



Susan C. Morse

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To the Andrews Community Forest Committee:

Thank you for giving me the chance to speak at your October meeting. I would like to present some important points to elaborate on the brief statements I made at the meeting.

Overall, I'm concerned that the trail system proposed for the forest would destructively introduce untold numbers of people and pets into what I know from decades of personal experience and research is functionally one of our region's most important remaining wildlife habitats. While that plan has its proponents, primarily among mountain biking groups, support seems to be based on erroneous claims of compatibility between heavily used recreational trails and natural resource protection.

Consolidating trails offers no solution when they're inserted into particularly sensitive parts of a forest. Broad and increasing evidence shows how trails, trail networks and the traffic they attract can affect individual animals, their populations and even multi-species wildlife communities (Knight and Cole, 1995a). Boyle and Samson (1983) reported that in 81% of studies reviewed, non-consumptive outdoor recreation had negative effects on wildlife.

At your last meeting I referred to "cumulative effects" – how the collective impacts of countless small and seemingly inconsequential anthropogenic events compromise wildlife well-being. Recreational paths open the way to those events, and can harm wildlife through:

- **Impacts to refugia.** However seemingly harmless, trails introduce significant stress factors within wildlife refugia that sustain numerous species of invertebrates, birds, amphibians, reptiles and mammals. For example, nesting birds, denning bobcats, foxes and mustelids are displaced, if not killed, as a result of people and domestic dogs regularly using formerly, largely undisturbed security and foraging habitats.
- **Altered wildlife behaviors.** When wild animals are flushed needlessly and repeatedly, their alarm and flight behaviors affect them in two ways. The cumulative effects of increased energetic demands for such activity may prove too costly for some animals, especially during the winter or during other periods of food shortage.

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Studies show increased mortality for disrupted wildlife, such as when wildlife expend energy when flushed (Whitfield et al., 2008; Taylor and Knight, 2003b); are displaced over extended periods of time (Neumann et al., 2010); and/or exhibit decreased nest fidelity after being disturbed (Vennesland, 2010). Secondly, some species may limit their use of, or even completely forsake what would otherwise be preferred foraging and resting habitats. Such altered behaviors and missed opportunities for optimal food and cover will insidiously compromise the fitness, sustainability and diversity of many species over time.

- **Impacts beyond the trail.** A trail alters the surrounding environment far beyond its actual footprint and may impact wildlife thousands of feet into adjacent areas. These “distance effects” in an “area of influence” surrounding a trail may cause displacement of wildlife from otherwise suitable habitat (Taylor and Knight, 2003b).

For example, when songbirds’ primary song was interrupted by human disturbance, the birds were reluctant to establish nesting territory (Reijnen and Foppen, 1994). Even a single pedestrian traveling through a bird’s territory causes a decline in the occurrence of primary song (Gutzwiller et al., 1994). As song is an integral component of the breeding process, birds sensitive to human disturbance may be reluctant to establish nest sites where human activity takes place, i.e., near trails (Gutzwiller et al., 1997).

- **Decline of resident species.** Researchers from the Department of Environmental Science Policy and Management at the University of California, Berkeley surveyed mammalian carnivores in 28 parks and preserves. Paired comparisons of neighboring protected areas, with and without recreation, revealed that the presence of dispersed non-motorized recreation led to a five-fold decline in the density of native carnivores. These biologists also noted a substantial shift in community composition from native to non-native species (Reed and Merenlender, 2008).
- **Disruption of key movement corridors.** Undeveloped, undisturbed riparian habitats often provide wildlife their only means of moving across human-dominated landscapes. The ACF’s central ravine and its banks are excellent examples of such habitats that should not be disturbed. This unfragmented core habitat secures species and genetic exchange throughout an impressive assemblage of connected habitats. In addition, these preferred travel routes (Garber and Burger, 1995) offer critical opportunities for demographic rescue—the ability for new individuals to reach and replenish a habitat should some stochastic event or disease cause an entire local population to perish.
- **Direct effects of increased access.** Negative impacts to ecosystems include habitat fragmentation, trampling, soil erosion, nutrient loading, pollution, poaching and the introduction of non-native invasive plant and animal species. In one 20-year study, herpetologists (Garber and Burger, 1995) concluded that the introduction of recreational

trails and corresponding increased public access led to the decline of turtles due to poaching and increased nest predation. The latter phenomenon was exacerbated by an increase of mesocarnivores, such as raccoon, skunk and opossum. These species are known to exploit fragmented habitats and to be subsidized by foods associated with people.

Worldwide, a growing body of scientific studies is dedicated to elucidating the aforementioned stresses. One study (Taylor and Knight, 2003b) summarized known impacts and shared the following startling information: "Millions of visitors annually are attracted to public lands to engage in recreational activities. Because outdoor recreation is the second leading cause for the decline of federally listed, threatened and endangered species on public lands (Losos et al., 1995), and the fourth leading cause on all lands (Czech et al., 2000), natural resource managers are becoming increasingly concerned about impacts of recreation on wildlife (Gutzwiller, 1995)."

In view of these scientific studies, it is understandably alarming to consider the impacts that trail traffic through the ACF will have on the forest's ecosystems. It is even more alarming in light of the objective to use an ACF trail network as a key link in constructing an even larger network spreading into similarly rich habitats on adjacent, privately owned properties. Can a recreational trail of this magnitude be compatible with the ACF's conservation easement? Does it meet the objectives of the Town Plan?

I have much trepidation about any proposed trails that will impact core habitat in the ACF not only because of the accumulated evidence from numerous scientific studies, but also because of what I have personally observed and learned in over 47 years of studying wildlife behavior and habitat, much of it within the ACF's forest block. I am sure that few people in Richmond want to see a forest without the wildlife that currently thrives there. Some may feel that the wildlife can just move elsewhere, forgetting, perhaps, that the ACF is already a refuge for wildlife that decades of development have driven off once-healthy habitats elsewhere in town.

Conservation isn't just about creating parks. It also gives us the chance to keep whole landscapes undeveloped, protecting places where natural communities and processes need to be left alone to keep providing the ecological benefits they've supplied for thousands of species over thousands years. I thank you for the long, difficult but highly important work you are doing, and I hope you will join me in recognizing the science needed to protect the Andrews Community Forest. As you continue in your efforts I stand ready to help in any way I can.

Sincerely,



Susan C. Morse