Macroinvertebrate Diversity in a Suburban Piedmont Watershed

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Introduction

As the major cities in the Southeastern United States continue to grow, the surrounding rural areas are quickly being transformed into suburbs, and this is affecting streams throughout the region. A suburban landscape is a diverse mixture of land use types, and the streams within suburban watersheds are highly variable in the macroinvertebrate communities that they can support. Using volunteer monitoring protocols from Georgia Adopt-a-Stream, we set out to determine the relationship between a stream's macroinvertebrate community and the surrounding land use in the southern suburbs of the Atlanta metropolitan area.

Materials and Methods

From January 2007 to February 2008, we monitored physical, chemical, and biological properties of several small stream reaches in Clayton, Henry, and Rockdale Counties using volunteer monitoring protocols from Georgia Adopt-a-Stream (AAS). To stay consistent with AAS protocols, we chose wadable sites that were safely and easily accessed.

AAS Macroinvertebrate Rating

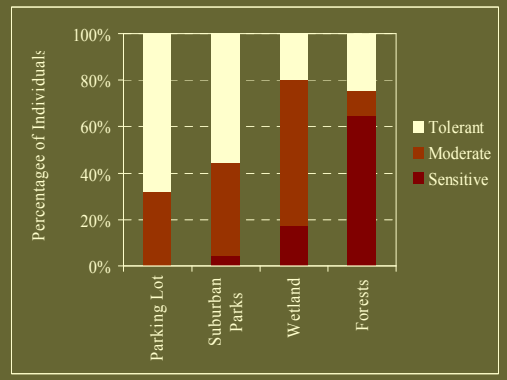
Sensitivity to Pollution	Macroinvertebrate Taxa
Tolerant 1 Point	Aquatic worms, blackfly larvae, midgefly larvae, leeches, lunged snails
Somewhat-Sensitive 2 Points	Alderfly larvae, common net spinning caddisflies, clams & mussels, crane flies, crayfish, damselfly nymphs, hellgrammites, dragonfly nymphs, fishfly larvae, scuds, sowbugs
Sensitive 3 Points	Caddisflies, gilled snails, mayfly nymphs, riffle beetle adult, stonefly nymphs, water penny larvae, water snipe flies

Poor < 11, Fair 11-16,
Good 17-22, Excellent >22

from Georgia Adopt-a-Stream. 2005. Biological & Chemical Stream Monitoring. 65 pp.

Results

Macroinvertebrate scores ranged from 2 (Poor) to 23 (Excellent) and dissolved oxygen ranged from 3.4 to 10.6 ppm. Sites that were close to parking lots had the fewest species and worst water quality. Stream reaches in suburban parks fared slightly better. Macroinvertebrate communities were generally the most diverse in sites located in wetlands and forests.



Stream Monitoring Results

Site Type	Average AAS Rating	Average # of Individuals	Average DO (ppm)
Parking Lot	2.3	5.5	3.0
Suburban Park	6.0	16.3	7.7
Wetlands	16.3	48.3	8.4
Forest	18.7	101.8	8.5

Conclusion

Our results suggest that diversity and composition of the macroinvertebrate community are related to the land use in the immediate vicinity of the stream reach. Interestingly, suburban parks harbored relatively poor macroinvertebrate communities, despite having both trees and lawns.