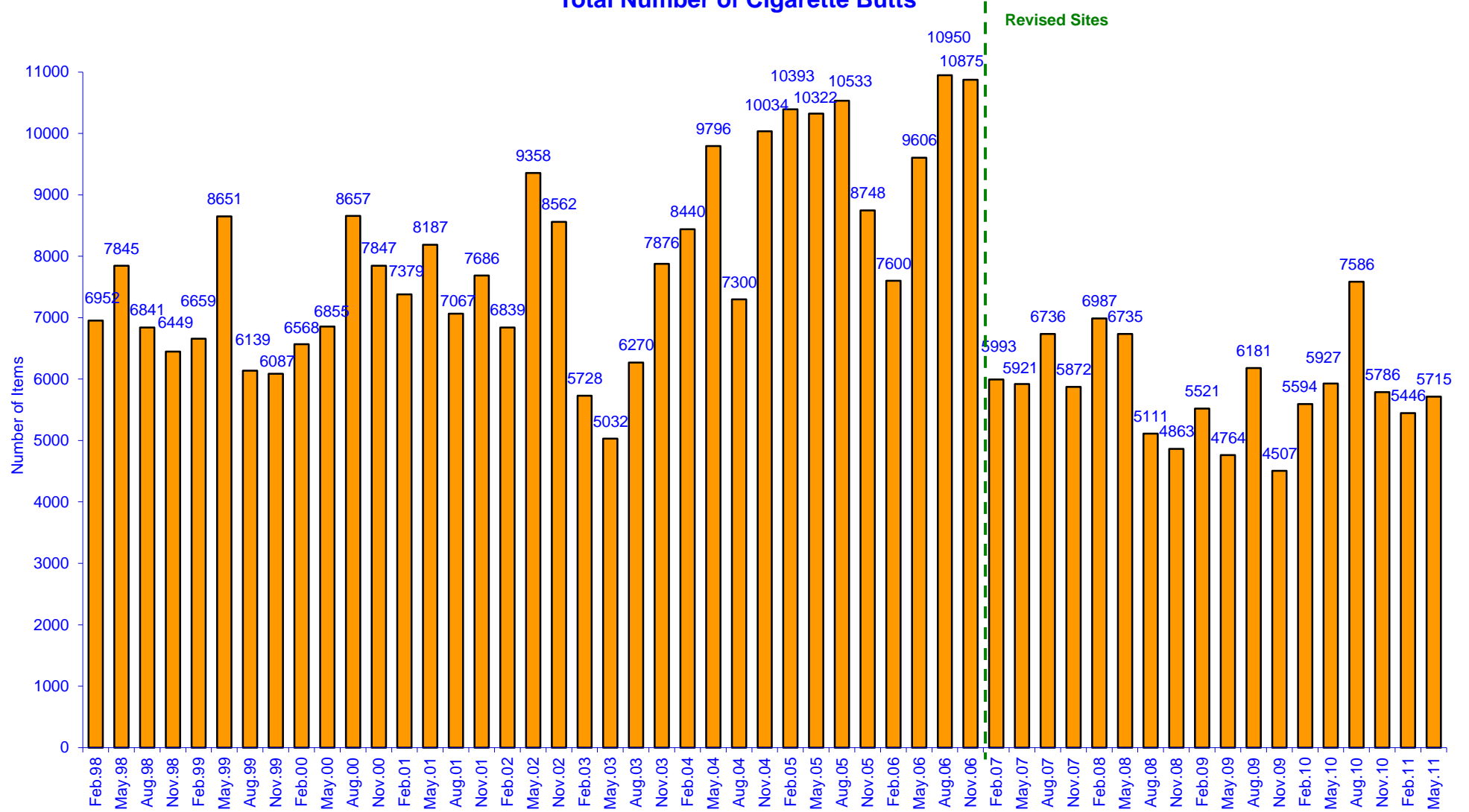
Number of Litter Items by Site Type



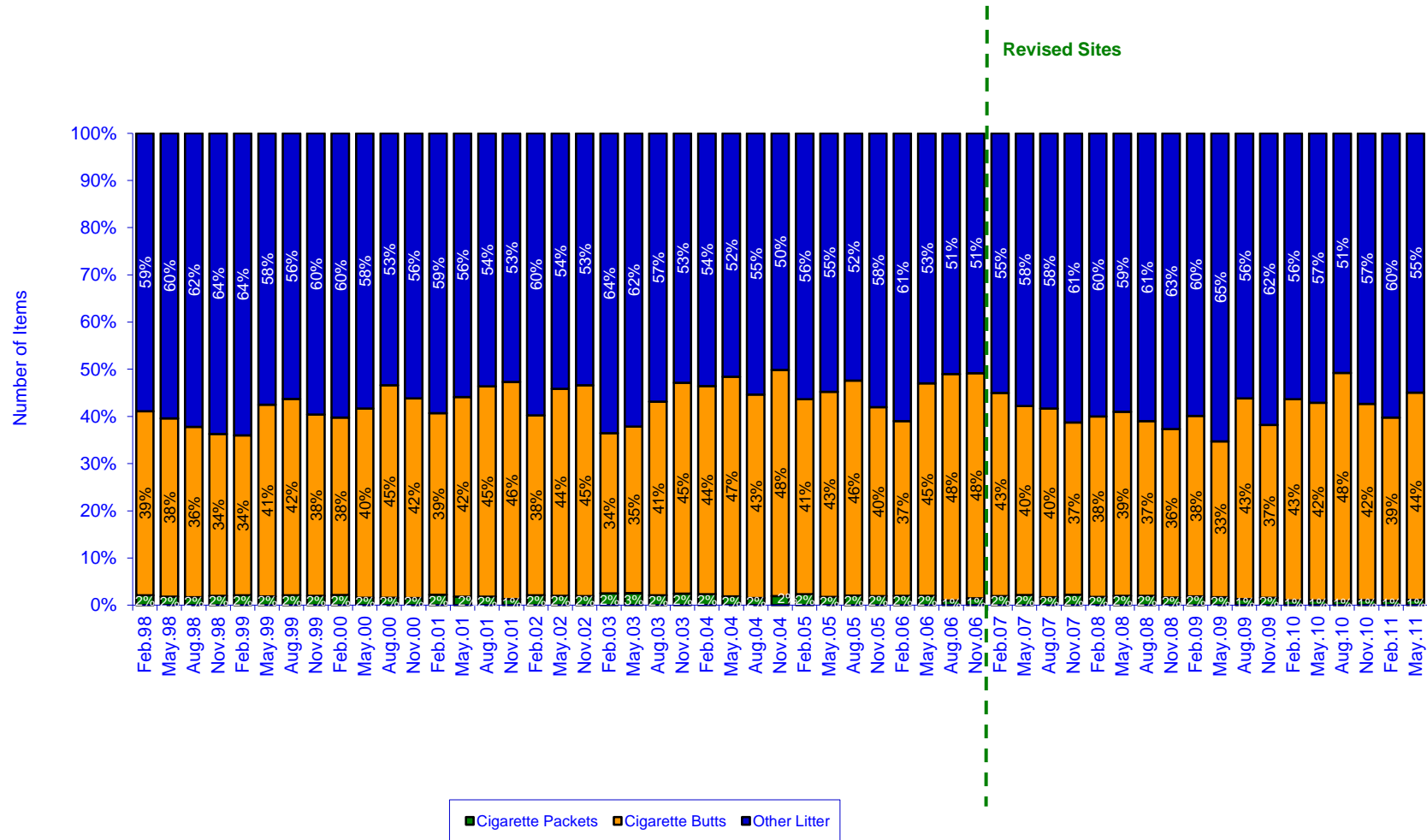
Proportion of Total Litter by Site Type



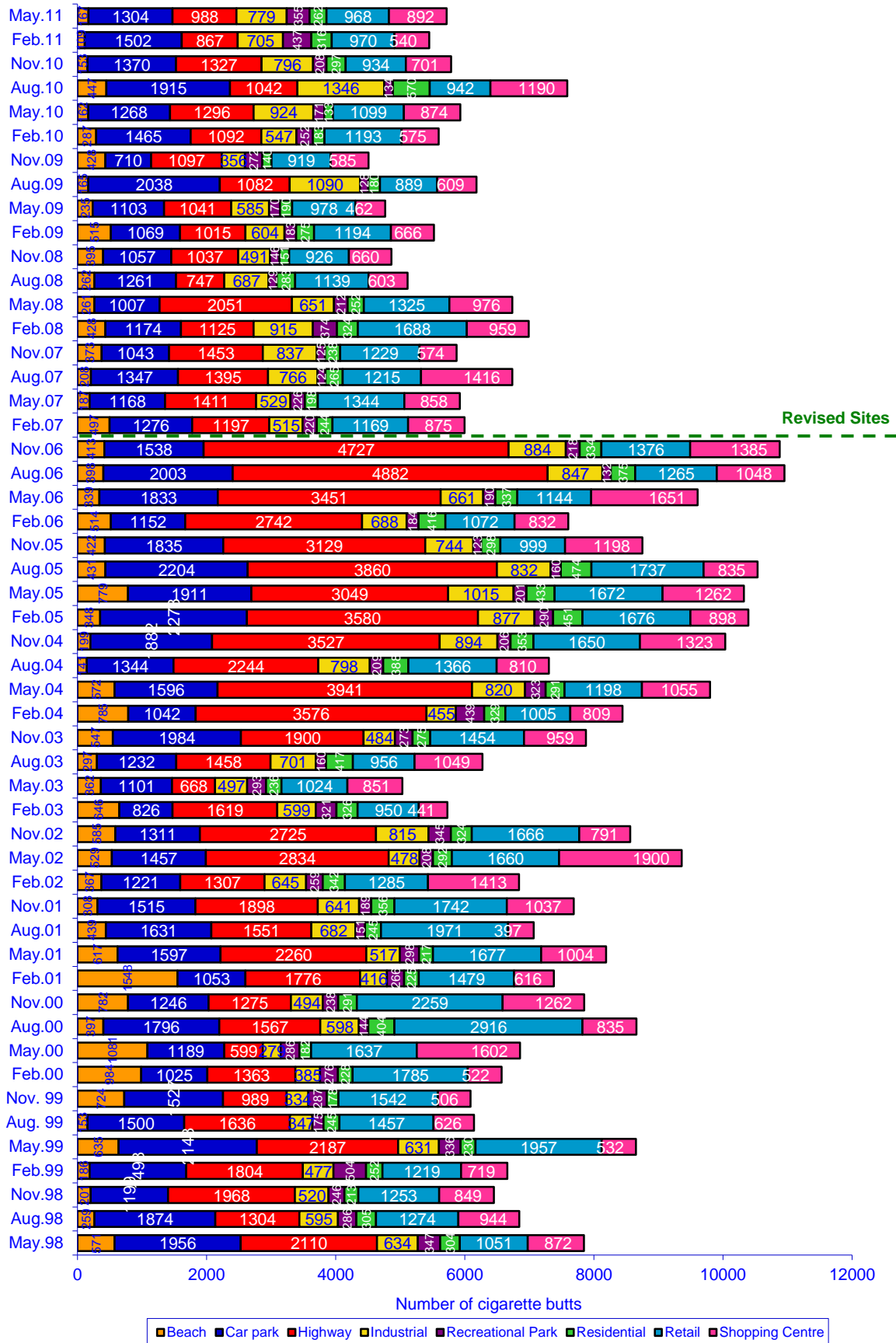
Total Number of Cigarette Butts



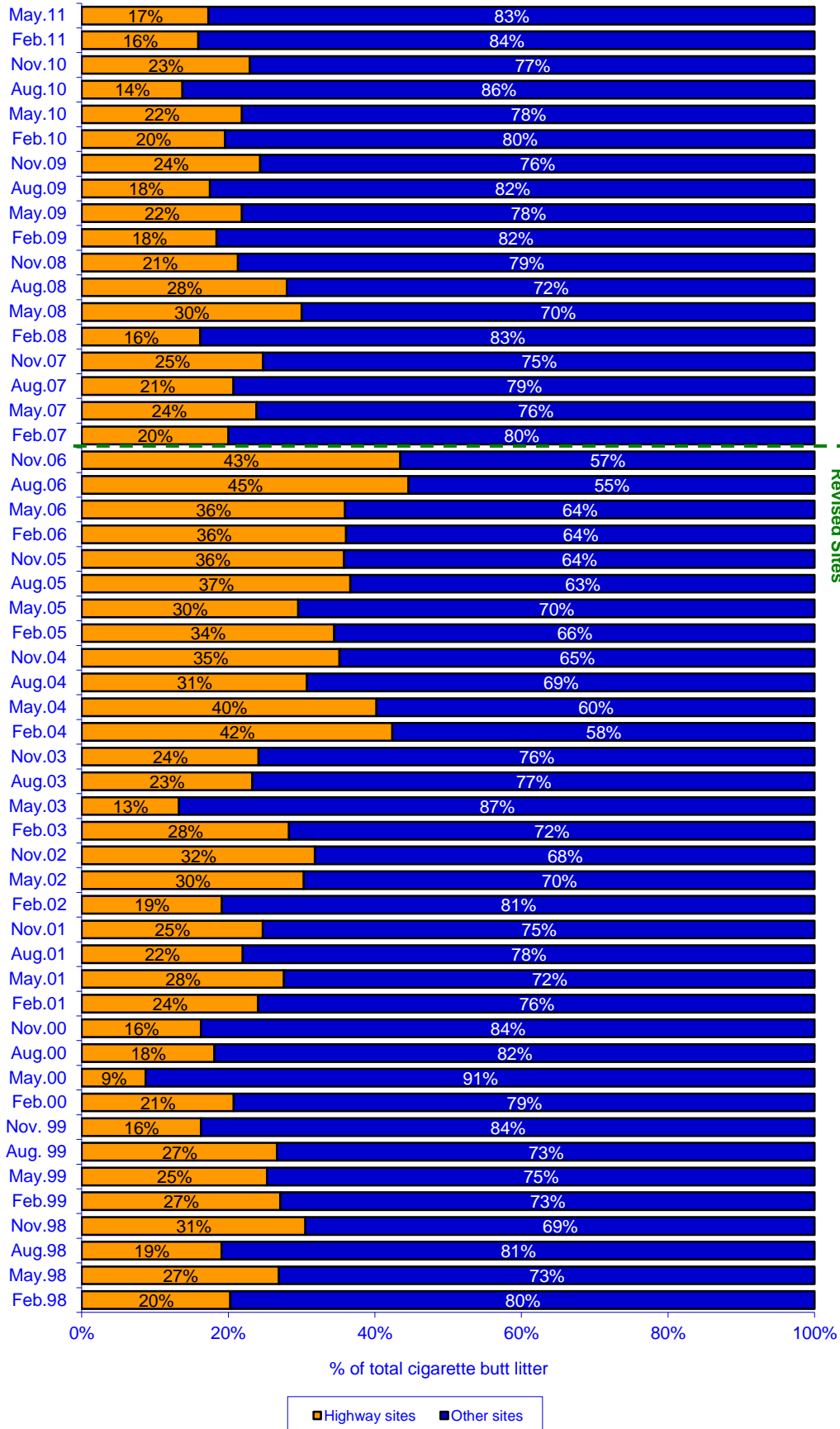
Proportion of Cigarette Related Litter Items in Total Litter Stream



Number of Cigarette Butts by Site Type

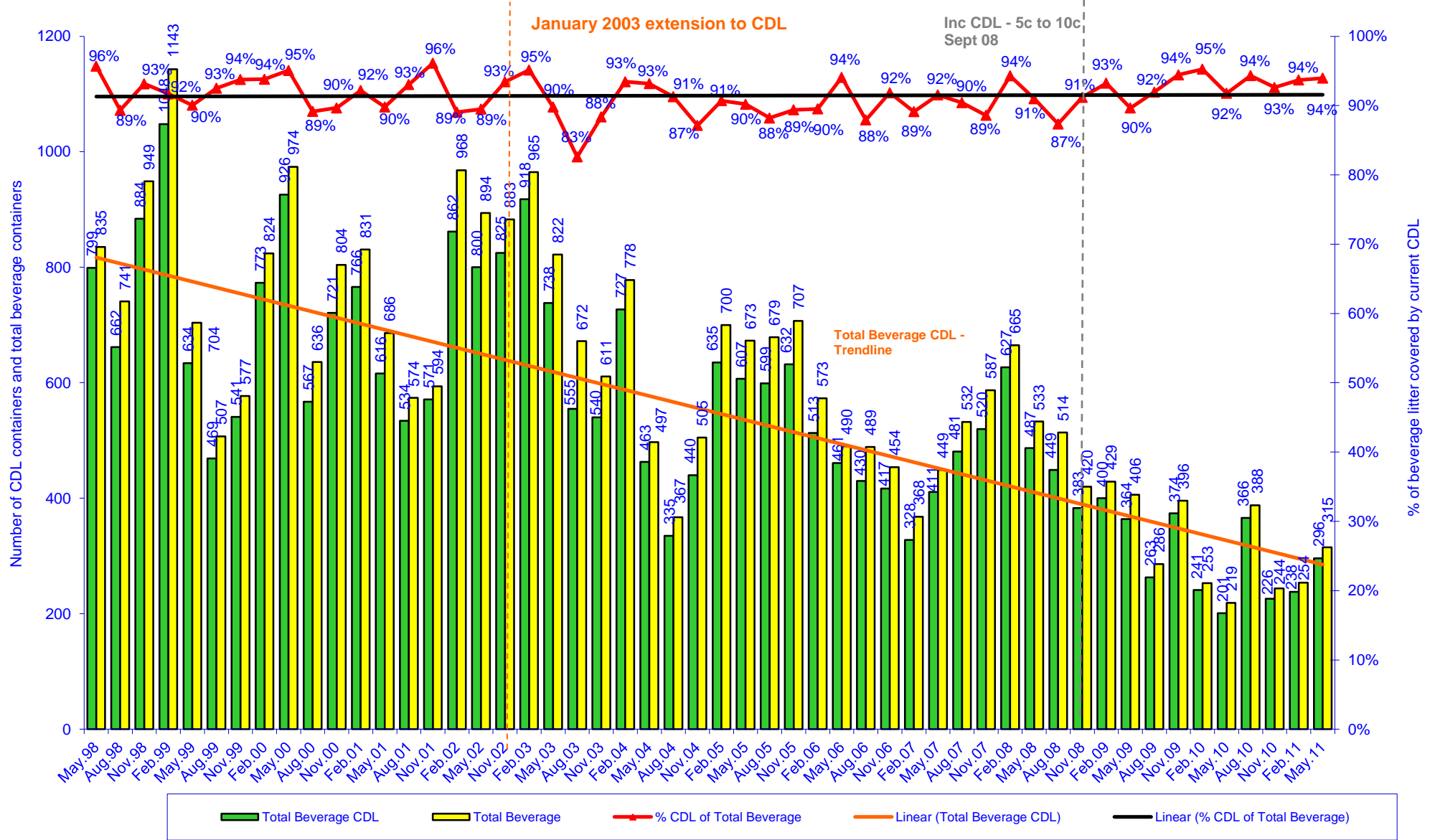


Proportion of Total Cigarette Butt Litter at Highway sites & Other sites

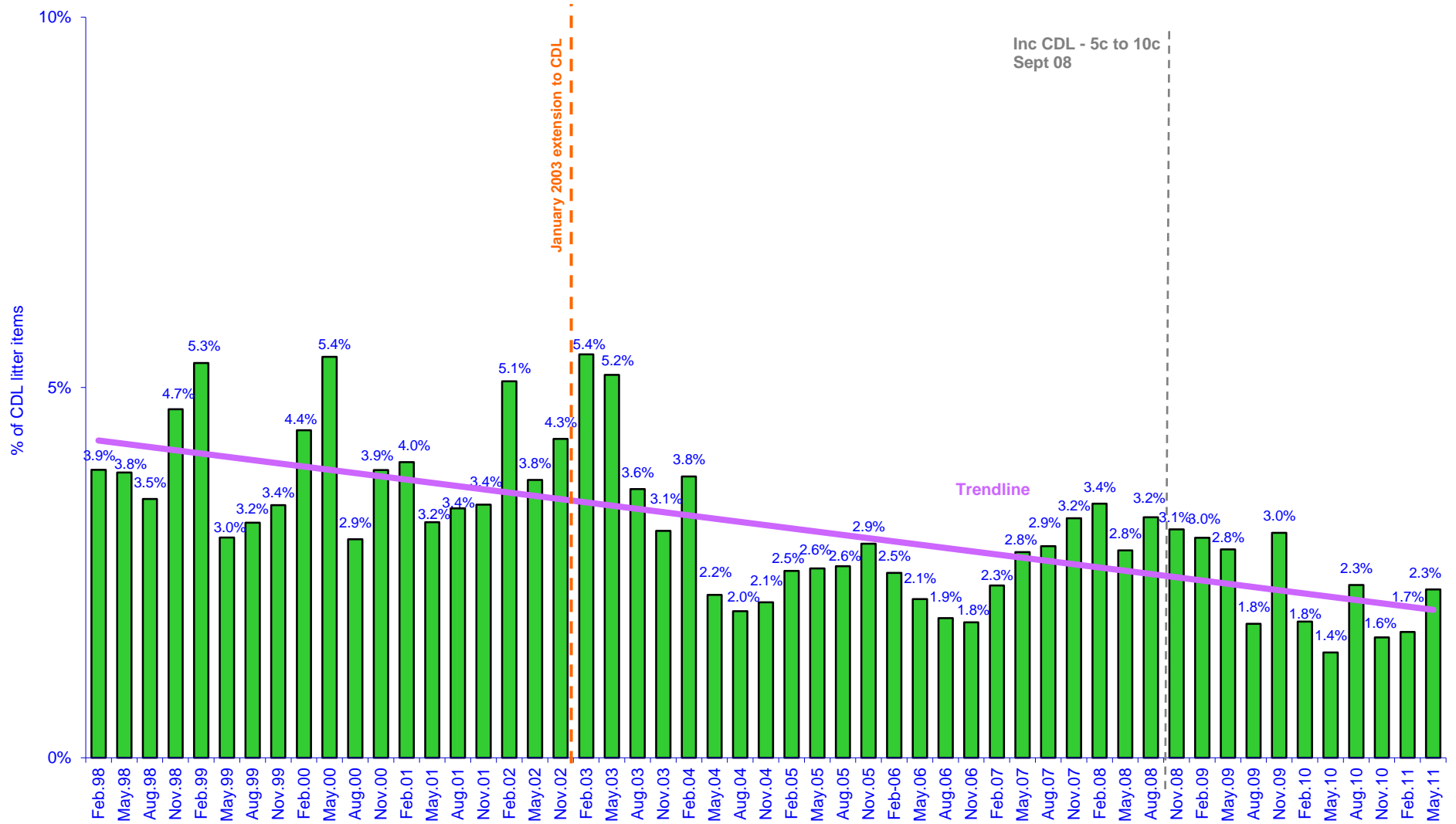


Revised Sites

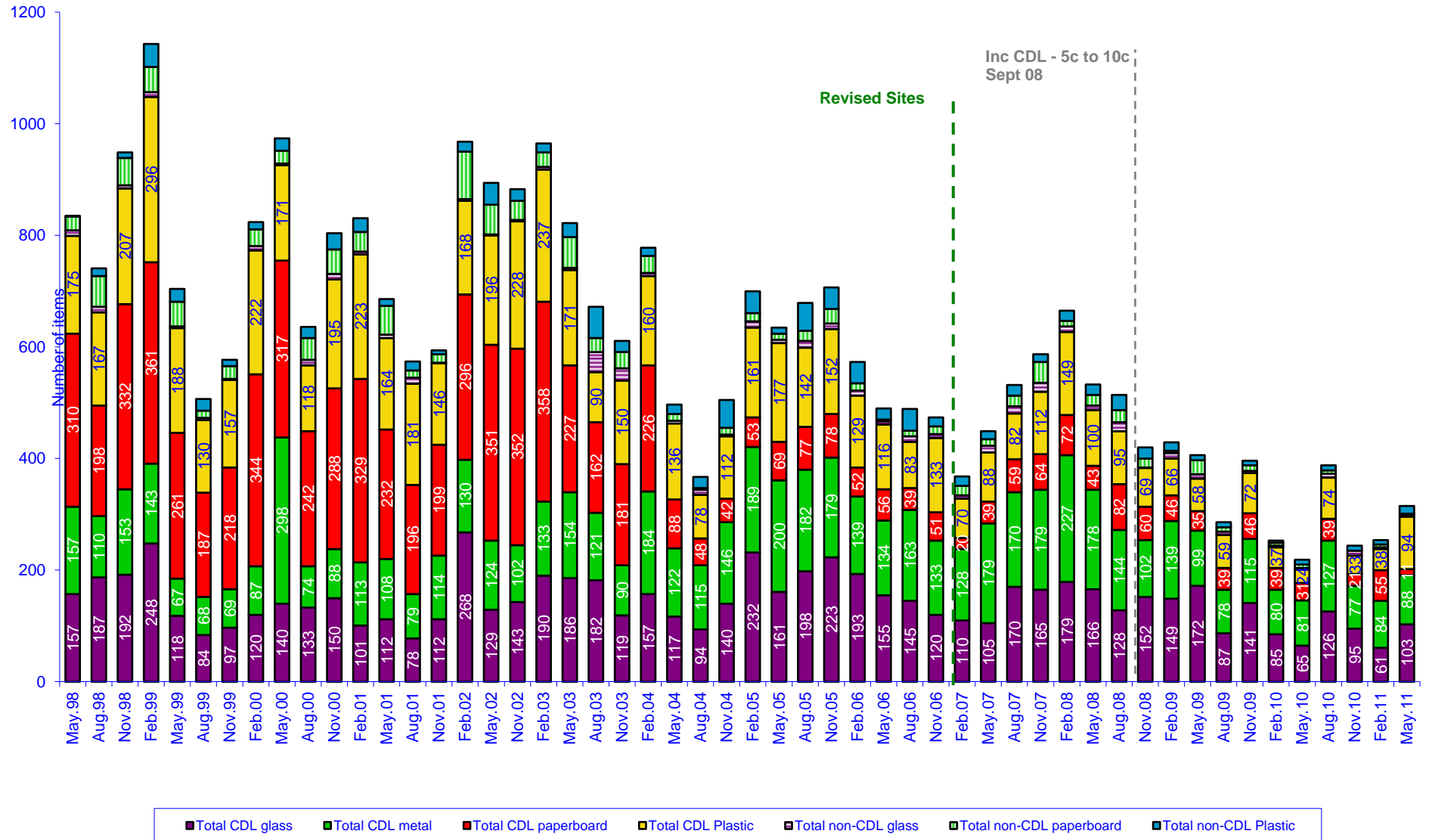
Proportion of Beverage Litter Covered By Current CDL & Total Number of Beverage Litter Items & Containers Covered By Current CDL



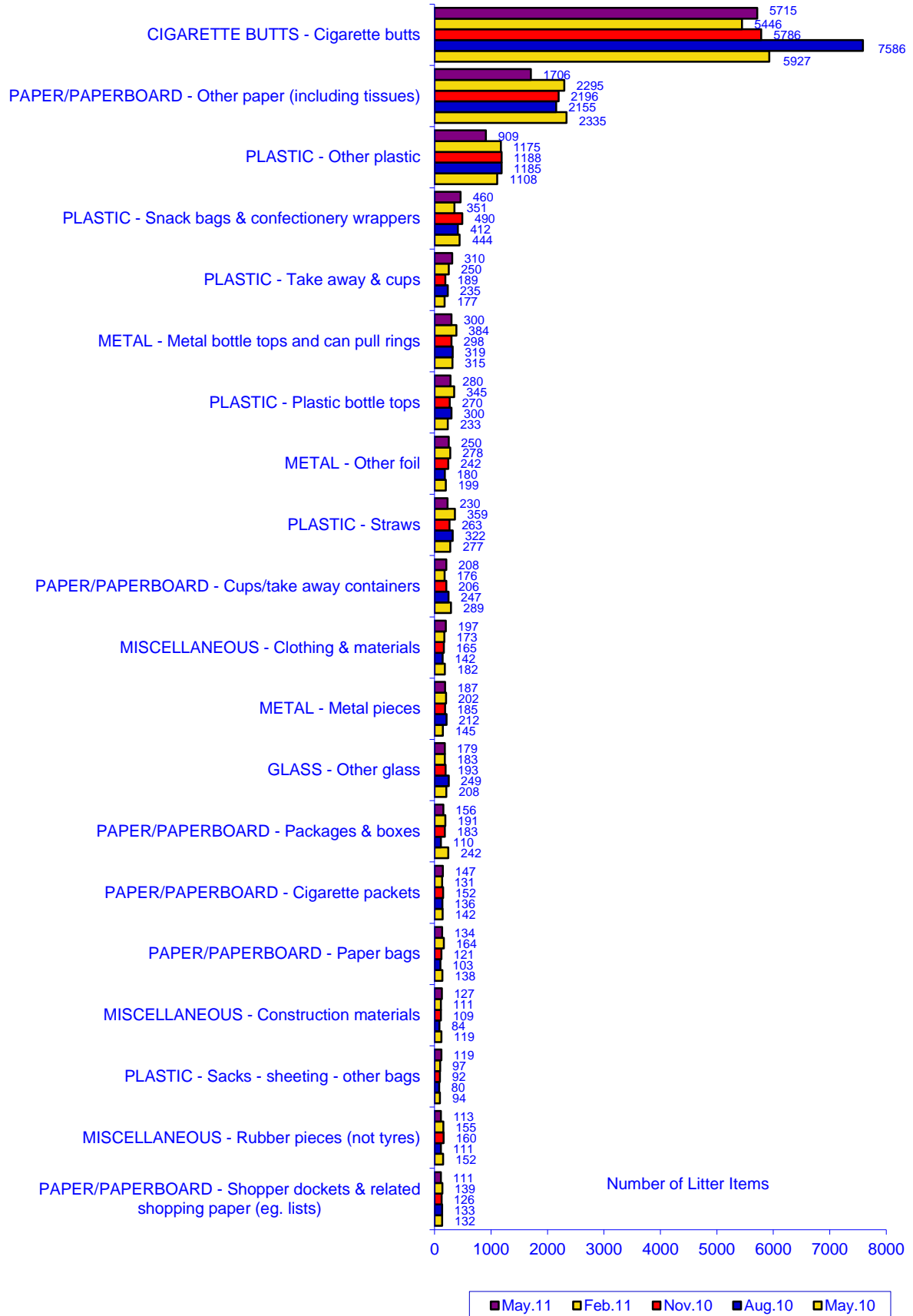
Proportion of Current CDL Litter Items in Total Litter Stream



CDL and Non-CDL Beverage Items Within Material Categories

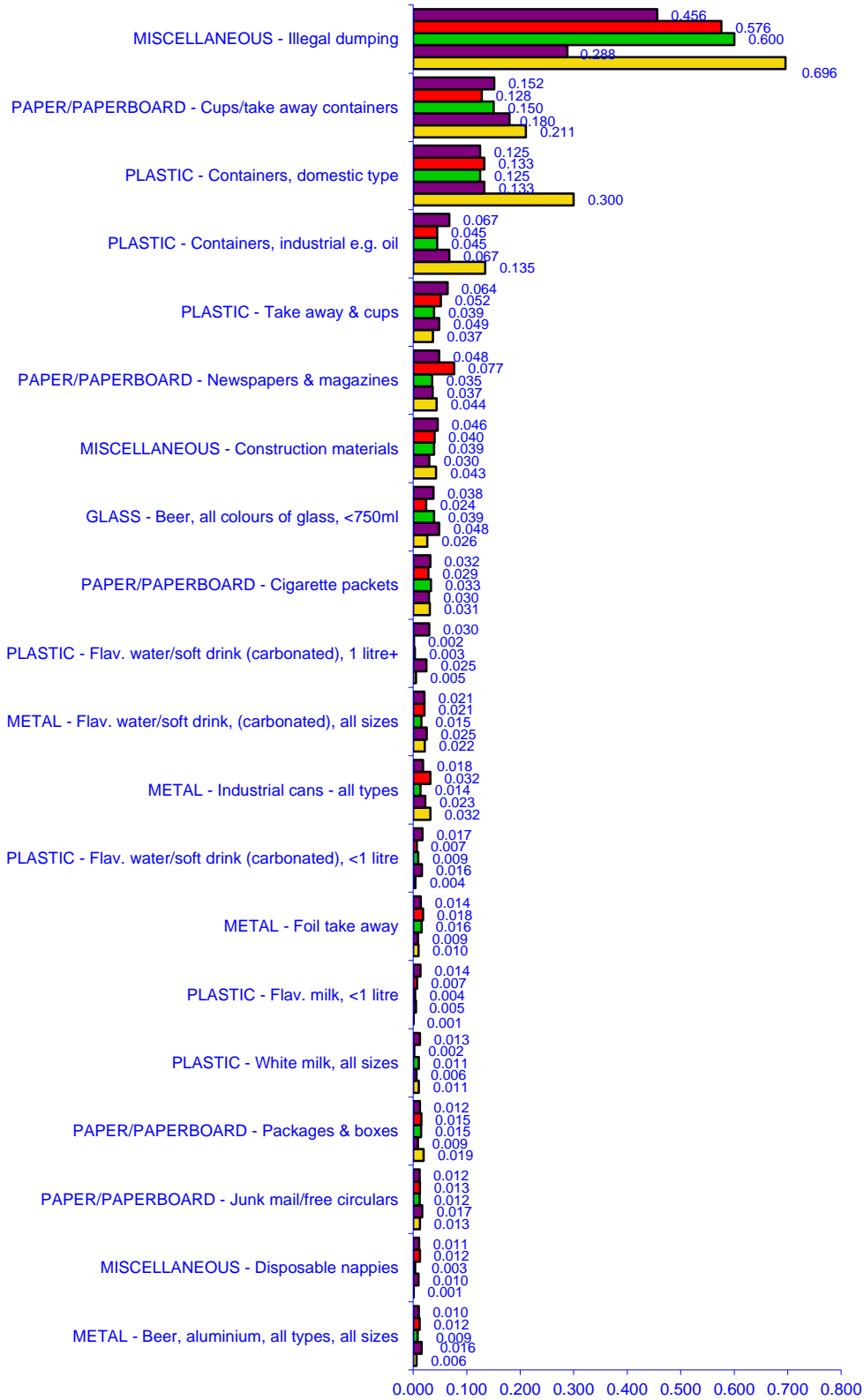


Top 20 Litter Items - Highest Counts



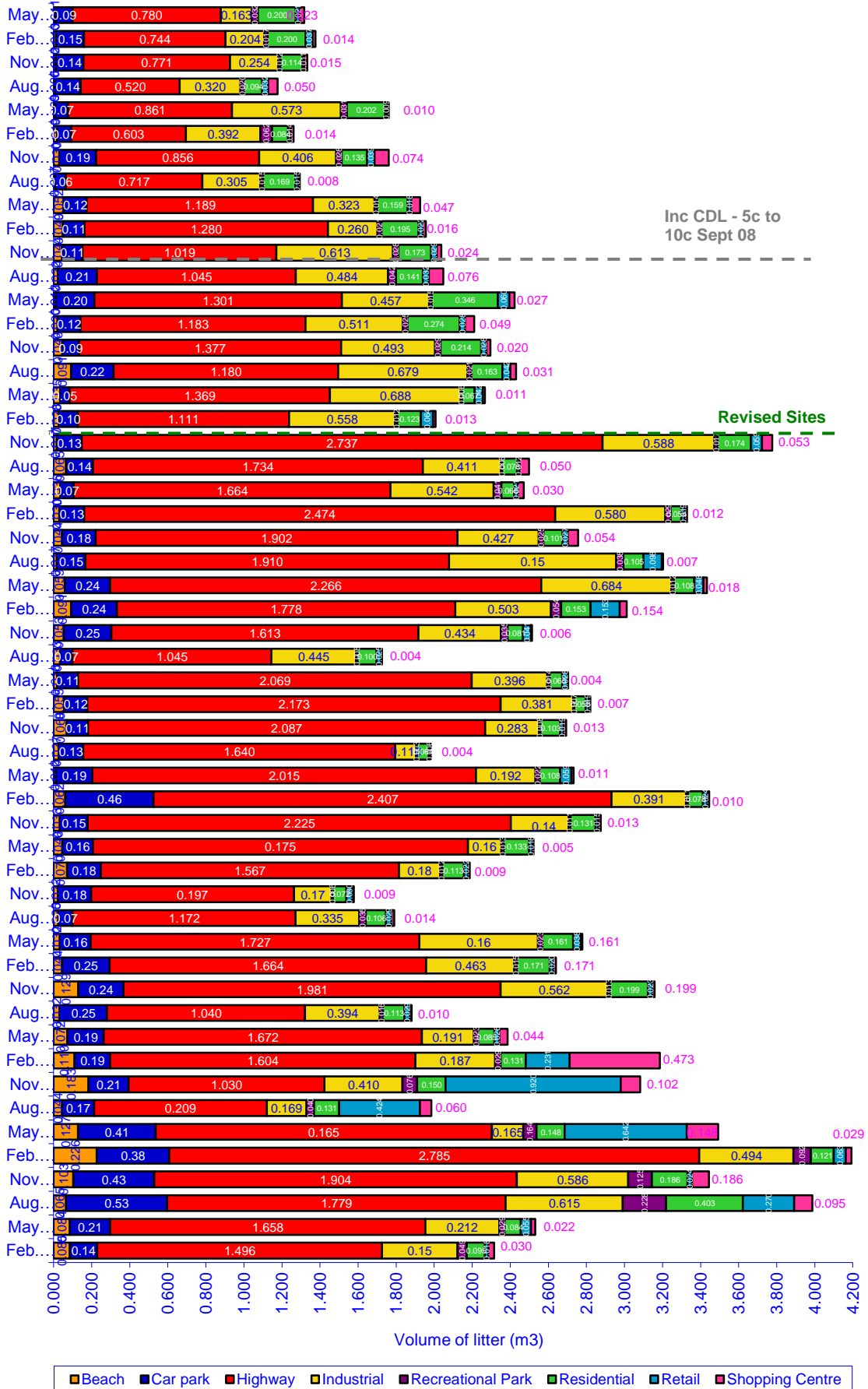
Unweighted Tracking Graphs
- Volume

Top 20 Litter Items by Volume

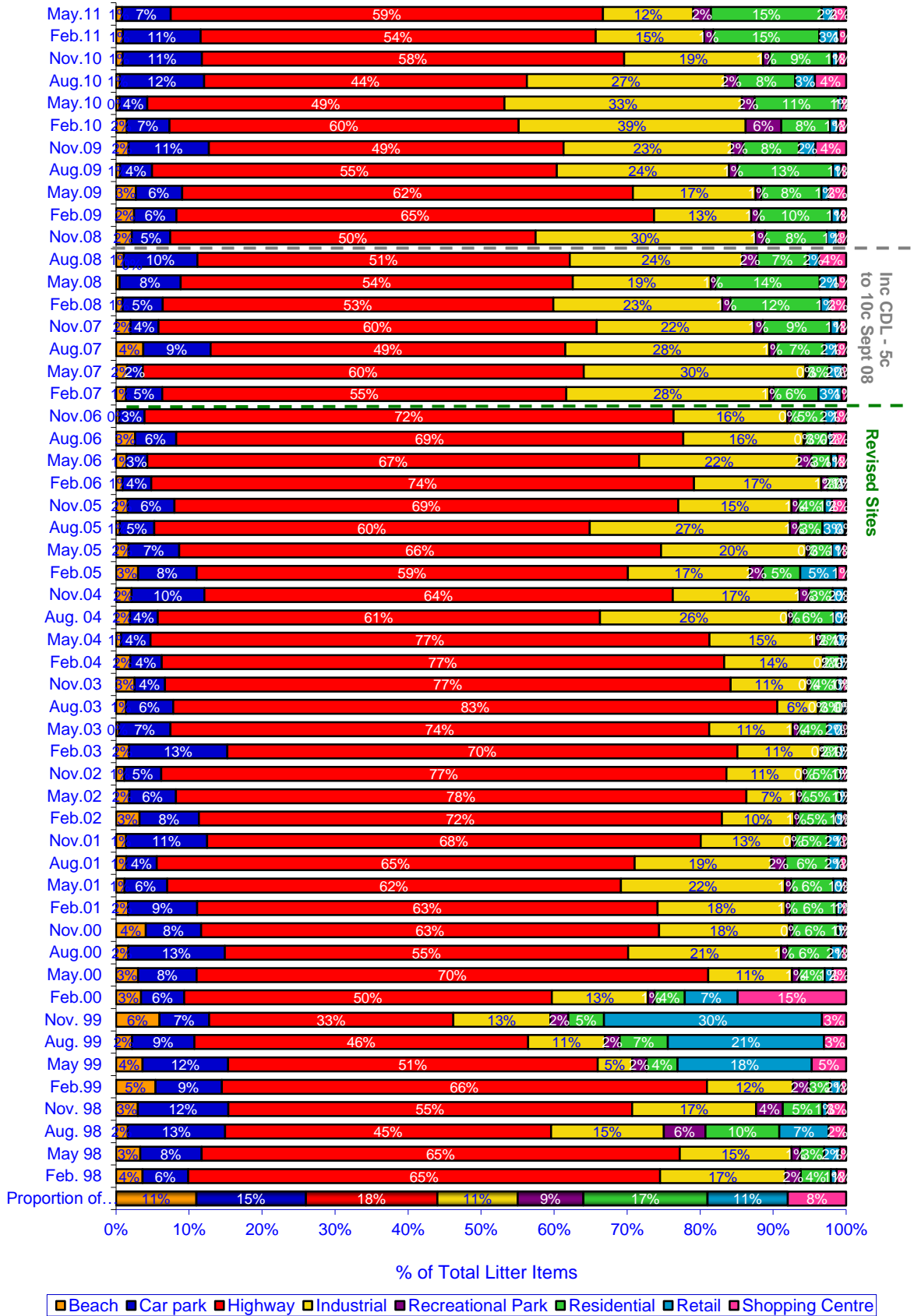


Legend: ■ May.11 ■ Feb.11 ■ Nov.10 ■ Aug.10 ■ May.10

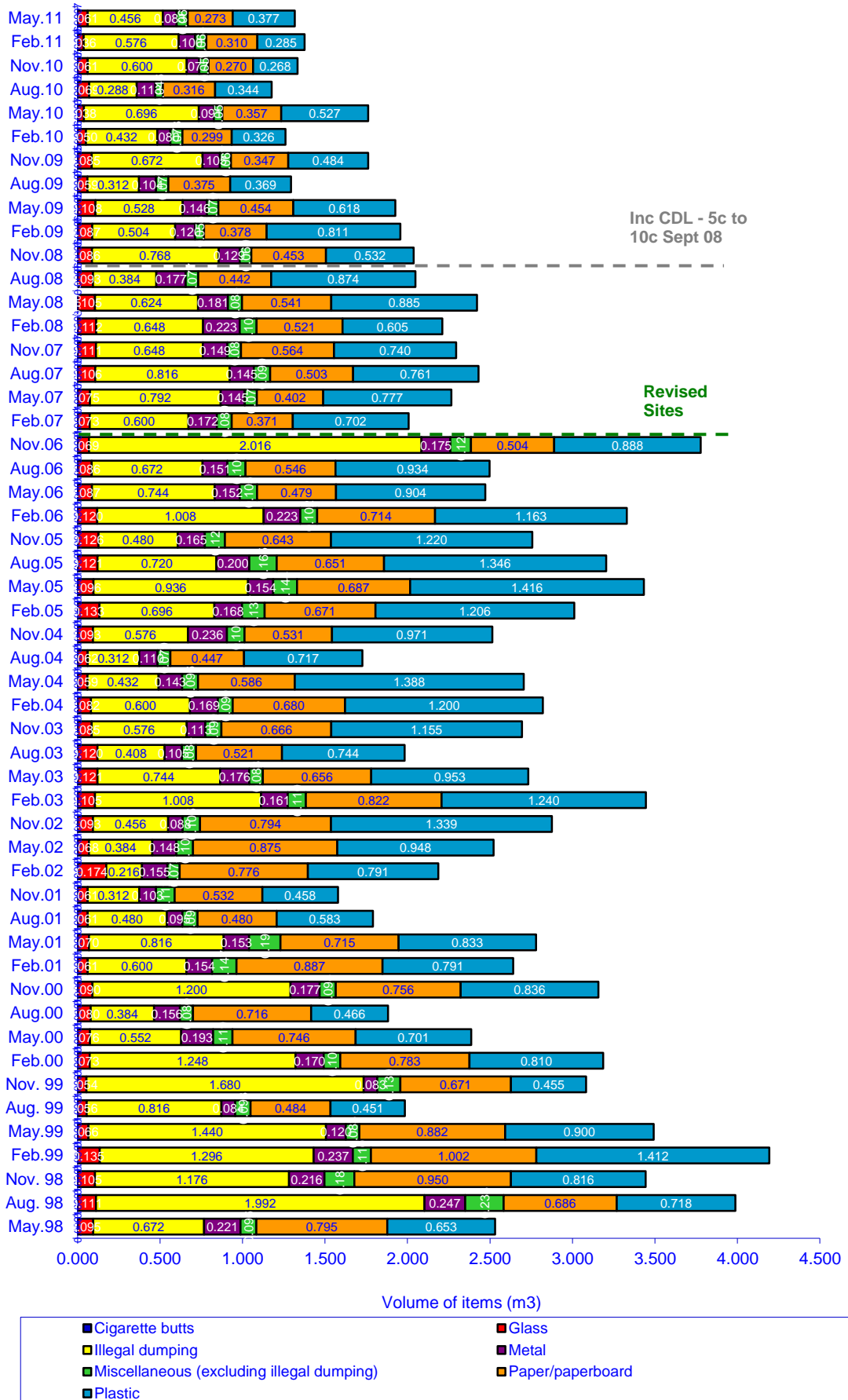
Volume of Litter by Site Type



Proportion of Litter Volume in Total Litter Stream by Site Type

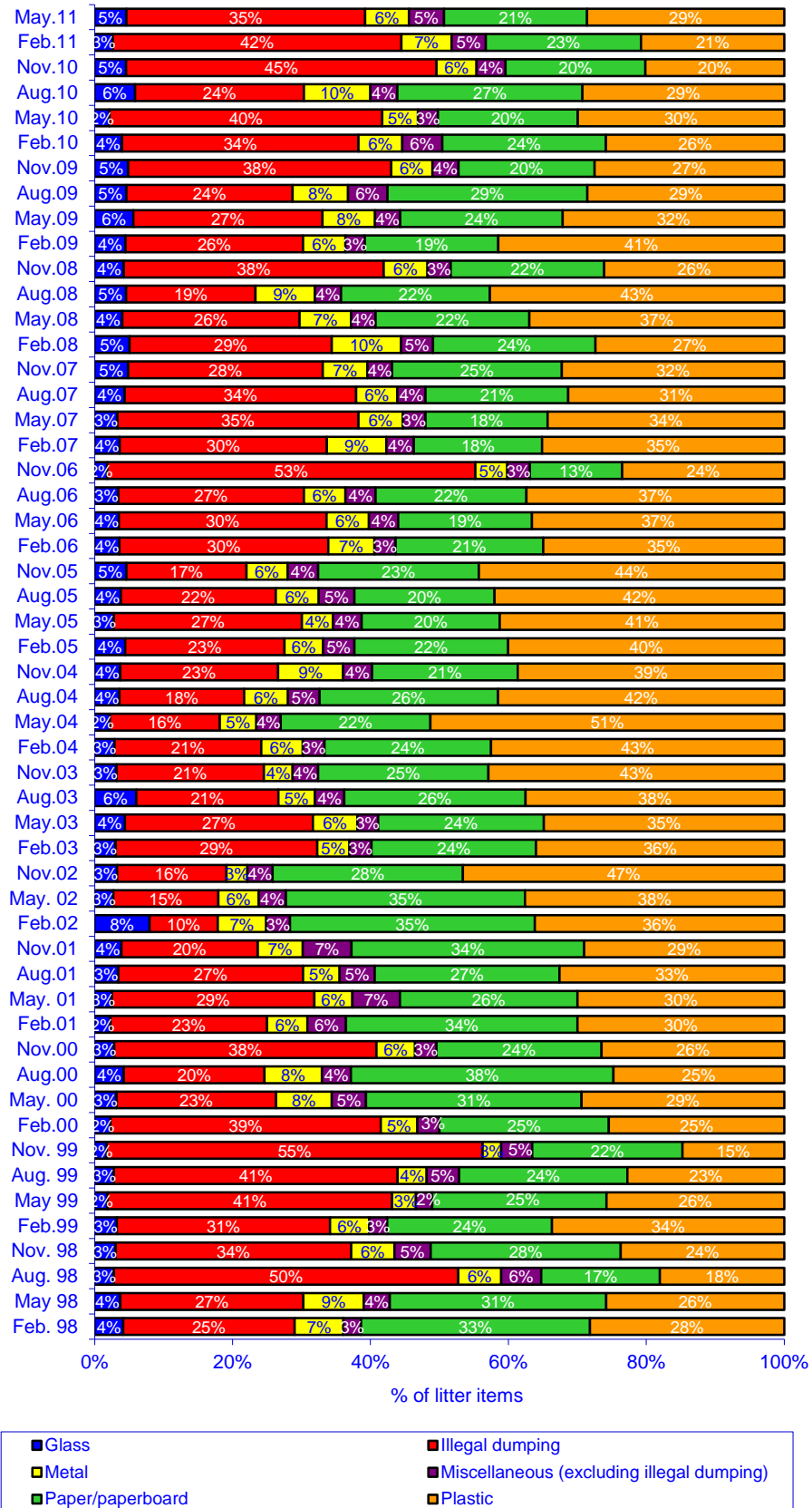


Volume of Litter Items by Material Type

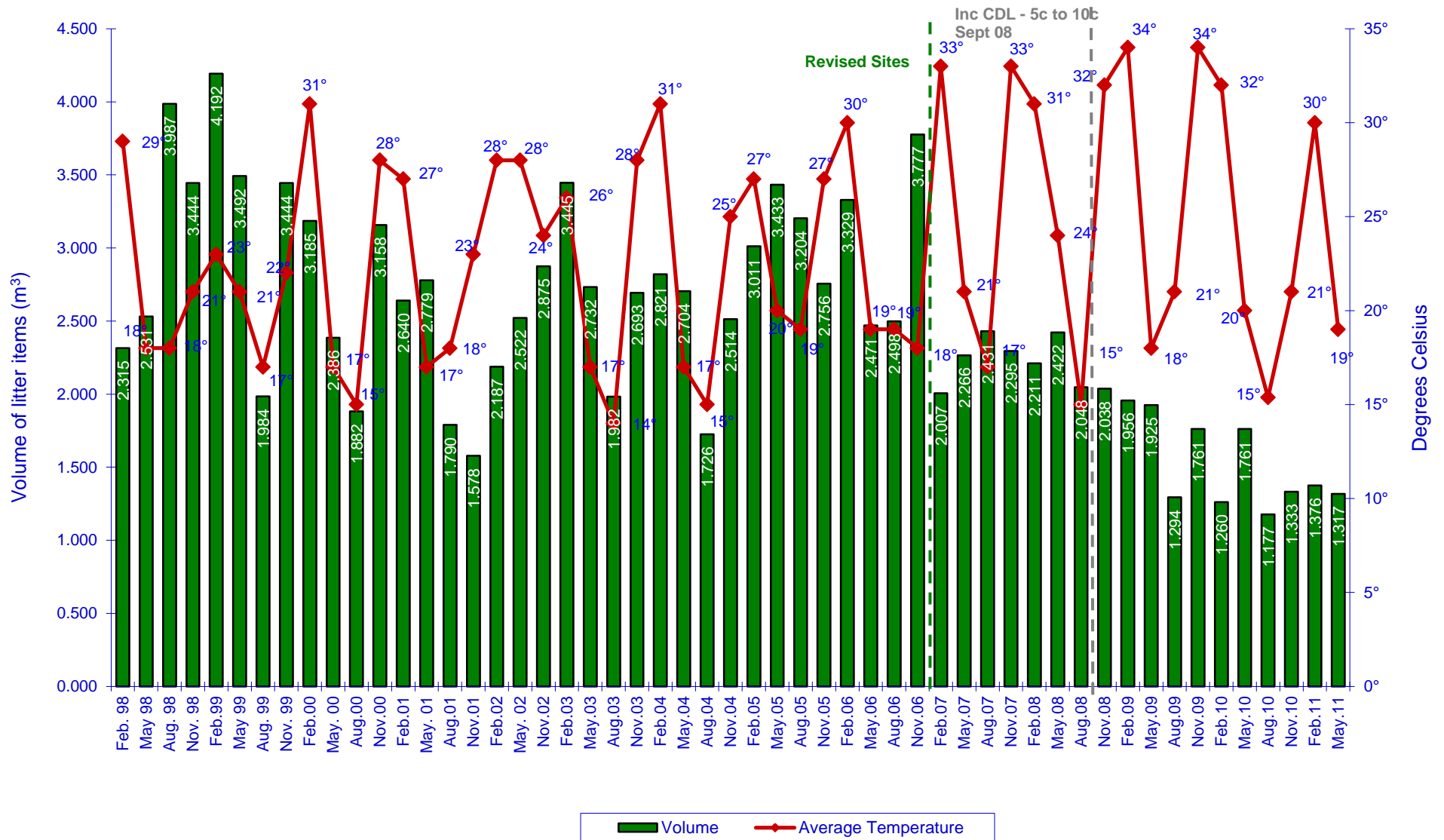


Proportion of Total Litter Volume by Material Type

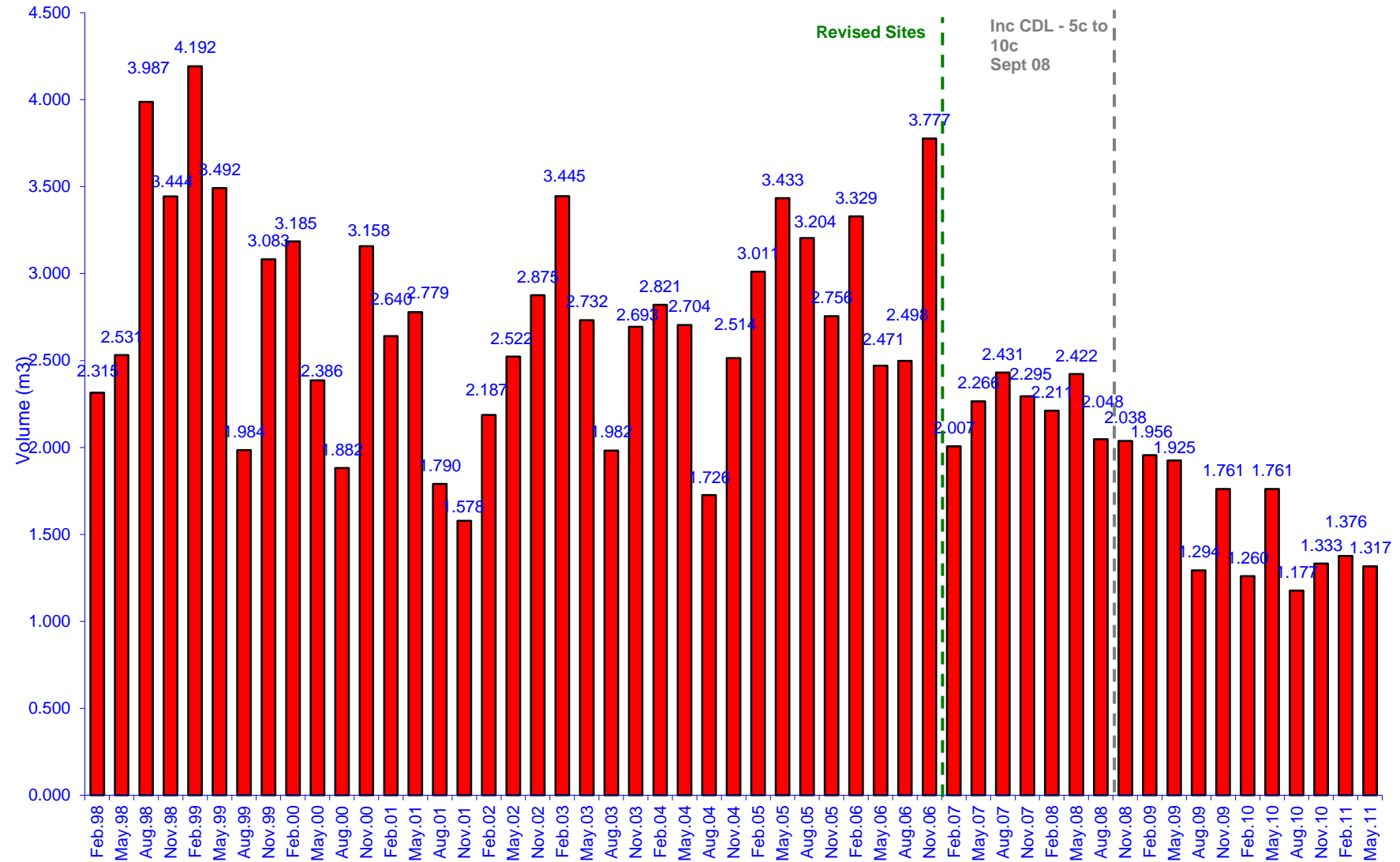
- Please note that cigarette butts are not included as the volumes of such are consistently negligible -



Weather Temperature and Total Volume of Litter Items



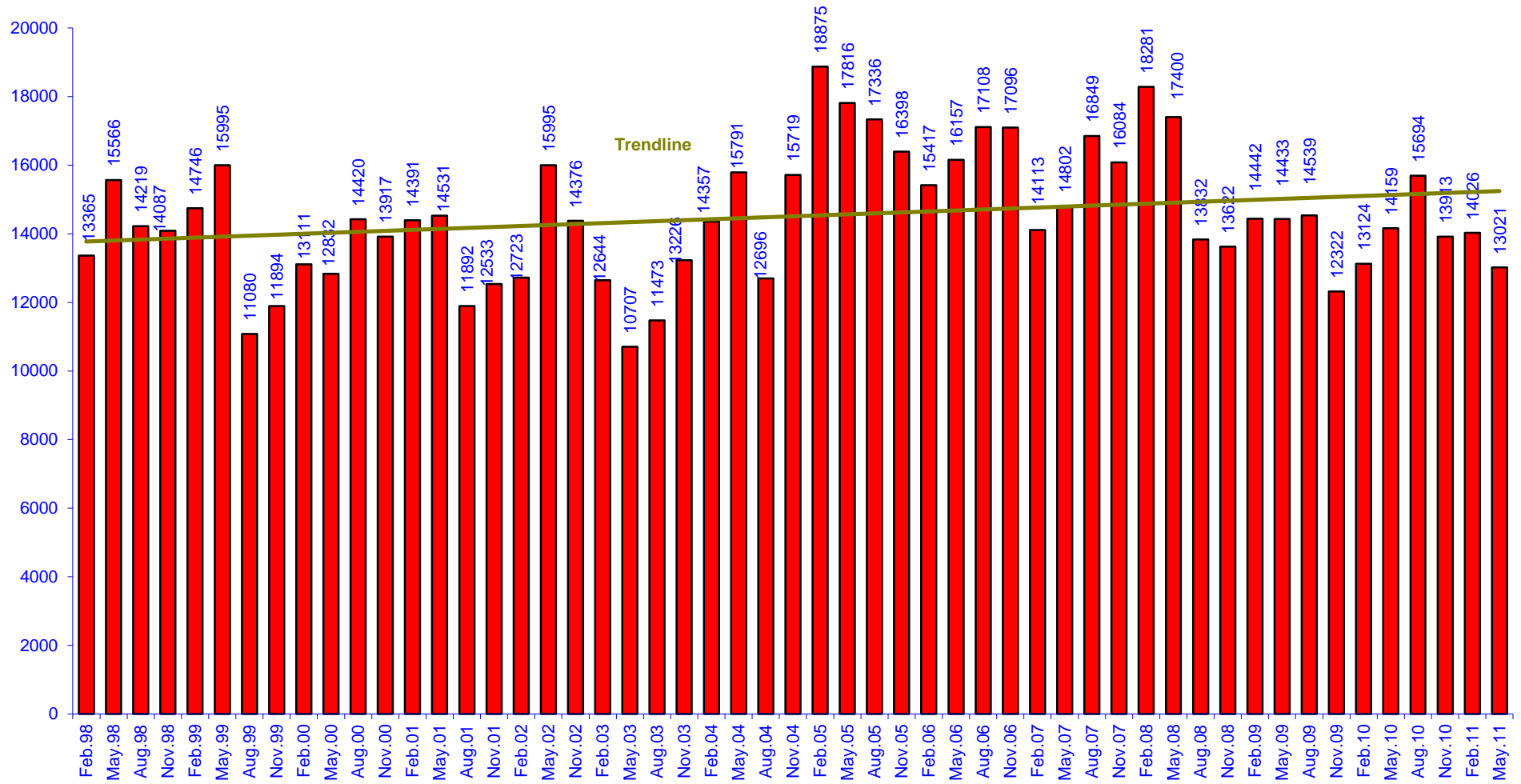
Total Volume (Cubic Metres) of Litter



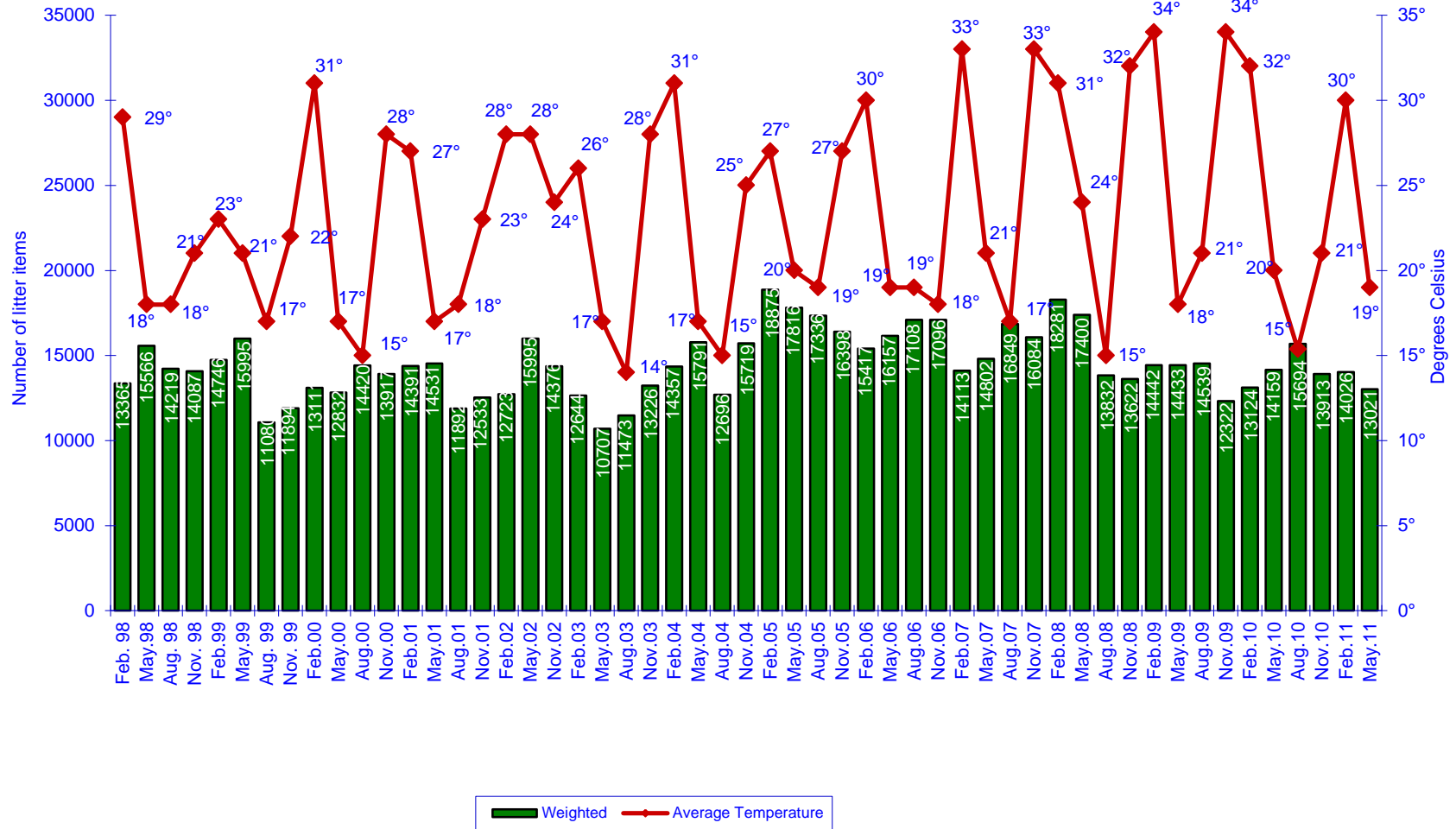
Weighted Tracking Graphs

- Items

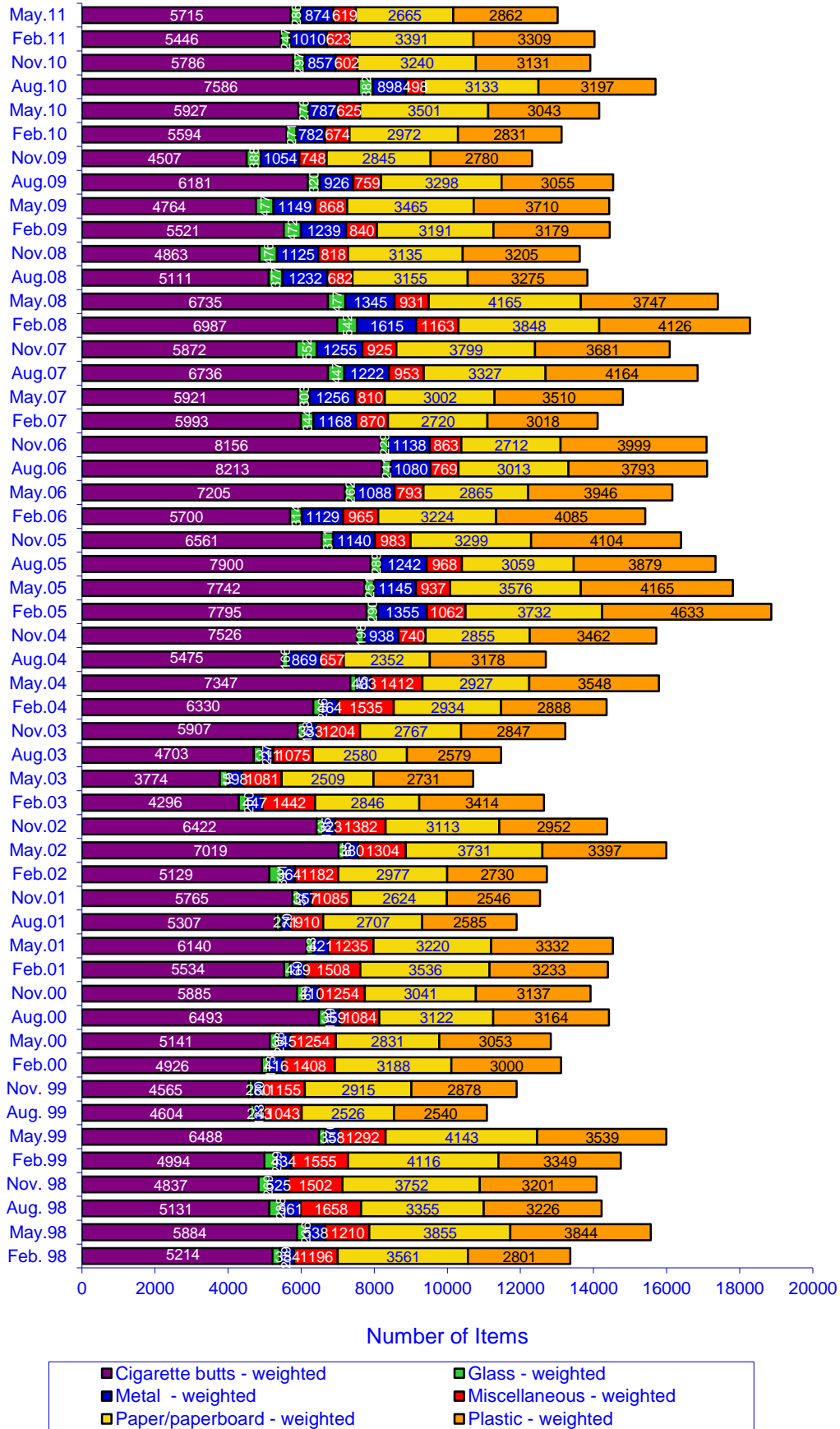
Total Litter - Number of Items - Weighted



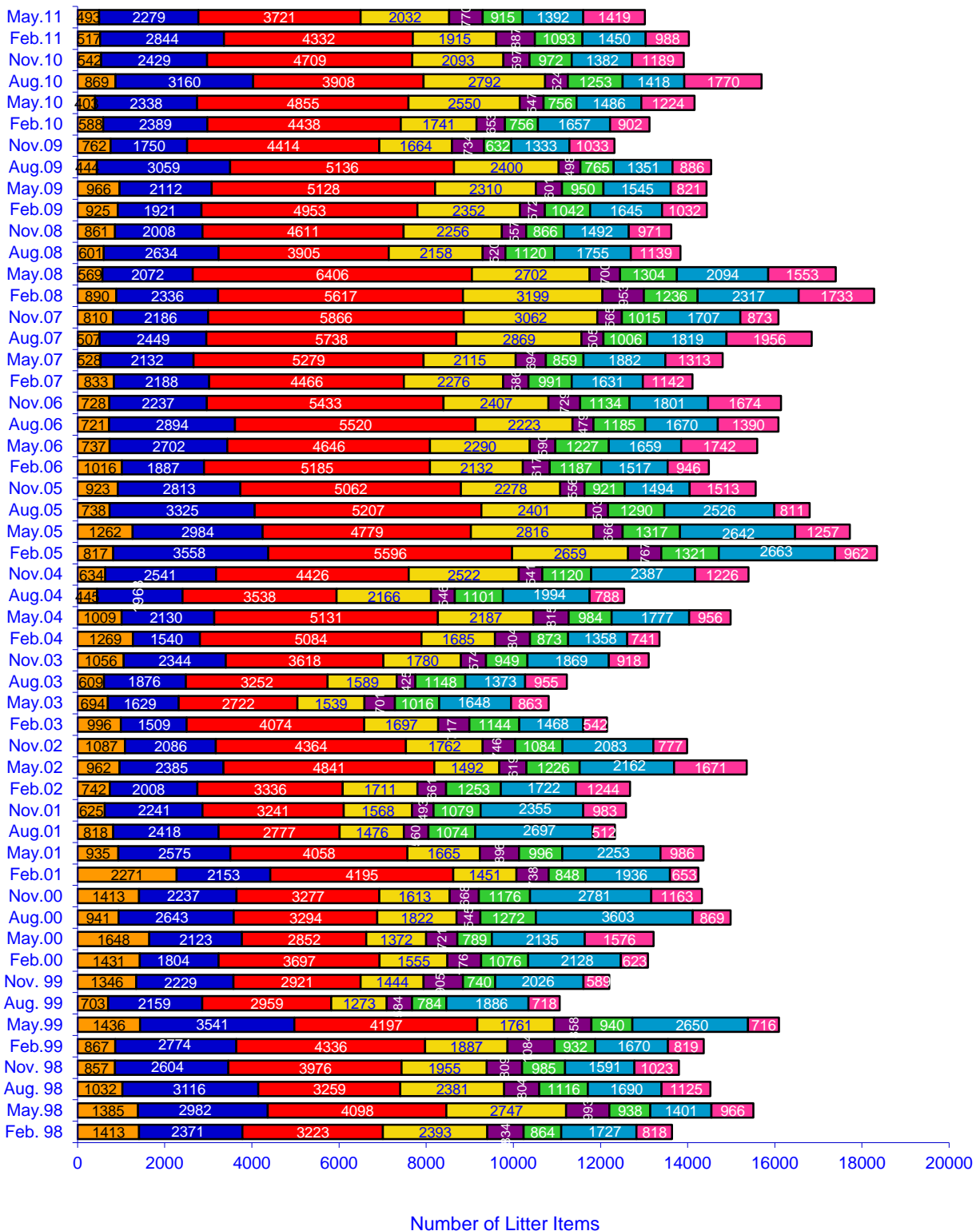
Weather Temperature and Total Number of Litter Items - Weighted



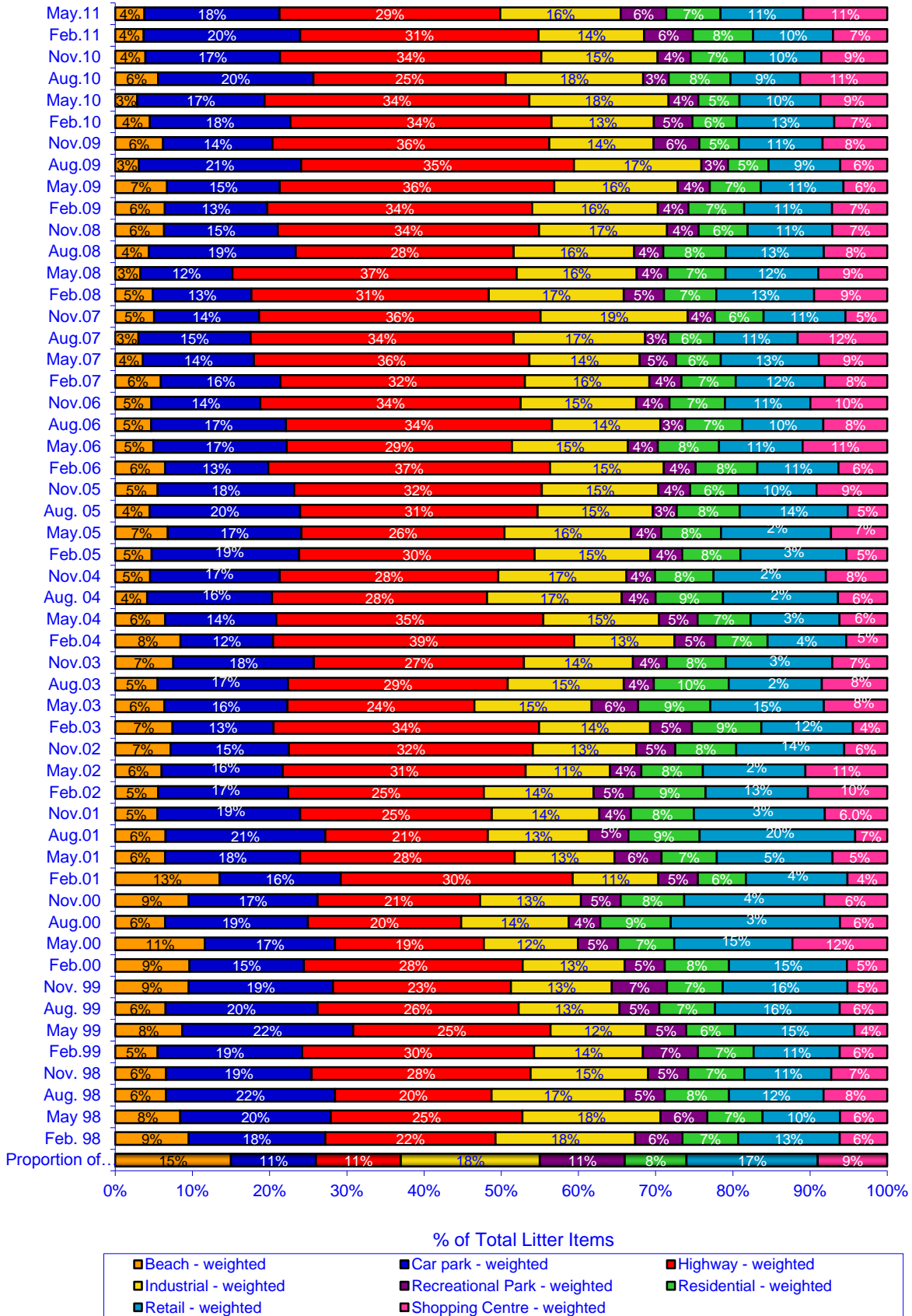
Number of Litter Items by Material Type - Weighted



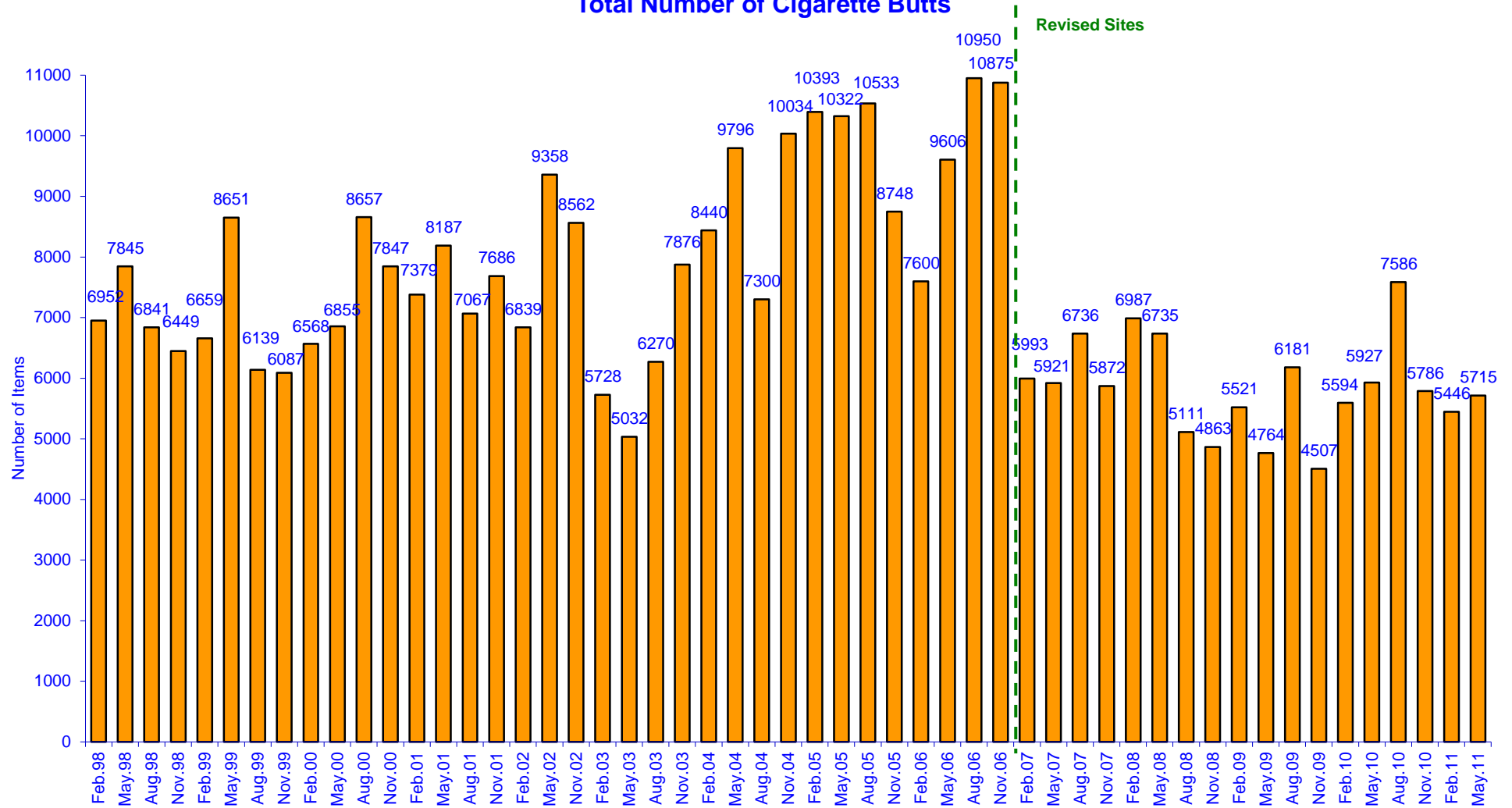
Number of Litter Items by Site Type - Weighted



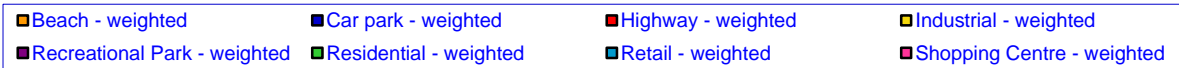
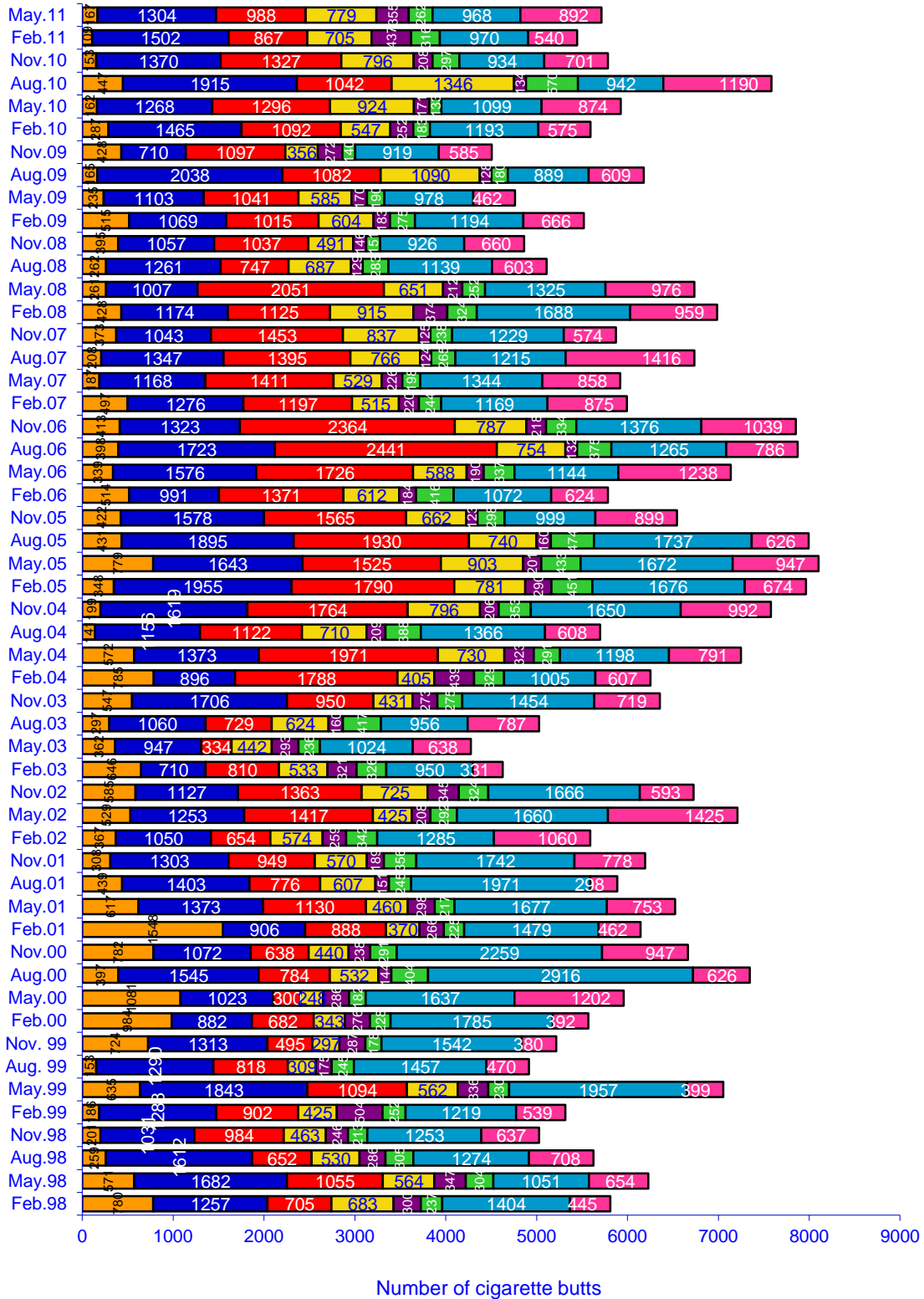
Proportion of Total Litter by Site Type - Weighted



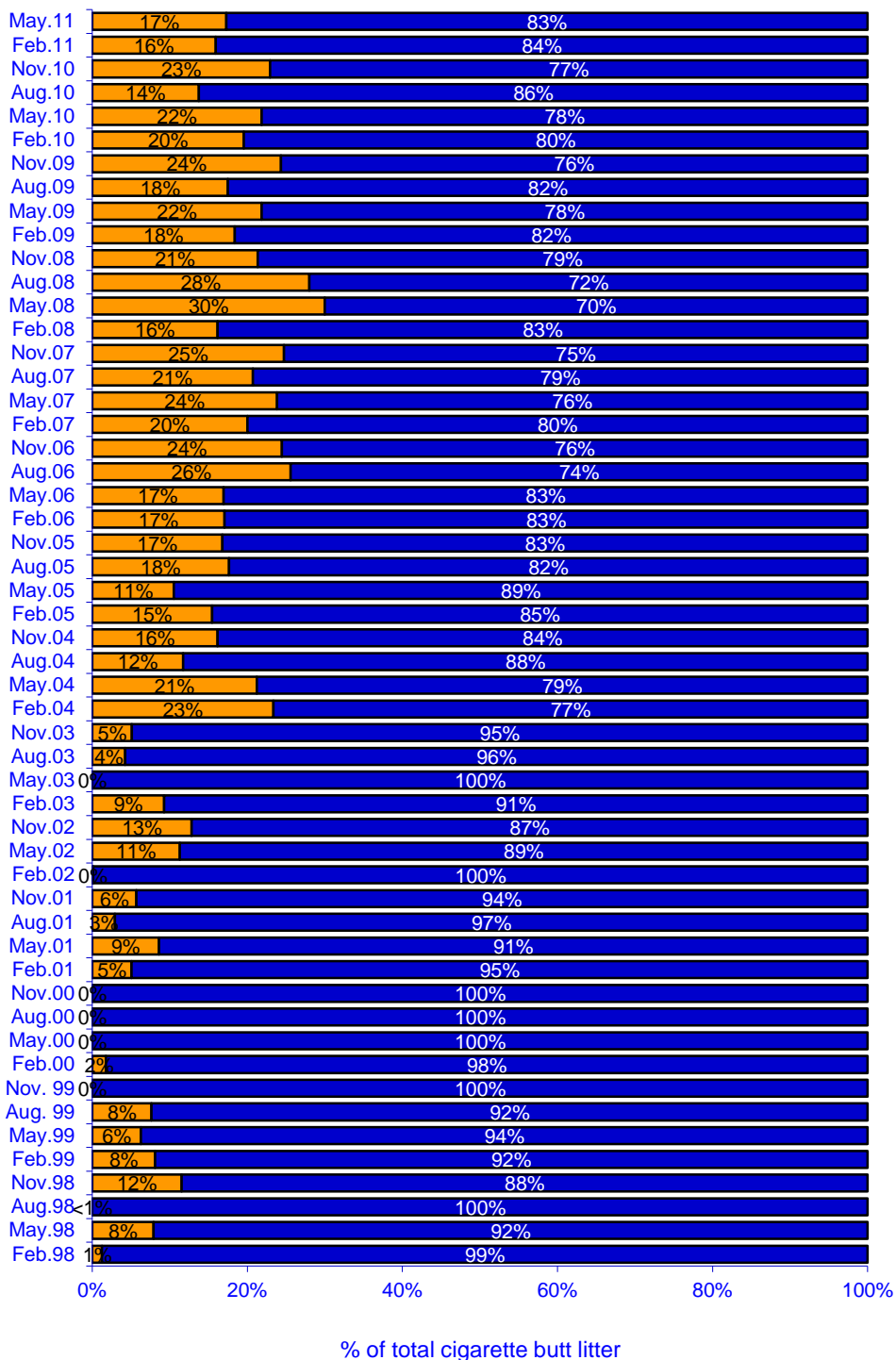
Total Number of Cigarette Butts



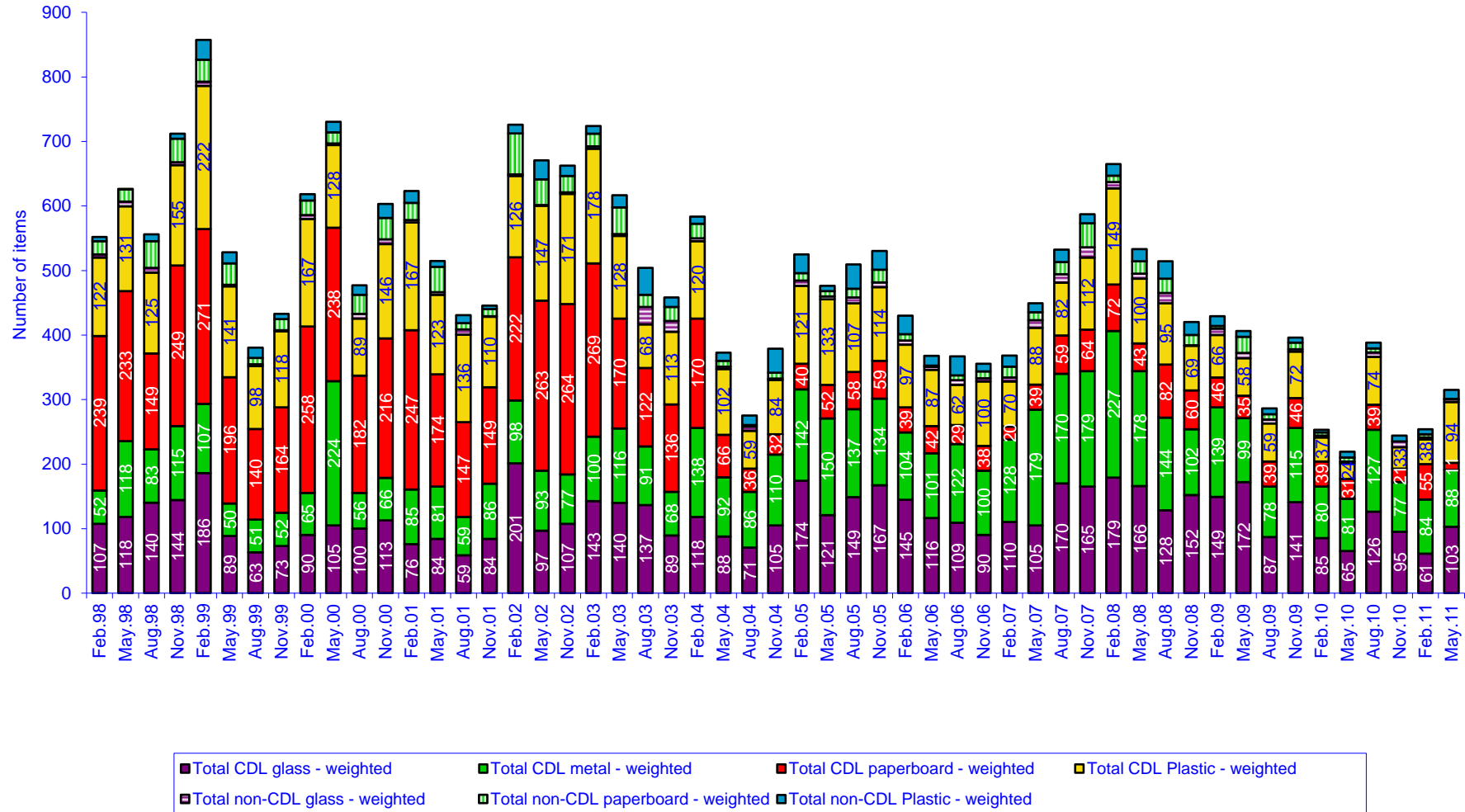
Number of Cigarette Butts by Site Type - Weighted



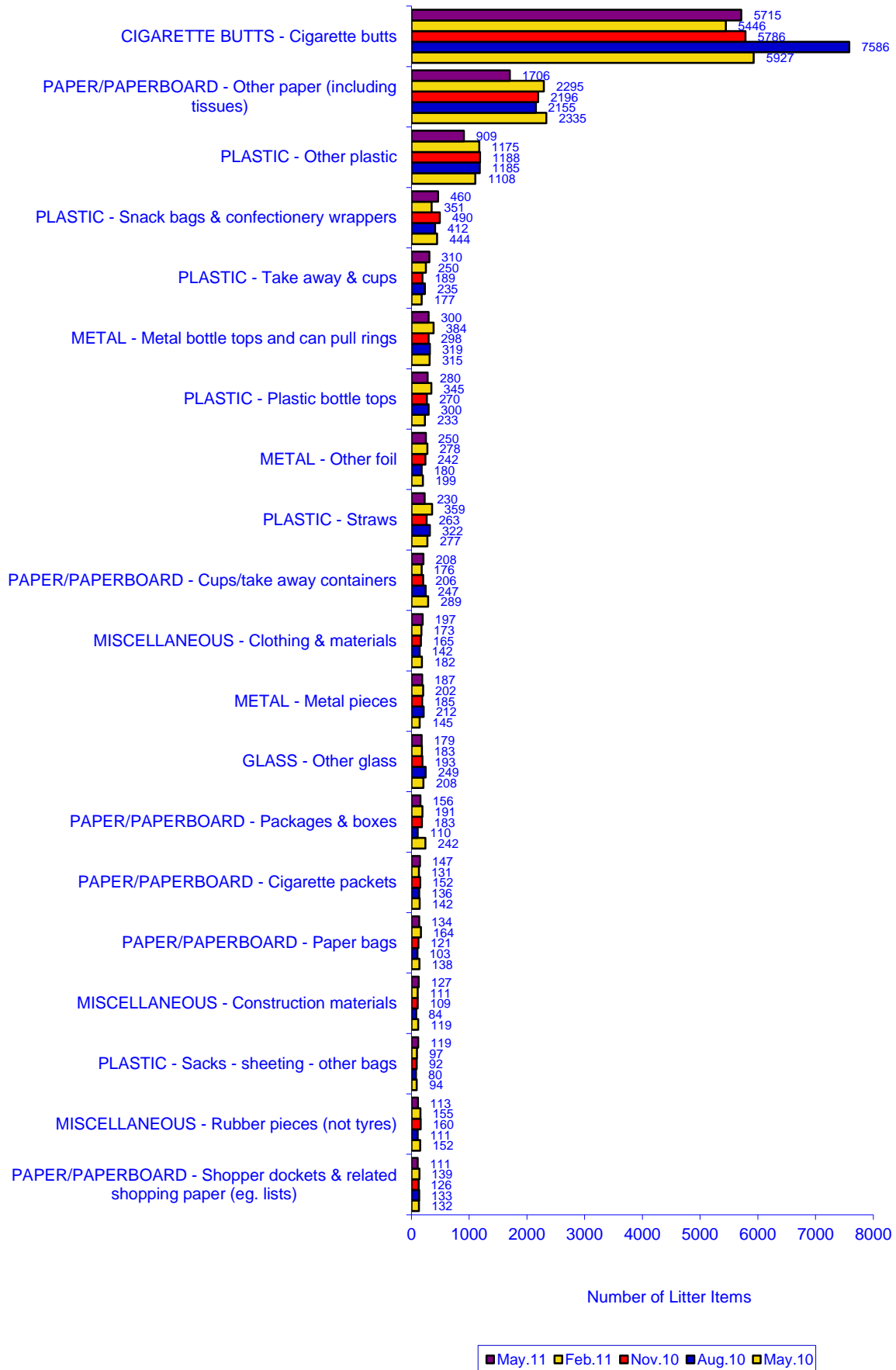
Proportion of Total Cigarette Butt Litter at Highway sites & Other sites - Weighted



CDL and Non-CDL Beverage Items Within Material Categories - Weighted

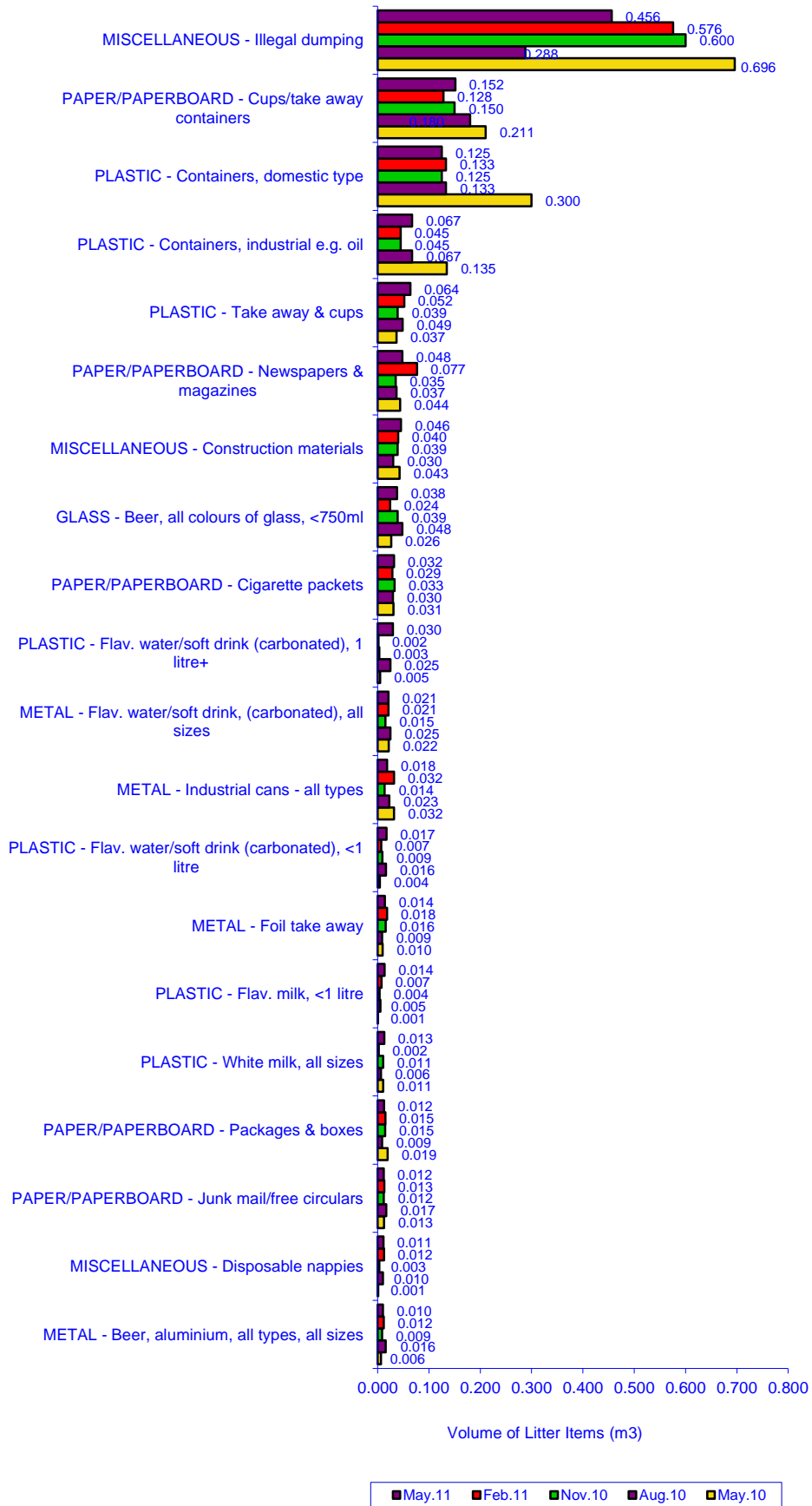


Top 20 Litter Items - Highest Counts - Weighted

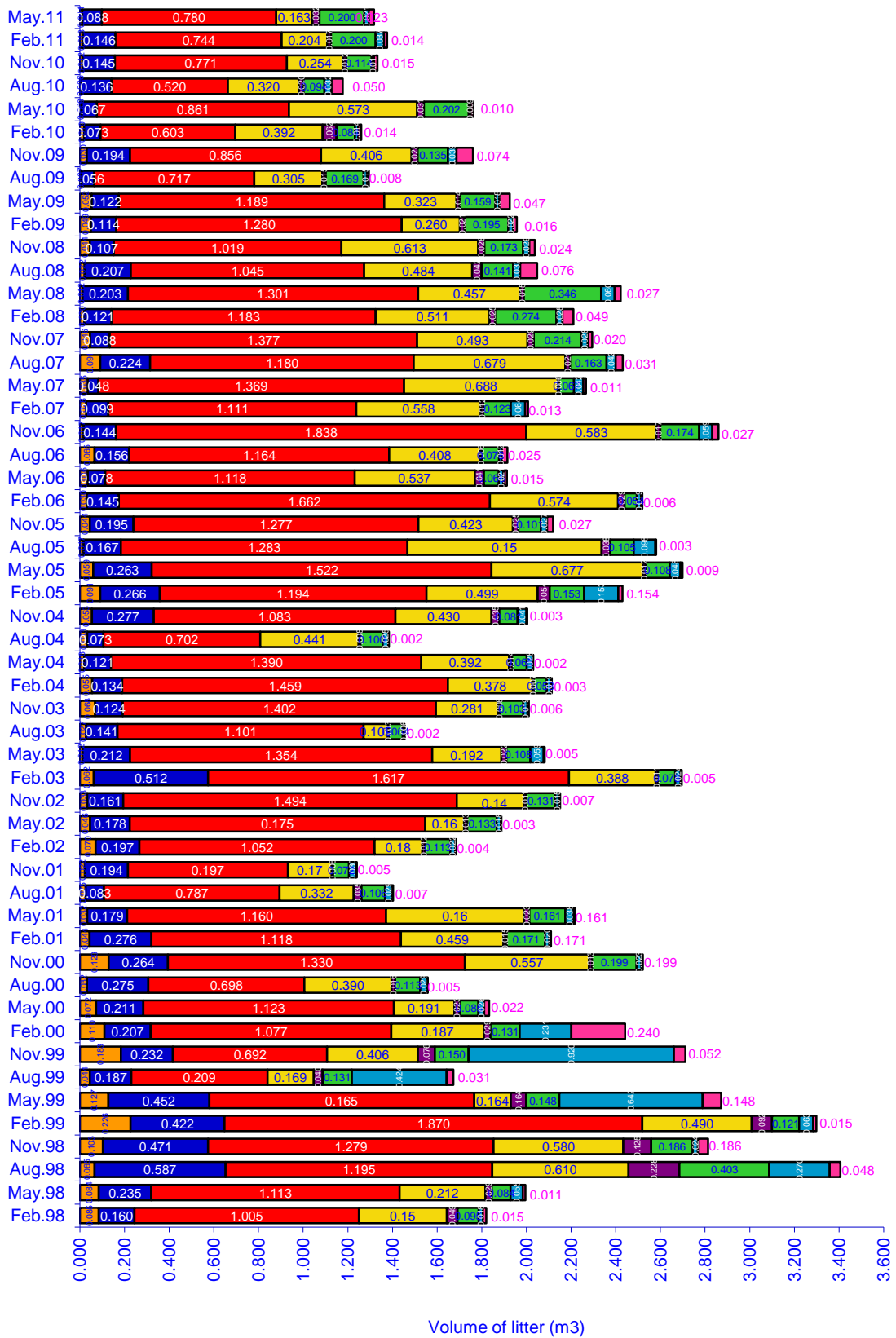


***Weighted Tracking Graphs
- Volumes***

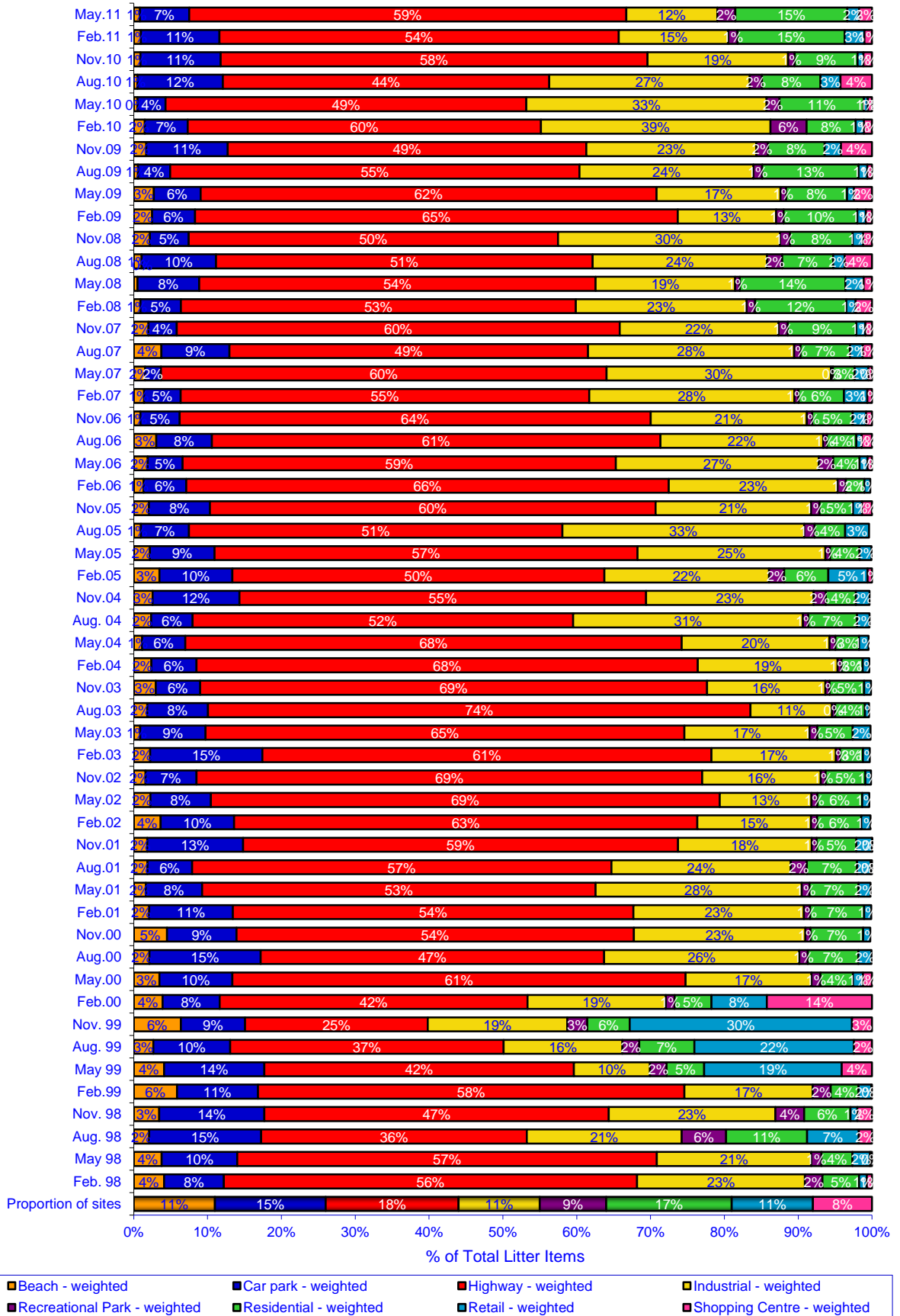
Top 20 Litter Items by Volume - Weighted



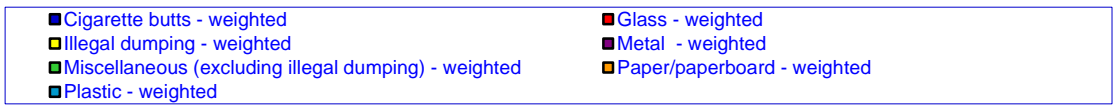
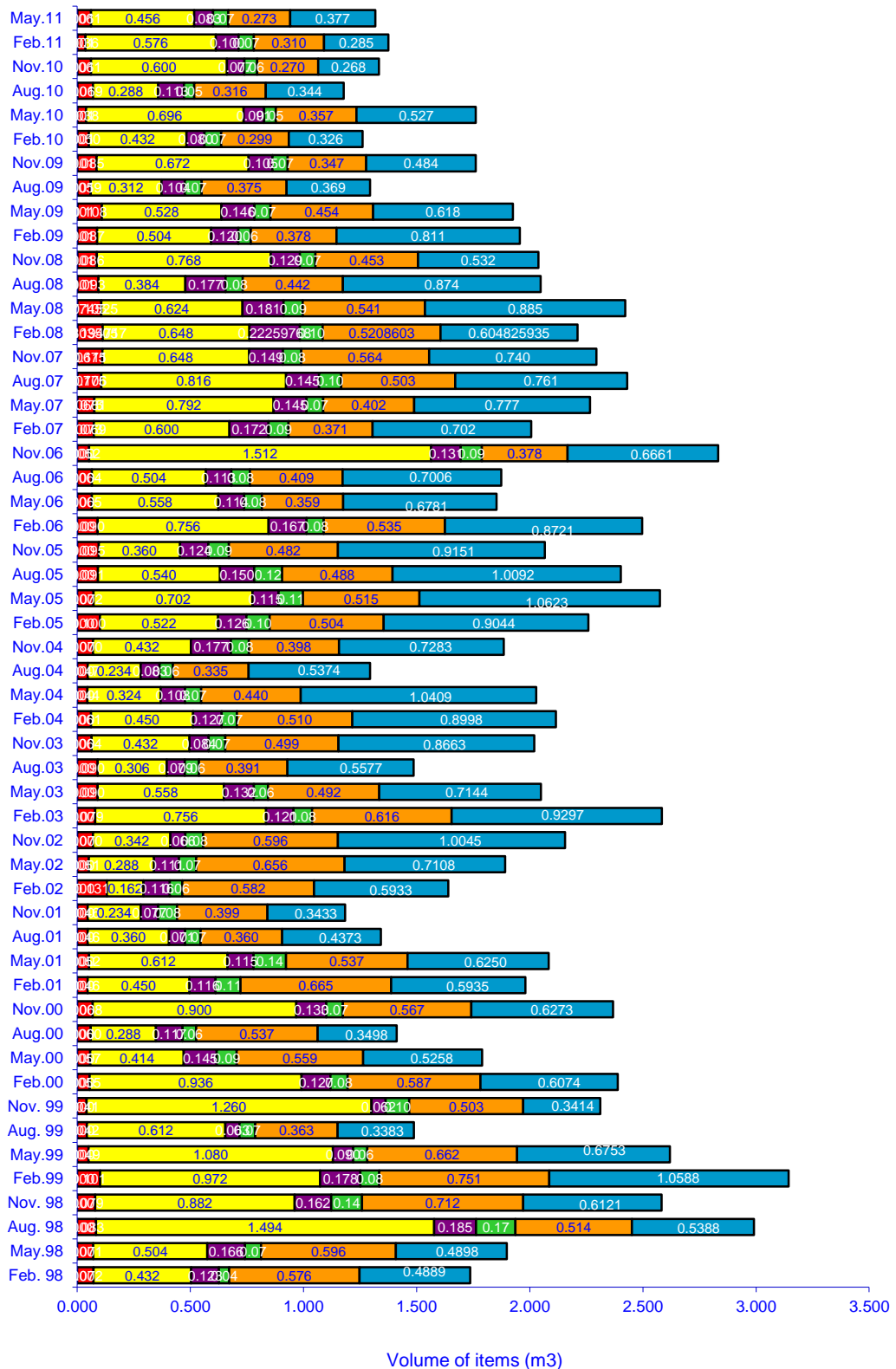
Volume of Litter by Site Type - Weighted



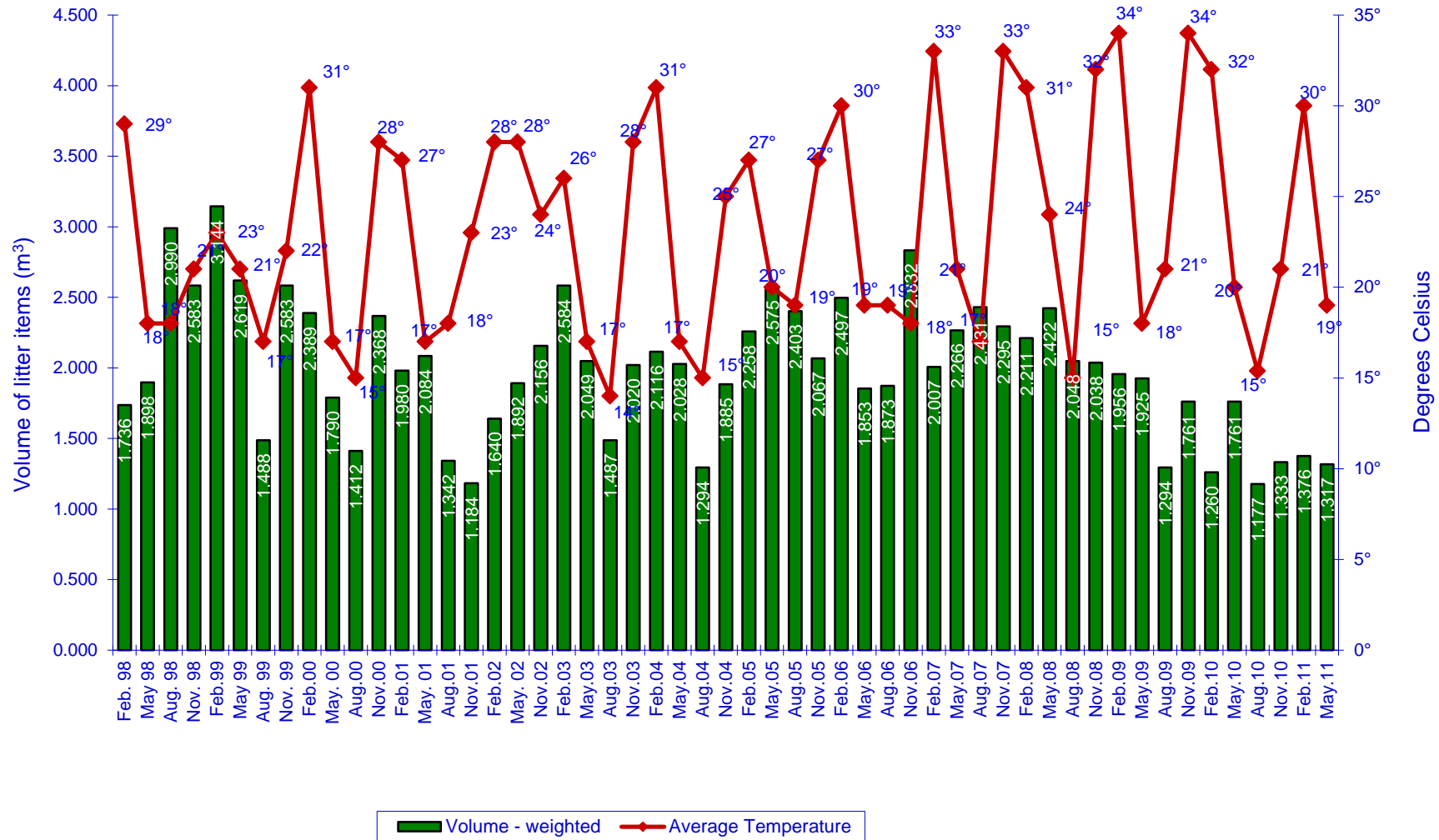
Proportion of Litter Volume in Total Litter Stream by Site Type - Weighted



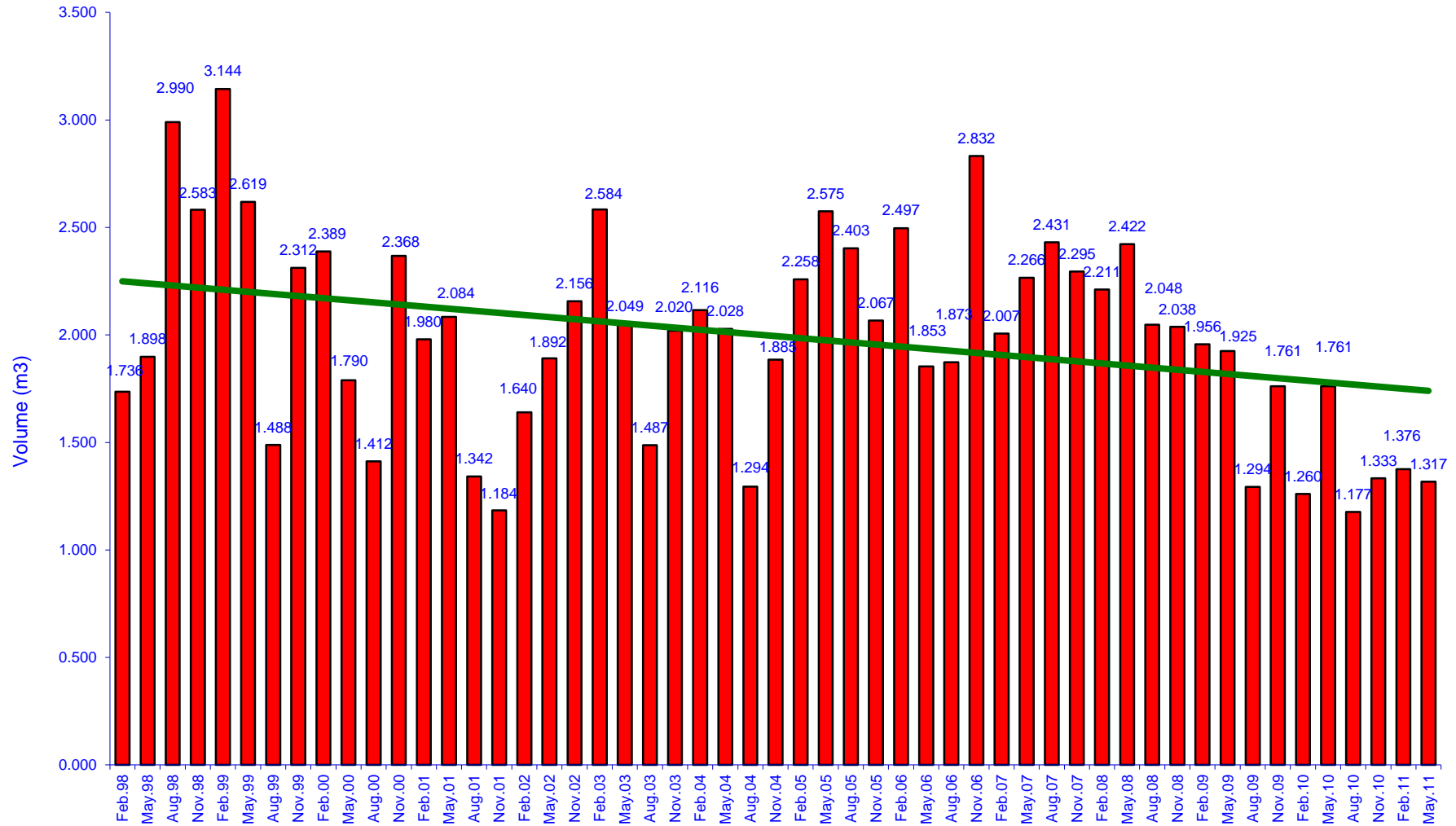
Volume of Litter Items by Material Type - Weighted



Weather Temperature and Total Volume of Litter Items - Weighted



Total Volume (Cubic Metres) of Litter - Weighted



***Appendix 2:
Data Collection Form***

KESAB - LITTER COUNT COVER SHEET

(REF: 7239)

SITE CODE:

PLEASE ENSURE THAT A COPY OF THIS COVER SHEET IS FILLED OUT AND ATTACHED TO THE COMPLETED LITTER COUNT FORM FOR EVERY SITE.

Date of count: ___/___/___

Site description: _____

Site responsible person: _____

Wet? (Y/N)

Windy? (Y/N)

Temp? °C

Conditions: (Circle appropriate numbers)

1. Area appeared to be cleaned before count
2. Deliberate dumping of rubbish
3. Area was mowed before count causing proliferation
4. Very recent storm/flood damage litter build-up
5. Very recent or current high winds causing build-up
6. Recent public event held in area – **specify:**
7. Uncovered load spilled in area causing litter

Please record number and type of bins in site area

No. of litter bins: _____

No. of butt bins: _____

No. and type of other bins: _____

SITE CODE:		SITE RESPONSIBLE PERSON:			DATE:						
Item Type		Brand	Work Area	Total	Item Type		Brand	Work Area	Total		
GLASS	Ga	Plain water (carbonated or non-carb.), 1 litre-	NONE		METAL	Ma	Beer, aluminium, all types, all sizes				
	Gb	Plain water (carbonated or non-carb.), <1 litre	NONE			Mb	Alcoholic sodas & spirit-based mixers	NONE			
	Gc	Flavoured water/soft drink (carbonated) 1 litre-	NONE			Mc	Cider/fruit based etc.	NONE			
	Gd	Flavoured water/soft drink (carbonated) <1 litre	NONE			Md	Water, carbonated & flavoured/soft drink	NONE			
	Ge	Flav. water / fruit juice drink/ sports drink, (non carb), 1 litre-	NONE			Me	Water, non-carbonated & flavoured, all sizes	NONE			
	Gf	Flav. water / fruit juice drink/ sports drink, (non carb), <1 litre	NONE			Mf	Food cans (including pet food)	NONE			
	Gg	Fruit juice, 1 litre or more	NONE			Mg	Industrial cans - all types	NONE			
	Gh	Fruit juice, < 1 litre	NONE			Mh	Aerosols - pressure packs	NONE			
	Gi	Wine cooler, all sizes	NONE			Mi	Metal bottle tops and can pull rings	NONE			
	Gj	Alcoholic sodas / spirit-based mixers, all sizes	NONE			Mj	Metal pieces	NONE			
	Gk	Cider/fruit based etc.	NONE			Mk	Foil take away	NONE			
	Gl	Wine & spirit, all sizes	NONE			Ml	Other foil	NONE			
	Gm	Beer, 750ml or more, all colours of glass	NONE			Xa	Tyres & pieces	NONE			
	Gn	Beer, < 750ml, all colours of glass	NONE			Xb	Clothing & materials	NONE			
	Go	Other glass	NONE			Xc	Illegal dumping	NONE			
	CIGARETTE BUTTS						MISCELLANEOUS	Xd	Syringes - Do Not Touch	NONE	
								Xe	Ice cream sticks	NONE	
							Xf	Rubber pieces (not tyres)	NONE		
							Xg	Condoms	NONE		
							Xh	Construction materials	NONE		
					Xi	Disposable nappies	NONE				
					Xj	OTHER MSC - (Please specify item types and brands below)					

		Item Type	Brand	Work Area	Total
PAPER / PAPERBOARD	Ka	Packages & boxes	NONE		
	Kb	Cigarette packets	NONE		
	Kc	Cartons, milk, plain (white), all sizes	NONE		
	Kd	Cartons, flavoured milk 1 litre or more	NONE		
	Ke	Cartons, flavoured milk < 1 litre	NONE		
	Kf	Cartons, flav. water / fruit juice drink/ sports drink, (non carb), 1 litre+	NONE		
	Kg	Cartons, flav. water / fruit juice drink/ sports drink, (non carb), <1 litre	NONE		
	Kh	Cartons, fruit juice, 1 litre or more	NONE		
	Ki	Cartons, fruit juice, < 1 litre	NONE		
	Kj	Newspapers & magazines	NONE		
	Kk	Junk mail / free circulars	NONE		
	Kl	Cups/take away containers	NONE		
	Km	Tickets, e.g. bus, ATM, vending machine etc.	NONE		
	Kn	Ice cream wrappers	NONE		
	Ko	Paper bags	NONE		
	PLASTIC	Kp	Shopper docket & related shopping paper (eg, lists)	NONE	
Kq		Other paper (including tissues)	NONE		
Pa		White milk, all sizes	NONE		
Pb		Flavoured milk, 1 litre or more	NONE		
Pc		Flavoured milk, < 1 litre	NONE		
Pd		Fruit juice, 1 litre or more	NONE		
Pe		Fruit juice < 1 litre	NONE		

PLASTIC