British Columbia Conservation Foundation
Wildlife Collision Prevention Program
Suite 200 1383 McGill Road
Kamloops B.C. V2C 6K7
Ph: 250.828.2551 Fx: 250.828.2597
Web: www.wildlifecollisions.ca
Email: wcpp@bccf.com

The Wildlife Collision Prevention Program does not recommend the use of deer whistles.

Many people are convinced that the deer whistles installed in their vehicles are effective at scaring wildlife off the road, and anecdotally, these people have many stories to support their ideas. However, the independent scientific research does not support this.

There are two types of deer whistles, wind-driven and electronically powered. Wind-driven whistles produce a sound when air is forced into them as the vehicle moves along the road. Testing of six different wind-driven whistles determined that they typically produce a signal either at a frequency of 3 kilohertz (kHz) or 12 kHz (Scheifele et al. 2003). Electronically powered whistles emit an ultrasonic sound, generally between 16 kHz and 20 kHz.

There have been several non-scientific studies comparing deer collision records before and after the installation of deer whistles, with results that are generally regarded as suspect, due to poor experimental design and documentation. There are currently no rigorous scientific studies that document a reduction in wildlife collisions due to the use of deer whistles.

Other studies have focused on the hearing capabilities of deer. Scheifele et al. (2003) tested six deer whistles to determine the sound intensity of the whistle and the ambient road noise. The laboratory results did not support the frequencies that were claimed by the manufacturers, as the primary operational frequencies were determined to be 3.3 kHz (closed end design) and 12 kHz (open end design). The best sensitivity hearing range of white-tailed deer has been determined to be between 2 and 6 kHz (Scheifele et al. 2003) and between 4 and 8 kHz (D'Angelo et al. 2007). Although deer may be capable of hearing a 3 kHz signal, Scheifele et al. (2003) concluded that the sound levels produced by the 3.3 kHz whistle would be "totally lost" within the road noise created by the car, and that the 12 kHz whistle would be likely be ineffective because it emits a sound outside the best hearing sensitivity range of deer. These difficulties would be exacerbated with additional traffic or if the wind was blowing. D'Angelo et al. (2007) determined that white-tailed deer could detect frequencies up to 30 kHz, and suggested that further research into ultrasonic devices capable of producing sounds greater than 20 kHz may be useful. However, D'Angelo et al. (2007) also noted that the sounds must be of adequate intensity (loudness) in order to be consistently audible to deer and that the sounds must alter the deer behaviour in the desired fashion.

Only a few studies have documented the behaviour of deer and their reactions to whistles. Romin and Dalton (1992) concluded that the response of mule deer to a vehicle with a whistle was the same as their response to a vehicle without a whistle. They did not test to see if the devices were emitting the sound advertised by the manufacturers, or if the mule deer could actually hear the sound within the specified noise range advertised by the manufacturer.

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To investigate deer responses to sound, Valitzski et al. (2009) emitted "pure tones" that were at the same frequency as various deer whistles (0.28, 1, 8, 15, and 28 kHz), and quantified deer roadside responses to the sounds. The pure-tone sounds did not alter the behaviour of the deer in a manner that would prevent deer vehicle collisions. The researchers concluded that:

1. There may be too little time for the deer to react in any way (i.e. no time to stop their risky behaviours)
2. Deer may lack the neurological ability to process the alarm information efficiently and react in the desired way (i.e. stop the risky behaviour)
3. Deer may not recognize the sounds as a threat

Additionally, in studies focussing on agricultural applications of deer-frightening devices, deer have either not been frightened away by alarms, motion-activated systems, or regular interval acoustic frightening devices, or the deer have quickly become habituated to them.

A further issue is that since deer whistles are mounted on the front of the vehicle, the whistle would soon become clogged with insects, dirt, and snow, and, unless regularly cleaned, would quickly stop emitting a useable signal.

The last concern is that installation of these devices may induce a feeling of complacency in drivers; an unproven sense of security, "Oh, I've got my deer whistle so I'll be fine," and that drivers may then be less attentive while driving on the road.

References

D'Angelo, G.J., A.R. de Chicchis, D.A. Osborn, G.R. Gallagher, R.J. Warren, and K.V. Miller. *Hearing range of white-tailed deer as determined by auditory brainstem response*. 2007. Journal of Wildlife Management 71(4):1238-1242. DOI: 10.2193/2006-326

> **ABSTRACT:** *Basic knowledge of white-tailed deer (*Odocoileus virginianus*) hearing can improve understanding of deer behavior and may assist in the development of effective deterrent strategies. Using auditory brainstem response testing, we determined that white-tailed deer hear within the range of frequencies we tested, between 0.25–30 kilohertz (kHz), with best sensitivity between 4–8 kHz. The upper limit of human hearing lies at about 20 kHz, whereas we demonstrated that white-tailed deer detected frequencies to at least 30 kHz. This difference suggests that research on the use of ultrasonic (frequencies >20 kHz) auditory deterrents is justified as a possible means of reducing deer—human conflicts.*

Romin, L.A., and L.B. Dalton. 1992. *Lack of response by mule deer to wildlife warning whistles*. Wildlife Society Bulletin. 20(4):382-384.

Scheifele, P.M., D.G. Browning, and L.M. Collins-Scheifele. 2003. *Analysis and effectiveness of deer whistles for motor vehicles: frequencies, levels, and animal threshold responses.* Acoustic Research Letters Online 4(3)71-76. DOI 10.1121/1.1582071 Accessed August 21, 2013 at http://asadl.org/arlo/resource/1/arlofj/v4/i3/p71_s1?bypassSSO=1

> **ABSTRACT:** *Whitetail deer (*Odocileus virginianus*) are common across much of the United States. In areas where deer populations are prevalent, there is a propensity for interactions with automobiles. Various methods have been suggested for*

reducing the number of automobile-deer collisions, including acoustic devices such as deer whistles. Six different whistles were tested in the laboratory and on motor vehicles. Frequencies and intensities generated by the devices when mounted on vehicles at speeds from 30–45 miles per hour were determined. The primary frequency of operation of the closed end whistles on vehicles was determined to be approximately 3.3 kHz with little variation with changes in air pressure. Open-end whistles had a primary frequency of about 12 kHz, with significant variation with changes in air pressure. The best frequency range of hearing for whitetail deer appears to be between 2 and 6 kHz. The effectiveness of these devices was concluded based on the comparison of the acoustical attributes of the devices to deer hearing thresholds and acoustic behavior.

Valitzski, S.A., G.J. D'Angelo, G.R. Gallagher, D.A. Osborn, K.V. Miller, and R.J. Warren. 2009. *Deer responses to sounds from a vehicle-mounted sound production system*. Journal of Wildlife Management 73(7):1072-1076. DOI: 10.2193/2007-581

ABSTRACT: *We evaluated efficacy of sound as a deterrent for reducing deer (*Odocoileus *spp.)–vehicle collisions by observing behavioral responses of free-ranging white-tailed deer (*O. virginianus*) to pure-tone sounds within their documented range of hearing. Behavior of free-ranging deer within 10 m of roadways was not altered in response to a moving automobile fitted with a sound-producing device and speakers that produced 5 sound treatments documented to be within the hearing range of white-tailed deer. Many commercially available, vehicle-mounted auditory deterrents (i.e., deer whistles) are purported to emit continuous pure-tone sounds similar to those we tested. However, our data suggest that deer whistles are likely not effective in altering deer behavior in a manner that would prevent deer-vehicle collisions.*

General Information Sources

A good resource (USA) for information is www.deercrash.com. There is an excellent summary of studies (up to 2003) examining deer whistles as a mitigation tool.
http://www.deercrash.com/Toolbox/CMToolboxWhistles.pdf

In 2008, a national (USA) study titled *Wildlife-Vehicle Collision Reduction Study: Report to Congress* was prepared and submitted to Congress, detailing the causes and impacts of wildlife vehicle collisions and identifying solutions. Chapter 6, which discusses mitigation methods that seek to influence animal behavior, including a section on audio signals in the right of way or attached to a vehicle (deer whistles), begins on page 111.
Huijser, M.P., P. McGowen, J. Fuller, A. Hardy, A. Kociolek, A.P. Clevenger, D. Smith, and R. Ament. 2008. *Wildlife-Vehicle Collision Reduction Study: Report to Congress*. FHWA-HRT-08-034. This report is available at
http://www.fhwa.dot.gov/publications/research/safety/08034/index.cfm