





# Featured Project:

## *Edge Effects in the Coastal Sage Scrub Plant Community at the Bernard Field Station*

Research by Tracy Perfors; article by Nancy Hamlett

In this issue, we present a student research project by Tracy Perfors, who graduated from Harvey Mudd College last May. Tracy's project dealt with "edge effects"—effects exerted by the surrounding environment on the edges of isolated patches of habitat. For example, edges are differentially affected by light, wind, moisture, access, noise, nutrient inputs, and chemical pollution, and they have different microclimates compared to the interior of a habitat patch.

Edge effects constitute a major focus of the discipline of Conservation Biology, but they have not been previously examined at the BFS. Understanding edge effects at the BFS is important for managing the BFS habitat and for understanding the consequences of development on or adjacent to the BFS.

To examine the effects of edges on the coastal sage scrub plant community at the field station, Tracy marked out sixty-three 1 m × 1 m regularly spaced plots in the southwest corner of the BFS, which contains the largest tract of coastal sage scrub. During the spring, at the height of the growing season, Tracy identified and counted every plant growing in each of her plots as well as measured nitrate concentrations. She then analyzed the data to see how the community varied as a function of distance from Foothill Blvd and College Ave.

As shown in the Table below, Tracy found several significant edge effects. Both species richness and species diversity were reduced at one or both edges, nitrate was higher near College Avenue, and some individual plant species had more or fewer plants near an edge than in the interior.

Measure affected by edge	Difference at edge compared to interior	Approximate extent of edge effect
<i>Species richness</i>	Fewer species near both edges	26.5 m from Foothill 8 m from College
<i>Species diversity</i>	Lower diversity near College Ave edge	8-13 m
Red-stemmed filaree, <i>Erodium cicutarium</i> (exotic)	Fewer plants near Foothill edge	26.2-52.2 m
Yerba santa, <i>Eriodictyon trichocalyx</i> (native)	More plants near Foothill edge	21.2 m
Unidentified croton <i>Croton californicus</i> ? (native)	Fewer plants near College Ave edge	8 m
Nitrate concentration	Higher near College Ave edge	26.5 m

**Editor's note:** It is clear that reducing the BFS would have significant effects on the plants and thus animals there.

*Tracy graduated from Harvey Mudd College with High Distinction and Honors in Biology.  
She will be currently serving in the U.S. Army Medical Corp.*

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*"A tour of the property readily convinces visitors of the importance of keeping such a beautiful expanse of land, shrubs, and trees for scientific purposes."*

Robert J. Bernard in "An Unfinished Dream"

