Trash in Creeks

Field Investigation Report
and
Benchmark Research Study

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Environmental Commission 9/21/2022

City of Austin
WATERSHED PROTECTION

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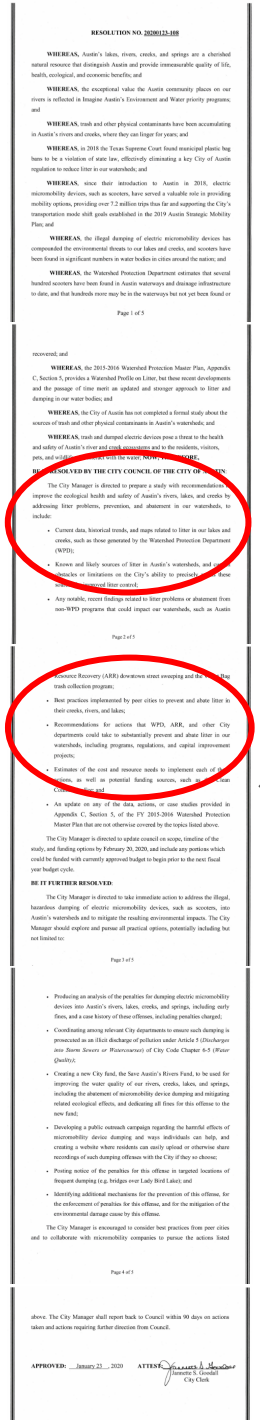


BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

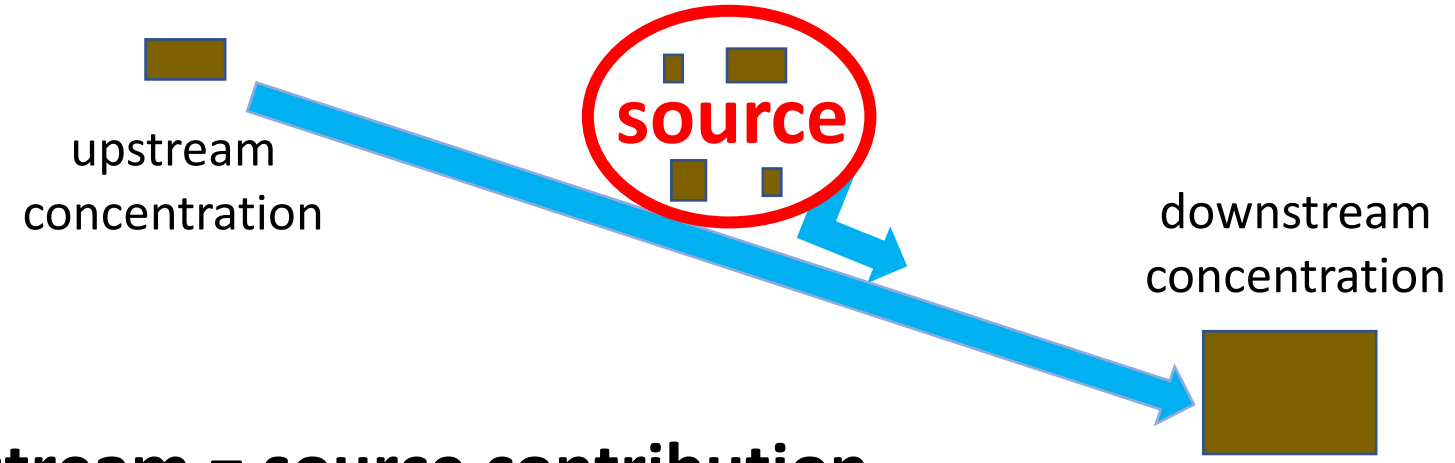
The City Manager is directed to prepare a study with recommendations to improve the ecological health and safety of Austin's rivers, lakes, and creeks by addressing litter problems, prevention, and abatement in our watersheds, to include:

- Current data, historical trends, and maps related to litter in our lakes and creeks, such as those generated by the Watershed Protection Department (WPD);
- Known and likely sources of litter in Austin's watersheds, and current obstacles or limitations on the City's ability to precisely assess these sources for improved litter control;

field study

- Best practices implemented by peer cities to prevent and abate litter in their creeks, rivers, and lakes;
- Recommendations for actions that WPD, ARR, and other City departments could take to substantially prevent and abate litter in our watersheds, including programs, regulations, and capital improvement projects;

benchmark report



Typical pollutant assessment:

downstream – upstream = source contribution

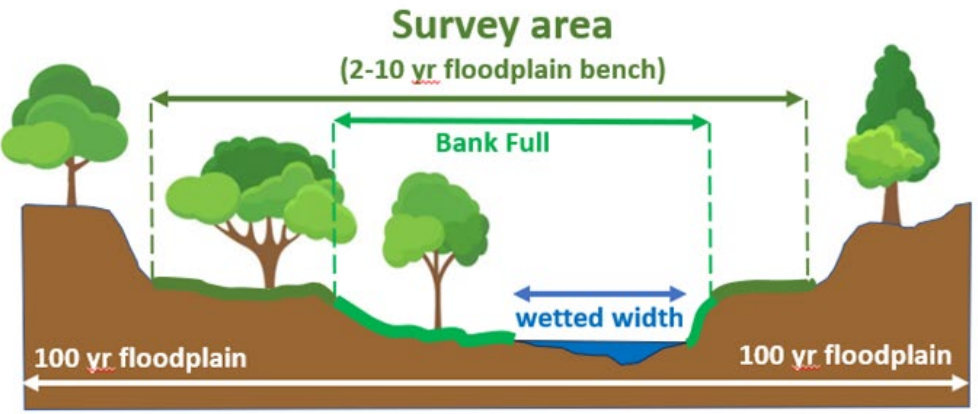
This assessment does not work for trash

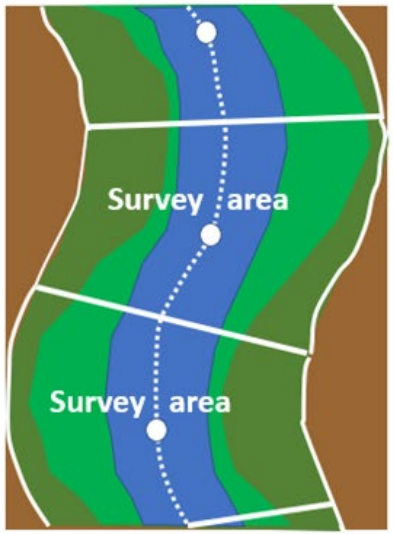
Variability in storm intensity

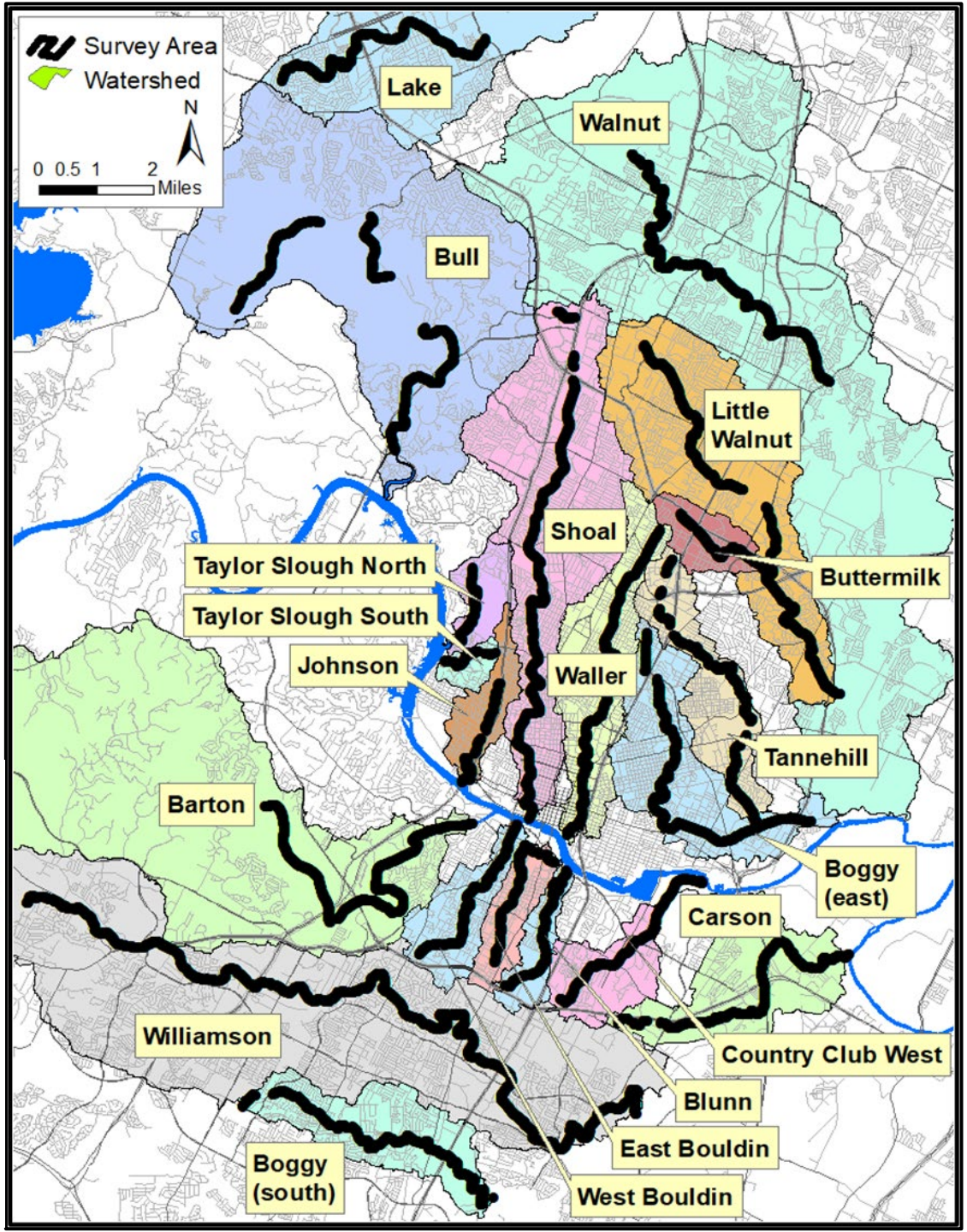
Variability in stream character

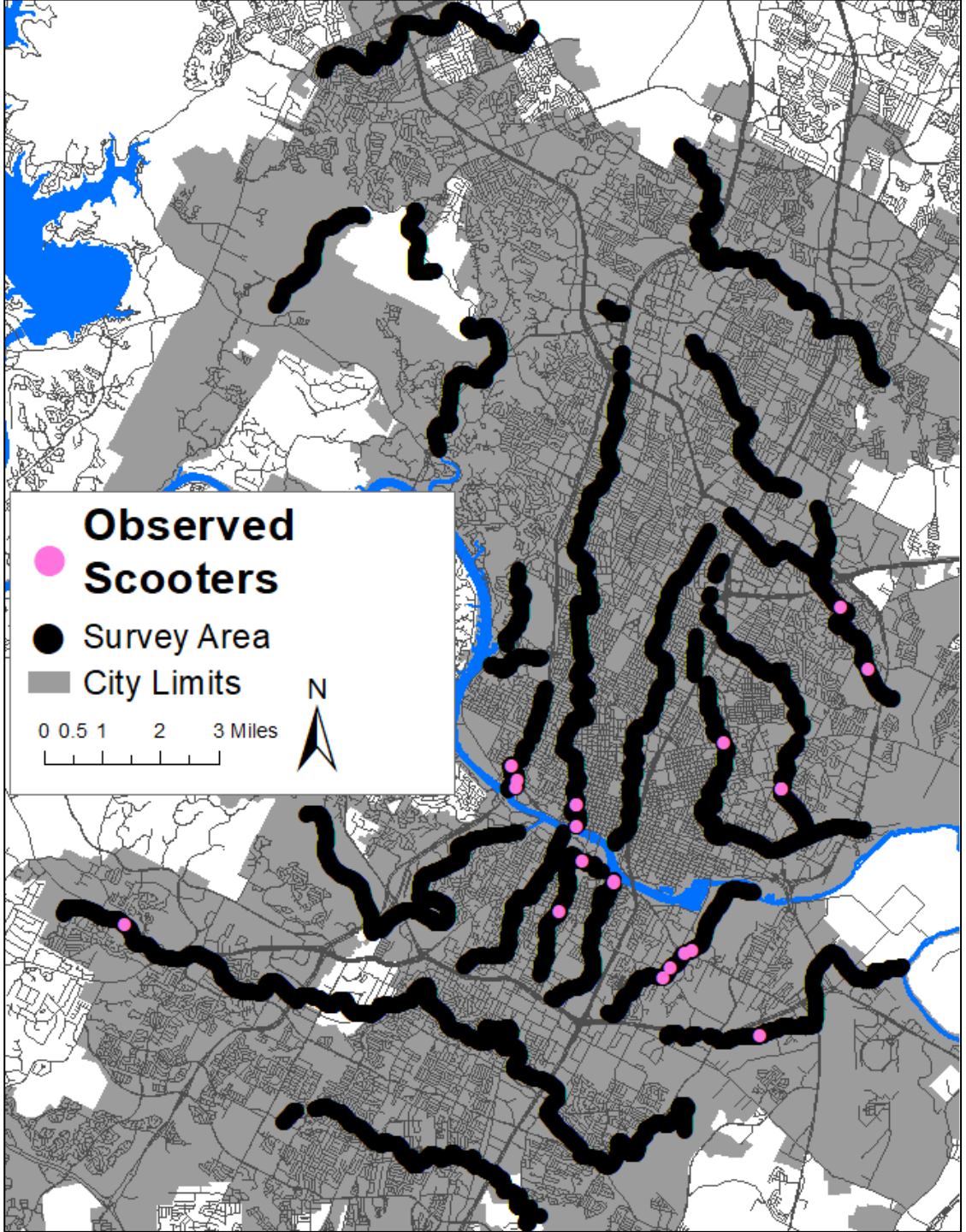
Data Collection

- 20 Creeks
- 110 miles
- Observations every 30ft
- **<u>19,467</u>** data points







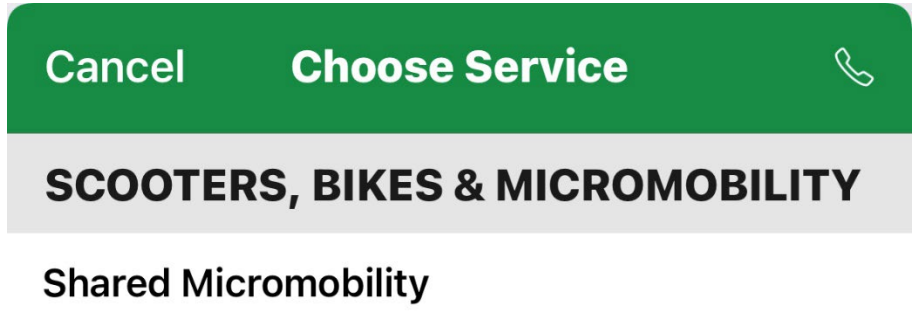


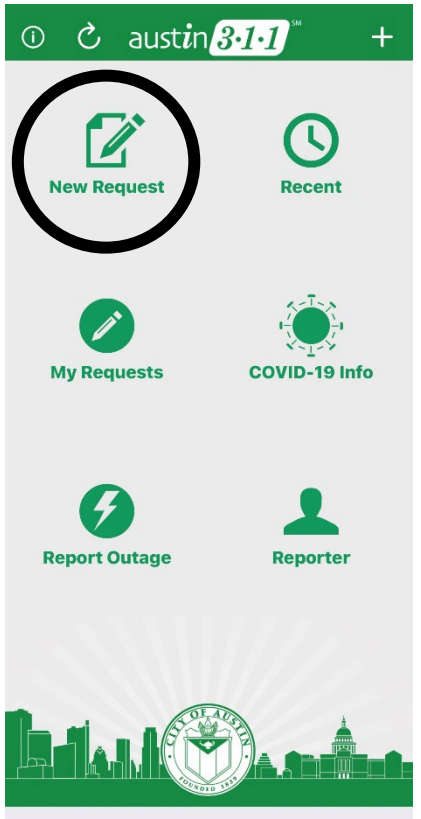
Scooters

only 21 found

Small number of occurrence due to:

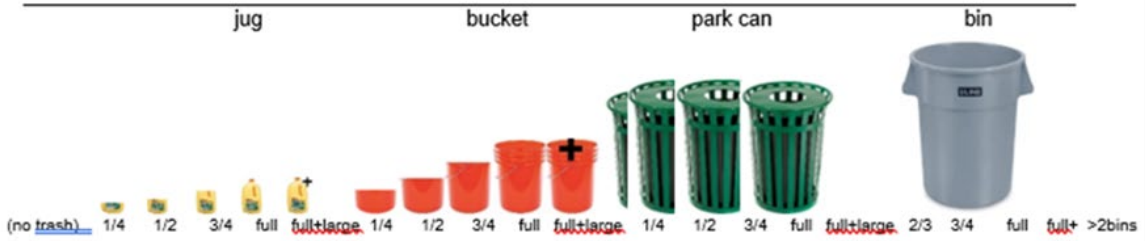
- reduced permitted fleets (since 2020)
- improved process for reporting (311)
- efficient process for removal (vendor)





Visual Trash Intensity Rubric for Creek Walk

1) Score is recorded at the center of a 30ft creek segment (15ft upstream and 15ft downstream of point)
2) Survey area extends outward to the high bank (perceived floodplain) visible from the channel banks, to include areas that trash will imminently reach the stream in a storm event even if above high bank
3) Accumulations of dead vegetation will not be considered trash, however if contained in bags, the bags will be considered trash (presume the bag is separated from leaves). Same with sandbags.
4) Immobile abandoned infrastructure (e.g., pipelines in channel, large blocks of concrete) will not be considered trash if infeasible (without heavy equipment) to remove/cleanup by hand), however, portions that could be easily cut off with hand tools (exposed rebar, cables, etc.) and removed will be considered trash. Small construction debris (bricks, cinderblocks, asphalt etc.) that can mobilize during storm events are considered trash. Materials that are in-place but failing are not considered trash (fence sagging, erosion matting dangling, etc.), but can be considered trash if no longer in-place and mobile

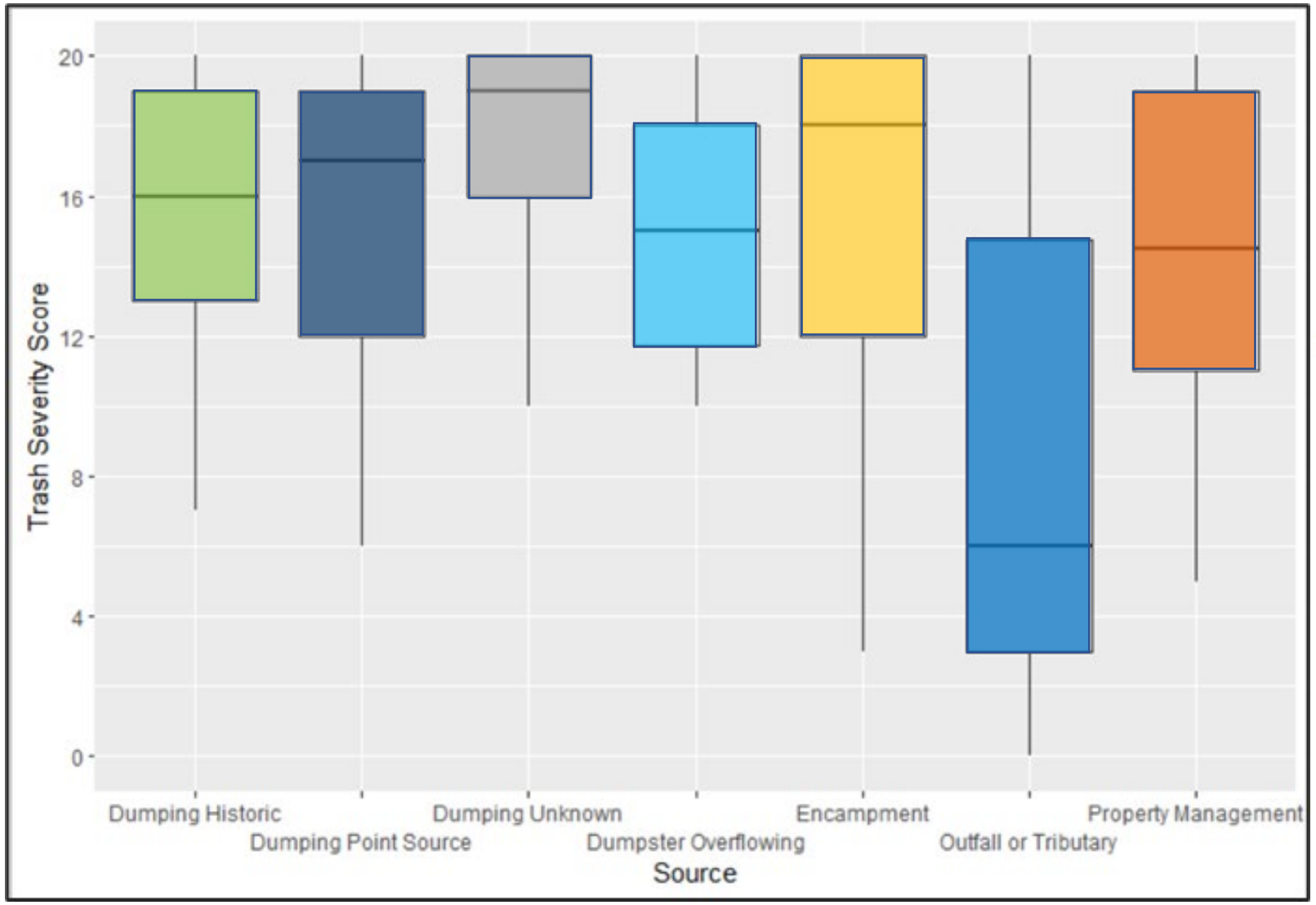


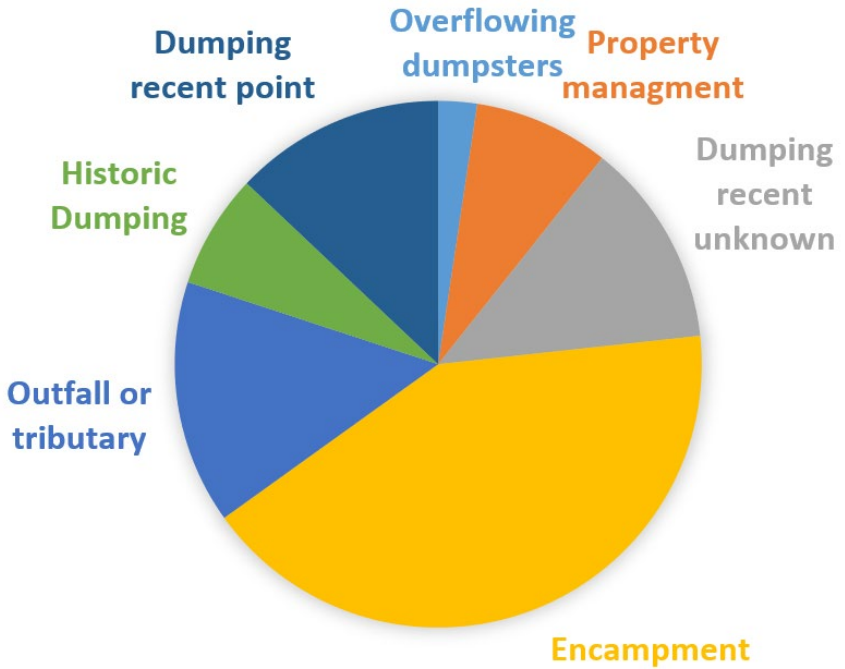
	Minimal					Apparent					Abundant					Dense				
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No litter observed within survey area	**Description:** "good" Few items here or there but not very noticeable. If noticeable, few **Volume**: The cumulative amount could easily fit within a 1-gallon milk jug, however, a single item that is larger than a milk jug (but still fits in a 5-gal bucket) can still be in this category **Effort:** Site could be easily and quickly cleaned by one person (<5 minutes)					**Description:** "not bad" Trash is noticeable but doesn't define the site **Volume**: The cumulative amount could easily fit within a 5-gallon bucket, however, a single item that is larger than a bucket (but still fits in a 25-gallon can) can still be in this category **Effort:** Site could easily be cleaned by one person but not quickly (~5-15 minutes)					**Description:** "bad" Site has obvious and salient accumulation. "Trashy" is forefront **Volume**: The cumulative amount could easily fit within a 25-gallon park trash can, however, a single item that is larger can still be in this category **Effort:** Site looks like a two-person job but could be cleaned by one person (~15-30 minutes)					**Description:** "horrible" Trash defines the site and offends the visitor. Desire for cleanup is overwhelming **Volume**: The cumulative amount requires the big 55-gallon bin(s) **Effort:** Site would take a long time for one person, (~30+ minutes) but site is better suited for a team				

Trash intensity score +

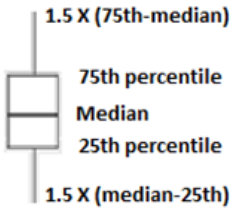
source presence

- Overflowing dumpster
- Outfall/tributary
- Encampment
- Dumping historic site
- Dumping point source
- Dumping unknown
- Property management





Sources by occurrence

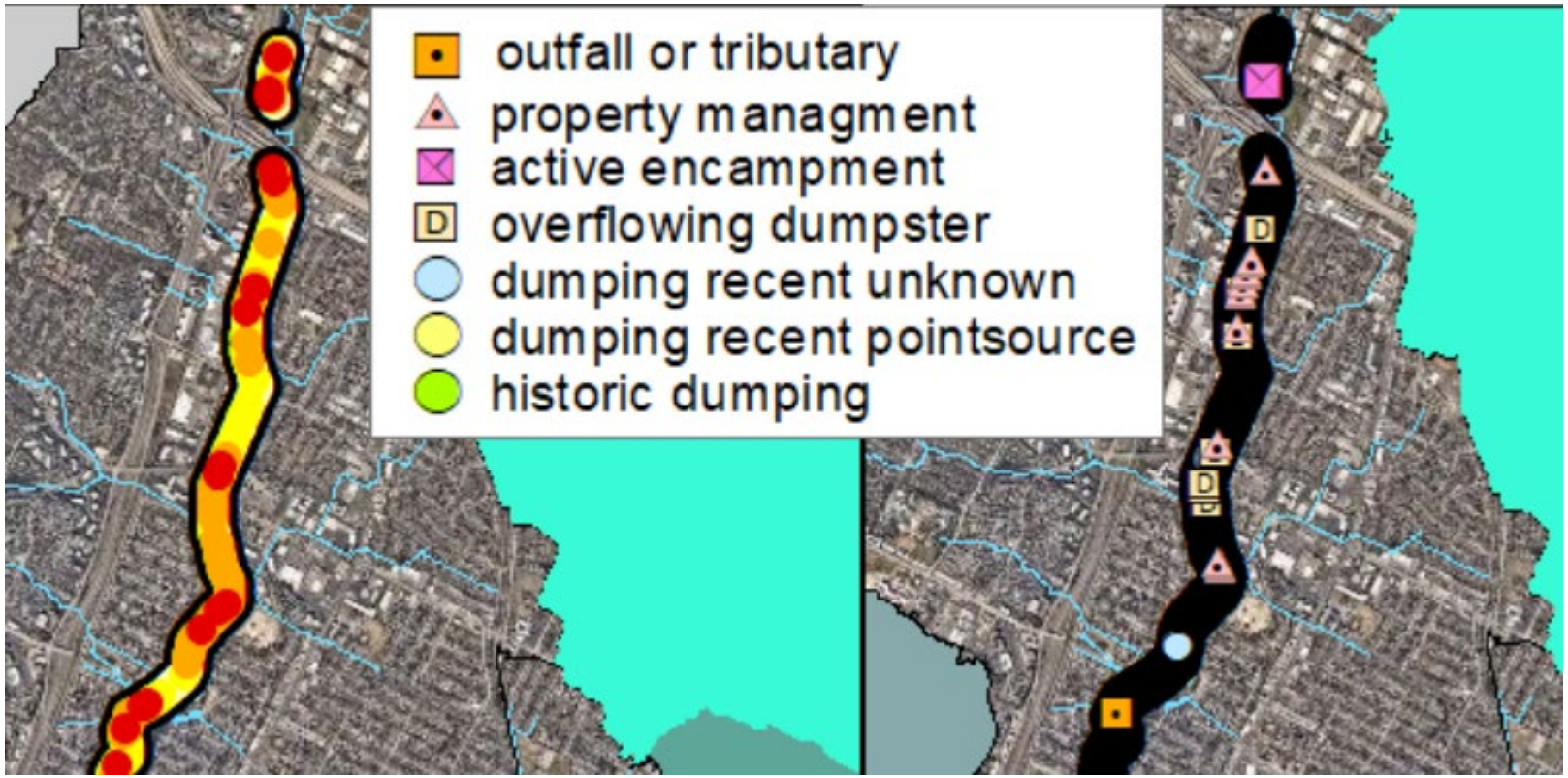


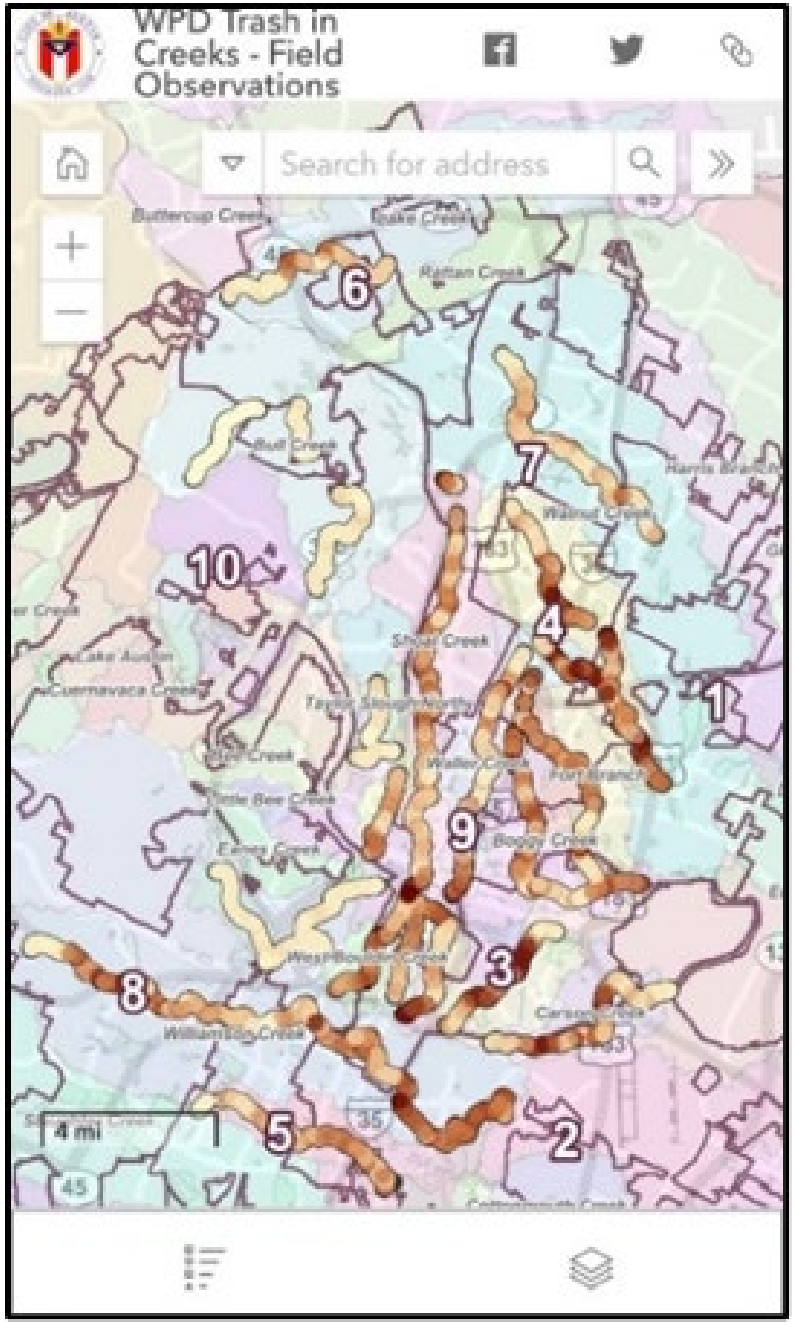
Takeaway # 1

Encampment was the most commonly-observed source, but is similar in intensity and range to most other sources

Result: A georeferenced map of intensity* and sources

example: upper shoal creek

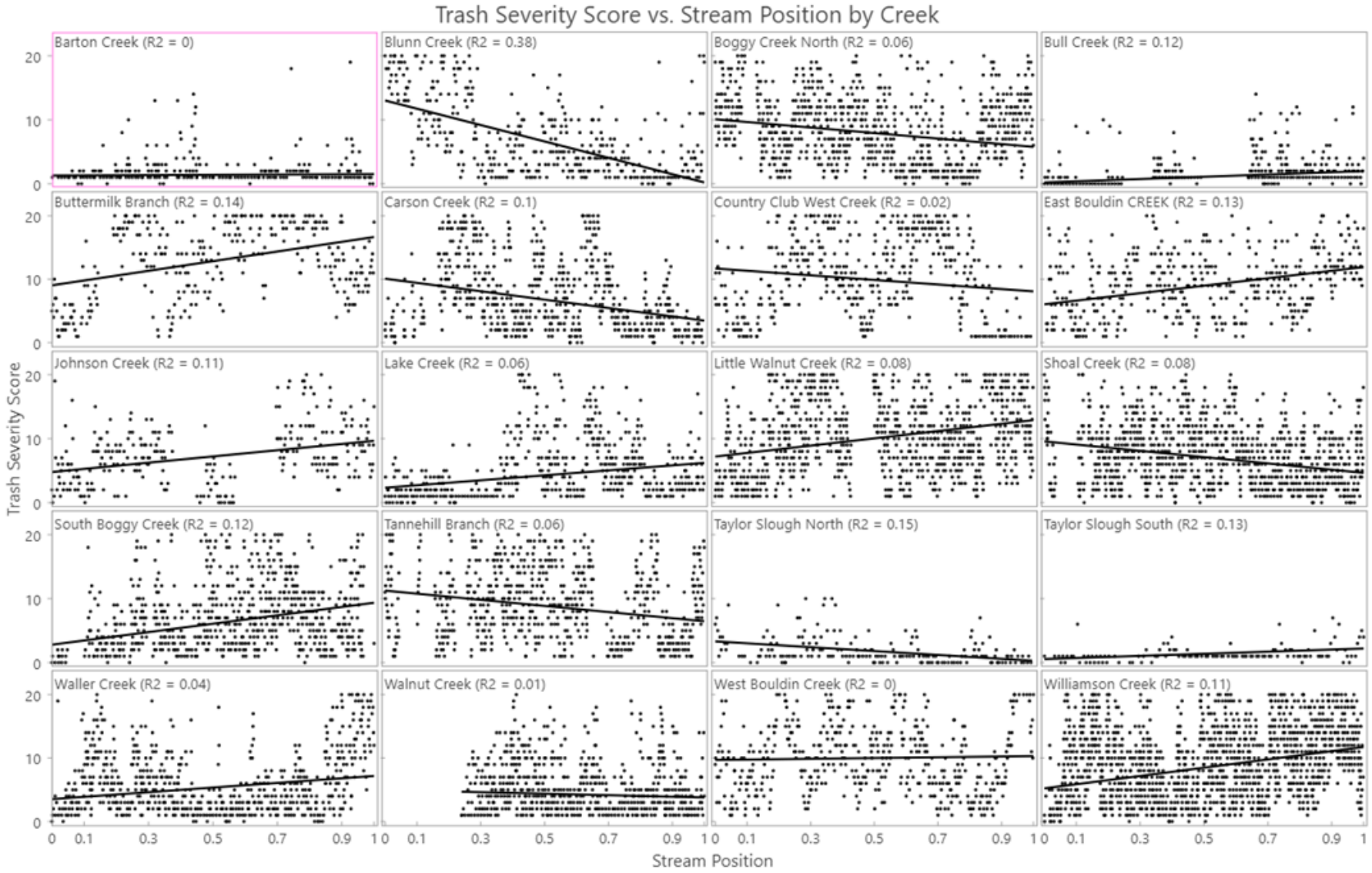




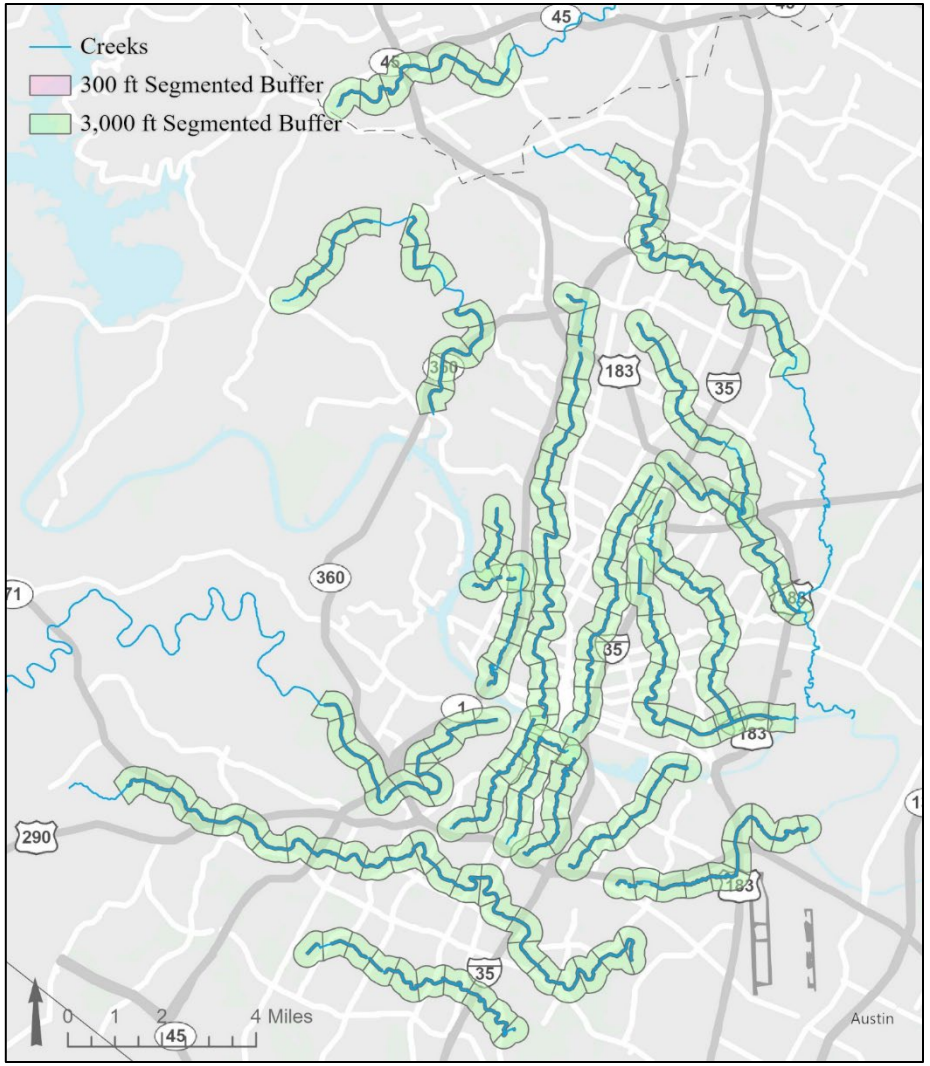
*can be used by internal or external partners for strategic cleaning

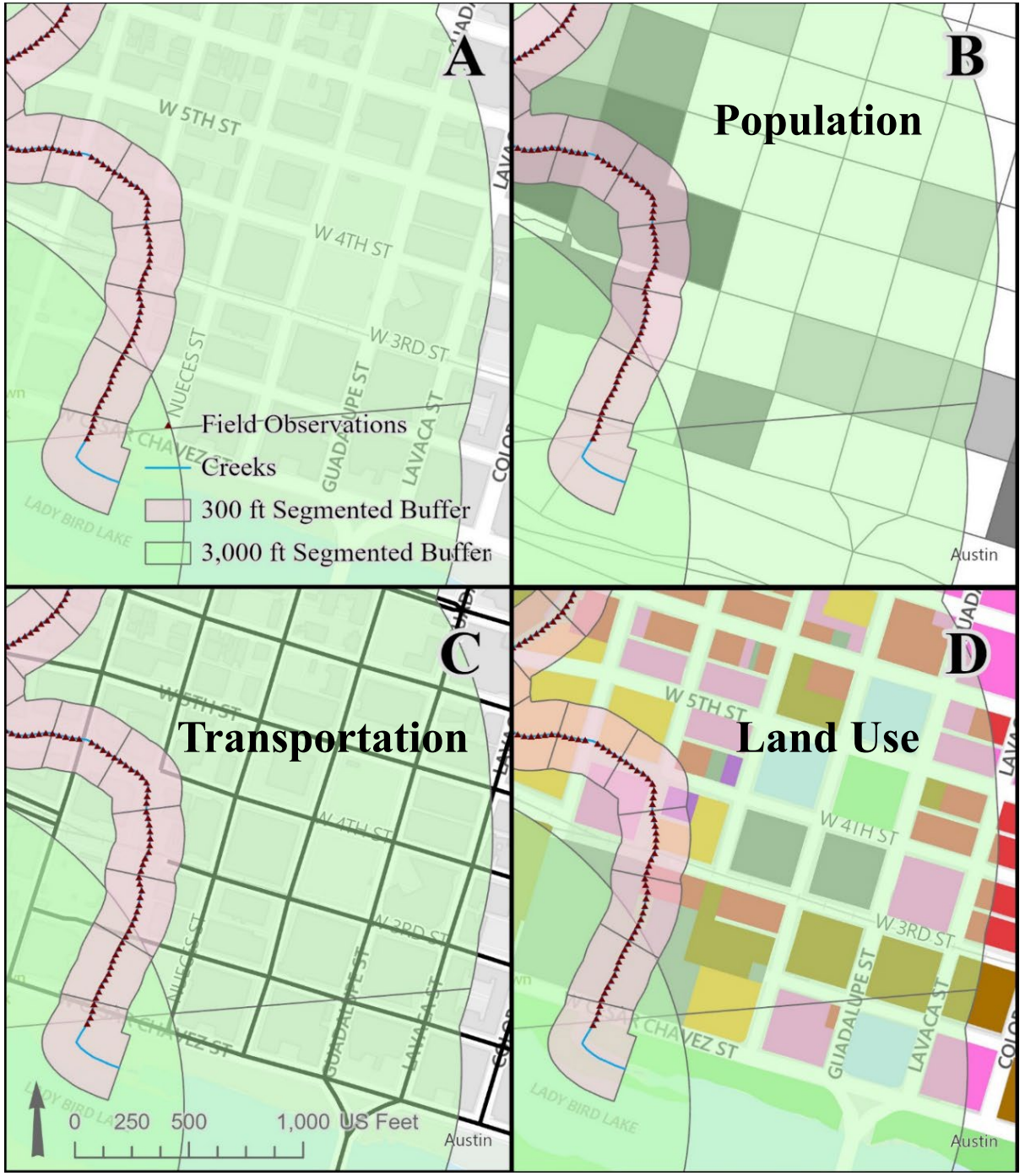
https://arcg.is/0z48bj0

Takeaway # 2 Trash intensity is not proportional to its drainage area (source input locations are deceiving)



Geospatial analysis using 300’ and 3000’ buffers

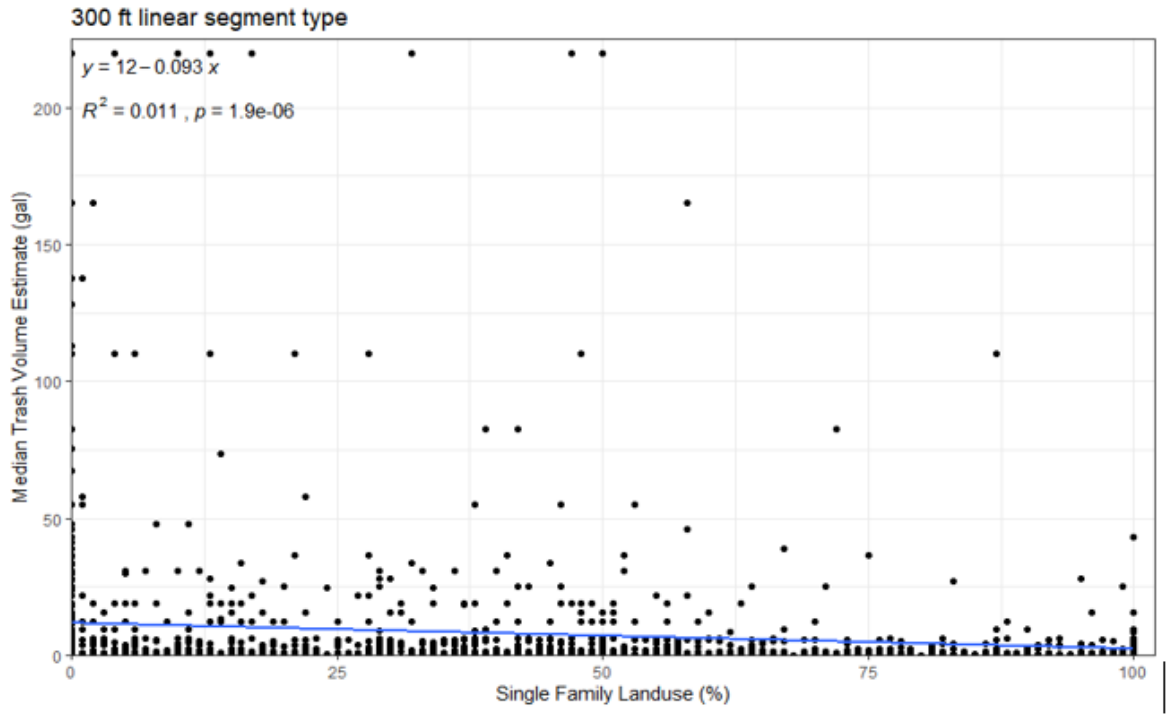


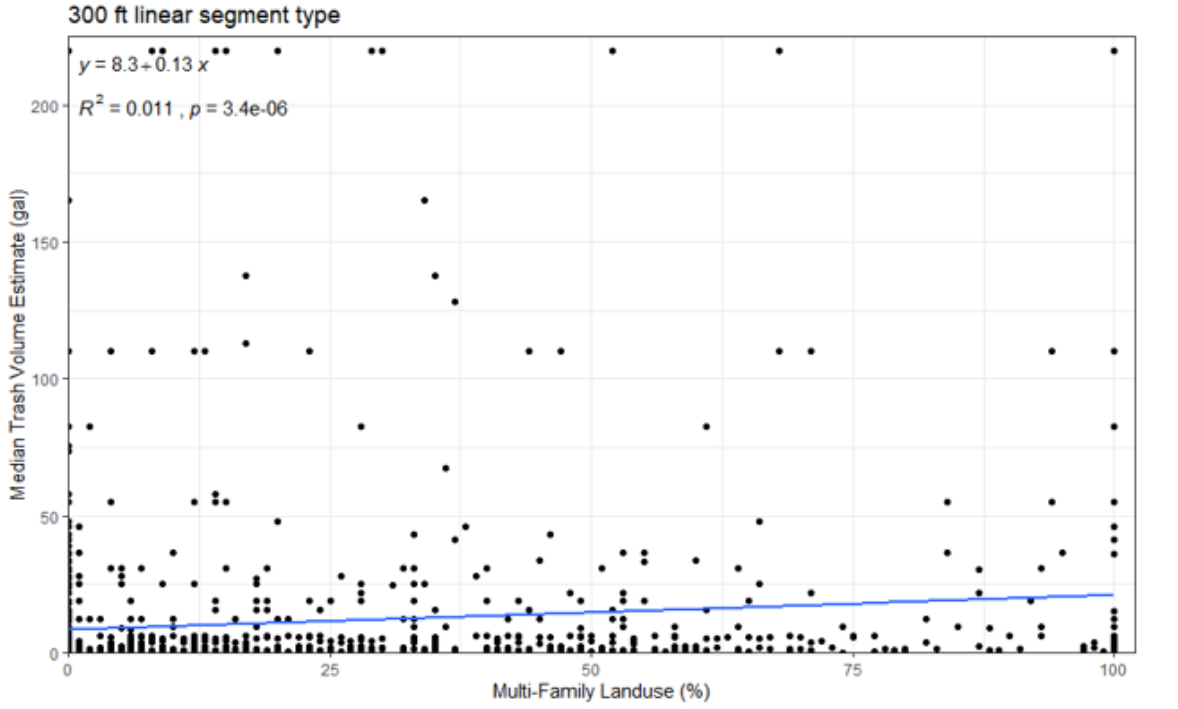


Takeaway # 3

There were no statistically significant correlations between trash intensity and:

- landuse,
- census,
- transportation,
- parks, etc.





Takeaway # 4

Virtually anything can be found in creeks, but

single use plastics were the most common item

clothing, tents, bedding

recreation items, toys

erosion matting, silt fences

packaging, shipping

office, household

lawn tools, mulch bags, garden hoses, appliances

medical, electronics, textiles, hardware

traffic cones, barriers, safety

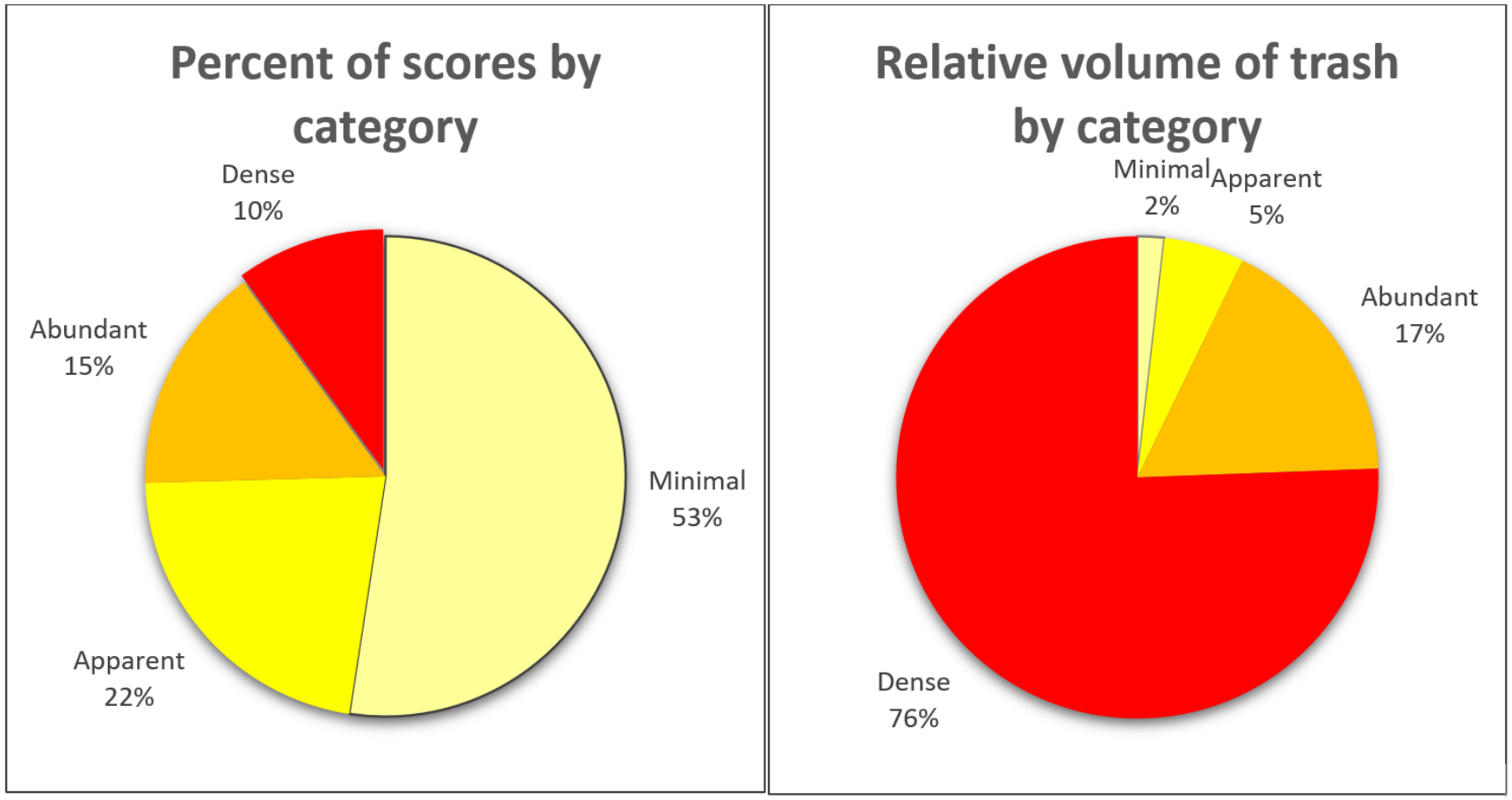
construction materials, asphalt, lumber

Telecommunication cables, displaced infrastructure

500+ shopping carts

Takeaway # 5

76% of the trash is found in 10% of the area



(opportunity for strategic site selection for cleanups by COA, partners, contractors, volunteers)

Field report provides diverse assemblage of recommendations at different scales

- site-specific cleanups,
- improved rules for dumpsters,
- structural controls,
- enforcement,
- education/outreach,
- coordination with partners,
- etc

Benchmarking Research Report

- **EXTRACTION** (physically removing trash from waterways)

  ex: structural controls, machines, manual labor

- **INTERCEPTION** (keeping trash from entering waterways)

  ex: education, enforcement, landscape cleanups, structural controls

- **SOURCE REDUCTION** (stemming the flow into our community)

  ex: limit single use plastics

Extraction

- creek and lake cleanups*
- requirement/enforcement of vendors/individuals to clean up
- targeted cleanups at "hot spots"
- novel devices to concentrate trash and/or ease retrieval

  (e.g. booms, trash traps, etc)

*Partners, contractors, COA staff, ARR “Clean Creeks Crew” staffed and operational this year,

Examples of highly visible incentivized community participation

Free kayaks for cleanup commitment

- Urban Rivers Chicago, River Rangers

Tourist "Trash Fishing"

-Netherlands (photo)

-Individual boats Troy, MI

Interception

- Enforcement and facilitated reporting

  ex: Philadelphia's "Sweep Program" including citations and fines

- Ordinances to reduce incidence and effects of overflowing dumpsters
- Shopping cart on-site retention
- Telecommunications cable removal

Interception

Capacity, proximity, accessibility

- Solar compacting bins
- Mesh bags on water (Buffalo River)
- Litter Boat
- Increase waste receptacles at picnic tables
- Free Dump Days
- Continue/increase services at encampments

Evaluate street sweeping

Evaluate drainage system controls

- Curb inlet guards with street sweeping or Adopt-A-Drain
- WQ/Detention ponds retention/removal of floatables

Source Reduction

New Braunfels Can Ban

Education and outreach

Solicit voluntary partnership/cooperation with businesses

- example: HEB leadership during/after the bag ban

Water stations to reduce dependance on bottles

Restriction/requirements

- glass/Styrofoam restriction/requirements in city-owned properties
- education/check-point at entry and launch points providing mesh bags and limiting Styrofoam coolers & glass (example: San Marcos)

Campaigns or strategies to reduce use of single-use plastics and Styrofoam

- Regulations/bans (novel strategies)
- Political considerations

Collaboration for a citywide, integrated trash management effort

Bottom Line

Trash in creeks is a result of the entire community;
there is no “one source” primarily to blame

COA and Partners are actively engaged in the solution;
there is room for improvement and innovation

Next Steps

COA is working to improve efficiency and effectiveness
of programs to extract, intercept, and reduce trash

The results and recommendations from reports can inform
site selection and strategies to address trash in creeks

Appreciation

Benchmark research
- Leila Gosselink

Design, fieldwork and report
- Mateo Scoggins
- Jeremy Walker-Lee
- Ryan Burke
- Lauren Parrish
- Todd Jackson
- Brent Bellinger

Data management and analysis
- Rob Clayton
- James Collins
- William Burdick
- Abel Porras
- Ed Peacock

Partners

Austin Resource Recovery
PARD
WPD Field Operations
Keep Austin Beautiful
The Other Ones Foundation
Austin Parks Foundation
Contractors and Volunteers


Questions?