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*Literature Review on the Welfare Implications of*  
***Leghold Trap Use***  
***in Conservation and Research***

(April 30, 2008)

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### THE ISSUE

A leghold trap (now often called a foot-hold trap) combines a foot plate and two curved bars with a spring-powered action that closes to hold an animal's foot. The trap is attached by a short chain to an anchor such as a stake or grapple hook to keep the animal in that area. Leghold traps are most commonly used on species such as coyote, bobcats, raccoons, and otter to harvest their pelt or to remove predators from an area containing humans, pets, livestock, recreationally hunted animals, or endangered species<sup>1</sup>—or to protect natural habitats or human communities from the negative effects of introduced species or over-population.<sup>2</sup> Leghold traps are also commonly used to capture animals for research manipulations (e.g. measuring, marking for identification and monitoring zoonoses) or relocation to another habitat. *The Association of Fish and Wildlife Agencies* provides best management practices (BMPs) outlining the most humane tracking techniques for use with a wide range of species, including recommended trap modifications.<sup>3</sup>

### ANIMAL WELFARE CONCERNS

Many commentators believe that restraining traps cause wild animals some degree of fear.<sup>4,5</sup> The skill, experience and goals of the technician and the protocol followed are important factors in determining the impact of a trap on an animal.<sup>5,6</sup>

**Immediate injury**—Publications describing trap refinement tend to equate animal welfare with injury alone, so data relating to other considerations is limited.<sup>4,7</sup> With the use of modern trap designs and improved procedures for setting traps, amputations and bone fractures are becoming more rare; swelling, hemorrhage, and lacerations still occur<sup>8</sup> and post-release survival may be impaired even by relatively minor injuries.<sup>9</sup>

**Restraint**—Being held and restrained is presumed to be distressing to many wild species, and limb restraint has been shown to cause more stress than cage enclosure for foxes and ferrets.<sup>7,10,11</sup> Raccoons seem to have particularly adverse reactions, spending extended periods attempting to escape<sup>12</sup> and having a high incidence of self-mutilation.<sup>12,13,14</sup> During restraint animals may die from exertion, predation or adverse climate.<sup>13</sup>

**Non-target animals**—Traps may capture under-sized animals or unintended species. Reported captures of non-target animals range from 0 to 67% of total catch,<sup>13,15,16,17,18</sup> but many studies do not fully report non-target catches and outcomes. Capture of some non-target animals can be reduced by selective trap placement or modifying the force necessary to activate the trap or sufficient to break free of the trap.<sup>14,19</sup> Traps may have a more severe impact on non-target animals;<sup>5,6</sup> for example, leg hold traps set for coyotes may be more damaging to small birds and animals and raccoons. Surveys of endangered animals such as flightless birds sometimes record high levels of trap injury.<sup>20</sup> Non-target animals can be released from leg hold traps, but their survival may be impaired.<sup>21</sup> More severe injuries may also result with multiple captures of the same animal in catch-and-release situations.<sup>18</sup>

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## REFINEMENT: TECHNOLOGICAL ADVANCES

Substantial efforts have been made to reduce the physical damage done by leghold traps which have been scrutinized more intensively than most other types of trap. International welfare standards for assessing restraining traps were developed by the *International Organization for Standardization* (ISO 10990-5:1999) and best management practices have been developed in response to these requirements.<sup>3</sup> Some of the major refinements are as follows:

**Offsetting and Padding**—Traps are now commonly set to leave a gap. Sharpness of the gripping edges is reduced by using a hard plastic surface without teeth. Both modifications help reduce severity of injuries.<sup>22,23,24,25</sup> As of 1994 uptake of padded traps was below 1%.<sup>26</sup>

**Trap Transmitters**—Devices are available that emit a signal once a trap has closed, allowing for more immediate capture or euthanasia of trapped animals.<sup>27</sup> This may reduce or eliminate mortalities due to exertion and predation.<sup>28,29</sup> Automatic timing devices can also record elapsed time to give an accurate record of duration of restraint.<sup>30</sup>

**Post-factory modification and species-specific trap designs**—Newly purchased traps often required substantial modification to improve efficacy and reduce injury.<sup>14</sup> Factory models seem to often have unsatisfactory features such as projections on jaws that need to be filed off.<sup>16</sup> Welfare outcomes can also be improved by modifying spring strength, chain length and using a swivel and/or shock absorber. Some injuries can only be avoided through a use of species-specific products such as the enclosed Egg trap for raccoons which prevents self-mutilation.<sup>12</sup> For this reason the appropriate use of traps requires extensive expertise and familiarity with best practices.

**Non-jaw trap designs**—Progress has been made in the design and use of cage, net, and snare traps to the extent that leg-hold traps are no longer automatically considered the preferred alternative. However, leg-hold traps may be the most selective or efficient of the currently available methods in some contexts.<sup>8</sup> In general, traps that contain the animal rather than restraining its limbs may cause less injury.<sup>7,18,31</sup> Foxes and ferrets are less stressed if captured using cage traps.<sup>10,11</sup> Cages may also be adapted to protect captured animals from predators and cold conditions. Leghold traps are used for capturing bobcats, feral cats, foxes, and otters. Cage traps have been declared to be ineffective<sup>32</sup> for many of these species; however, it is worth noting that some trappers have successfully used cage traps with these species in under favorable conditions.<sup>18,33,34,35</sup> Cage traps tend to fail when a habituation period is not employed prior to use (“prebaiting”).<sup>8</sup> It is the combination of many variables such as accessibility of terrain, shyness of the animal, and length of study that may ultimately determine which trap is the most humane option.

**Sedation and anesthetics**—Although their use is still difficult in field settings, tranquilizers may be attached directly to jawed traps where they are ingested by the animal and can reduce injuries, and presumably anxiety, during restraint.<sup>36,37,38</sup> Tranquilizers or anesthetics can also be delivered by pole or blow dart<sup>15</sup> prior to removing animals from traps. Rendering animals unconscious before handling may increase chances of later recapture.<sup>39</sup> Long-acting tranquilizers may also be used during periods of capture.<sup>15</sup>

## LEG HOLD TRAP USES THAT MAY BENEFIT ANIMALS OR SPECIES, OR PROTECT HUMAN SAFETY

In some circumstances, it may benefit individual animals to be trapped for relocation and the leg-hold trap may be the most efficient available method. For example, if wolves prey on cattle and are not deterred by non-lethal measures, they can be moved to areas further away from livestock to prevent them from being killed as a nuisance animals.<sup>40</sup>

Researchers have employed leg-hold traps to establish new populations of species,<sup>17,40</sup> and study risks to animal health such as lead poisoning,<sup>41</sup> tuberculosis,<sup>11</sup> toxoplasmosis,<sup>42</sup> and rabies.<sup>43</sup>

Studies using leg-hold traps represent a risk for captured animals, but they also provide information that can assist in reducing conflicts between wildlife and humans. Studies in which leg-hold traps have been employed have demonstrated that wolves may cross agricultural land without representing a significant risk to stock<sup>44</sup> and that jackals are not a major reservoir of rabies in Zimbabwe.<sup>43</sup>

## ALTERNATIVES: OTHER TRAPPING TECHNOLOGIES AND ALTERNATIVES TO TRAPPING

Leghold traps are versatile in terms of species and terrain. They are a readily available tool with a long history of use and refinement that tends to make them more familiar and effective than recently developed alternatives. In some settings, however, reliable alternatives to leg hold traps exist. Examples include obtaining information about animals remotely via cameras, or using sticky or barbed wire traps for collecting hair.<sup>6</sup> Although supervised capture techniques such as tranquilizer darts and nets are more costly they may allow for more rapid and less injurious capture. When euthanasia is the goal, shooting or kill traps have the potential to avoid stressful restraint periods; however, such traps may not kill humanely<sup>45,46</sup> and non-target animals cannot be saved. It can be difficult to determine when use of a leghold trap is absolutely necessary or the best alternative. There is widespread agreement that some species, such as coyotes, are difficult to capture by alternative methods.

## LEGISLATION AND ACCEPTABILITY

Use of leg-hold traps to capture wildlife for fur suffers from poor public acceptability and is in decline.<sup>26</sup> Leghold traps are banned in many countries including the European Union, and several states. In their recent review of mammal trapping methods Iossa et al state: "*Leg-hold traps are clearly not the most humane capture technique.*"<sup>7</sup> In many areas leghold not allowed, although exemptions may be available for research or when public health and safety is threatened. Conservation professionals have mixed attitudes toward leg hold traps. In one survey, 46%<sup>47</sup> of respondents supported prohibiting their use for furbearer management/harvest, and more than half of those respondents stated that leg-hold trap use was not necessary.

## SUMMARY

Leghold traps pose a risk of injury to both target and non-target animals. Limb restraint is likely to cause fear and intermittent collection of animals caught in leg-hold traps means that fear may sometimes be extended as long as 24-hours (with 9 states allowing longer periods).<sup>48</sup> Leghold traps cause injury that sometimes exceeds ISO welfare standards.<sup>7</sup> When supervised methods or cage trapping are effective they may better ensure animal welfare.

The use of beneficial trap refinements such as offset, padded jaws is not mandatory in most states, but appears to be common when trapping is carried out for research and conservation purposes. Experienced technicians, employing modern trap models with modifications in conjunction with tranquilizers and trap monitors can substantially reduce the negative welfare effects of leghold trap use. Leghold traps have been used as an effective method of capturing animals in studies that have contributed to our understanding and conservation of wildlife, and to the safety of livestock, vulnerable species and habitats, and humans.

Powell & Proulx stated, "*Researchers must be able to argue convincingly that the potential positive effects of their research exceed the potential negative effect.*"<sup>46</sup> Many studies, however, fail to report important data such as restraint periods and conditions, and short- and longer-term impacts on all animals trapped, including non-target species. Such information is needed to make informed decisions regarding the use of leghold traps on a case-by-case basis.<sup>47</sup> It would be advisable for trapping projects to have established levels of negative impact at which trapping would be discontinued, analogous to endpoints in animal-based research.

Any sanctioned use of leg hold traps should be accompanied by evidence that their use is necessary and the most humane option that meets the needs of the research or other sanctioned use. Leghold trap use is a relatively active area of animal welfare research; ongoing development and implementation of these refinements should be strongly encouraged.<sup>47</sup>

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