

# Are PAHs from coal-tar sealants degrading Austin streams?

## Biological studies:

- Laboratory toxicity study
- Microcosm community study
- Field community study



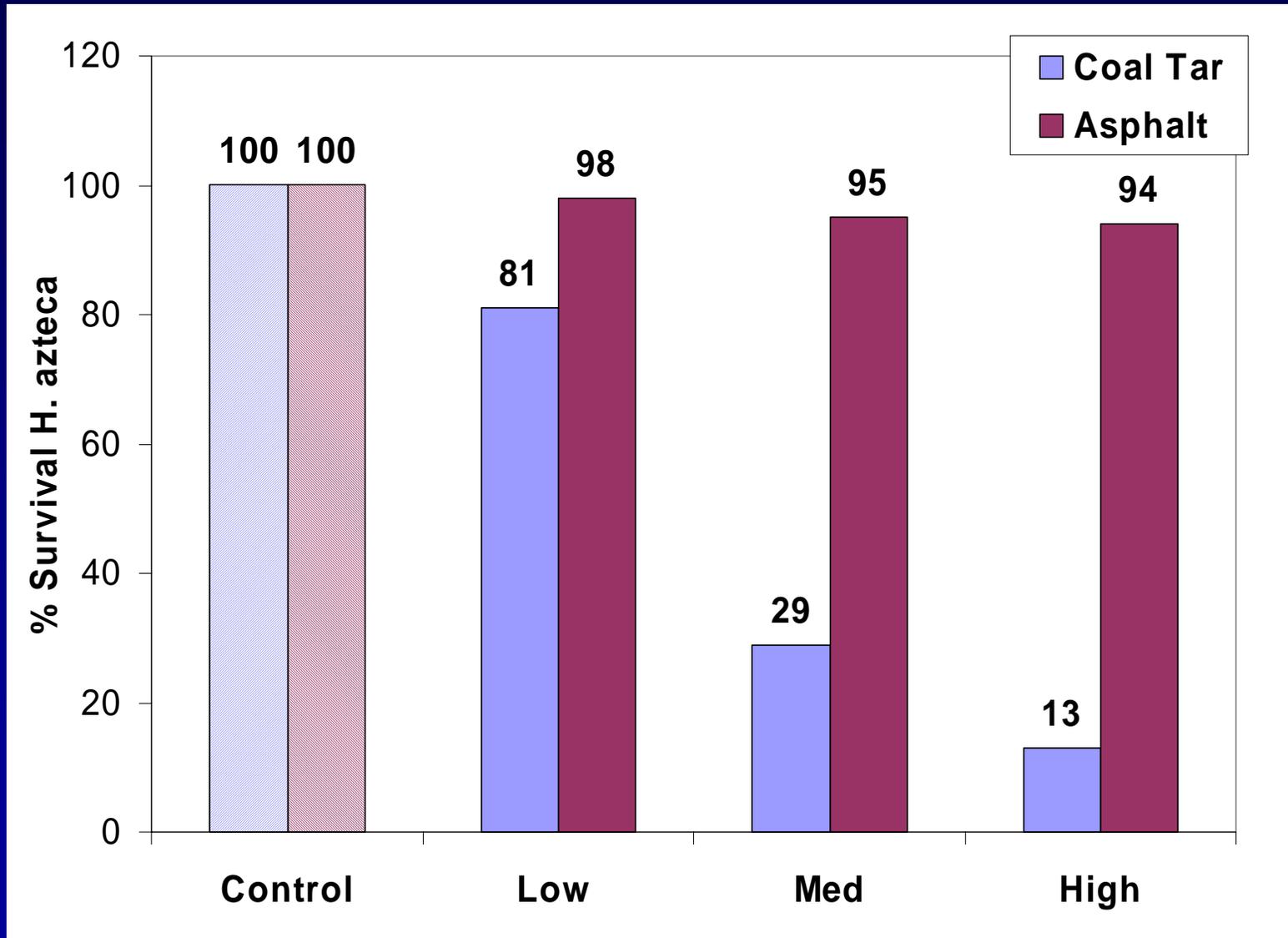
# Background: Sealant work to date

- Coal tar sealants contain high concentrations of PAHs.
- Sealants abrade off of parking lots and wash off in stormwater.
- Concentrations and yields of sealant wash-off indicate it is a major source of PAHs in urban environments.

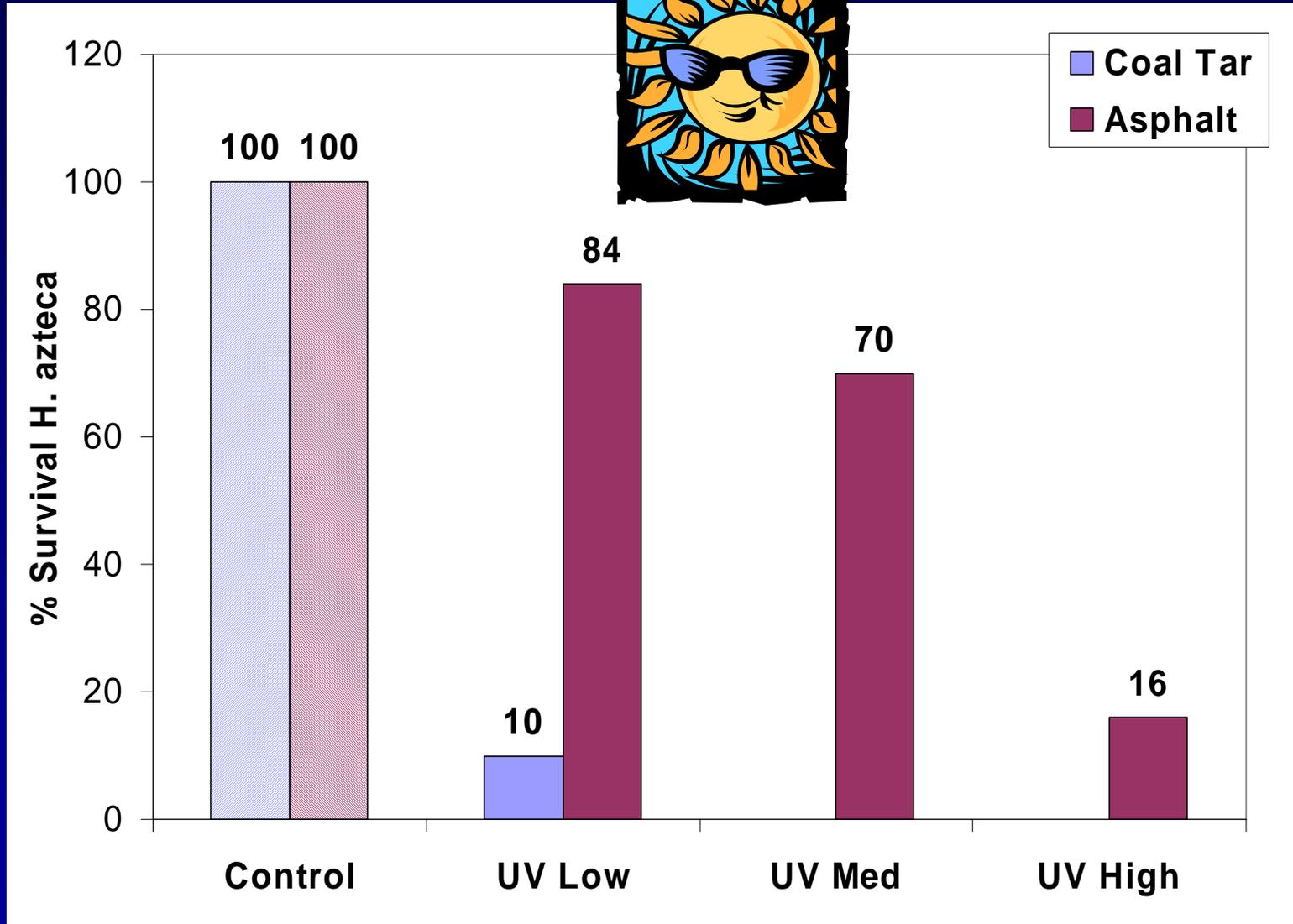
# 1. Lab Study: Are sealants toxic to aquatic organisms?

- Sediment spiked with dried pavement sealant (low, medium high).
- 28 day exposure followed by UV.

# 1. Lab Study



# 1. Lab Study



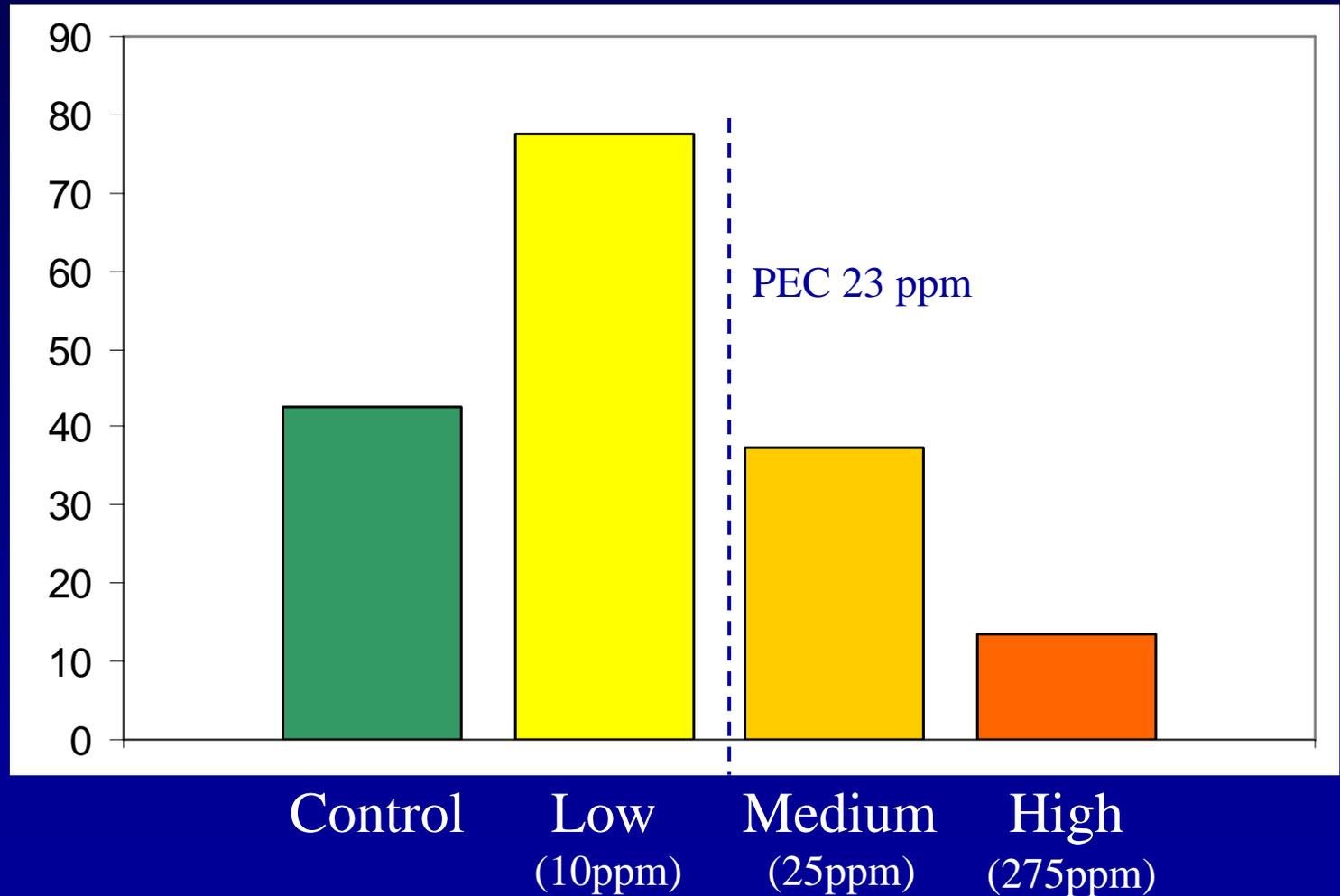
## 2. Microcosm: Is coal tar toxic to aquatic communities?

- Spiked at three treatment levels.
- Seeded with stream organisms.
- 24-day exposure period.

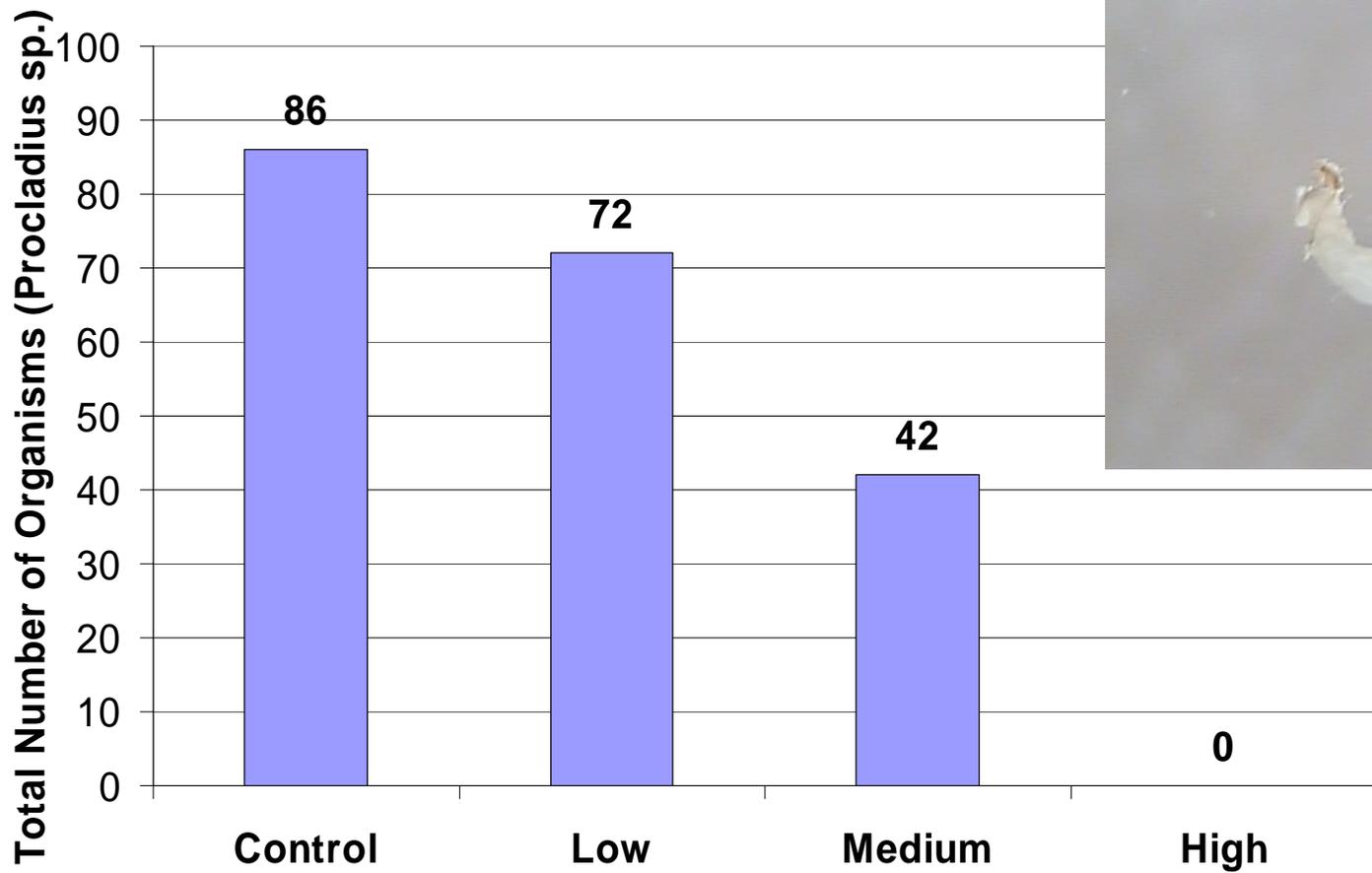


## 2. Microcosm

Average  
Number of  
organisms



## 2. Microcosm



### 3. Field Study: Are PAH's degrading aquatic life in Austin streams?

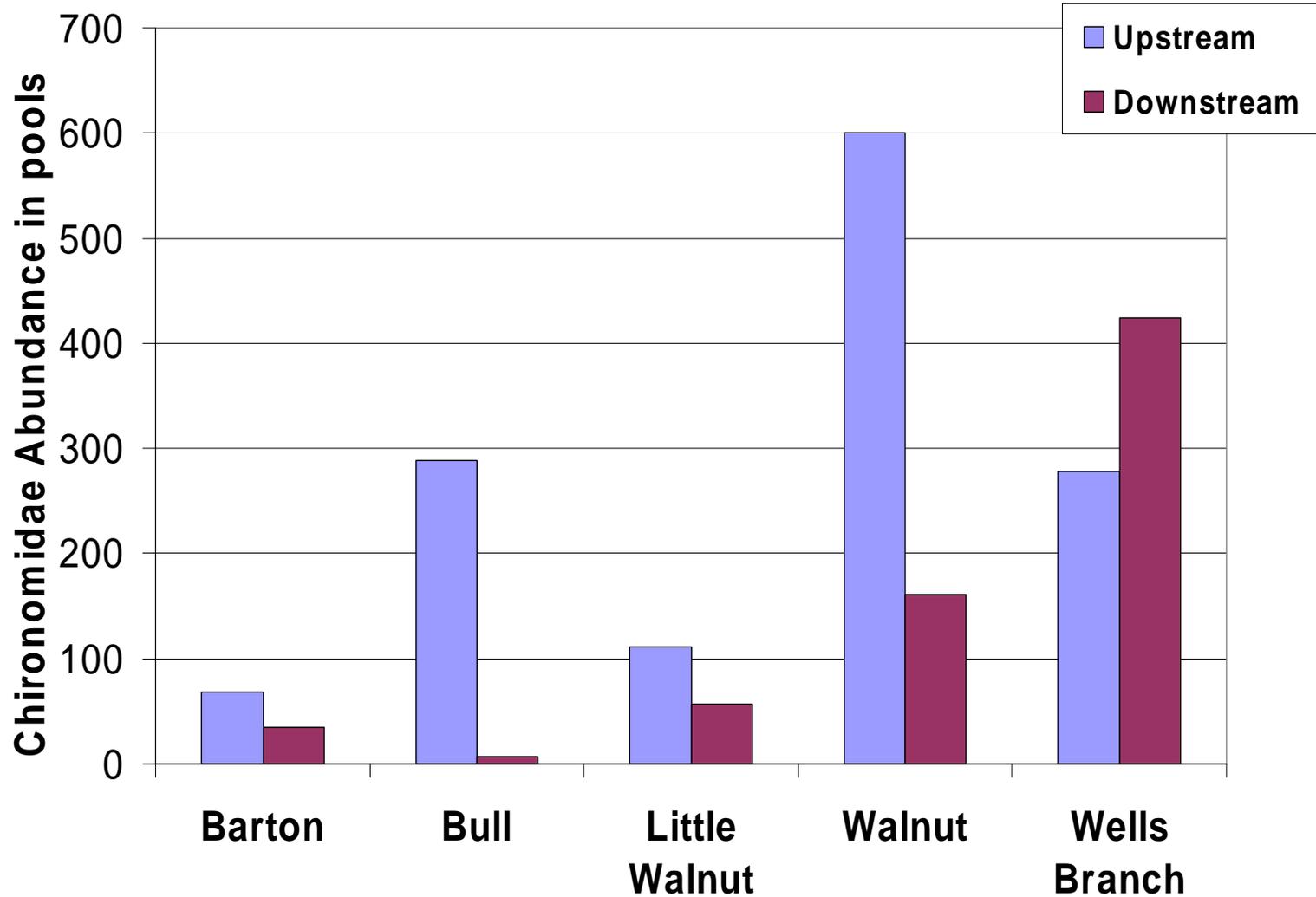
- Upstream and downstream of coal tar sealed lots.
- Biological communities and sediment chemistry sampled in 5 streams.



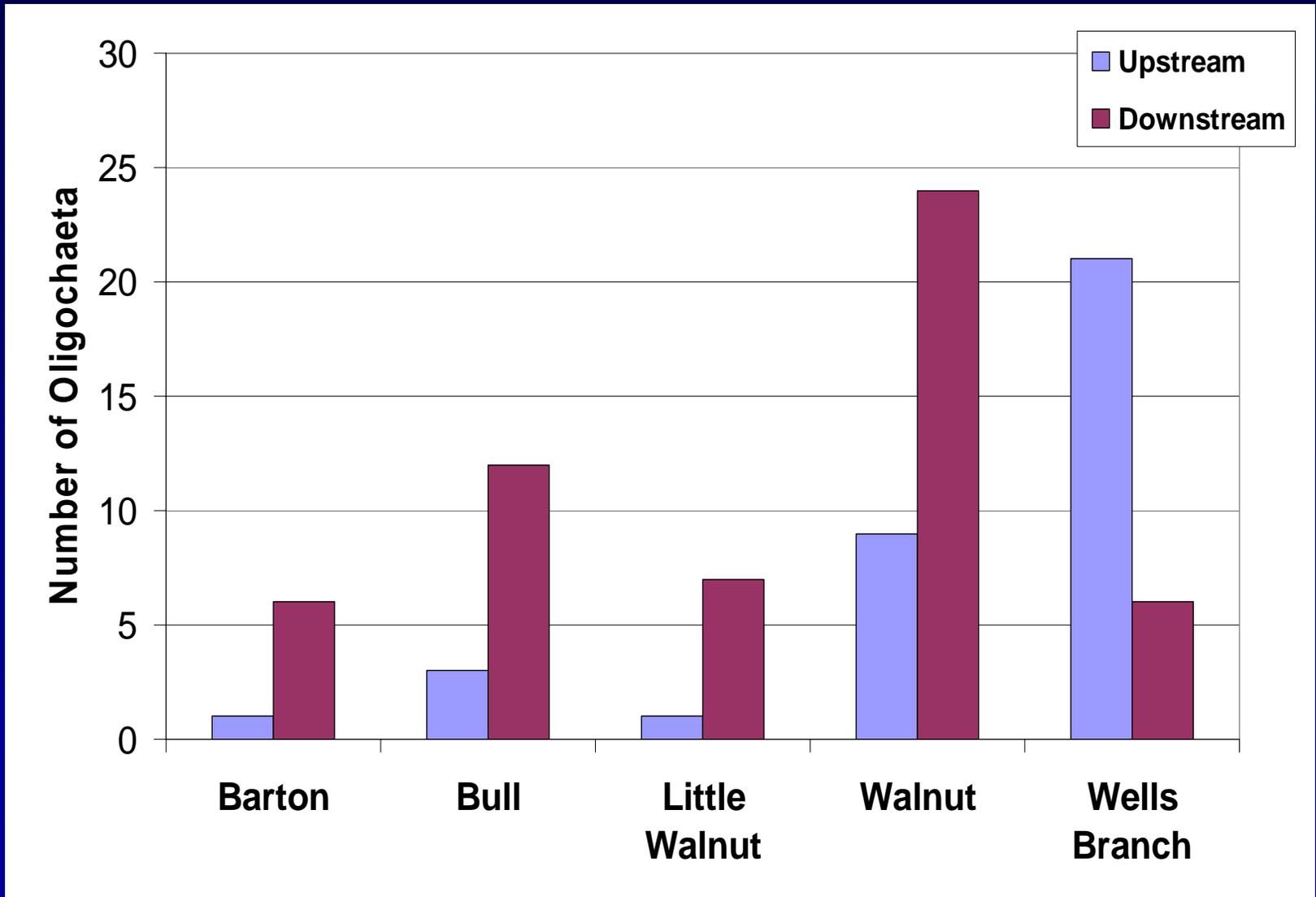
# 3. Field Study



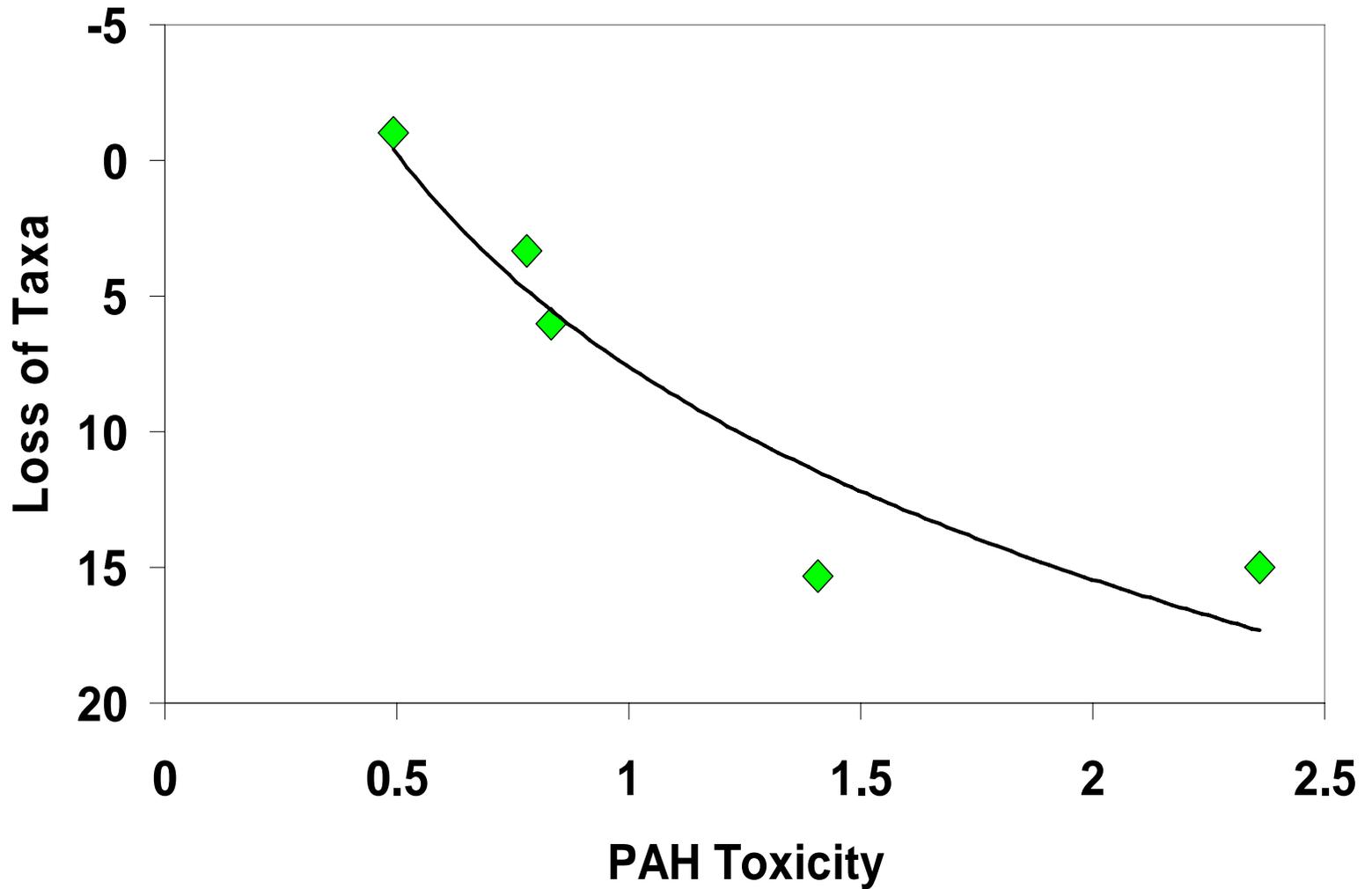
# 3. Field Study



# 3. Field Study



# 3. Field Study



# Conclusions

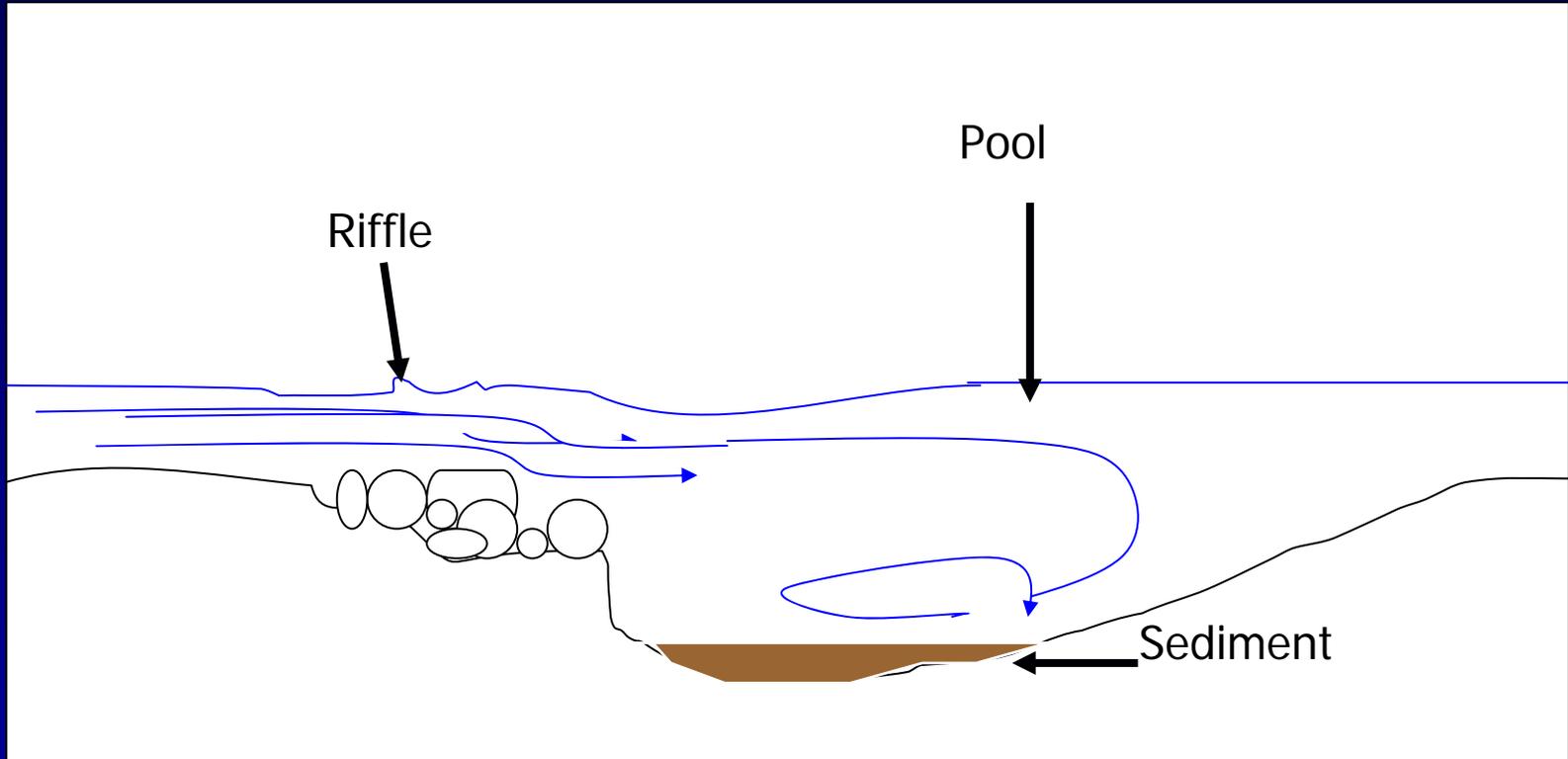
- Coal tar sealants are concentrated source of PAHs.
- Sealants represent a major source of PAHs in urban streams.
- Ecological impacts demonstrated in Austin.
  - Chemical tracing, toxicity, field verification
- Austin City Council Bans use and sale of coal tar sealant.



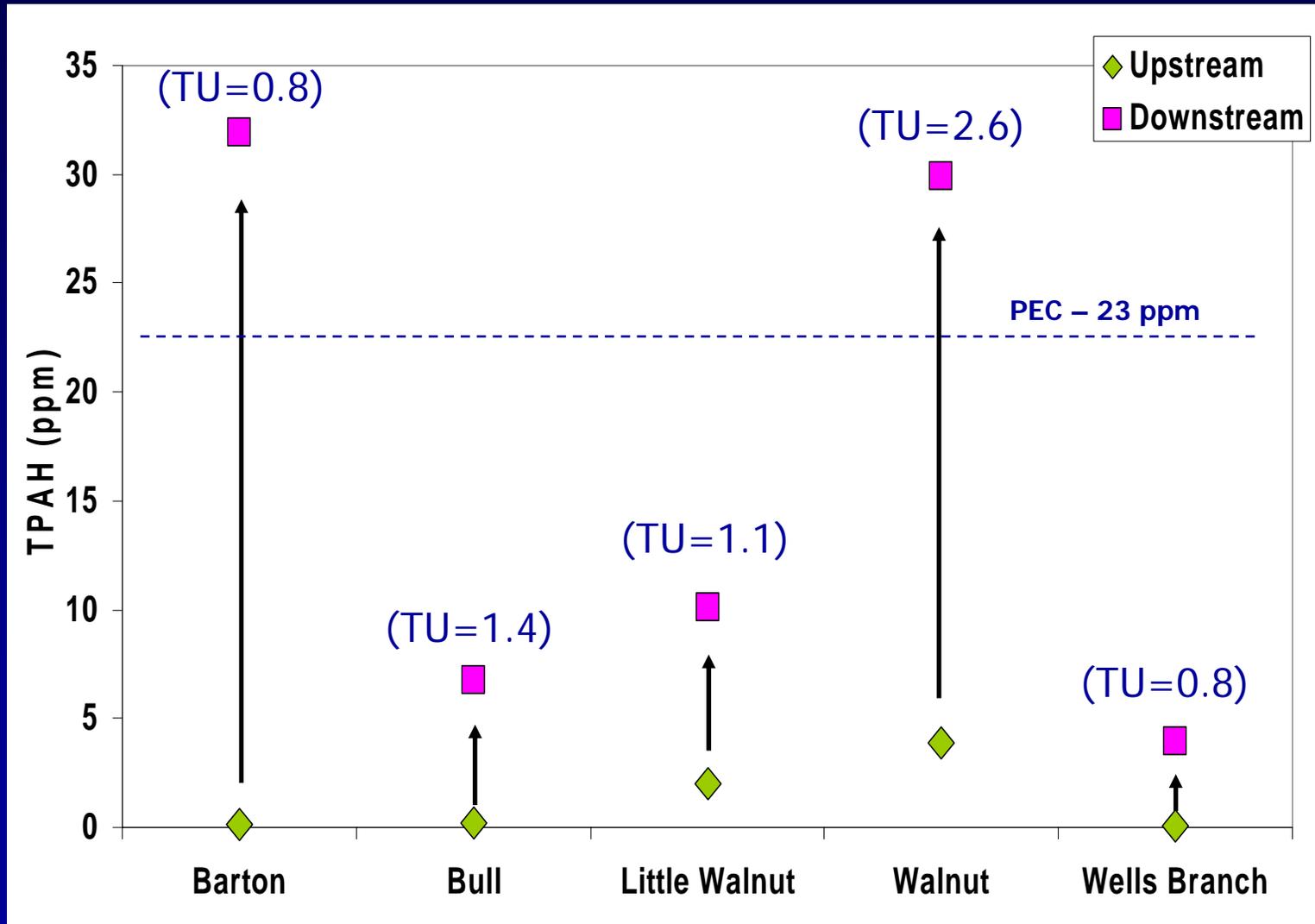
# Coal Tar vs. Asphalt Sealants

- Concentrations of PAHs in coal tar sealants 1,000 times higher than asphalt-based sealants.
- Particulates washing off coal tar sealed lots had PAH concentrations 6.5 times higher than asphalt sealed lots.
- USGS PAH load estimates are 2x times higher from coal tar sealed lots than asphalt-sealed lots. Industry reports current asphalt formulations are less durable.
- Due to the concentrated source and local stream hydrology, higher concentrations from coal tar sealed lots would result in local "hot spots".
- Toxicity was higher for coal tar compared to asphalt sealants at equivalent dilutions in lab studies.

# Field Study – sampling locations



# Field Study



# Field Study

