

# **Addendum to: An open letter to Minister Petitpas Taylor and Canada's Pest Management Regulatory Agency regarding the use of strychnine, sodium monofluoroacetate (Compound 1080), and sodium cyanide to kill wildlife in Canada**

## **Background information for arguments presented:**

### **1. These poisons are inhumane wildlife killing methods, causing undue pain and distress**

Courts have confirmed that the treatment of sentient animals is an important issue that informs our legal obligations with respect to stewardship of the environment and the animals with whom we share the Earth (Reece v Edmonton 2011). Protection of vulnerable animals from the risks posed by improper human conduct is a fundamental value in Canadian society (R v DLW 2016).

Poisoning wildlife with sodium monofluoroacetate, sodium cyanide, and/or strychnine is inhumane due to the intensity and/or duration of the suffering these poisons cause. Animals that ingest these poisons can experience excruciating pain for several hours; sometimes even longer than 24 hours, before finally losing consciousness (Eason & Wickstrom 2001).

Scientists and veterinarians have recently examined strychnine poisoning with respect to the following national guidelines, and found that:

*According to the Canadian Council on Animal Care (CCAC 2003), a killing method is humane if it causes rapid (immediate) unconsciousness and subsequent death without pain or distress. Death by strychnine ingestion is inhumane, as it causes frequent periods of tetanic seizures, occasional cessation of breathing, hyperthermia, extreme suffering, and death from exhaustion or asphyxiation, which typically occurs within 1–2 hours of the onset of clinical signs (Khan 2010). However, death can take up to 24 hours or longer if the dose is low (Eason & Wickstrom 2001).*

*The use of strychnine is in contravention of CCAC guidelines (CCAC 2003), the American Veterinary Medical Association (AVMA 2013), the Canadian Veterinary Medical Association (CVMA 2014), and the American Society of Mammalogists (Sikes et al. 2011).*

Source: Proulx et al. 2015 [additional references therein]:

Compound 1080 and sodium cyanide cause excruciating pain and distress through tectonic seizures, severe and prolonged convulsions, vomiting, unusual vocalizations, excessive salivation, muscular weakness and respiratory distress (Sherley 2007 & CCWHC 1999). Victims suffer from injuries and tissue trauma if they come in contact with rigid objects during their uncontrollable muscle spasms. In addition to strychnine, the Canadian Veterinary Medical Association also specifically condemns the use of Compound 1080 and sodium cyanide as inhumane (CVMA 2014).

That it remains legal to use these poisons in Canada fails to satisfy the public's expectations of the government to prohibit animal cruelty.

## **2. The environmental risks posed by these products are unacceptable because they pose a threat to non-target species, including species at risk of extinction, and biodiversity**

Each of these poisons is delivered in baits, which do not always attract the intended individual. Although these poisons are often used to target rodents and/or wild canids, many other animals have been unintentionally killed by them, including species at risk of extinction, people, livestock and pets (Proulx et al. 2015, Cowan & Blakley 2015, PMRA 2014, Randall 1981). Moreover, the residual poison left in the tissues of victims of Compound 1080 or strychnine is toxic to scavengers and can therefore affect many species in an ecosystem. For this reason, these poisons are food chain killers.

### Strychnine

Strychnine-laced baits intended for wolves that were placed in Alberta's Little Smoky caribou range by trained government staff unintentionally killed at least 243 non-target animals from 11 species between 2005 and 2017 (Hervieux et al 2014 [supplementary data] & AEP FOIP E17-G-1191), including a Threatened grizzly bear, despite permit conditions intended to prevent non-target poisoning.

In the past, strychnine use as a rodenticide has been documented as having contributed to the endangerment of the long-tailed weasel in the Prairies, and local extirpation of the American badger (Proulx & MacKenzie 2012), which was subsequently designated a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2012). Reports suggest that poisons have had an adverse impact on populations of burrowing owl (Hjertaas et al. 1995) and swift fox (COSEWIC 2009) and have resulted in the death of many other species, including thousands of songbirds in Saskatchewan in 2001 alone (PMRA 2005) and pronghorn antelope, which weigh more than 100 times the amount of the non-target rodents strychnine is typically used to poison.

Strychnine is water soluble and expected to persist in soils unless specialized microbial populations are present (PMRA 2005). It could move in the environment during runoff events, and during the last (incomplete) evaluation of strychnine, "no data on the environmental fate of strychnine under terrestrial field conditions were available for review" (PMRA 2005). The PMRA insisted that the probability of strychnine entering and moving through the environment, including aquatic environments where it has been demonstrated as moderately to highly toxic to aquatic life, is not of concern because the use of strychnine is localized. However, field investigations in the Little Smoky caribou range, Alberta in 2018 exposed strychnine baits laid for wolves directly at the surface of a frozen river. Of 16 strychnine bait sites checked, 6 were unmarked but still had visible draw bait carcasses, some with partially exposed bait mounds. One of these unmarked sites had blood streaked bait mounds exposed by wildlife, and 1 dead raven, a non-target mortality, suggesting active use. Subsequent toxicity testing confirmed the presence of strychnine in a piece of meat found at an unmarked bait site (Animal Health Laboratory, 2018). Deep snowpack that prevented thorough investigation is likely to have also made it impossible for managers to ensure all strychnine tablets were removed from unmarked sites, if in fact they were removed at all. This investigation suggests it is impossible to prevent strychnine from entering the environment during spring thaw when snow and superficial river ice breaks.

### Compound 1080

Before discontinuing use of Compound 1080 in 2002, a BC government report found that 20-28% of wolf baits containing the poison were taken by non-target species (BCMOELP 1999). Compound 1080 is believed to be at least partly responsible for the decline of several species at risk in North America,

including the kit fox (Ginsberg & MacDonald 1990), California condor, and black-footed ferret (Defenders of Wildlife 1982). This is of great concern because use of Compound 1080 tablets and liquid in livestock protection collars overlaps with species at risk ranges outlined by the Committee on Endangered Wildlife in Canada (COSEWIC) for American badger, swift fox, burrowing owl, ferruginous hawk, peregrine falcon, grizzly bear and wolverine.

#### Sodium Cyanide

In the United States, M-44 sodium cyanide bombs deployed by Wildlife Services, a government agency, have killed swift and grey fox (both species at risk in Canada), red fox, black bear, bobcat, fisher, marmot, raccoon and raptors, among other species (USDA Animal and Plant Health Inspection Service 2017). In Alberta, use of M-44 cyanide has occurred in grizzly bear and sensitive raptor range (FOIP AF 2017-G-0010 2017).

### **3. Current conditions for use are not adequately enforced and sometimes impossible to adhere to**

At least 1 active strychnine poison site in Alberta's Little Smoky caribou range was unmarked during a ground investigation in 2018 (S. Fink, Pers. Comm. April 30 2018). Marking poison sites is perhaps the easiest permit condition to adhere to, and the Alberta Government's failure to do so demonstrates gross incompetency.

Moreover, the published research from outlining past wolf poisoning with this same strychnine use permit #20410 in Little Smoky makes it clear that the bait stations were not checked at least every 7 days, which is mandatory according to the strychnine permit #20410. Instead, "bait stations were checked, on average, every 8 days; at which time, any wolf carcasses were promptly removed and incinerated" (Hervieux et al. 2014). During and after snowfall, it is impossible to track, find and remove all poisoned wildlife, whether target species or not, in remote areas such as the Little Smoky. This permit holder was not investigated, despite the clear violations of the strychnine product permit #20410 (Kirby S. Pers. Comm. 2017).

### **4. The health risks of these products are unacceptable, given that they pose a threat to the health and safety of Canadians, as well as people, pets, and livestock**

The Minister has a statutory duty under the PCPA to prevent unacceptable risks to human health. As a matter of global security, Compound 1080, strychnine, and cyanide have all been listed as potential biological warfare agents (Hickman 1999).

Labels and warning signs cannot prevent public safety or environmental damage incidents if they are not being heeded. In addition, human error and accidents occur and are under-reported. Given the high toxicity of these poisons, even sporadic non-compliance with Health Canada's conditions for use should indicate that the risks outweigh any perceived benefit.

#### Compound 1080:

There is no antidote for Compound 1080. Labelled as a Class 1A poison (the most toxic category) by the World Health Organization (WHO) and considered a super poison by the U.S. Environmental Protection

Agency (EPA), Compound 1080 is a colourless, odourless salt that is highly soluble in water. Following terrorist attacks in America in 2011, the FBI listed it as a highly toxic chemical considered likely to be used by terrorists. Compound 1080 has resulted in accidental human deaths (CCWHC 1999).

#### Sodium Cyanide

Sodium Cyanide can kill all warm-blooded animals, including humans if “swallowed, inhaled or absorbed through the skin” (Alberta Agriculture and Forestry Food Safety and Technology Division 2016). Recently, a young boy was injured when he was accidentally exposed to sodium cyanide following his dog’s deployment of an M-44 device (Wilkinson 2017). The dose intended for a single canid killed the dog and caused critical harm to the boy. Aside from short-term health effects from human exposure to sodium cyanide (including death), there are also serious long-term health effects that come with exposure to this toxin.

#### Strychnine

Strychnine is a bitter, odourless, crystalline, and highly toxic powder. Strychnine is soluble in water, expected to be persistent in soil, and has the potential for bioaccumulation (PMRA 2005). The EPA rates strychnine as a Category 1A toxicant, the most acute class (EPA 1996). Strychnine is highly toxic to many animals, and in 2005, Health Canada emphasized “the primary health concern with any strychnine formulation is its acute toxicity to humans”.

### **5. The usefulness of these products is questionable because indiscriminate killing of wildlife does not often solve the conflicts the poisons are intended to address, results of localized use are often unassessed and/or are poorly documented, and better alternatives exist**

Given the availability of other more appropriate measures to protect livestock from natural predators, and the ineffectiveness of these poisons to reduce target rodent populations, the use of strychnine, sodium cyanide, and Compound 1080 is unacceptable. A growing body of research evidences that indiscriminate killing of large carnivores does not have the intended effect of reducing conflicts with livestock, and indeed may exacerbate such conflicts (e.g. Santiago-Avila et al. 2018, Treves et al. 2016).

Furthermore, whether or not using strychnine, Compound 1080 and/or sodium cyanide benefits livestock producers or ungulate managers in Canada remains unclear, because the results of localized use are often unassessed or poorly documented (see FOIP E17-G-0418). For example, occurrence reports filed by staff at the Alberta government for the use of Compound 1080 in response to livestock depredation by wolves indicated “baited calf totally consumed. Unable to locate carcasses.” (File # 15-8694) and “(baited) calf has been consumed. No carcasses located.” (File # 15-6177). This is especially troubling given that these occurrences happened after a Special Review of Compound 1080 was completed by PMRA in 2014 (RVD2014-03) in response to concerns about the risks and value of use. The Alberta Environment and Sustainable Resource Development, the permit registrant for predacidal strychnine and Compound 1080 noted in the 2012 report update on the *Use of Toxicants for Wildlife Management* that:

*it is very difficult to monitor its [Compound 1080] effectiveness as it is slow acting; animals*

*can travel long distances before succumbing to its toxicity. Retrieval of carcasses is typically impossible and secondary poisoning of other wildlife species feeding on the carcass is a potential concern.*

No information regarding the efficacy of the poisoning can be completed when the carcasses of the poisoned animals cannot even be located. Moreover, the effect on non-target species is also unknown.

The primary objective of Canada's regulatory system governing pesticides is to promote sustainable development by preventing unacceptable risks to individuals and the environment from the use of pest control products. Pest control products can be registered for use in Canada under the Pest Control Products Act (PCPA 2002) only where their value is acceptable, in that their use would be efficacious. As Minister, you have a mandatory duty to "encourage the development and implementation of innovative, sustainable pest management strategies by facilitating access to pest control products that pose lower risks and by other appropriate measures" (PCPA ss.4(2)(b)). For example, the previous proposed re-evaluation decision of strychnine by PMRA emphasized the need for research into alternative practices (PMRA 2005). However, funding for this research and "the ongoing work by a national expert committee to identify, develop and promote a pest management control strategy for Richardson's ground squirrels" (PMRA 2007) was pulled, the assessment planned for 2008 never occurred, and PMRA failed to complete the full evaluation for this highly toxic poison. Despite environmental concerns published over a decade ago, permits for its use extend to multiple provinces. Such regulatory failures do not elicit our confidence in your Ministry's ability or intent to protect Canadians and the environment from unnecessary risk.

## References

- Alberta Agriculture and Forestry, Food Safety and Technology Division, Animal Health and Assurance Branch Inspection and Investigation Section. 2016.
- Alberta Agriculture and Forestry. 2017. Documents received through Freedom of Information and Privacy Act, Request No. AF 2017-G-0010 2017. Available at: <https://www.wehowl.ca/foip>  
<https://www.wehowl.ca/foip>
- Alberta Environment and Parks. 2018. Documents received through Freedom of Information and Privacy Act, Request No. E17-G-0418. Available at: <https://www.wehowl.ca/foip>
- Alberta Environment and Parks. 2018. Document received through Freedom of Information and Privacy Act, Request No. E17-G-1191. Available at: <https://www.wehowl.ca/foip>
- Alberta Environment and Sustainable Resource Development. 2012. *Use of Toxicants for Wildlife Management*.
- Animal Health Laboratory. 2018. Final Report, Case G18-030528. University of Guelph Laboratory Services.
- AVMA (American Veterinary Medical Association). 2013 AVMA Guidelines for the euthanasia of animals: 2013 edition. Schaumburg, IL, USA: American Veterinary Medical Association. URL <https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>
- BCMOELP. (British Columbia Ministry of Environment, Lands and Parks). 1999. Final Pesticide Use Report for Permit #139-061-96/98.
- Brown, Chambers, and Singleton. 2002. Pre-sowing control of house mice (*Mus domesticus*) using zinc phosphide: efficacy and potential non-target effects. *Wildlife Research* 29:27-37.

- CCWHC (Canadian Cooperative Wildlife Health Center). 1999. 1080 Review. Unpublished report prepared for the Wildlife Branch BC Ministry of Environment, Lands and Parks, Victoria. 8 pp.
- CCAC (Canadian Council of Animal Care). 2003. CCAC Guidelines: On the Care and Use of Wildlife. Ottawa, Ontario, Canada: Canadian Council on Animal Care.
- CVMA (Canadian Veterinary Medical Association). 2014. Pest control. Position statement. <http://www.canadianveterinarians.net/documents/pest-control> Accessed November 10, 2017.
- Cowan and Blakley. 2015. A retrospective study of canine strychnine poisonings from 1998 to 2013 in western Canada. *Canadian Veterinary Journal*. 56:587–590.
- Defenders of Wildlife. 1982. 1080, the case against poisoning our wildlife. Washington, D.C., special report.
- Eason and Wickstrom. 2001. Vertebrate Pesticide Toxicology Manual (Poisons). Department of Conservation Technical Series No. 23. Wellington, New Zealand: Department of Conservation.
- Environmental Protection Agency (EPA) – Office of Prevention – Pesticides and Toxic Substances July 1996. Reregistration Eligibility Decision. Facts: Strychnine.
- Environmental Protection Agency - Office of Prevention - Pesticides and Toxic Substances. July 1996b. Reregistration Eligibility Decision: Strychnine.
- Ginsberg and MacDonald. 1990. Canid Action Plan with updated references from Foxes, Wolves, Jackals, and Dogs, an action plan for the conservation of canids the IUCN/SSC Canid Specialist Group's 1990 Action Plan IUNC/SSC Canid Specialist Group IUCN Wolf Specialist Group (L.D. Mech, Chair). IUCN Publications. 116 pp.
- Hervieux, Hebblewhite, Stepnisky, Bacon, and Boutin. 2014. Managing wolves (*Canis lupus*) to recover threatened woodland caribou (*Rangifer tarandus caribou*) in Alberta. *Canadian Journal of Zoology*. 92:1029 - 1037.
- Hickman. 1999. A Chemical and Biological Warfare Threat: USAF Water Systems at Risk. The Counterproliferation Papers - Future Warfare Series No. 3. USAF Counterproliferation Center. Maxwell Air Force Base, Alabama. <http://www.globalsecurity.org/wmd/library/report/1999/hickman.htm>
- Hjertaas, Brechtel, De Smet, Dyer, Haug, Holroyd, James, and Schmutz. 1995. National recovery plan for the Burrowing Owl. Report No. 13. A report prepared for the Committee for the Recovery of Nationally Endangered Wildlife. Canadian Wildlife Federation. 33 pp, at 17, 26.
- Khan. 2010. Overview of strychnine poisoning. In: *The Merck Veterinary Manual*, 10th Ed, ed. C.M. Kahn & S. Line, pp. 2744–2746. Whitehouse Station, NJ, USA: Merck & Co.
- Kirby, S. PMRA. Personal communication at PMRA office, September 22 2017.
- Krieger. 2010. Hayes' handbook of pesticide toxicology. 3d Ed. Vol 1. Elsevier Press, London UK.
- PMRA. 2005. Proposed Acceptability for Continuing Registration document PACR2005-08, Re-evaluation of Strychnine. Catalogue number: H113-18/2005-8E (H113-18/2005-8E-PDF). <http://publications.gc.ca/collections/Collection/H113-18-2005-8E.pdf> Accessed May 24, 2018.
- PMRA. 2007. Update on the Re-evaluation of Strychnine. Re-valuation Note REV2007-03. Catalogue number: H113-5/2007-3E (H113-5/2007-3E-PDF). <http://publications.gc.ca/collections/Collection/H113-5-2007-3E.pdf> Accessed May 24, 2018.
- PMRA. 2014. Re-evaluation Decision: Special Review Decision for Compound 1080, Ref. no. RVD2014-03. Catalogue number: H113-28/2014-03E [http://publications.gc.ca/collections/collection\\_2014/sc-](http://publications.gc.ca/collections/collection_2014/sc-)

[hc/H113-28-2014-3-eng.pdf](#) Accessed May 24, 2018.

Proulx, Brook, Cattet, and Paquet. 2015. Poisoning wolves with strychnine is unacceptable in experimental studies and conservation programmes. *Environmental Conservation* 43:1-2.

Proulx and MacKenzie, 2012. Relative abundance of American badger (*Taxidea taxus*) and red fox (*Vulpes vulpes*) in two landscapes with high and low rodenticide poisoning levels. *Integrative Zoology* 7: 41-47.

*R v DLW*, 2016 SCC 22 at para 69.

*Reece v Edmonton (City)*, 2011 ABCA 238 at para 58.

Randall. 1981. "Bitter Truths About 1080". *Defenders of Wildlife*, Vol. 96, No. 5 pp. 18-21.

Santiago-Avila, Cornman, Treves. 2018. Killing wolves to prevent predation on livestock may protect one farm but harm neighbors. *PLoS ONE*, published Jan 10, 2018.

Sherley. 2007. Is sodium fluoroacetate (1080) a humane poison? *Animal Welfare* 16: 449-458.

Sikes R., Gannon, W. & the Animal Care and Use Committee of the American Society of Mammalogists. 2011. Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *Journal of Mammalogy* 92: 235–253.

Treves, Krofel, and McManus. 2016. Predator killing should not be a shot in the dark. *Frontiers in Ecology and the Environment* 14(7):380–388.

The Two Way. April 11, 2017. After Outcry, USDA Stops Using 'Cyanide Bombs' In Idaho — For Now <http://www.npr.org/sections/thetwo-way/2017/04/11/523420494/after-outcry-usda-stops-using-cyanide-bombs-in-idaho-for-now> Accessed January 4, 2018.

United Nations. 2009. Department of Economic and Social Affairs Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or not Approved by Governments. Thirteenth Issue. <http://www.un.org/esa/coordination/Consolidated.list-13FinalFinal.pdf> Accessed January 4, 2018.

USDA Animal and Plant Health Inspection Service – Program Data Report, as referenced by The Center for Biological Diversity: <http://therevelator.org/big-picture-cyanide-killers/>. Accessed October 3 2017.

Wilkinson. 2017. Dog's Death Spotlights Use of Cyanide 'Bombs' to Kill Predators National Geographic – Wildlife Watch. <http://news.nationalgeographic.com/2017/04/wildlife-watch-wildlife-services-cyanide-idaho-predator-control/> Accessed January 4, 2018.