TRASH AND DEBRIS IN THE WEST RIVER

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ABSTRACT
In the West River Watershed, trash and debris is a growing issue. The West River is impaired for recreation and aquatic life due to bacteria from stormwater runoff and other sources. In 2015, Save the Sound (my community partner) and the West River Watershed Coalition completed a watershed management plan for the river and its tributaries. As a part of the watershed planning process, over 20 volunteers walked and canoed 21 miles of stream throughout the watershed to survey physical stream conditions (Fig. 1)—such as bank erosion, riparian vegetation, channel morphology, water color, odor, and trash and debris accumulation. Trash and illegal dumping, which contribute to bacterial pollution, were identified as a problem throughout the watershed. This project reviews data collected by volunteers in 2015 with a focus on the problem of trash and illegal dumping; maps the trash “hot spots”; and make recommendations to the watershed coalition and Save the Sound to help them address trash and illegal dumping. Our hope is to identify the areas with high accumulation of trash and gain an understanding of how the trash got there (illegal dumping, stormwater outfalls, etc.). In addition to evaluating the information collected by the volunteers, I went into some of these areas to observe in-stream conditions. I also collected macroinvertebrate samples in three stream segments to evaluate water quality and the effects of the pollution. With the information we collected in this project we hope to put some actions in place to address these issues and hopefully eliminate them in the near future.

WHAT’S THE BIG DEAL?
To many people, a little bit of trash here and there does not seem like an issue. However, as trash moves down the watershed and makes its way to Long Island Sound, the amount accumulates and becomes a concern (see Fig. 1). As construction of highways and residential areas increases in New Haven and many surrounding towns so does the trash and other types of debris and pollutants.

OUR GOAL
The goal of this project was to identify and raise awareness about trash “hot spots” throughout the West River watershed and better understand how to address them. To achieve this goal, I worked with my community partner to organize and evaluate stream survey data collected by volunteers as a part of the West River Watershed-Based Plan. The project had three parts: 1) reviewing and organizing the raw data into an ArcGIS map 2) visiting “hot spots” identified in the surveys to verify the extent of trash accumulation and 3) going out into three sections of the watershed to survey macroinvertebrates to determine the health of these areas.

USING ARCGIS TO IDENTIFY TRASH PROBLEM AREAS IN A WATERSHED

Mapping Data
• Volunteers surveyed over 21 miles of stream divided into 34 stream segments (Fig. 2a).
• Data were collected between July 2015 and August 2015 using NRCS stream survey methods.
• I first examined all the field data and then identified sections with trash issues.
• I compiled all trash and debris data into an Excel sheet.
• Using ArcGIS desktop and online, I worked with my community partner to create an interactive map highlighting the location, type, and likely source of trash (Fig. 2b).

What can this tell us?
• This map (Fig. 2b) will provide Save the Sound with a valuable tool to visualize the areas that need management.
• 11 of 34 sections have trash and debris issues.
• Most of the problem areas are in the lower sections of the watershed:
  ○ Unnamed Tributaries
  ○ Belden Brook
  ○ Parts of the Lower West River
  ○ Parts of Wintergreen Brook
  ○ The reach below Lake Dawson in Wilmot Brook (Fig. 3; red dot).
• Using this map, I picked two sites near trash and debris hotspots to survey macroinvertebrates to be used as biocиндicators of water quality.

HOW WE CAN ADDRESS THIS ISSUE:
Trash and debris from any source is damaging our watershed. Not only that, it travels down our waterways and empties into Long Island Sound—further harming wildlife. Community awareness is the first step to solving this growing issue. Most people are not aware of their direct impact on the ecosystem. Nature walks along sections of our watershed with the West River Watershed Coalition will allow residents to see that there are streams all around them. The next step is community involvement. As we went through the results we were baffled to see 788 Hydropsychidae (Middle red dot) This reach LW6 had fair water quality.
• There was an abundance of macroinvertebrates and a lot with low tolerance.
• In these results, the number of different types of organisms was low; there was not much community balance or presence of low-tolerance organisms.
• Lower red dot) This last reach LWL6 had very poor water quality.

MACROINVERTEBRATE SURVEYS
To better understand how pollution from illegal dumping, stormwater runoff, and other sources impact the watershed, I surveyed macroinvertebrates at three sites along the mainstem of the West River, above tidal influence.
• Three stream reaches surveyed include: Upstream LW5, Upstream LW6 (Fig. 3; red dots), and the reach that was used as a reference just below Lake Dawson in Wilmot Brook (Fig. 3; blue dot).
• Upstream LW5 had trash and debris.
• Upstream LW6 was not fully surveyed by volunteers, due to a recent dam removal project—but there was evidence of trash and debris problems.
• A reach just below Lake Dawson is a reservoir that feeds the West River.

Macroinvertebrates are important to this project because they can directly indicate the water quality in a particular area of a reach. To survey, I:
• Used a D-Net to collect benthic macroinvertebrates in a rocky bottom stream.
• Identified the organisms to family in each site.
• Compared number and abundance of macroinvertebrate families between each site to assess relative health of these parts of the watershed.

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