

Hearing protection for heli-ski guides

Heli-ski guides face high noise levels from helicopters, particularly during loading and unloading activities. So it's important to find the most effective hearing protection that's compatible with the ski helmets guides are required to wear. This bulletin explains the noise hazards and makes recommendations on the best available hearing protection for guides.

When loading and unloading helicopters, heli-ski guides may be exposed to hazardous levels of noise. Regular exposure to sounds above 85 decibels (dBA) can cause permanent hearing loss, and helicopters can produce noise levels much higher than that. Without adequate hearing protection, guides could be overexposed to noise in a matter of minutes, as shown in the following table.

Helicopter type	Estimated noise level for landing, ferry, takeoff	Maximum daily unprotected exposure time (min:sec)
A Star	99.5 dBA	16:50
Bell 205	98.8 dBA	19:47
Bell 212	102.4 dBA	8:37

The table above shows the overall noise levels of three helicopters tested in a 2016 HeliCat Canada study. The combinations of noise level and exposure time shown above are all equal to the Regulation's limit of 85 dBA L_{ex} . Exposures exceeding this limit can cause permanent hearing loss.

If noise levels exceed the 85 dBA L_{ex} limit set by the Occupational Health and Safety Regulation, employers must put in place a noise control and hearing conservation program.

In addition to using hearing protection, guides are also required to wear ski helmets to protect them from head injuries on the job. Some types of hearing protection can be awkward, uncomfortable, or impossible to use with a ski helmet. As a result, some guides may feel forced to choose between the hearing protection and the helmet. This puts them at risk for hearing damage or head injuries.

Helmets do not provide protection from noise. And a 2016 study by HeliCat Canada found that helmet ear flaps provide virtually no protection from noise. Guides should not depend on their helmets or ear flaps for hearing protection, nor should they use earmuffs over ear flaps.



A guide wears behind-the-head earmuffs, along with a ski helmet.

How to reduce the risk

The key to reducing the risk is to find the most effective hearing protection that's compatible with a guide's ski helmet.

Based on helicopter noise levels recorded in the HeliCat Canada study, guides need at least Class B-rated hearing protection (as detailed in CSA *Standard Z94.2-14*).

Hearing protection devices such as semi-inserts (canal caps) and other earplugs may be suitable for use by guides. The study also showed that behind-the-head earmuffs can provide excellent hearing protection.

Semi-inserts can be put in place easily while wearing gloves, and they can be worn with toques. However, foam and custom earplugs can be difficult to insert while wearing gloves, and they can be dropped or lost easily.

The study also found that toques can dramatically reduce the protection provided by earmuffs. A thick toque can reduce protection by as much as 24 dBA, leaving a guide's hearing almost unprotected. If conditions are cold enough to require toques, guides should consider wearing earplugs. If guides prefer earmuffs, they should wear them with the thinnest toques available.

When using earmuffs, guides should also ensure that:

- There are no folds or seams in the toques that could reduce the effectiveness of the earmuff seal.
- Helmet straps are not twisted or bunched up, and no plastic tabs are located under the earmuff seal.

The wear and tear of a guide's job can easily damage hearing protection. Guides must inspect their hearing protection daily to ensure it is in good working condition. Replace worn or damaged earplugs and earmuffs as needed to prevent overexposure to noise.

In addition to hearing protection, a noise control and hearing conservation program must include:

- Noise measurement
- Education and training
- Engineered noise control
- Signage warning of noise-hazard areas
- Annual hearing tests
- Records of hearing tests and other elements of the hearing conservation program
- Annual program review

Regulation requirements

For requirements related to hearing protection, see the following sections of the Occupational Health and Safety Regulation and its related guidelines (available on worksafebc.com).

- [Section 7.2, Noise exposure limits](#)
- [Section 7.5, Noise control and hearing conservation program](#)
- [Section 7.7, Hearing protection and warning signs](#)
- [Guideline G8.11\(2\)-2, Activity specific safety headgear — Ski helmets](#)

For more information

The following resources are available online:

- [Sound Advice: A Guide to Hearing Conservation Programs](#) (WorkSafeBC)
- [Noise Exposure of Heli-Ski Guides Research Report — Spring 2016](#) (HeliCat Canada)
- [CSA Standard Z94.2-14, Hearing Protection Devices — Performance, Selection, Care, and Use](#) (CSA Group)