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FROM THE FIELD

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Considerations for furbearer trapping regulations to prevent grizzly bear toe amputation and injury

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Abstract

Under the North American Model of wildlife Conservation, wildlife managers are encouraged to update management approaches when new information arises whose implementation could improve the viability of wildlife populations and the well-being of animals. Here we detail an observation of several grizzly bears with amputated toes in southeast British Columbia between 2016-2020 and assemble evidence to inform management strategies to remedy the issue. During the capture of 59 grizzly bears, 4 individuals (~7%) had amputated toes on one of their front feet. The wounds were all healed and linear in nature. Further opportunistic record collection revealed that similar examples of amputated toes occurred beyond our study area in neighboring mountain ranges and internationally. We found evidence that seasonal overlap between the active season for grizzly bears and the fall trapping seasons—for small furbearers with body-gripping traps and for wolves with foothold traps—were frequently responsible for toe amputation. Photo evidence suggested that body-gripping traps were the main trap type associated with toe amputation. Multiple options to reduce or eliminate the incidental amputation of grizzly bear toes exist, and the options have varying degrees of expected efficacy and require differing levels of monitoring. One option is to delay the start of the marten trapping season until December 1, when most bears have denned, instead of opening the season on or prior to

November 1, when more than 50% of bears are still active. An alternative solution, such as a license condition that requests trappers narrow trap-box entrances to exclude bear feet while still allowing entrance of target furbearers, has the potential to minimize accidental capture of bears, but the effectiveness of this approach is unknown. Finally, experimental toe extraction trials suggested that better anchoring traps was not a viable solution given that adult grizzly bear feet only came free from body-gripping traps 20% of the time under maximum human force. At least 230 kg pull was required to consistently free toes from body-gripping traps, which not all bears will be able to produce unless the cable is long and allows a running start. Solutions that do not involve season changes will require monitoring of efficacy and compliance to ensure success.

KEYWORDS

adaptive management, amputation, animal welfare, body-gripping trap, bycatch, Conibear, foothold trap, furbearer, grizzly bear, incidental catch, leghold trap

IDENTIFYING AN ISSUE

Grizzly bears (*Ursus arctos*) are wide-ranging mammals that rapidly ingest high-energy foods in preparation for denning (McLellan 2011). In the Rocky Mountains of southern Canada, grizzly bears occupy large home ranges (200–1300 km^2) where they search for mates and seasonal foods (Graham and Stenhouse 2014). Key natural foods for grizzly bears include high-calorie fruits, abundant herbaceous vegetation, ungulates (killed or scavenged), ants, and roots (McLellan and Hovey 1995, Munro et al. 2006). In addition to natural foods, grizzly bears are well known to take advantage of unsecured human foods such as residential fruit trees, garbage, roadkill, grain, and livestock (Craighead and Craighead 1972, Lamb et al. 2017, 2019, Morehouse et al. 2020). Food-motivated behavior is generally adaptive and allows grizzly bears to increase their weight by about 35% in the 6–8 months of non-denning season (McLellan 2011), but bears can also be attracted to, and allowed to feed on, human-sourced foods, which can create human and bear safety issues (Lamb et al. 2020).

Challenges to human-bear coexistence are exacerbated when abundant grizzly bear populations co-occur with humans in areas with abundant natural foods and accessible human-sourced foods. The southeast corner of British Columbia, Canada, is home to abundant grizzly bear populations, productive habitat, and growing rural and urban communities. In response to recent grizzly bear population declines, ecological trap dynamics, and high human-caused mortality rates (Lamb et al. 2017, 2019, 2020), we initiated a research project to better understand sources of grizzly bear mortality and examine how use of the landscape influenced population dynamics. Between 2016 and 2020, we captured and radio collared 59 grizzly bears in the Elk Valley near Fernie, British Columbia. (Figure 1A). Here we focus on a particular observation from our live capture work in which we noticed that several grizzly bears had amputated toes. Our observations of toe amputation were important because ethics and values have a major role in wildlife management in British Columbia and resulted in closing a decades-long sustainable grizzly bear hunt in 2018, despite a large and viable population (Auditor General 2017, McLellan et al. 2017, Hatter et al. 2018). Thus, identifying how toes were amputated and mitigating the source of amputation became one of the objectives of our study.

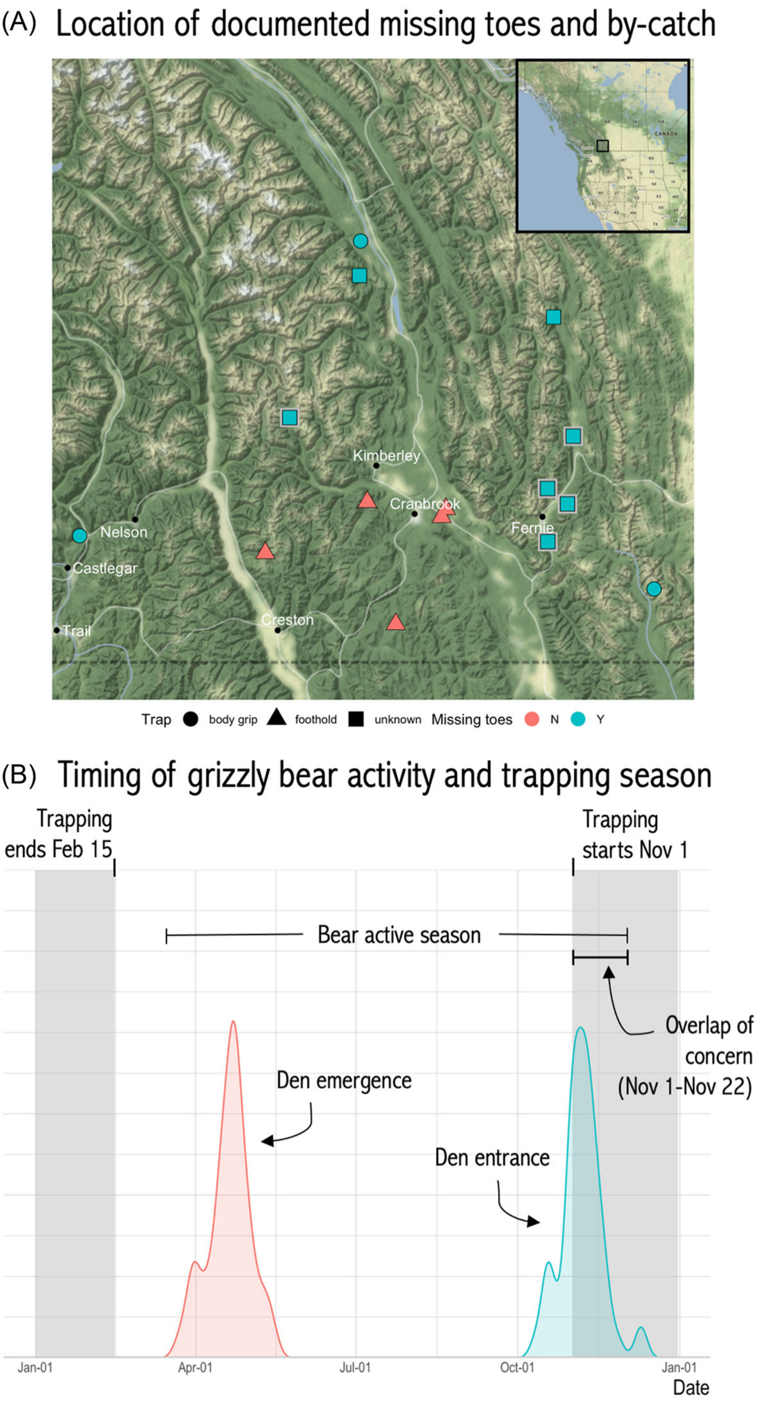

FIGURE 1 (A) Locations of observations of bears with amputated toes and bears with traps on their feet. Detections made through research are outlined in grey, while detections opportunistically gathered throughout southeast British Columbia are not outlined in grey. (B) The grizzly bear active season, defined from 61 collared bear den emergence and entrance dates, with the marten trapping season (November 1 to February 15) shown in grey. The 95th percentile of den entrance dates was November 22. We suggest that December 1 represents an evidence-based start date for trapping to reduce conflicts between bears and trappers.

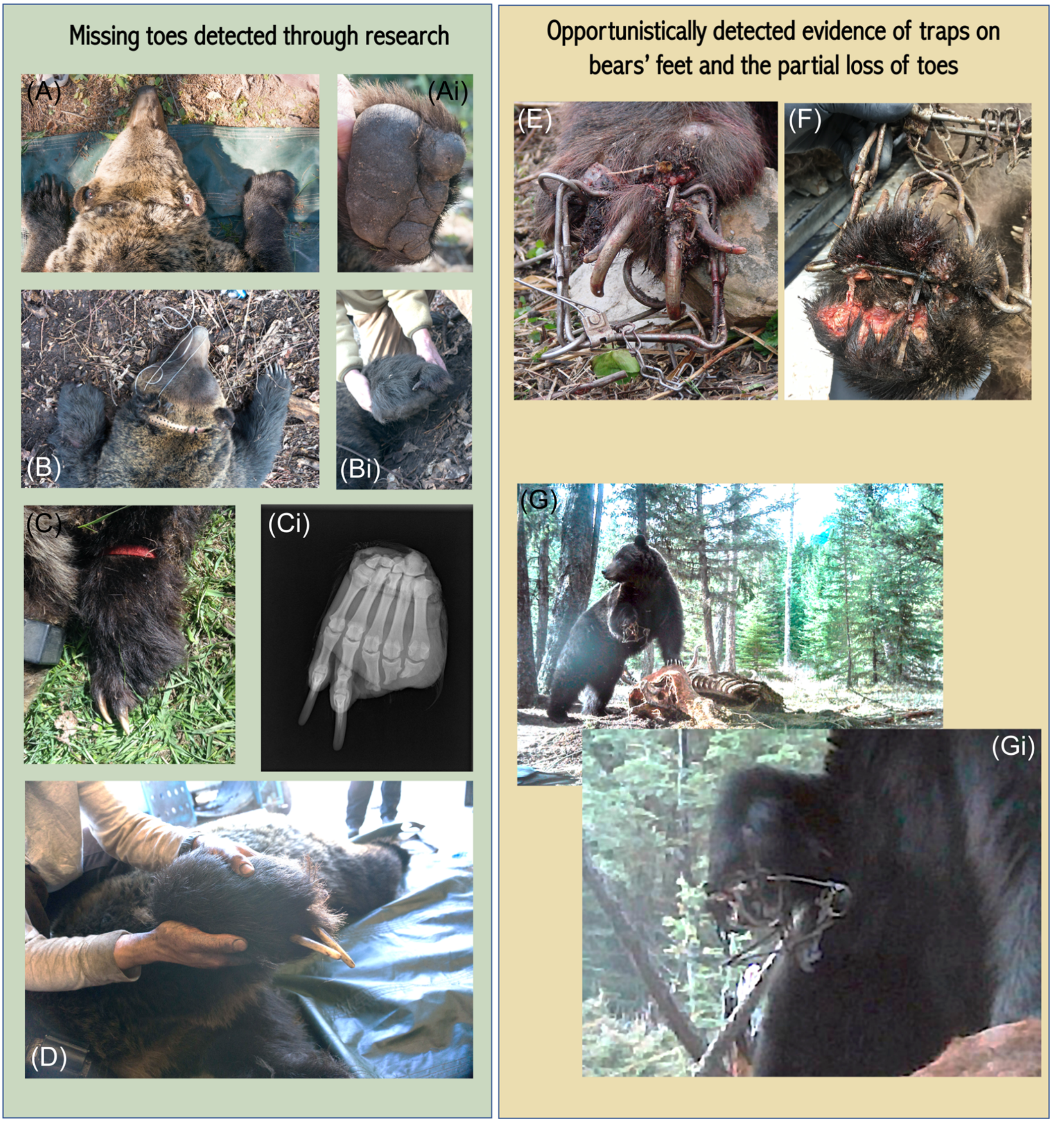

FIGURE 2 Animals detected with amputated toes through research captures in the Elk Valley (A–D), and anecdotal evidence of grizzly bears with traps on their feet (E–G). Each letter in A-D represents one of the 4 unique individuals detected with amputated toes. An X-ray of the foot of EVGM55, who was killed in a conflict with a cattle rancher is shown in Ci. (E) A body-gripping trap on the foot of a hunter-killed grizzly bear from the Flathead Valley. (F) The paw of a 1-year-old grizzly bear stuck in a body-gripping trap captured by conservation officers near Pass Creek due to conflict behavior from a mom and offspring; severe infection was present, and the toes had nearly completely separated from the foot by the time of capture. (G) A grizzly bear with a body-gripping trap on its foot detected feeding on a cow carcass by a remote camera west of Invermere, British Columbia, Canada.

Grizzly bears have 20 digits. Of the 59 individual bears captured, 4 (~7%) were missing some of the toes on one of their front feet (Figure 2). In all cases, the toes lost were adjacent and terminated in a linear plane, and the injury had healed. At the time of capture, the bears with amputated toes were all between the ages of 4 and 12 years old. Three of the 4 bears were male, whereas our larger collar sample had slightly more females ($n = 31$) than males ($n = 28$). The female with amputated toes was captured with a yearling cub, suggesting that amputated toes did not preclude reproduction. Based on radio collar telemetry data, the bears with amputated toes appeared to move around the landscape similarly to bears with all their digits (C. Lamb, University of British Columbia, unpublished data). Although toe loss did not appear to impact their locomotion, it may have influenced conflict behavior. Three of the 4 individuals with amputated toes were involved in human-bear conflicts. One of the 4 bears was killed shortly after capture while breaking into a rancher's calf pen, another was likely involved in an attack on a human, and a third was captured by conservation officers in late fall after complaints of bear issues on a farm. Although the sample size for conflict behavior is small, less than one third of the bears with all their toes ($n = 55$) died or were involved in conflict during the time they were collared. A potential reason for elevated conflict behavior observed in the bears with amputated toes could be related to challenges feeding on natural foods at certain times of year, such as digging roots during spring and fall (McLellan and Hovey 1995), or these bears could be naturally bolder individuals and thus more likely to become both trapped and involved in future conflict. Alternatively, the pattern of increased conflict could be an artefact of the small sample sizes we had available ($n = 4$). Nevertheless, although we had identified a concerning pattern of amputated bear toes, the healed wounds left us little evidence for the cause of the toe loss.

SEARCHING FOR CAUSE

We consulted with veterinary professionals to determine if the amputated toes could be congenital (i.e., lost before birth and due to natural causes). After review of multiple photos and X-rays (Figure 2) there was no evidence to suggest that the amputations were congenital. However, there was strong evidence for injury post-birth, including toe bone fracture and healing, and consistent linear wounds suggesting amputation related to human sources, given that linear wounds such as these would be rare in nature.

Southern British Columbia is fortunate to have a long history of people interacting with grizzly bears through research, human-wildlife conflict work, hunting, guide outfitting, trapping, and simply living in bear country. After identifying the amputated toe issue, we spoke with First Nations community members and land guardians, scientists, conservation officers, wildlife managers, guide outfitters, and trappers. A common topic in our discussions was grizzly bears being incidentally caught in baited traps set for furbearers, particularly in traps set for marten (*Martes americana*) and wolves (*Canis lupus*). Nontarget captures stemming from legal trapping activities have been reported for many species, including cougars (*Puma concolor*) which have been incidentally captured in foothold traps or snares set for wolves and bobcat (*Lynx rufus*; Knopff et al. 2010, Andreasen et al. 2018). Free-ranging cats, dogs, and birds can also be incidentally caught in furbearer traps (White et al. 2021). We knew that grizzly bears could be caught in foothold traps set for wolves, given that in recent years several bears had either been killed in, or required release from, wolf traps in southern British Columbia (M. Proctor, Birchdale Ecological, and C. Lamb, University of British Columbia, unpublished data). However, we were less familiar with the role that body-gripping traps could play in the loss of toes. Body-gripping traps are killing traps designed for furbearers such as marten, skunk (*Mephitis mephitis*), fisher (*Pekania pennanti*), weasel (*Mustela sp.*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), bobcat, and lynx (*Lynx canadensis*; Figure 2). Trapping legislation in British Columbia allows for the use of a variety of trap models made by different manufacturers, provided the devices reliably and humanely kill their target species (Province of British Columbia 2021, White et al. 2021). In our region of interest (Figure 1A), small body-gripping traps are most often used to capture marten or weasels and are typically set at the mouth of a baited wooden box that is attached to a tree at a height of approximately 1.5 meters from the ground. Reports from trappers suggested that at times grizzly bears would get their feet stuck in these traps, which are often anchored with light wire or a staple, and that bears would leave the site with the traps affixed on their toes.

Over a 2-week period in June 2018, we deployed 4 Northwoods 155 body-gripping traps (Oneida Victor, Cleveland, OH, USA), complete with wooden boxes and bait (usually a small piece of meat), on trees to see if bears would investigate these traps. We wired the traps in such a way that they could fire but not close and trap the bears. We monitored the traps with remote cameras to see if bears would visit and spring the traps. Grizzly bears visited all 4 traps and sprung 2 of them. Pictures and videos showed bears investigating the traps and manipulating the boxes with their paws (Figure 3A–C). Video showed that one of the traps was set off with a bear's nose, but the cause of the other trap being set off could not be determined because we only had pictures, not video, of bears investigating the trap. Although our data represent a small trial, younger bears seemed to investigate and set off traps more often than older bears. Even with the small sample, it was clear that baited traps attracted bears and that bears set off the traps as they tried to get the bait. We heard from some trappers that they voluntarily delayed the start of their marten trapping season (which legally opens November 1; Province of British Columbia 2021) by approximately one month to avoid having bears wreck their trap sets, further confirming that bears are attracted to these common sets. The voluntary delays to avoid catching bears are pragmatic, i.e., to reduce trap loss, but are also consistent with mandatory trapper training in British Columbia (21 hours, 3 full days) which educates trappers about ethical harvesting and reducing bycatch.

We became more convinced that furbearer traps were the cause of the amputated toes as we accumulated anecdotes and photo evidence from hunters, remote cameras on ranches, and conservation officers of grizzly bear

FIGURE 3 Grizzly bears detected at trial marten body-gripping traps (A–C). The traps were wired so they could spring but not close on bears' feet, and they were set for 2 weeks in areas frequented by bears. Investigatory behavior was common, and 2 of the 4 deployments were set off. (D) X-rays from experimental trials assessing if body-gripping traps would break bones immediately, and (E) photos showing how we tested whether bears could easily pull their feet free from traps. Here a person attempted to free a grizzly bear foot by pulling on the leg with maximum human pull.

feet stuck in traps (Figure 2). Photos consistently showed a body-gripping trap affixed just behind the toes and often there was visual evidence that amputation was underway. At this point we had evidence that 1) the amputated toes were not congenital, 2) when toes were amputated the wounds were linear and bones terminated along their length or at the joint (Figures 2A–D, and 3). The photo evidence suggested that the traps had been on the bears' feet for weeks to months and that the pressure from the trap appeared to be causing necrosis, due to a lack of circulation, which resulted in subsequent infection and sloughing of the tissue (C. Lewis, Tanglefoot Veterinary Services, personal communication, Figure 2E–F). Through experimental testing, detailed below in the Honing a Solution section, we show that the traps do not immediately fracture bones even for cubs which have smaller, more fragile bones than adults. Taken together this evidence suggests that bears were losing their toes in body-gripping traps due to the prolonged duration of the trap on their foot, not the initial snap of the trap. The bone loss observed in Figure 2 Ci either happened due to a weakening of the bone during necrosis and osteomyelitis, force applied to the bone from the trap while the bear walked or ran, or from the bear chewing off this portion of the toe and bone if sensation had been lost.

Beyond identifying a likely cause for the amputated toes, the photo evidence revealed that bears with traps stuck on their feet and amputated toes was an issue beyond the extent of our study area. In addition to the records of body-gripping traps on bears' feet in southeast British Columbia, photos of a grizzly bear with a body-gripping trap on its foot were reported in Wyoming, USA in 2017 (McKim 2017), and brown bears with body-gripping traps on their feet are observed almost every year in Finland (Kai-Eerik Nyholm, Finnish Wildlife Agency, personal communication).

We were also aware of multiple reports of grizzly bears being caught in foothold traps set for wolves, and we believe this is another possible source of toe loss although less so than body-gripping traps. Between 2010 and 2020, at least 5 grizzly bears in southeast British Columbia were caught in wolf foothold traps (with the trap often closing right behind the toes) and had to be released by conservation officers and biologists (M. Proctor, Birchdale Ecological, and C. Lamb, University of British Columbia, unpublished data). However, in the records we were able to collect, body-gripping traps were the only trap on bears' feet where it was clear the trap was causing toe loss ($n = 3$; Figure 2E, F). In one case, it is suspected that a bear's foot became stuck in a body-gripping trap set on the ground for skunks on private property. However, given the near ubiquity of marten trapping with box traps across our region (an average of 2,082 marten were harvested annually in southeast British Columbia from 2013–2017), and the broad occurrence of amputated toes and traps on feet (Figure 1A), we focus on marten and weasel trapping as likely sources of most of the body-gripping traps that end up on bear feet.

We compiled data from collaring projects in adjacent areas within British Columbia to assess if a broader pattern of toe loss could be revealed. Collaring projects in the Selkirk and Purcell Mountains near Nelson and Creston (Figure 1A) between 2004 and 2018, and in the Flathead Valley southeast of Fernie between 1978 and 2020, captured 72 and 206 grizzly bears respectively. Of the 20 bears captured in the Purcell Mountains, one adult male bear (5%) fit the pattern of having healed but amputated toes, whereas none of the 52 bears captured in the Selkirk Mountains had amputated toes. Grizzly bears were accidently captured by trappers in foothold traps set for wolves on at least 3 occasions during the study in the Selkirk and Purcell Mountains, but no evidence of toe loss due to incidental grizzly bear capture in footholds was reported, likely because bears were either released from the traps or killed. None of the bears captured in the remote Flathead Valley had amputated toes; however, a hunter killed a bear just north of the Flathead study, closer to a human-settled valley, with a body-gripping trap on its foot (Figure 2E). Results from adjacent studies did not reveal any general insights into the observed spatial distribution of bears with amputated toes. The paucity of amputated toe records in these studies is not surprising given that traplines in British Columbia are distinct areas trapped exclusively by registered trappers, and variation in trapping intensity, target species, and timing creates variable exposure of bears to body-gripping traps across the landscape. The degree to which each study overlaps with human-settled valleys may have an influence on whether amputated toes are observed. Most grizzly bears caught in traps and with missing toes occurred within or adjacent to towns and highways (Figure 1A). Unsecured attractants in human settled valleys such as apple trees, garbage, roadkill, and livestock may increase bear use of low elevation areas and delay den entry perhaps increasing the chance of overlap with the onset of fall trapping activities in these areas and thus increases the likelihood of bears being incidentally trapped during this time.

Observations of bears stuck in body-gripping traps and bears with amputated toes have mainly been documented in the past 15 years and are not restricted to a single area or trapline, but rather occur broadly at low frequency across southeast British Columbia and beyond. Increased detection of bear toe loss could be related to an increase in grizzly bear research and monitoring; however, opportunities to identify issues have been abundant for several decades as many bears were captured by conservation officers, harvested by hunters, and monitored for research purposes in the Flathead. In recent years the increased use of stronger traps, as mandated by evolving humane trapping standards (White et al. 2021), may have created a situation where bears now have more difficulty extracting themselves from body-gripping traps when captured.

We summarized the den entry and exit dates for 61 animal-years in the Elk Valley to assess when bears were denning in the fall. We found the median den entry date (i.e., the date when 50% of bears had denned) was November 6, and the 95^{th} quantile of den entry was November 22, revealing a 3-week period of overlap between active bears and the beginning of the trapping season on November 1. We found no overlap between den emergence and the end of the trapping season; thus, we focus on fall trapping as the likely source of body-gripping traps that end up on bears' feet. More support for the idea that the concurrence of the fall active season for bears and the beginning of the trapping season is the main cause of amputated grizzly bear toes is that we have not seen similar problems of amputated toes in black bears (despite dozens being captured in the area annually by conservation officers), which den several weeks earlier than grizzly bears and would thus be less exposed to traps.

HONING A SOLUTION

Most trapping of furbearers is done in winter when fur is prime and most valuable (i.e., underfur is dense and guard hairs are long). Given that grizzly bears hibernate for the winter, trappers should generally be able to avoid accidently catching bears. However, some trapping seasons open in late fall, such as the marten season in much of British Columbia which begins November 1 and extends to February 15. Reducing the overlap between the period when bears are active, and the trapping season is open, is one way to minimize the amputation of bear toes and prevent trappers from losing their traps and having their sets destroyed by bears. Shifting the start of most trapping that coincides with the active bear season from November 1 to December 1 would eliminate most overlap between trapping and bears. A similar solution has been previously used in southeast British Columbia to avoid catching and killing bears in neck snares set for wolves, an issue first documented by the Flathead Grizzly Bear Project (McLellan 2015, Province of British Columbia 2021).

Indeed, such a change to the trapping regulations to address the amputated toe issue was proposed in 2019 but was not implemented. Much of the trapped landscape in the southeast British Columbia is rugged, mountainous terrain, and many trappers, especially in the western portion of the region, reported that they were unable to access their traplines for much of the winter beginning in early December due to high avalanche risk and associated safety concerns. The trappers stated they did most of their trapping in November and early December, and that shortening the season by delaying the opening date to December 1 would largely preclude their ability to harvest marten from their trapline. However, this was not a ubiquitous issue because many trappers in the eastern portion of southeast British Columbia reported voluntarily delaying their trapping until December to avoid bears, and other users of the landscape such as backcountry skiers and snowmobilers recreate in the mountains throughout the winter. Nevertheless, provincial biologists instead implemented a condition on all active trapping licenses in southeast British Columbia stipulating that, beginning in 2021, all body-gripping traps set for marten during the month of November must be enclosed in a box with an opening no larger than 8.9 centimeters (3-½ inches). The constricted entrance is created by adding a wooden faceplate with a hole onto the front of the box, which is expected to be narrower than most bear paws, precluding bears' access to the trap. The license condition also recommended that, prior to December 1, trappers should use these same boxes to enclose similarly sized killing traps set for other species on dry ground. The efficacy of the modified enclosure entrance in eliminating bear toe loss has not yet been tested, but the modified marten trap boxes are believed to be sufficient to ensure grizzly bears are not able to access a set trap. Because there is some uncertainty in the effectiveness of the modified enclosure approach compared to delaying the start of the trapping season, we recommend that compliance and efficacy is monitored to ensure this intervention is effective. Monitoring could take the form of cameras on baited traps with the constricted entrance that would assess if the design successfully excluded bear paws from the traps. Such monitoring would allow for changes to the approach as needed to ensure a successful outcome for bears and trappers alike.

An additional solution was proposed by government biologists, trappers, and reviewers, whereby sufficient anchoring of traps might allow an incidentally captured bear to pull its foot free, but we do not recommend its implementation. To address the viability of anchoring traps to remedy the amputated toe issue, we conducted a small experiment using front appendages of deceased bears and 4 types of traps approved for marten trapping in British Columbia (Province of British Columbia 2021). Our experiment consisted of 3 phases: the first used before and after X-rays to assess whether traps could immediately break bear toe bones, the second assessed whether bears could easily pull their feet free from traps (which we simulated by solidly anchoring the trap and having an 85 kg person attempt to free the feet by pulling on the leg with maximum human effort), and the third assessed how much dead pull (kg) was required to free the feet. We gathered the front appendages from one adult and 2 cub grizzly bears killed in the Elk Valley during fall 2021 and tested 4 approved body-gripping traps: 1) Bélisle Super X 120 (Belisle Enterprises, Blainville, Quebec, Canada), 2) Northwoods 155 (Oneida Victor, Cleveland, OH, USA), 3) Sauvageau 2001-5 (Les Pièges du Québec Inc, St-Hyacinthe, Quebec, Canada), and 4) Sauvageau 2001-6 (Les Pièges du Québec Inc, St-Hyacinthe, Quebec, Canada).

Results from our experiment suggested that body-gripping traps do not immediately break bones, but bears were unable to easily extract themselves from the traps. X-ray results confirmed that setting traps off on adult or cub feet did not break or fracture any bones (Figure 3D). Despite using maximum human effort and both sustained and jerking pulls, we only freed adult grizzly feet from traps 20% (95% CI = 7–33%) of the time, and cub feet 63% (95% CI = 53–72%) of the time (Figure 3E). Considerable variation in release efficacy was observed between trap models (Table 1), where the Sauvageau traps generally released bears the least frequently, and Northwoods 155 released bears the most frequently. Finally, we used a hand winch or a truck, with a scale affixed inline, to determine the steady pull required to extract an adult foot from the Sauvageau traps. The average pull required to free a foot was 164 kg (min–max = 91–232 kg, Table 2). Even after maximum pull was applied, we did not detect superficial

TABLE 1 Phase 2 results of the toe extraction experiment where maximum human pulling ability was applied in an attempt to free grizzly bear feet from traps. At least 5 trials were conducted for each age (adult or cub) and trap type, and the percent trials that ended with the foot releasing from the trap were recorded. The trials were conducted in Fernie, British Columbia, Canada, October 2021.

Age	Trap	Trials	Percent released
Adult	Bel120	5	0
Adult	North155	5	60
Adult	Sauv160	5	0
Cub	Bel120	5	100
Cub	North155	5	100
Cub	Sauv120	8	50
Cub	Sauv160	6	0

TABLE 2 Phase 3 results of the toe extraction experiment where a steady pull from either a hand winch or a truck was applied to extract adult feet from traps. The maximum pull (kg) recorded on an inline scale prior to release was recorded for each trial. The trials were conducted in Fernie, British Columbia, Canada, October 2021.

Age	Trap	Trials	mean	min	max
Adult	Sauv120	3	170	118	232
Adult	Sauv160	2	155	91	218

damage to toe bones or joints, although acute pain would likely be experienced by the bears during this time. We are not certain that bears could always muster the >230 kg pull required to ensure reliable release.

Based on the results of our experiment, we believe that better anchoring traps would present safety concerns for bears, trappers, and wildlife professionals that might be called to release bears. Although there is little work assessing the pull of a bear, a strong animal such as a horse provides some insight into the forces animals can generate. A horse can exert ~70% of its body weight at maximum exertion (Smith 1896). If we apply this weight to exertion relationship to the 140 kg adult female grizzly bear whose appendages we used, she would likely be able to generate a dead pull of ~98 kg. This 98 kg of dead pull would be well below the maximum of >230 kg required to reliably extract feet from these traps, and barely above the minimum recorded of 91 kg. As a result, bears may often be unable to escape from well anchored traps using a dead pull. There is a greater chance that bears could free themselves if a long leash (>2 m) is used so bears could run and generate more pull. A 140-kg bear can generate between 400–1000 kg of pull with a running start (Flaa et al. 2009), however, damage to bears' feet and traps is possible in this case and we do not recommend this solution. Overall, our experiment suggests that bears may not be able to easily extract their feet from traps and better anchoring traps presents risk to people and bears. Furthermore, current regulations for trap check intervals on body-gripping traps can be up to 14 days in British Columbia and would require significant reduction (<24 hours) if bears could become permanently held in traps. Such a change in trap check intervals from 14 days to 24 hours would render most large winter traplines impractical for trappers.

The most viable solution to the amputated toe issue requires that bears' feet do not enter traps at all. We believe that changing the season length would be a reliable solution, but this change possibly reduces trapper access to trapping opportunities in portions of southeast British Columbia. Constricting the entrance size of the trap presents a simple solution but requires further testing to ensure the design is effective at excluding bears while not dissuading marten from entering. Constricting the entrance will also require financial and time resources from trappers who will have to modify their boxes, which may number in the hundreds. Modified entrance size requirements also require compliance monitoring, adding additional responsibilities to conservation officers. The solutions we present here have various pros and cons, and we hope that this work can help policy makers choose a solution that will resolve the amputated toe issue while ensuring trappers have sufficient opportunity to trap furbearers.

Trappers have a long history of supporting conservation efforts and are sentinels of changing landscapes and wildlife populations (White et al. 2021). However, trapping of furbearers in British Columbia has received increased scrutiny amidst shifting sociopolitical trends in society. Innovative strategies will be required from trapping organizations and wildlife management agencies to maintain public support while also recruiting and retaining the next generation of trappers. A tactful strategy to uphold public support is to proactively assess and react to emerging evidence that threatens social acceptance of trapping (e.g., grizzly bears with amputated toes), and where changes could help increase the well-being of animals. This approach is the backbone of the North American Model of wildlife management, and while emerging evidence or science can sometimes conclude no direct threat to wildlife populations, organizations must equally weigh social ramifications and understand that the future of trapping may be predicated more on social support than consensus over sustainability, such as was recently seen with grizzly bear hunting (Darimont 2017).

Here we document grizzly bears losing their toes after becoming stuck in baited furbearer traps. The timing of furbearer seasons is the primary issue, with trapping seasons opening 3–4 weeks before all bears have denned, creating a problematic period of overlap between active bears and baited traps (Figure 1B). We provide solutions to remedy grizzly bear toe amputation and urge immediate action.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ETHICS STATEMENT

Captures were in accordance with University of Alberta Animal Ethics No. AUP00002181 and Province of British Columbia Capture Permit No. CB17-264200.

DATA AVAILABILITY STATEMENT

All analyses and supporting data can be found at https://github.com/ctlamb/Grizzly-MissingToes.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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