

# A Watershed Monitoring Program Approach towards Assessing Trash and Debris in Urbanized Channels

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October 2008



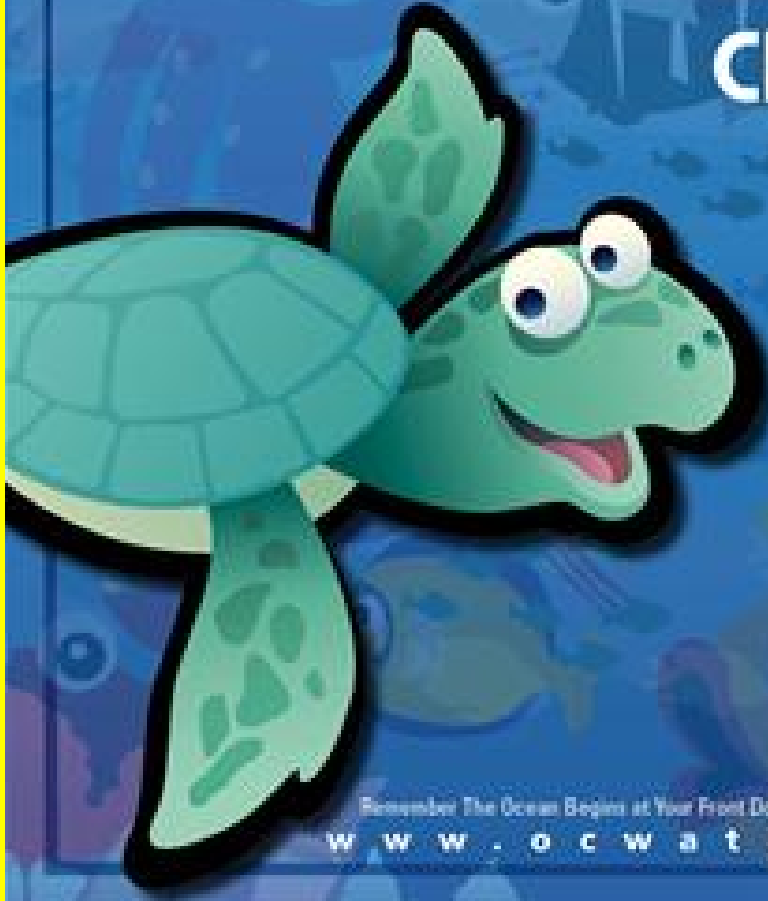
# Statement of Problem

*Fullerton Creek at Coyote Creek confluence*

*May 1, 2008*



# Annual Inner Coastal Cleanup




**Cleanup Day  
2008**

Litter is polluting our creeks, rivers, bays and ocean. Join your friends and neighbors in helping to keep our waterways healthy.

Coastal and Inner Coastal Cleanup Day  
**Saturday, September 20, 2008**  
8:00 am to 12:00 pm

Remember: The Ocean Begins at Your Front Door

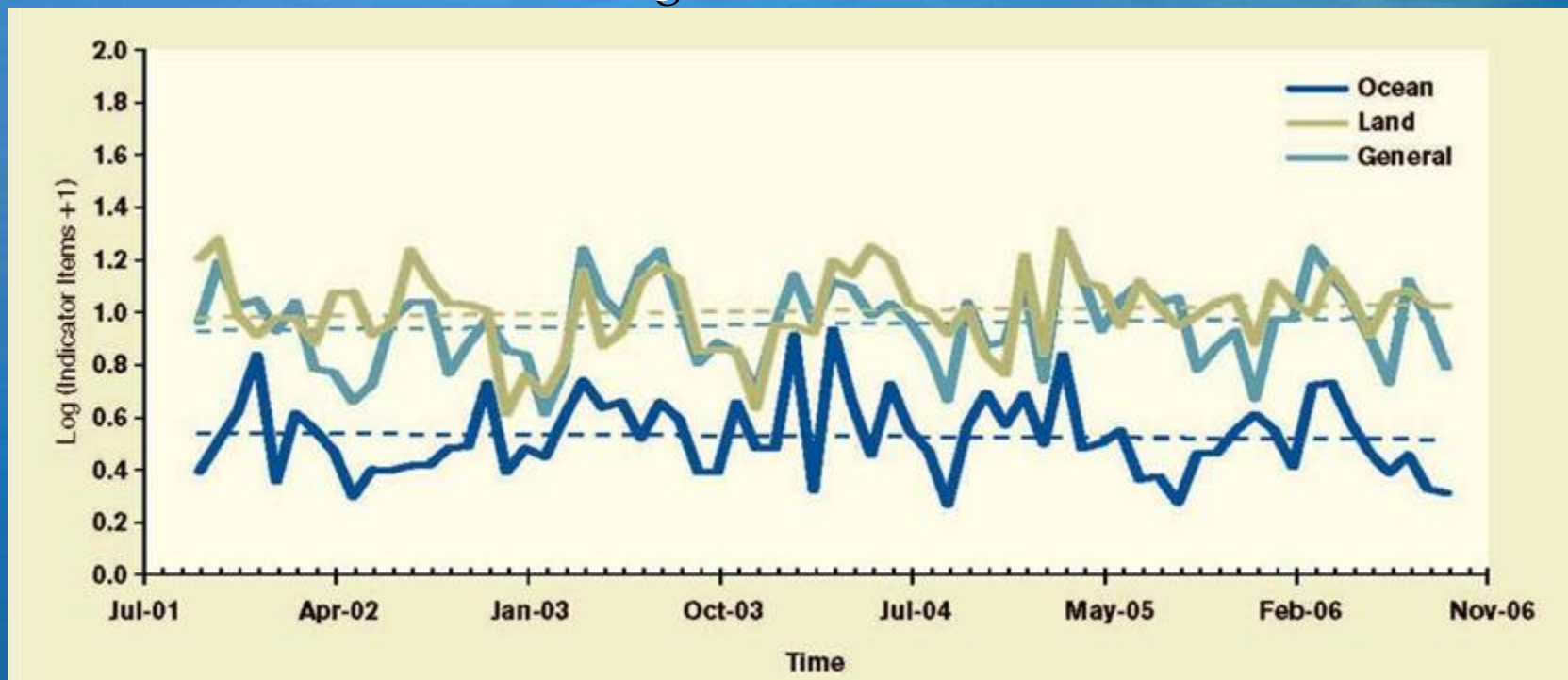
For more information and locations visit  
[www.ocwatersheds.com](http://www.ocwatersheds.com)



# Indicator of Trash BMP Program:

## National Marine Debris Monitoring Program Report 2007; West Coast United States

Beach debris is surrogate measure of watershed debris



Flat trend line = [increasing population] – [better BMP effectiveness]  
(more trash with time) (less trash with time)

# Local Conditions with respect to NMDMP Report 2007

- National Marine Debris report does not detail local government level information
  - No way to determine how OC ranks in trash management
  - Cannot decipher if local conditions are improving

# Motivation for Fullerton Creek Pilot Program

- **NEGATIVE:** Formal trash assessment program in response to “letter of encouragement” from Santa Ana Regional Board
  - Monitoring programs focused on a proactive effort to avoid adoption of a Trash TMDL
- **POSITIVE:** Establish quantitative method to characterize BMP management of in-stream trash levels
  - “Can we demonstrate that conditions are getting or will get better?”

# Fullerton Creek Trash & Debris Assessment Program

## Monitoring Objectives;

- 1) What is the current level of trash and debris along the main channel? (*status*)
- 2) What are the relative sources of trash? (*stressors*)
- 3) Are levels of trash conditions getting better or worse? (*trend*)

# Monitoring Program Design

- “Before-After Control-Impact” (BACI)
  - Overall conditions before and after education outreach project
    - Complimentary to effort from Earth Resource Foundation
  - Assess Impacted vs Reference conditions
    - Reference = Neighborhoods with effective trash BMPs
- Targeted assessment of influences
  - Adjacent land uses
  - Public right-of-way intersections with creek
  - Storm drain debris fields
  - Trash levels in dry weather vs post storm events

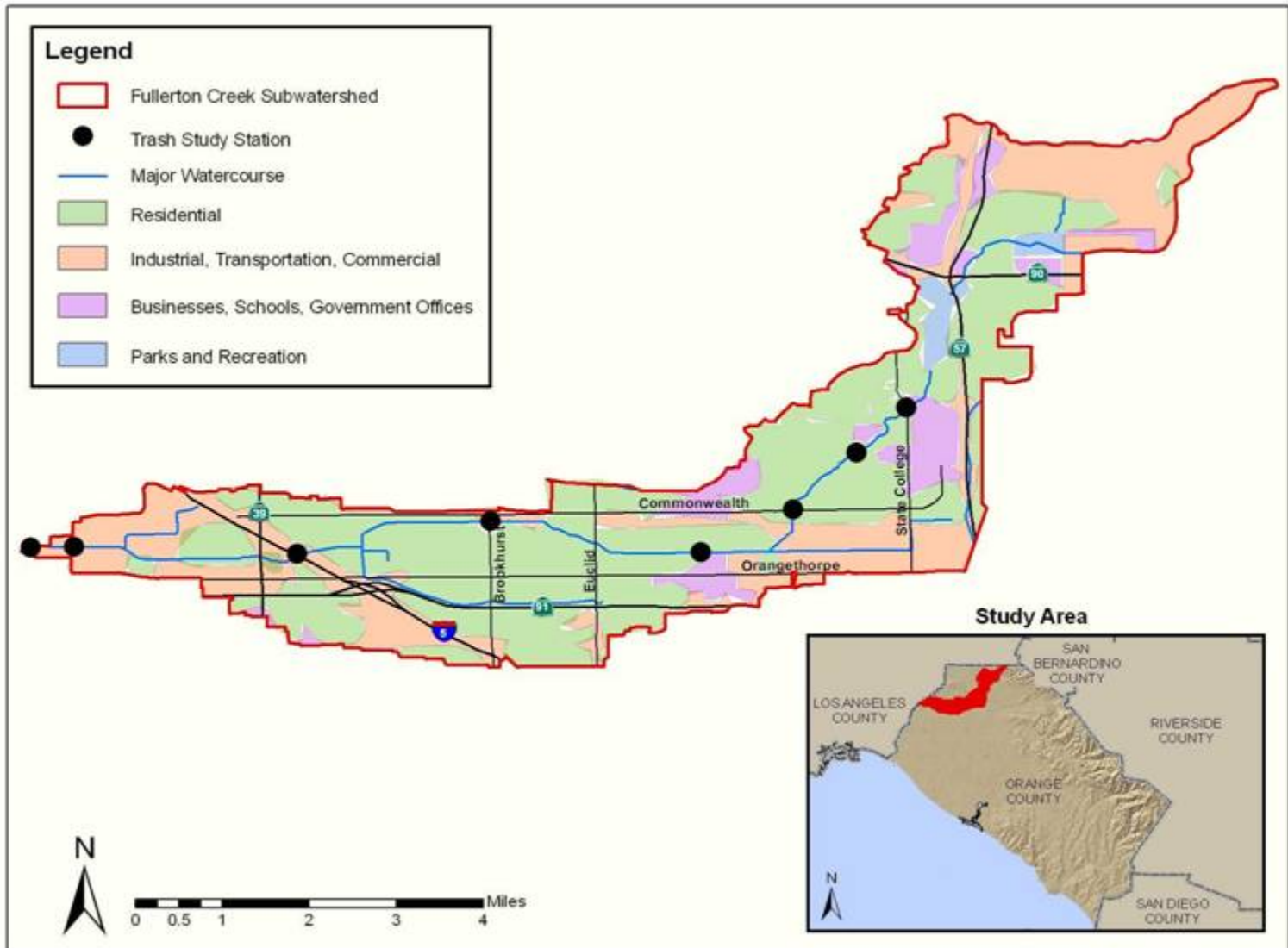
# Monitoring Program Design

- Intensive sampling for 2 years
  - Complete watershed assessment to inform **OC TRASH AND DEBRIS TASK FORCE** about problematic areas
  - Assess between year variability
- Reduced number of monitoring sites for trends assessment
  - Elimination of redundant sites or locations with little value based on initial results

# Sampling Method

- Modified version of State's Surface Water Ambient Monitoring Program (SWAMP) method
  - Trash Level Index Rating
    - Ranking system similar to physical habitat method for stream Bioassessment
  - Item Tally Worksheet
    - Sorts by general categories and description
      - Plastic wrappers vs. plastic bags
    - Modified version from state to record additional site measurements and field observations.

# Fullerton Creek Watershed



# Disclaimer

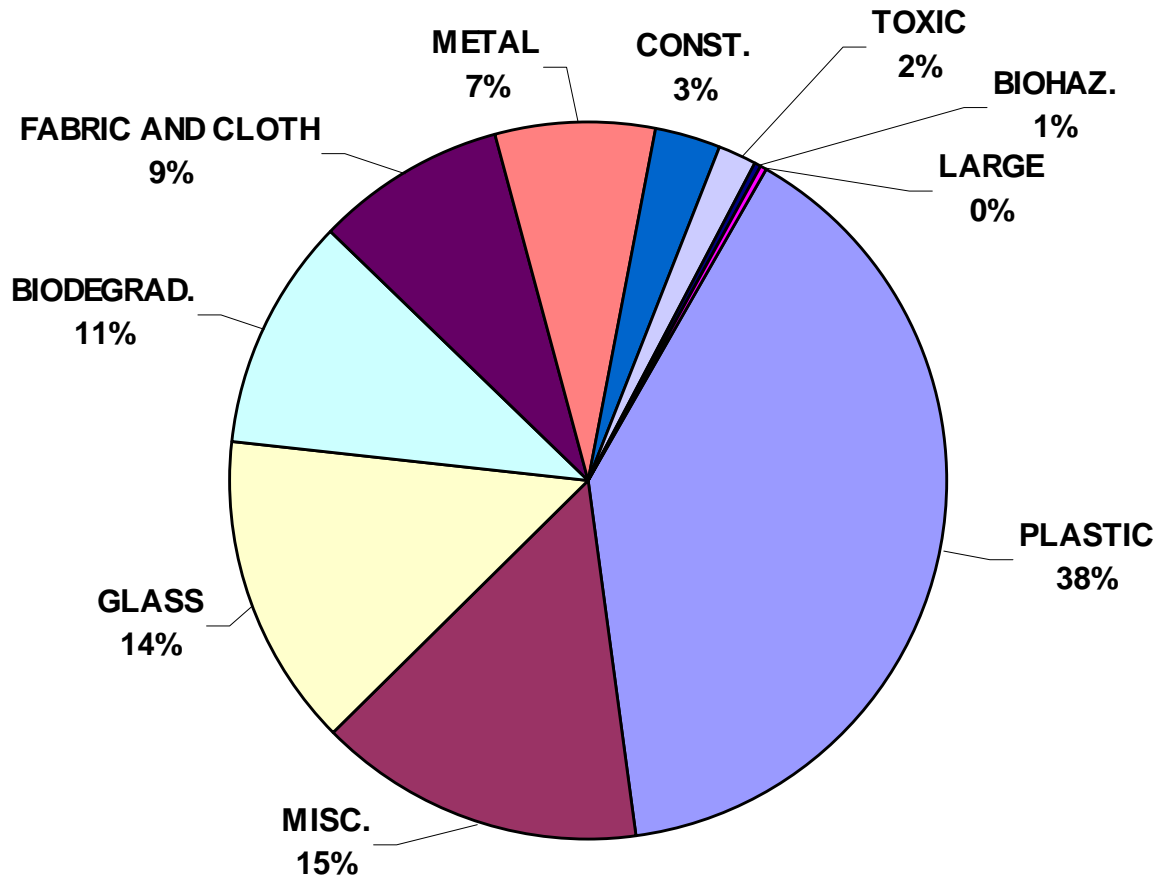
*\*Results are considered preliminary given the small sample size and findings are not conclusive at this date. Figures without sufficient environmental data use fake data to demonstrate the monitoring program.*

# Monitoring Objectives:

- 1) What is the current level of trash and debris along the main channel?  
(*status*)

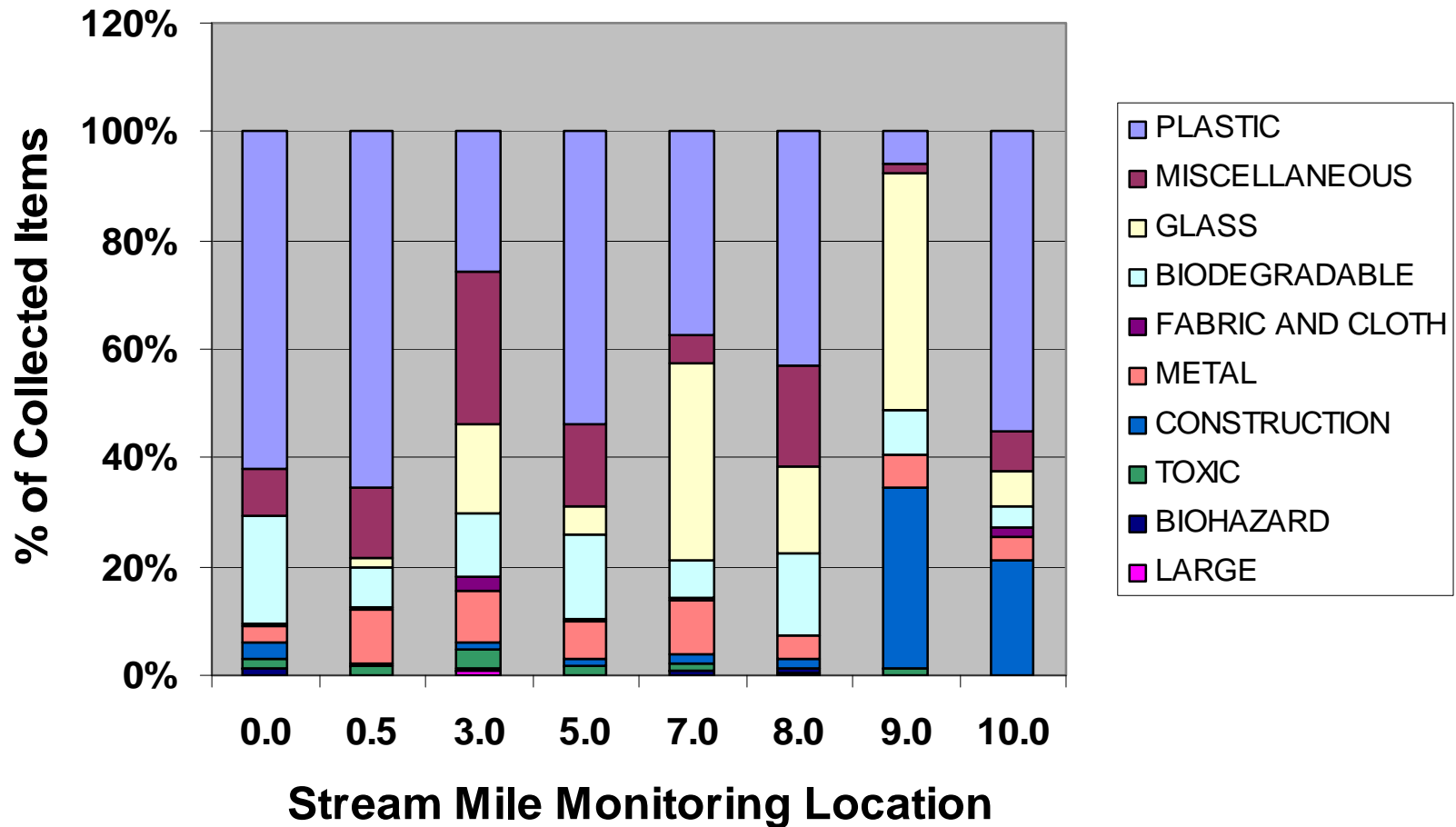
# 1A.) What are the relative types of trash and debris found

## Fullerton Creek Trash and Debris Distribution

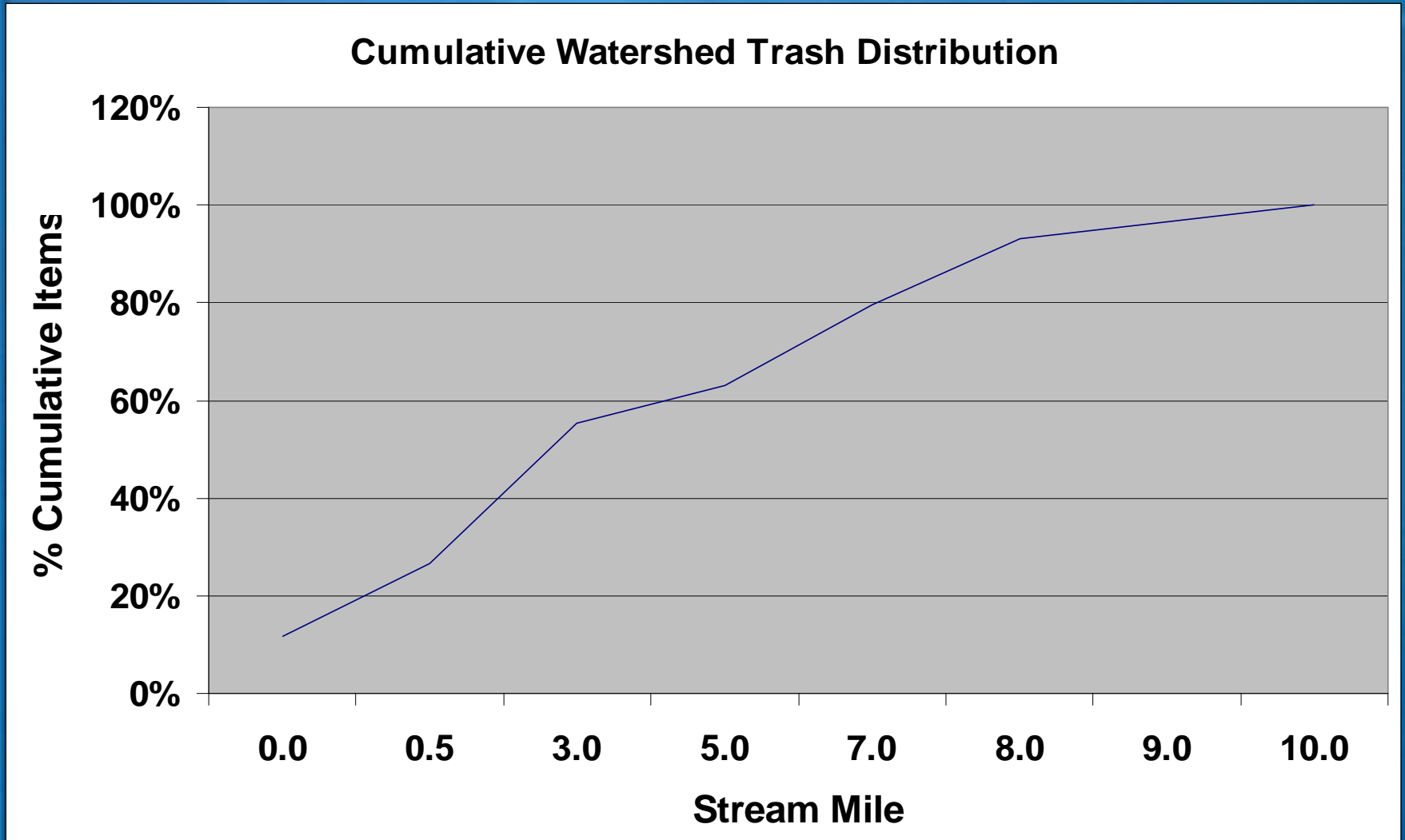


# 1B.) How do sites compare by relative percentages of trash type

Trash and Debris Distribution by Site

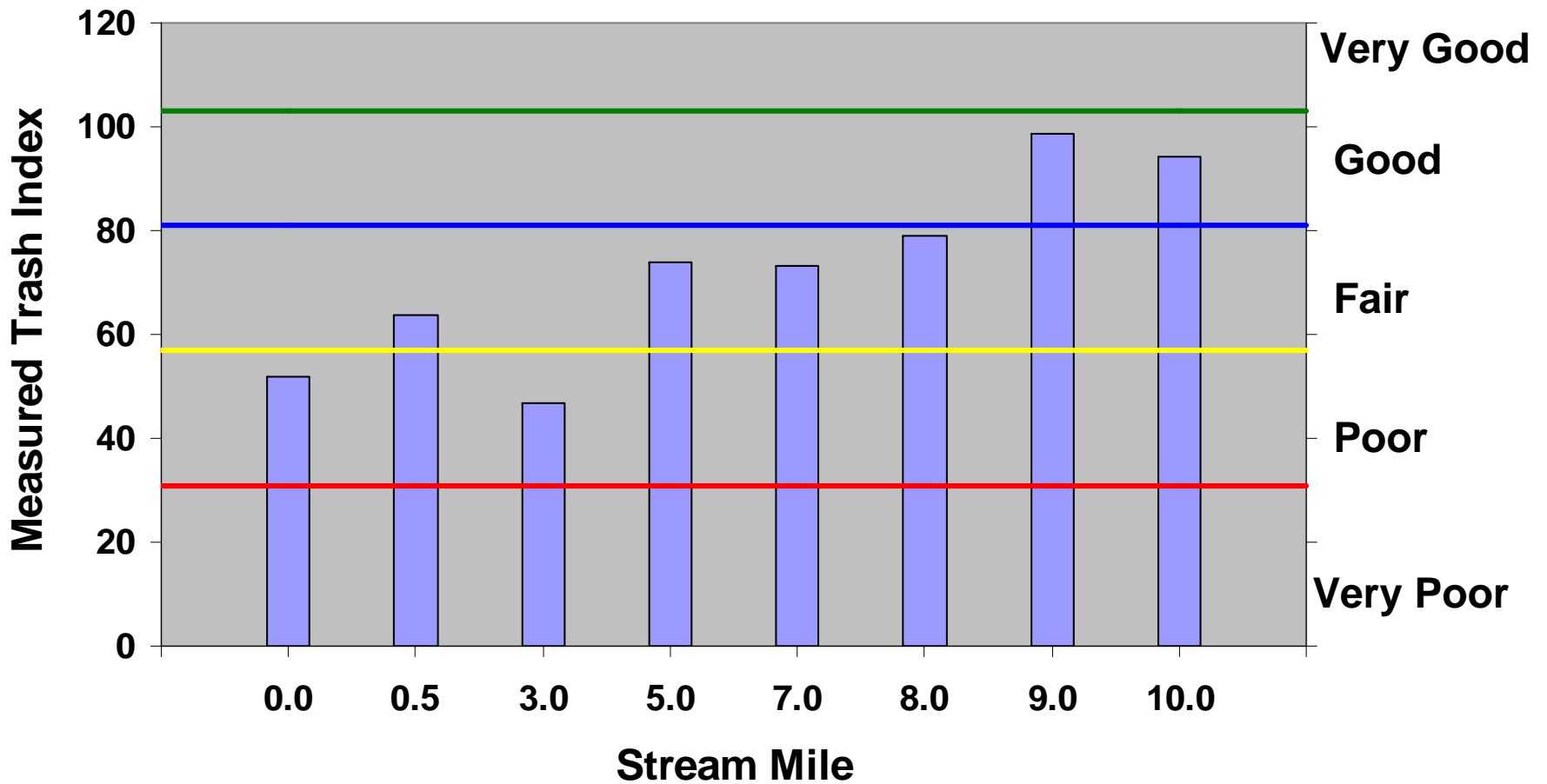


# 1C.) What is the distribution of trash and debris along the main channel?

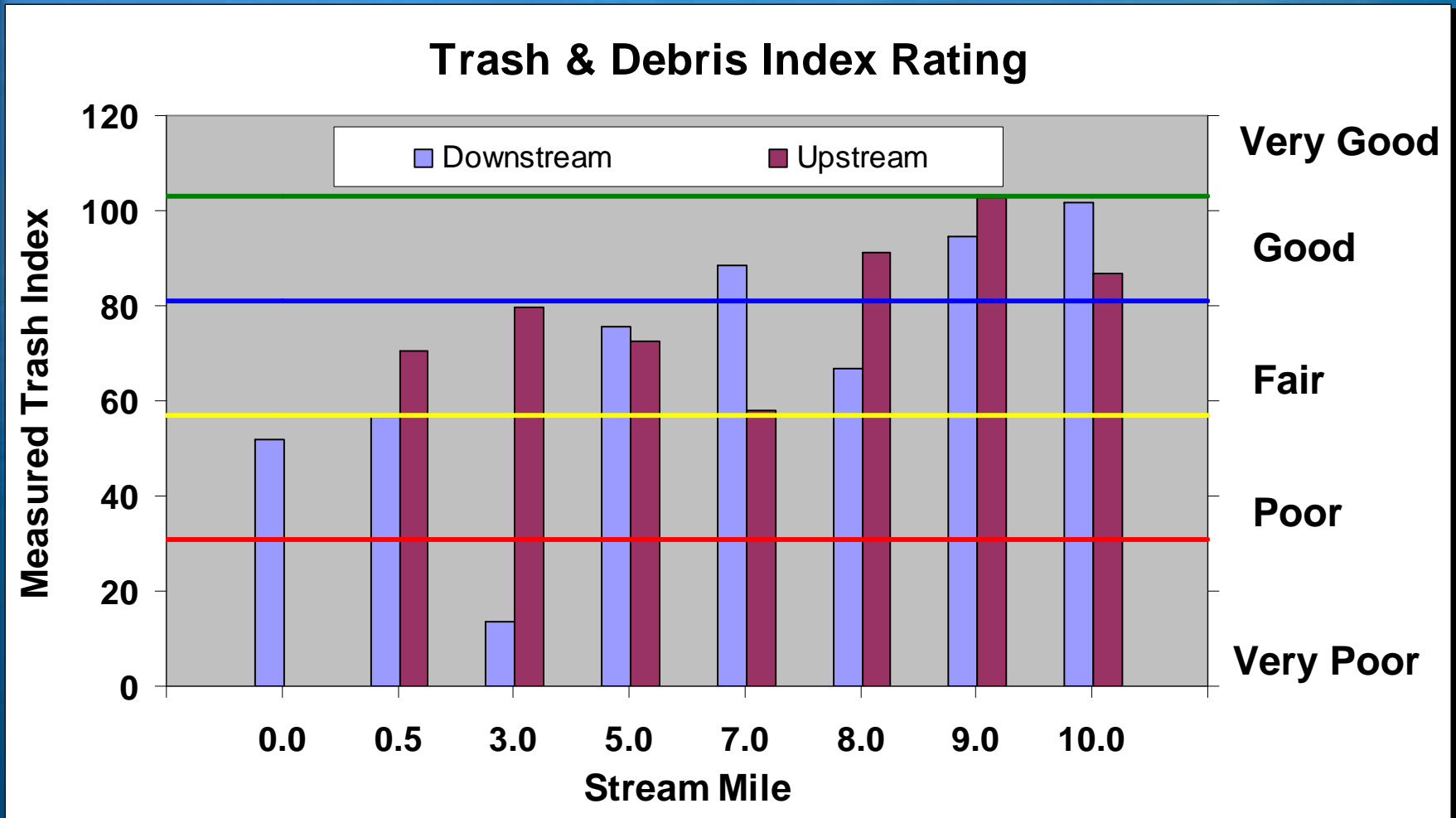


# 1D.) How do the monitored locations rank in terms of relative cleanliness?

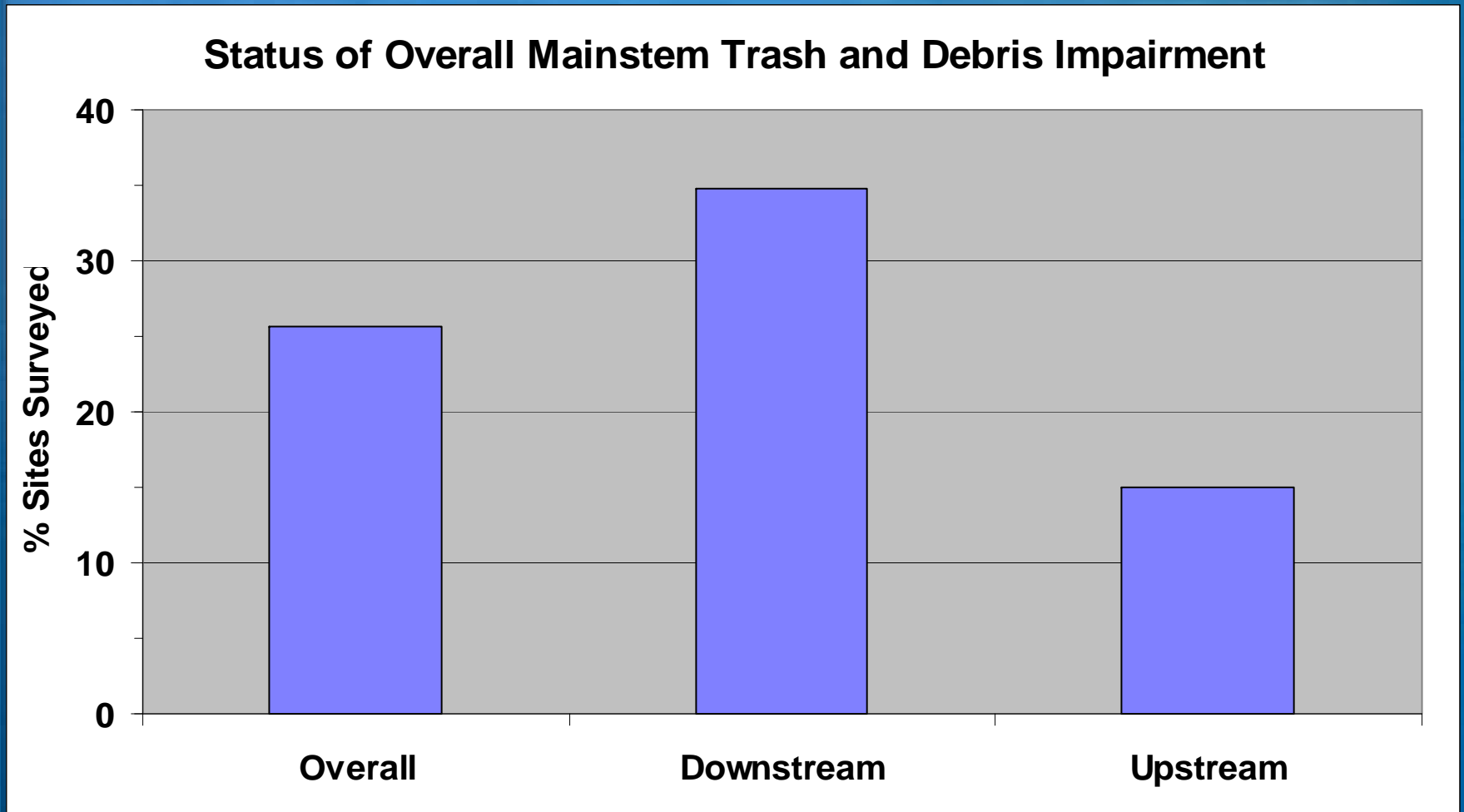
Trash & Debris Index Rating



# 1E.) Is there a difference in the trash index at public right-of-ways?



# 1E.) What is the overall level of trash impairment along the main channel?

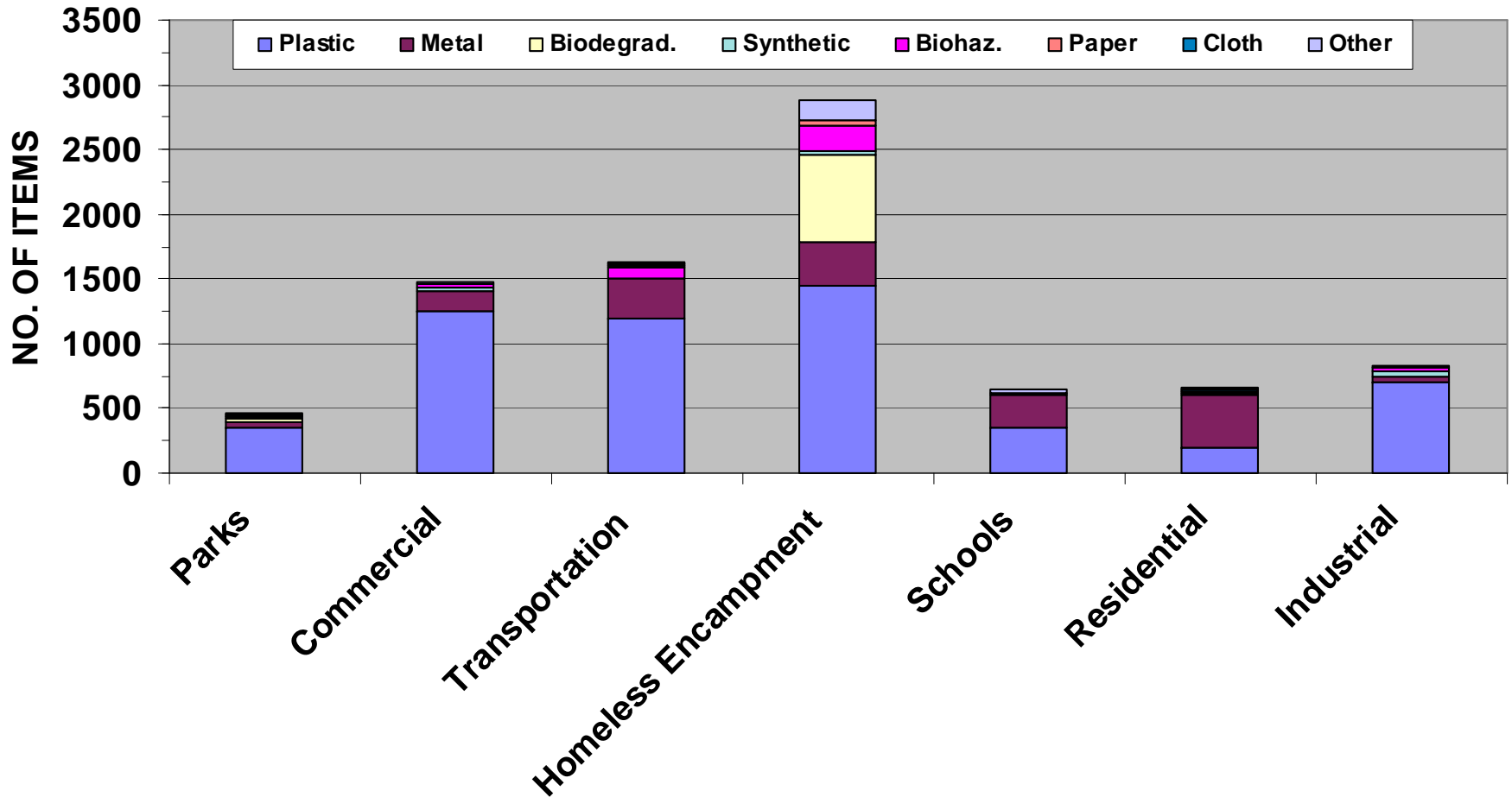


**2) What are the relative sources of trash?  
(*stressors*)**

# 2A.) What sources contribute the most trash to Fullerton Creek?

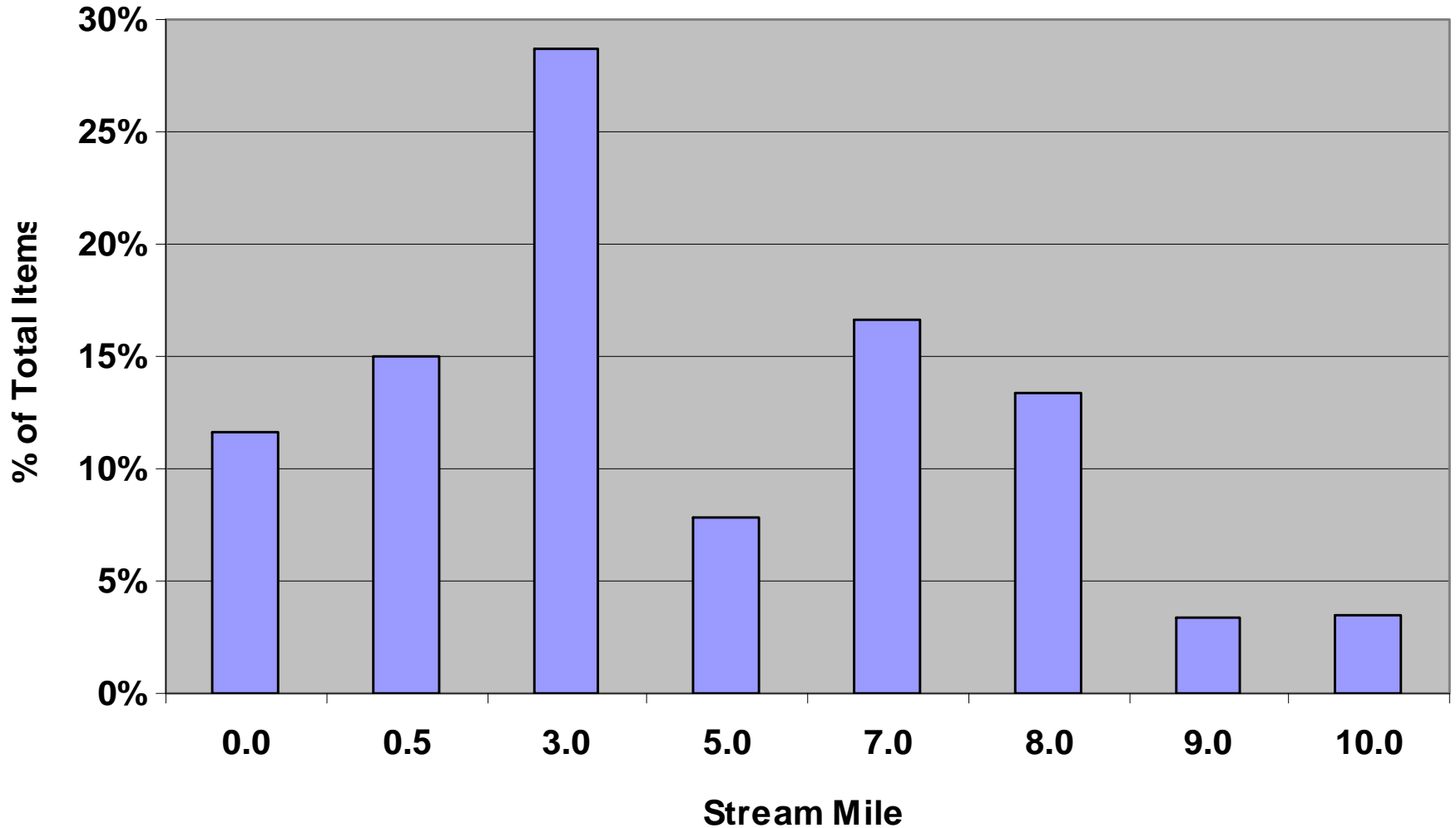
## LAND USE ASSOCIATIONS OF URBAN STREAM TRASH

(\*Fake Trash Data)

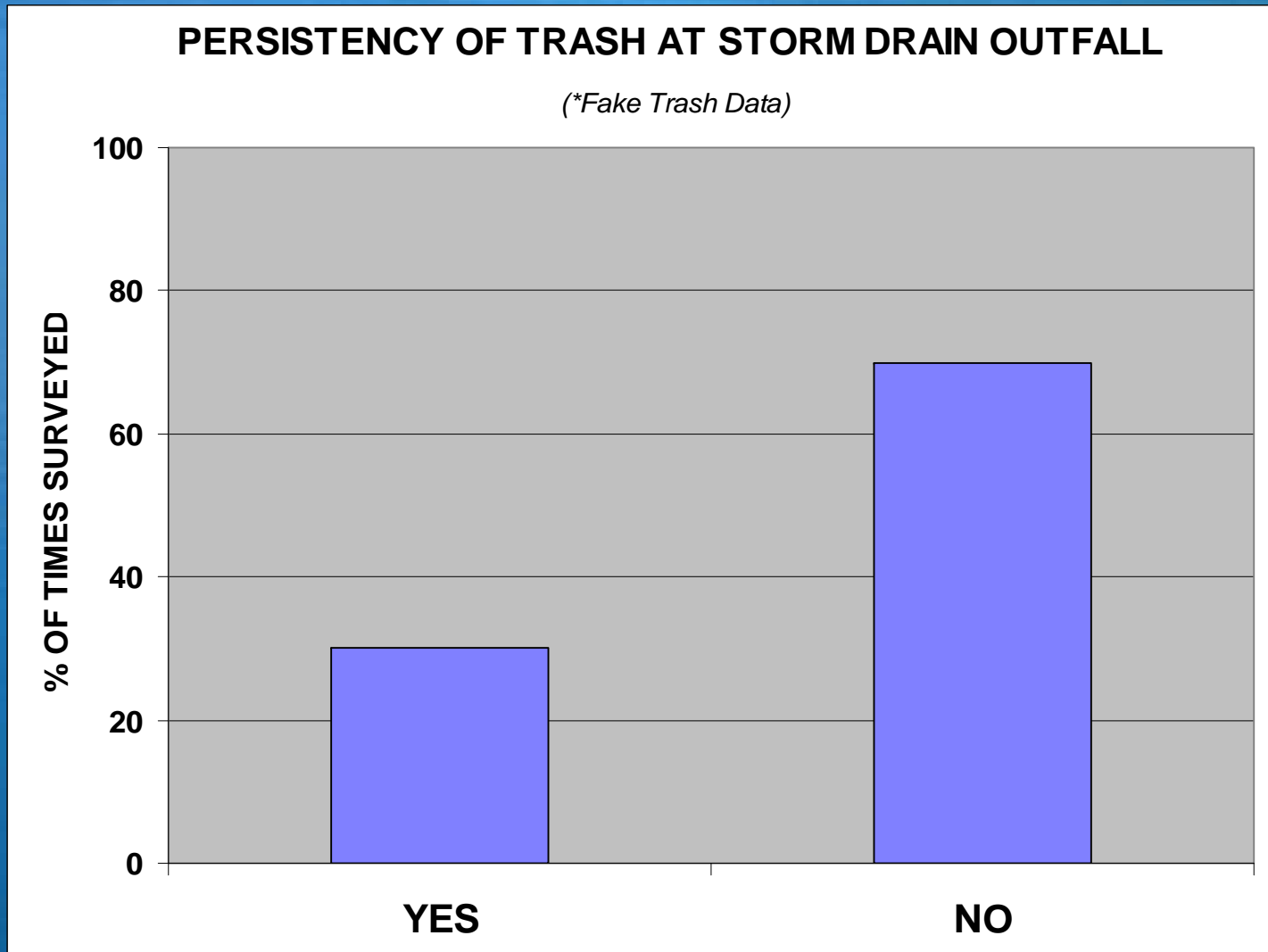


## 2B.) Where are the problem locations in the watershed?

CUMULATIVE ITEMS COLLECTED BY SITE



## 2C.) How does the storm drain system influence trash levels in the main channel?

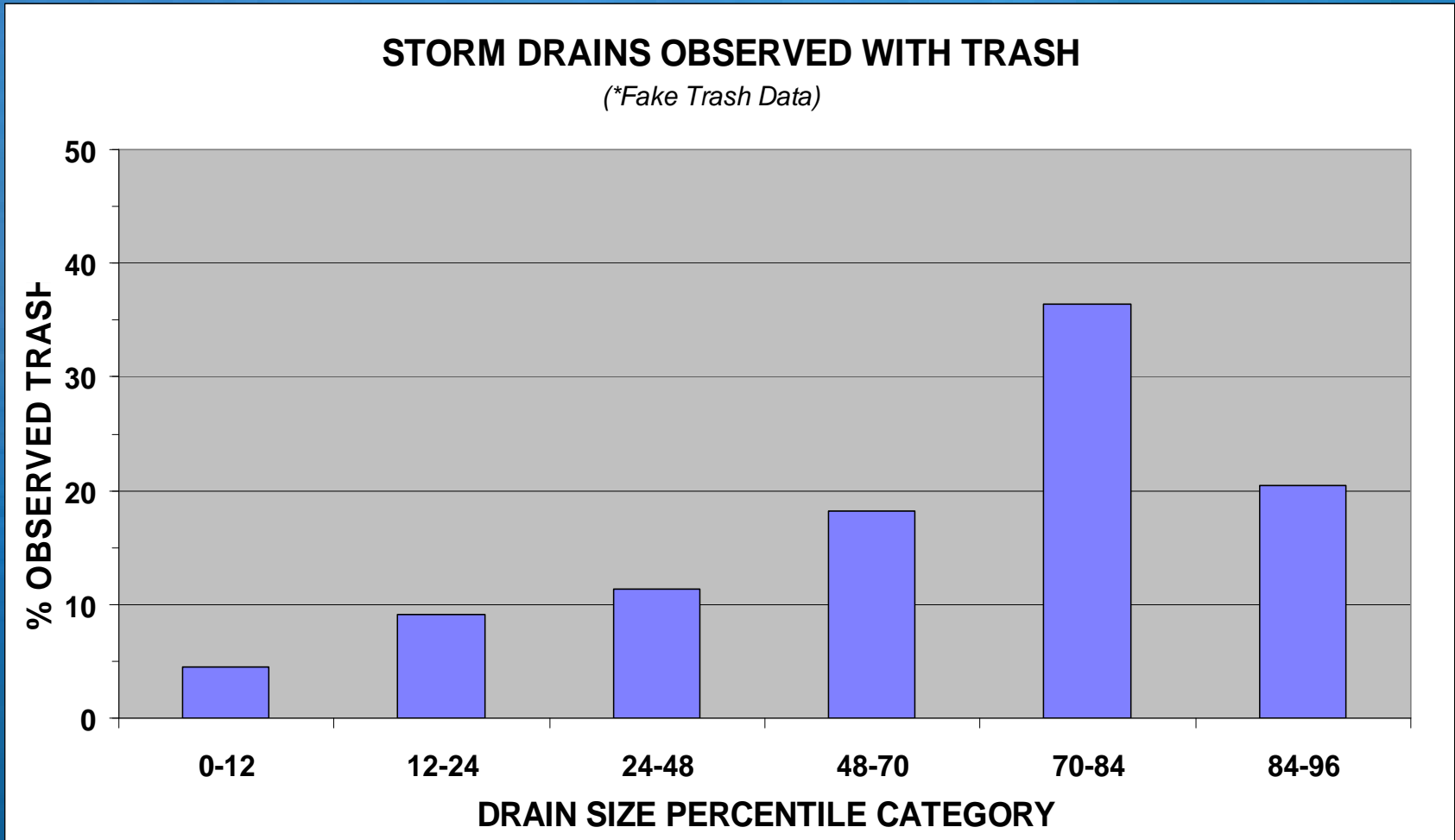


# Example of identifiable source during dry weather conditions



“Need to determine if this is a random or prevalent occurrence?”

## 2B.) Which size drains are most problematic?

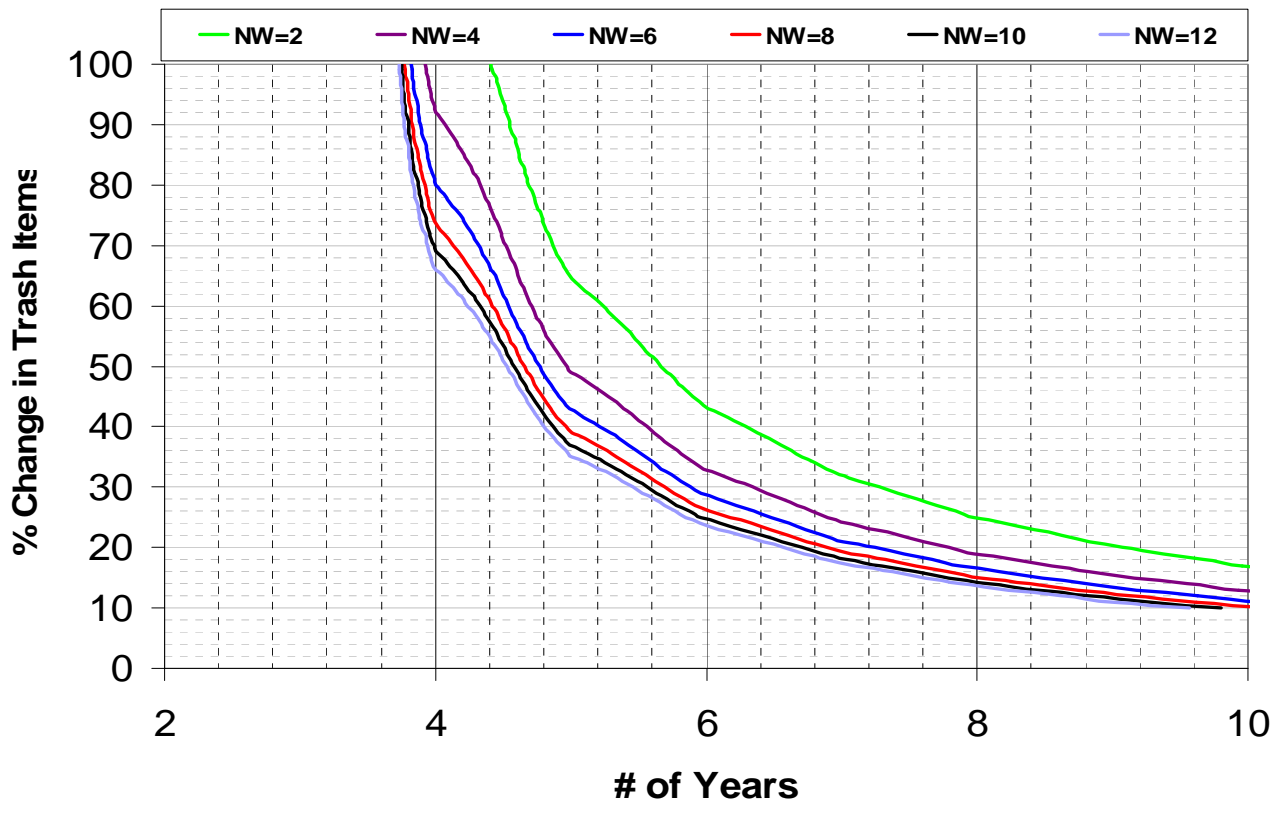


**3) Are levels of trash conditions getting better or worse? (*trend*)**

# 3A.) Can we determine if conditions will become better or worse?

- A change can be detected sooner by sampling more times per year.
- Larger decreases in total trash items will produce downward trend sooner

NMDMP Data from OC Coastkeeper Study in Crystal Cove State Park

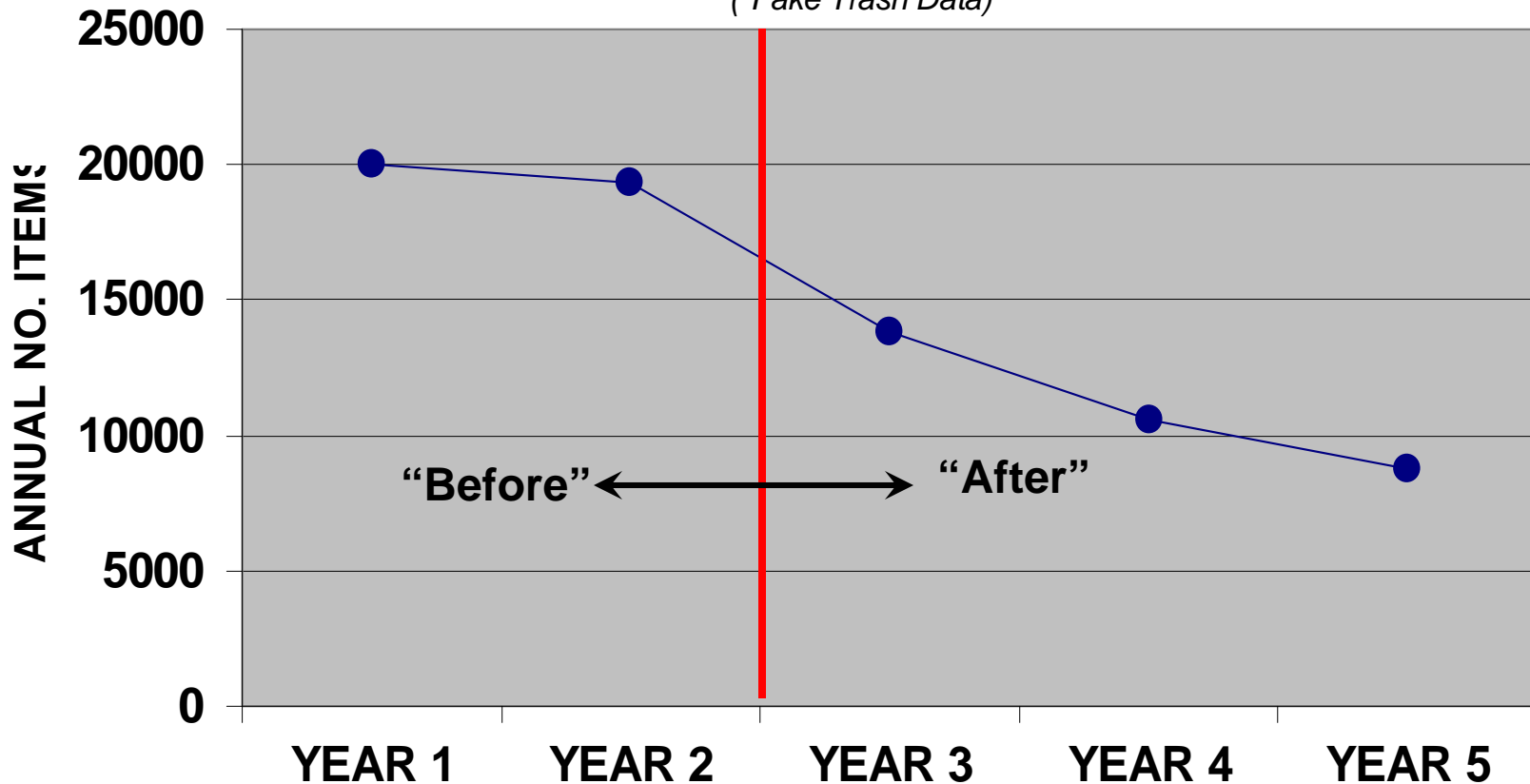


Sites were sampled monthly over 6 year period

# 3B) What is the end result for annual trends in trash items collected

## ANNUAL TRENDS IN FULLERTON CREEK TRASH

(\*Fake Trash Data)



# Big Picture Questions to be Answered

“Are we effectively controlling trash to the maximum extent possible?”

1. What are the trends in stream trash relative to land based BMPs.

“Are we collecting less trash from the roadways and catch basins, or”

“Do we just have better trash BMPs?”

2. Are impaired sites due to a lack of trash BMPs?

“Is public access a more significant source than storm drains?”

**QUESTIONS?**