RESPONDING TO HUMAN-BEAR CONFLICT & CAPTURE-HANDLING OF BLACK BEARS

*A Field Techniques Guide for Agency Bear Biologists and Officers*

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Field Techniques Guide for Agency Bear Biologists and Officers

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Cover photo: A male black bear in downtown Reno, NV in 2007
# TABLE OF CONTENTS

- **Informational Sources Used in Creating This Manual** .............. VIII
- **Author's Note** ................................................................................ IX
- **Acknowledgements** ........................................................................ X
- **The Basics of Bear-Human Conflict Response** ......................... 1
  - A Note on Use of the Term “Nuisance” ........................................... 1
  - Why Do Human-Bear Conflicts Occur? ........................................ 2
  - Why So Some Bears Become Involved in Conflict? ..................... 2
  - Considerations When Responding to Human-Bear Conflicts ...... 3
  - Final Phase of Response – Avoiding the Repeat Performance.... 5
  - Considerations When Responding to Livestock and Pet Incidents.................................................................................. 6
- **Bear Behavior and Agency Messaging** .......................................... 6
  - Some Basics on Bear Behavior .................................................... 6
  - First Responders: You Are the Professional................................. 7
  - Examples of Agency Messages ................................................... 8
  - Sightings vs. Encounters vs. Attacks .......................................... 11
  - Giving Advice on How to Act During an Encounter..................... 12
- **Public Education** ........................................................................... 14
- **Capturing and Immobilizing Free-Ranging Bears** ....................... 15
  - Physical vs. Chemical Restraint.................................................. 15
  - Considerations When Using Chemical Restraint ...................... 16
  - Basic Field Gear Required for Capture....................................... 19
    - Bear Capture Tarp................................................................... 19
    - Climbing Gear ......................................................................... 21
    - The Work-Up Kit...................................................................... 21
**BLACK BEAR DEN WORK** ................................................................. 45
The Approach to the Den ............................................................... 47
Sedation of Hibernating Bears .......................................................... 48
Bears with Newborn Cubs .................................................................. 49
Media Relationships ........................................................................... 49
Understand the Reporters Motives .................................................. 51
When a Reporter Calls ...................................................................... 51
Hints for the Interview ....................................................................... 51
Appearance is Important .................................................................... 52
Build Good Media Relationships ..................................................... 52

**APPENDIX** .................................................................................. 53
Appendix 1. Example of potential actions to consider when responding to human-bear conflict ........................................... 53
Appendix 2. Example of bear behavior and public safety risks to consider when trapping and relocating black bears ............. 54
Appendix 3. Example of site factors to consider when releasing bears involved in human conflict .............................................. 55
Appendix 4. Estimating black bear age using tooth wear ................. 56
Appendix 5. Estimating age of cubs of the year ................................ 61
Appendix 6. Weight estimation using chest girth for black bears ....... 62
Appendix 7. Measuring bear paws and paw measurements .......... 63
Appendix 8. Track measurements of black bears in Arizona ........... 64
Appendix 9. Tips for investigating livestock incidents and carnivore ID ................................................................. 65
Field Techniques Guide for Agency Bear Biologists and Officers

Bear ............................................................................................. 65
Coyote ......................................................................................... 66
Cougar ......................................................................................... 67
APPENDIX 10. Comparison of bear paws and human hands/feet....69
Appendix 11. Vendor List ............................................................... 71
INFORMATIONAL SOURCES USED IN CREATING THIS MANUAL


Hunt, C. L. 2004. Bear shepherding guidelines for safe and effective treatment of human/bear conflicts. Wind River Bear Institute, Missoula, MT, USA.


We also recommend the following additional references

Brown, G. 1996. Great bear almanac. The Lyons Press, Guilford, CT, USA.


Herrero, S. Bear attacks their causes and avoidance. 2002. The Lyons Press, Guilford, CT, USA.

AUTHORS’ NOTE

This manual is intended to be a reference and guide for agency field personnel involved in responding to and managing human-black bear conflict and capturing-handling bears. This manual is in no way intended as a substitute to any wildlife agency policy or procedure. It also is not a chemical immobilization manual, although we discuss the topic and its use. Immobilization delivery systems and legal responsibilities associated with chemical immobilization (such as DEA compliance, agency policy, and storage) are critical topics that are not covered in this manual. All field personnel should be familiar with ethical animal handling protocols and should have attended formal immobilization training before performing any of these activities in the field.

Our goal in producing this field techniques manual was to summarize methods and techniques that we have found to be useful strategies for handling human-bear conflicts and to allow other agency staff the option of using a similar approach. Too often, biologists and officers have to spend time “reinventing the wheel” instead of being able to take advantage of potential solutions developed by others who faced the same challenges. As bear managers beginning our careers, we benefitted immensely from the knowledge of others, but this information was not always easy to find in written form. One exception was Al LeCount’s *Black Bear Field Guide: A Managers Manual*. This manual contained a lot of the information we needed to get started when we first began handling bears. By writing our manual, we wish to build upon Al’s work and include some of the information and techniques that have evolved over the last 27 years. Throughout this manual we offer tips and suggestions resulting from our collective 37 years of experience as wildlife managers thus far, but they are just that, suggestions. We do not pretend to know or discuss all techniques and there are certainly other options available.

How human-bear conflict situations are resolved is often left to the discretion of responding personnel, yet it can mean the difference between a peaceful solution where the public gains valuable and educational information, and a serious conflict resulting in property
damage or possible human or animal injury. Documenting your actions and following agency policy is essential, as is resolving the conflict in an efficient and professional manner. Your actions should represent a concern for your safety as well as the public’s, followed by safety for the animal. We recommend agency staff collect data and use marks to properly identify every animal handled, released, or removed to assure the availability of a reliable database that can then be used in future management. Without data, agency management decisions are difficult to justify to the public.

This is version 3 of this manual. We intend to update this manual periodically and welcome any comments from readers and wildlife professionals. Please contact the authors directly.

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All photos are courtesy of the authors unless noted
THE BASICS OF HUMAN-BEAR CONFLICT RESPONSE

A Note on Use of the Term “Nuisance”
Merriam-Webster’s definition of nuisance is:

In law, an act, object, or practice that interferes with another’s rights or interests by being offensive, annoying, dangerous, obstructive, or unhealthful. A private nuisance is an activity or condition (e.g., excessive noise, disagreeable odor) that interferes with the use and enjoyment of one’s property and that may be a cause of action in civil litigation. An attractive nuisance is something on one’s property that poses a risk to children or others who may be attracted to it.

The last sentence probably best describes the proper use of the term nuisance as it relates to describing human-bear conflict. However, based on the definition, it would be grammatically correct to describe a homeowner, business, or camper as a nuisance rather than a bear taking advantage of an opportunity to obtain calories, because people tend to be the ones who provide the attractant (intentionally or unintentionally) and lure bears to their property/site. Agency use of the term “nuisance bear” has a connotation of blame that is traditionally assigned to the bear rather than including the people involved. Because of this, and the fact that we need to make the public our partners in conflict management, we suggest agency personnel refrain from using the term nuisance for either species and use human-bear conflict, as it’s a more consistent and accurate explanation of the scenario; we will use this term throughout this document.
Why Do Human-Bear Conflicts Occur?
The answer to this question is simple...food. In our experience, regardless of the State or Province, every agency staff member we talk with agrees that the overwhelming majority of human-bear conflicts occur as a result of anthropogenic food sources provided by people (intentionally or unintentionally) and being taken advantage of by bears. The “Big 3” in our opinion are garbage, bird feeders (seed and nectar), and fruit trees. Although there are many other types of food attractants (including pet food, compost, barbeque grills, and woodpiles that attract rodents and bugs, etc.) if agency personal focused on educating homeowners, businesses, and campers to remove the “Big 3” when they respond to conflict situations the number of conflicts would likely decrease markedly over time. It’s important to note that food attractants are almost always more widespread than just at the site of the reporting party. Time spent identifying these attractants throughout the community, neighborhood, or campground, and educating people on why it’s important to remove them is a wise investment. There will always be human-bear conflict as long as people and bears coexist in the same habitats. Spikes in conflicts oftentimes coincide with a total or partial failure of specific natural food items that bears rely on (e.g. soft and hard mast). That’s why it’s important for field staff to explain this phenomenon to the public so it’s not misinterpreted as an increase in the bear population or that something is abnormal or wrong with a particular bear that visits an attractant. Additionally, when speaking to the public, it is beneficial to discuss caloric intake and the importance of bears obtaining the best source of food with the least amount of energy expended.

Why Do Some Bears Become Involved in Conflict?
There are many terms that have been used when describing bear behavior around people and how that leads to conflict. Human habituation and human-food-conditioning are two such terms describing the process that leads to what we describe as a bear “climbing the behavioral ladder of progression” towards becoming more involved in conflict. As a side note, we should mention that bears are individuals just like people, and behavior cannot truly be neatly categorized. However, the message is essentially this; the more a bear receives a positive reward such as food, and does not receive a negative response from people, the higher up the ladder of conflict it is likely to go. Public education and people
management are huge components of human-bear conflict response because: (1) people are providing the food; and (2) the public is usually the way agencies find out about conflicts. The longer it takes to remove attractants, or report the early stages of conflict, the harder it will be to resolve and the more likely a bear will need to be lethally removed.

It’s important to note that a bear taking advantage of a food source provided by people does not necessarily make it a bear warranting an agency response or removal. A bear manager once put it this way; *we lure bears in with an easy meal, and then punish them with death for accepting our invitation*. A bear taking advantage of human food is no different than you or I hitting the drive-thru restaurant for a quick and easy meal on a busy day; it’s the bear’s version of time management. Throughout the country, bears have roughly 7-8 months to put on enough weight and survive the winter months, and in the case of adult female bears reproduce and nurse cubs while denning, so acquiring food and putting on mass with as little effort as possible is paramount; we call it Bear-Logic. The importance in explaining this fact to the public cannot be overstated.

**Considerations When Responding to Human-Bear Conflicts**

There are 3 general rules to consider when responding to a human-bear conflict: (1) the least amount of restraint is best; (2) anytime you are working with bears you will attract public attention; and (3) it’s important to recognize that the decisions you make now will affect the outcome later, on many fronts. Be prepared, be the professional, gather the necessary information, and take time to weigh the pros and cons of your proposed actions (and talk with other staff). Not only will your response be safe and more effective, but you will also have the data to justify your course of action.
There are questions you can ask yourself and discuss with other responders that can help guide the decision-making process. How close is bear habitat from the site of the incident? Does this situation warrant physical capture? Can crowds (people, vehicles, dogs, etc.) be controlled so the bear can safely exit and be hazed in the direction that is best? What is the safety level for the bear if I proceed with immobilization/capture? What is the safety level for people (agency staff, reporting party, and onlookers) if I proceed with immobilization/capture? If necessary, do I have the needed assistance to move forward with my plan? If the animal is above the ground (in a tree or on a power pole) and falls, do I have a tarp/net that can handle the force of the falling animal (keeping in mind it may go higher after being hit with a dart, thus fall further)? If the bear becomes immobilized in the tree, am I prepared to climb and lower it safely down using ropes? What is the purpose of having the animal in hand? Is this bear part of a family
group (never relocate a cub or a mom without her cubs)? How will the animal be transported? If transported, where do I need to take it? Or should this animal be lethally removed?

As you can see, the choices are straightforward: do nothing, haze, capture, or remove (euthanize). The decisions that go along with these choices are more complex. No manual can guide field response 100%, nor should it because it’s impossible to describe every scenario that might be encountered. Respect the process and have a plan, and your successes will far outnumber your failures. In any case, never limit your response options, always be prepared for anything and have an assortment of the equipment on hand that you may need.

Final Phase of Response – Avoiding the Repeat Performance
Before the human-bear conflict response is marked as complete, time should be taken to identify the reason the conflict occurred in the first place and steps taken to ensure it doesn’t happen again. The overwhelming majority of the time an attractant can be identified. It is important to recognize and explain to the public that capture-relocation is a Band-Aid® in human-bear conflict; it doesn’t address the root cause, only the symptom. Agency personnel should follow through and provide advice on preventing a repeat of the incident.

- Advise removal and proper storage of garbage/trash cans or the use of bear-resistant containers (BRCs) where applicable and work with homeowners associations to amend covenants and ordinances.
- Advise removal of bird feeders altogether during months when bears are potentially active (March-December).
- Advise removal of pet food from porches/sheds, including horse feeds which typically contain sweets such as molasses.
Advise orchard owners and homeowners to install electrical fencing, pick ripened fruit, and remove fallen fruit from the ground.

Advise beekeepers and hobby farms to set up apiaries and chicken houses away from the forest edge and use electric fencing (solar-powered is an option, see Appendix).

Considerations When Responding to Livestock and Pet Incidents
Agency staff may be called upon to investigate reported incidents between bears and people, pets, and livestock. These reports may come directly from the public or messages relayed through radio dispatch. Many times, dispatch radio traffic is scanned by the local press and members of the public. It is important that when speaking to a member of the public, or dispatch on radio, staff refrain from speaking in absolute terms of the reported incident until a formal investigation is conducted. For example, a call may come in saying that a sheep has been attacked by a bear and response is being requested. While this is plausible, at this point it is not yet confirmed. Staff should refer to the response as a potential bear-livestock conflict rather than a bear attack on a sheep. This avoids confusion by all parties and elevates professionalism of the responder (see Appendix for investigation tips.

BEAR BEHAVIOR AND AGENCY MESSAGING

Some Basics on Bear Behavior
Bears are like people in that they are individuals, so behavior cannot be presented in absolute terms. Also like people, they live in a social environment where interaction amongst other bears is common and they have developed ways of communicating that we as responders should understand. All bears exhibit similar body language clues that you can read to decipher their dispositions and possible intentions. Particularly important are signs of stress which can be placed into 3 categories.

Photo courtesy of Tim Torrell
You may notice one or several of these behaviors, singularly or together, depending on the individual bear and the result of its’ prior encounters with humans.

- Light stress – pause in activity, stiffen in stance or change in orientation, a yawn that seems out of place.
- Moderate stress – huffing or moaning, popping of teeth, head swinging back and forth.
- High stress – rapid, vocal huffing, open mouthed “jawing”, guttural noises that are almost like growling, swatting the ground with their paw, and charging with or without physical contact.

It’s important the agency responder be knowledgeable enough to recognize and categorize these behaviors, determine why they’re being used, and assess the level of risk to the public. Also, knowing the gender and age class of the animal is beneficial. Is it an adult female with cubs nearby? Is it a young bear just trying to make it on its own? Is the bear injured? Or, is this a human food-conditioned bear?

First Responders: You Are the Professional
Agency personnel responding to human-bear conflicts should be familiar with bear behaviors and understand their complexities. This will not only ensure your safety as well as that of others, but just as importantly, it will allow you to deliver a clear and consistent message to the public. Please keep in mind that the reporting party likely is not qualified to be assigning behaviors to the bear. As an agency representative you are the professional: it’s your job to collect the facts without bias, categorize the level of risk, and initiate the proper response (if any). As an example, in our experience many people associate a bear standing on its hind legs as a threat. This however is not a threatening posture, but is merely a way to identify escape routes, survey the landscape, catch a scent and for mothers to locate cubs. Similarly, huffing or tooth chomping are
signs of stress and many times are used as warnings to avoid an interaction.

Many people tend to overestimate the size of a bear, especially if they saw it during some sort of close encounter. A general method for agency personnel to determine general size is to look at the ears. The ears on black bears are all about 5” long once they reach dispersal age (18 months). If the ears appear large you’re probably dealing with a small or young bear. If the ears blend in more with the side of the bears head, you likely have a larger adult bear (see photos above). The message here is the facts must be gathered first and without bias and the message agency staff delivers to the public must be well thought out and based on science and sound management principles. The safest way to reduce risk is to understand as much as possible about bear behavior and motivation, and be able to respond properly. The notion that bears are unpredictable closes the door to a better understanding of bears and denies that there is a great deal of consistent behavior that we can usually interpret.

Examples of Agency Messages
Below are some of the more important messages than can be relayed to the public.

- The public should try and do everything they can to avoid and prevent an encounter in the first place. This typically means removing all attractants around the home, such as garbage, bird feeders, ripened fruit, and pet food. If you wait until you have a conflict you have waited one day too long.

- Bears are very intelligent and are accomplished problem solvers. Use bear-resistant food containers when living or traveling in bear country. Don’t learn the hard way as thousands of others have had to do before you.
It is normal for bears in a natural (wild) situation to be actively feeding during the day, especially just after den emergence and just prior to den entry. Night-time active behavior is often seen with conflict bears that are taking advantage of human foods but attempting to avoid humans at the same time. Day-time active bears in human conflict situations should be monitored closely to see if their behavior becomes bolder during the day as removal may be necessary.

Translocation, also referred to as relocation, is not a preferred response for a number of reasons:

- Most bears will likely return, regardless of how far they are moved. Especially adults that want to get back to their home range (e.g. a place they know where the groceries are).
- Survival may not be insured since the bear will likely cross roads to return to their home range
- It doesn’t solve the problem. The attractants must be permanently removed.
- It is logistically expensive (time and gas).
- It can create issues with the bear population
demographics in the release area (e.g. competition, infanticide, resource selection and dispersal).

- It further reinforces people’s attitudes that the bear is the root of the problem, not their actions, and they don’t need to remove attractants.

✓ In the woods, avoid the surprise encounter with a bear by alerting a bear of your presence; make noise as you travel.

✓ Bears in general will go out of their way to avoid a physical confrontation. For black bears, which are the most common species in North America, retreat is their usual preferred option. Black bears evolved as a forest animal where escape cover was typically close by, and this is why a black bear will usually flee or climb a tree when it feels threatened. This is also the reason you shouldn’t haze or harass a black bear that is up a tree; you are teaching it that a tree is not a safe place; a message which is contradictory to its instinct.

✓ All but a fraction of human-bear encounters end peacefully. These figures may be tempered somewhat by the fact that the chances of having an encounter may actually be higher today than they were in past decades (mostly due to human population increase and a significant increase in outdoor activities) but the statistics are still valid.

✓ Stay alert and aware of your surroundings when in bear country, and try not to surprise a bear. Warn bears of your presence by making noise as you travel, especially in thick cover. Choose campsites carefully, well away from bear trails, food sources such as shrubs with berries, and areas known to have bears. Keep a clean camp, free of assessable attractants such as food, garbage and unwashed dishes or cookware. Never take food or
Field Techniques Guide for Agency Bear Biologists and Officers

toiletries into tents, and remember to change the clothes that you cooked in before going to bed.

**Sightings vs. Encounters vs. Attacks**

It is important to state a clear and consistent definition of a sighting vs. an encounter vs. an attack. Two of these may or may not warrant immobilization or elevated concern. A bear sighting by itself is not an encounter, regardless of the person’s heightened level of anxiety. An encounter can better be defined as a situation occurring within 50 yards, in which the presence of one or more people causes a change in the behavior (response) of the bear. If you encounter a bear on a trail, knowing the difference between the “defensive” and “non-defensive” behavior of the bear is key to your response and can affect the outcome of the situation. Remember, most bears will avoid you if possible, but when they don’t there are reasons why, and these can usually be grouped into two categories.

- **Defensive encounters** – encounters where the bear may feel threatened by your presence. This could be due to your proximity to the bear, or possibly you surprised it or made it feel crowded. A defensive bear may be protecting young or food. Such a bear will appear agitated and show obvious signs of stress (see above-Bear Behavior).

- **Non-defensive encounters** – may occur for several different reasons. The bear may be curious; its approach slow and hesitant with ears and head raised as it sniffs the air. It may be human-habituated and appear unconcerned with normal human activities. These bears may be bold and deliberate, and hard to dissuade. Sometimes a bold bear will approach a human to test its dominance.

The definition of an attack is when physical contact is made between a bear and a human. These are rare. We suggest bears making physical contact with people be lethally removed. However,
it’s important to consider the context of the situation. For instance, a hunter using a predator call, dressed in camouflage, with scent block on, and looking to attract a bear which results in contact being made in the brush is not what we would typically describe as an attack. This is a case of mistaken identity and removal may not be necessary. Also a bear wounded by a hunter may strike out in self-defense when the hunter approaches. This is usually classified as an attack by agencies because human contact and injury resulted. Expanding agency databases to allow better explanation of bear attacks is beneficial for education, media discussion, and management.

**Giving Advice on How to Act During an Encounter**

This is probably the question most often asked of agency personnel. Again, it is very important that a clear and consistent message be given. While there is no uniform response that will be successful 100% of the time, the suggestions below are derived from the best available science and literature concerning black bear encounters.

- If you see a bear, stop, remain calm and assess the situation. If it appears to be unaware of you, move away quietly when it’s not looking in your direction. Continue to observe the bear as you retreat and watch for changes in its behavior.
- Never intentionally approach a black bear as your proximity may invoke an aggressive response. If the bear is already aware of your presence, you are in a safe location, and you want it to leave (such as a bear in your garbage can) talk firmly to the bear and making noise, such as clapping your hands, blowing a whistle, or stomping your feet.
- Black bears can see and hear probably as well as most humans, but they depend on their nose in most cases to warn them of danger. For this reason some bears may not react to your presence simply because they have not recognized you as a human. They may see movement or hear a sound and then stand on their hind legs in an attempt to sniff the air for your scent or to assess escape routes. As we said before, standing on their hind legs is not a sign of aggression.
- Often, a bear will move away when it realizes you are a human. It’s best to leave the area yourself but if you have to move in the direction of the bear do so at a very safe
distance, remaining alert and cautious and making noise. Making noise will help the bear know your location, avoiding a surprise encounter.

✓ If you hear bear vocalizations, or if you suspect cubs are present, leave the area immediately, retreating the same way you came. Disturbing a mother with cubs is highly stressful and could cause a defensive response,

✓ If you are with another person or in a group, stand together and present a more intimidating front. Keep small children from running around.

✓ Bear pepper spray, made specifically for bear encounters, has been shown to be an effective way to deter bears.

✓ A bear that intentionally approaches you is an indication of a potentially more serious encounter. Stop, stay calm and assess the situation. Is the bear acting defensively? Don’t run unless you are absolutely certain you can reach safety very close by, knowing black bears can run up to 35 miles per hour. What you do next depends on whether the bear is acting defensively or non-defensively.

- Remember, a defensive bear is stressed and your goal is to reduce that stress by appearing non-threatening. Talk in a low but firm voice, back away if the bear is not currently moving in your direction, and do not throw things at the bear. Increasing your separation from the bear is the best way to resolve this situation.

- If a defensive bear charges, stand your ground. Most charges are bluff charges and the bear will stop short of making contact. Use pepper spray if you have it.

- A non-defensive bear approaches deliberately, showing no sign of stress. Such a bear may be curious, habituated, food-conditioned, asserting dominance, or very rarely, predatory.

- With a non-defensive bear you should stop, remain calm and face the bear. Talk in a firm voice while moving away from the animal. Give the bear an escape route by moving off the trail, uphill if possible. This may be all the animal wants. If the bear follows with its attention directed at you, stop and stand your ground. At this point all but an
aggressive or predatory bear will stop or move away.

- If a bear enters a tent or building it should be considered non-defensive and a potential threat. Shout, wave your arms and clap your hands. If the bear is intent on food in the building and is ignoring you, then retreat to a safe place and call authorities.

- Any bear that continues to approach is a serious threat. You should act aggressively, letting the bear know that you will fight if attacked. Clapping your hands loudly is effective with black bears, however the more it persists the more aggressive your response should be. Shout, stamp your feet, look the animal in the eyes, and take a step or two toward the bear. If the bear attacks – fight back by kicking and punching the bear and gouging its eyes. In essence you are fighting for your life.

PUBLIC EDUCATION

We hope readers of this manual will recognize the education messages that are laden throughout this document. Every topic we have discussed thus far is interwoven with education, as it should be. The most important education message we would encourage agency personal to utilize is prevention of human-bear conflict. If people wait until they have a conflict, they waited too long. Throughout our careers we have tried numerous ways to educate the public including signs, stickers, brochures, press releases, interviews, and public presentations. All of these tools have a place in education but in our minds the most effective educational methods include the one-on-one interaction with landowners and at public presentations, and media messages that can reach millions of people. We recommend you utilize these
outlets to deliver your message whenever possible.

When you respond to hundreds of human-bear conflicts in a season and see the same attractants and mistakes being made over and over again, the push to continue with your education message can get discouraging. Our explanation is that human-bear conflict education is like the heart disease of wildlife management. Just as in health education, people know they need to exercise and eat right in order to avoid heart disease, but a large number of people don’t take the necessary steps to do so until they find themselves in a hospital with a heart issue. The parallel in human-bear conflict education is that while people are mostly aware of the attractants and that they can attract bears, they rarely take the steps to avoid a negative interaction until they have experienced it first-hand. Our message to responders is to not quit. The messages are simple; keep saying them throughout your career, you will make a difference.

CAPTURING AND IMMOBILIZING FREE-RANGING BEARS

Physical vs. Chemical Restraint
Capturing a bear to solve a conflict situation should only occur under certain circumstances. In almost all cases of human-bear conflicts, emphasis should be placed on removing all attractants rather than removing the bear(s). Indeed, there are plenty of situations where agency personnel will need to trap or immobilize a bear, but there are also situations and reasons when there is no need to capture the animal to resolve the conflict. Capturing for other reasons, such as research, is a different matter. Keep in mind that once you capture the bear then additional work must follow; immobilizing the bear, processing it with identification tags, taking biological samples, and then
deciding on the most appropriate location for release, which we recommend is done the next day after the bear recovers fully (unless it is part of a family group not also captured). If the attractants have not been removed, even moving the bear will prove to be a temporary solution at best.

So let’s tackle the easy one first. When it comes to bears, there are only two types of physical restraint that we would consider relevant for discussion: manual restraint such as the use of a net and/or a catch pole, or chemical immobilization. Experience has taught many responders before you, unless it’s a cub of the year that weighs less than 15-20lbs, do not use physical restraint devices to capture/move a bear. Additionally, if a catch pole is used, the cable cannot simply be placed around the neck; it has to go under one arm and across the chest to avoid serious neck injury. Unless the animal is confined in some way this is a difficult task. So bottom line, manual restraint on a bear larger than 20 pounds is not recommended.

If you choose chemical immobilization as the method of constraint, there are many factors that must be considered. First and foremost you must recognize that once you begin that immobilization process, you have assumed responsibility for the life of the bear and the success of the operation. If you are just not comfortable assuming full responsibility, or have the necessary time to invest, do not immobilize the animal. To obtain consistent results, take time to become familiar with the animal’s normal behavior, the effect of the drug on behavior and physiology, and the possible complications produced by the drug used or the conditions presented (temperature, terrain, etc.). Carefully consider the animal’s condition, its emotional state, the immediate and physical surroundings, and the geography as all will affect the animal during sedation and recovery.

**Considerations When Using Chemical Restraint**
In every immobilization a thorough knowledge on accurate weight prediction is paramount. Is it a juvenile or adult? Is it fat, lean, or emaciated? Condition of the animal will dictate the needle length that is required as well as the placement of the shot (e.g. rump or shoulder). If these considerations are not evaluated drugs may be
injected into fat rather than tissue and the desired effect will not be achieved because drugs are absorbed very slowly from fat. Also, with delivery systems, be sure to use only enough charge (air or powder) necessary to complete the injection; too much force causes unnecessary tissue trauma.

The emotional state of the animal prior to injection can also determine the success or failure of the capture effort. The physical and psychological stress created releases adrenalin, resulting in the activation of the “flight or fight” response. Chances of successful restraint will be greatest with calm animals, and least likely with highly-stressed animals. Try not to excite or closely chase a partially immobilized animal (within reason). Remain at a safe distance behind and let the immobilization take effect.

Bears that are relocated even considerable distances will almost always return to the capture site. This is the main reason we recommend considering on-site releases, which usually means in the immediate vicinity of the capture. There are some general guidelines to consider whenever you are faced with capturing free-ranging bears.

✓ Be sure you are comfortable with the immobilizing equipment and drugs. Arriving at a situation where the public and media are present and law enforcement is on
scene with weapons at hand is not the time to be trying to remember proper dosages or how to mix a drug cocktail.

- If the animal is free-ranging, a chemical immobilization attempt should be critically evaluated. Missed targets result in wayward or lost darts; both have consequences. Additionally, darter animals can travel great distances in a short amount of time prior to the desired effects of immobilizing drugs. Steep hills, waterways, dense brush and urban areas all pose potential hazards for a capture attempt. Plan and prepare for the worst case scenario.

- In a free-range capture situation it is very important to keep the bear from getting more excited than necessary, at least to the extent possible. While in route to a call in urban areas, if you have contact with dispatch, ask them to tell other responders (typically law enforcement) to keep themselves and the public as far away from the animal as possible while maintaining a visual. When you arrive, take control of the situation by removing people and pets from the general area, turning off flashing lights, and backing vehicles away, to avoid stressing the animal any further.

- Try not to “push” the bear unless you want it to go a certain direction, such as up a tree, or back to the woods. Once the bear is in a tree, stay just close enough to keep the bear there. By moving closer or standing under the tree you will invariably cause the bear to climb higher, which may be undesirable, depending on what you are going to do next.

- If at all possible, stay out of sight when darting the bear. Once darted, you should move away or out of sight; again, trying to maintain a visual without further stressing the bear. Often times even though the bear has been darted it will quit running, or avoid climbing higher if you just back off.

- If the bear is in a tree when you dart it, keep in mind that it may react (jerk) when hit. For this reason try to have the bear between the dart and the tree trunk so that if the bear reacts it will move inward towards the trunk rather than away from it which may cause a fall or a frightened bear to climb higher.

- Front shoulder dart placement is the preferred site for most bears because of the potential for a heavy fat layer in the hindquarters. If you inject drugs into the fat layer it may
take 3-4 times as long for induction to take place. This is because the immobilization drugs are lipophilic, meaning they affect the lipids in the brain. When drugs are injected into a fatty layer (lipids) and not muscle they are absorbed at a much slower rate because of the lack of blood flow in the fat layers. The result is a bear that takes much longer to immobilize and longer to recover. This does require that the person be proficient with their dart gun as the shoulder is a much smaller target than the rump.

If you are faced with capturing multiple free-ranging bears, i.e. a sow with cubs, there are a few things to be aware of. It is usually easier to immobilize the sow first and then the cubs as they will generally stay in the vicinity of their mother or tree as a result of her vocalizations. Placing the immobilized mother bear outside of the trap or at the base of a tree (if the cubs have climbed a tree) is one way to bring the cubs to you for easier darting. Obviously much smaller darts with short needles are used for most cub immobilizations. If possible, use a blow-gun rather than a dart rifle to avoid excessive tissue damage. If they remain in a tree, a capture net must be used (see “capture tarps” section below). Once immobilized check to be sure each bear has an open airway and then ear tag each bear. This will help assure proper identification and avoid contamination of the samples and data collection. Finally, if you capture an adult that has cubs of the year, and you cannot capture the cubs (or vice versa), do an on-site release as the cubs have a decreased chance of surviving without their mother.

Basic Field Gear Required for Capture
We have found that organization of the field gear required for bear captures is critical to the success of a capture effort. As long as you have quick and easy access to the equipment you need, when you need it, and you keep it clean and organized, you will have eliminated one huge obstacle to a safe and efficient capture. One way to accomplish this is to carry the necessary field gear in bags or backpacks. We recommend the following:

Bear Capture Tarp
A capture tarp is used to safely catch a bear that has been darted in
a tree or up a power pole and falls as a result of being immobilized (as most will). Transporting the recommended capture tarp will require 2 backpacks (1 for each half of the net which weighs approximately 25lbs). Once completely set up, the tarp extends 10 feet in every direction from the stem of the tree/pole. As a general rule, the higher a bear is the further away from the trunk it will fall. For this reason we recommend that bears higher than 40 feet not be darted.

Be aware of limbs and how they may affect the bear's trajectory as it falls. If there is a potential for the bear to miss the net, do not immobilize the animal. Remember, a bear may climb higher after being darted and your capture net may not extend far enough. Finally, there are instances when a capture tarp simply can't be used because there aren't enough neighboring trees or structures to tie off to.

The first step to setting up a capture tarp is attaching a daisy chain to the tree trunk and securing it with a carabiner (see photo). The daisy chain is a heavy duty strap with a series of loops allowing the daisy chain to be customized for various tree circumferences. They can be made with webbing or purchased at climbing stores. The daisy chain should be secured approximately 6 feet above ground; this allows some flex in the tarp to occur once the bear falls so that it doesn't hit the ground in
the tarp. Each half of the tarp resembles ½ a circle and has one straight edge lined with grommets. The first step to attaching the tarp to the daisy chain is to hang the 2 halves from their center points on opposite sides of the trunk using carabiners (it’s also useful to mark the center point so it’s easily identifiable). Once the 2 sides wrap around the tree and meet, the remainder of the 2 halves of the trap literally clip together with carabiners the rest of the way. Once the halves are joined, it’s time to lift the net. Each half of the net has 8 D-rings with climbing rope attached. The ropes need to be secured to other trees or vehicles if necessary.

The complete set-up of the capture tarp should take place before an immobilization occurs. That way the animal doesn’t fall prematurely and injure itself or capture personnel. Keep in mind that if the animal stayed in the tree during setup it’s likely it will remain in that particular tree after being darted.

Climbing Gear
There are some instances when an immobilized bear will remain on a limb, or wedge itself between 2 limbs, and not fall out of a tree. Someone on the scene will need to climb up to and lower the animal, especially if the bear’s airway is compromised. Your climbing pack should include climbing spikes (gaffs), a climbing harness, a safety lanyard, a hand saw, 100 feet of rope (rated over 1,000lbs) with a carabiner attached to the end, and a Y-rope with a carabiner attached at the top (see photo). The Y-Rope is a quick and easy method allowing the animal to be lowered down humanely by both front paws.

The Work-Up Kit
Your work-up kit should contain everything necessary to mark the animal and gather pertinent data. Items typically included are: the transport/work-up tarp with handles for weighing and moving;
Field Techniques Guide for Agency Bear Biologists and Officers

a block and tackle for weighing larger bears; clipboard and data sheets for recording information; face shroud and ophthalmic ointment to protect the eyes; marking supplies such as ear tags, PIT tags and their associated application tools, a tattoo kit, and a radio collar with a cotton spacer; items for monitoring the bears’ vitals, such as a pulse oximeter (or stethoscope and thermometer) and a first aid kit (antibiotic spray, iodine, alcohol pads, dissolvable sutures); and items for collecting biological samples and recording information, including a measuring tape, weigh scale, DNA vials, coin envelopes for hair, tooth or tissue samples and a tooth elevator; and a sharps container.

TRAPPING BEARS

Culvert Trap Advantages and Disadvantages

If you’ve made the decision to trap a bear then a culvert trap is the preferred method of capture. Culvert traps have evolved over the years from simple steel water culverts to sophisticated aluminum transport systems. As with other management tools there are many positive and negative aspects to using culvert traps that the user should be cognizant of.

Advantages include:

✔ Animals can be easily transported and released.
✔ With proper use they are safe to use around animals and people.
✔ When a bear is captured there is no rush to immobilize it.
✔ Personnel can release non-target animals such as raccoons and domestic dogs.
Disadvantages include:

- Culvert traps are heavy and bulky, which may limit availability of trap site locations.
- Culvert trap doors can cause injury to animals and people.
- Bear claws and teeth may be broken or damaged.
- Size of captured animal may be difficult to determine, affecting proper drug dosage.

Tips for Setting Culvert Traps

When using a culvert trap spend some time scouting for the best trap location. Bears are creatures of habit and tend to use well known trail systems and established points of entry. If you locate such a trail and place the trap as close by as possible, your odds of a capture will increase markedly. Other factors to be taken into consideration include:

- Can the trap be set on somewhat level ground and can it be secured using the trap’s stabilizers and wheel chocks? An unstable trap will be less likely to catch a bear since it will increase the bear’s wariness. Also, bears will likely rock the trap once captured which poses the danger of an unstable trap moving or rolling.
- Is there shade at all times of the day for the animal should a capture be made? Although equipped with windows, culvert trap temperatures can be extreme in the sun and can kill captured animals. Newer, manufactured style culvert traps are made of aluminum which remains much cooler than steel.
- Have residents in the area been notified to avoid the trap and keep pets and children away, and to be careful not to approach if a bear is captured?
- Have you informed other intra-agency personnel of the trap location? Notifying local law enforcement as well is a professional courtesy and they may check the trap for you.
while on routine patrol.

✓ Are you using effective bait? Rotten fruit, pastry products and fish are all effective baits. Bears follow their nose so try to use odiferous products as well. Most landowners will be more than willing to touch up the bait for you if asked, but warn them not to add too much bait.

✓ In hot weather be sure to use baits with high oil content so they don’t dry out or lose their scent. Sardines work well.

✓ Do not over-bait. It does not take a lot to capture a bear. Too much food may affect the time it takes for induction once a bear is given immobilizing drugs. About two cans of sardines or six donuts scattered around the bottom of the trap and a few inside the bait bag is all that is needed.

✓ When hanging the bait bag in the trap avoid using wire if possible, or at least use the minimum amount required. Wire may be pulled down or chewed on by the bear causing potential injuries to the mouth or eyes. Zip-ties are a good alternative.

✓ Be sure the proper signage is affixed to the traps warning people to stay away. We recommend your message appear in both English and Spanish.

✓ Placing a thin layer of hay or straw in the trap serves several functions.
  - It creates a more natural trap so wary bears can be captured.
  - It allows urine and feces to be contained keeping the bear (and the responder) cleaner during capture and processing.
  - It allows a more comfortable transport for the bear after processing.
  - It is considered a more ethical treatment of the bear overall.

✓ Trap maintenance is very important. Captured bears will
urinate/defecate in the traps, and most bait will rot over time. Minimize the spread of disease by thoroughly cleaning the trap after use, even if a capture isn’t made. This will also insure the traps maintain a professional look, as you never know when your next capture will be on TV.

Transporting Bears in Culvert Traps
Time management is always an issue for agency personnel and we recognize that sometimes a bear may need to be transported off site before it is fully recovered from an immobilization.

Take extra care when transporting a fully immobilized bear because airways can be constricted. Additionally, before transporting bears it is important to remember that while under the effects of the immobilizing drugs, the ability for a bear to blink and close its eyes may be compromised. We recommend three steps to keep debris out of the eyes and prevent highway winds from drying them out: (1) use an eye cover, preferably one that can be removed by the bear when it wakes, such as a simple cotton sleeve (cut-off sweatshirt sleeves work well); (2) place the bear with its head towards the door; and (3) if the trap is equipped with a grate-style opening in the rear, cover the opening with a tarp (all suggestions keep debris out of the eyes and keep highway winds from drying out the bear’s eyes). Modern culvert traps have closable windows for this purpose. Finally, placing hay or straw in the trap will protect the bear from injury (i.e. bouncing) should the trap be transported over unstable or unpaved roads.

Culvert Trap Modifications
As safe as culvert trap use can be, there are 2 issues we’d like to outline. Many older traps have safety issues, for bears and people, which field personnel should address prior to setting a culvert trap. The first involves bear safety.
Many older traps have a grate-type structure in the rear of the trap. If the grates are 2 inches by 2 inches or larger, we suggest the trap be modified to avoid broken teeth. Out of frustration, captured bears will clamp on to the grates and can exert enough force to actually break their canine(s). This is completely avoidable by welding a mesh plate to the grate (see photo). If necessary, we advise maintaining an opening in the mesh to use during immobilization. The second issue with older traps involves the openings on the trap. Many traps have a lockable opening that allows bait bags to be placed on the trigger without entering the trap, or to allow an opening for immobilizing. Unfortunately, these openings can be larger than necessary resulting in bears being able to extend their arms through the opening and/or smaller bears being able to escape. For obvious reasons these should not be opened when a bear is inside.

If not currently equipped, we advise holes be drilled in the bottom of culvert traps allowing urine and water to drain from the trap. Additionally, to avoid debris from building up on the trailer below the trap, holes or a 3” wide channel can be cut in the trailer deck.

**Foot-Hold Snares**

A foot snare is a method used to capture bears in remote areas (mostly for research) in places where a culvert trap is impractical. It’s a technique that has been used for decades but it takes time and practice to make it a safe and efficient technique. Trail sets and cubby sets are the most common types of foot hold snare sets. The most important thing in setting these devices is gathering input from others that have used them as this will insure you are employing the safest and most efficient techniques. We recommend you make snares rather than purchase them so they can be customized for safety:
The Aldrich spring-activated throwing arm uses 2 “legs” to anchor it securely in the ground. Some manufacturers sharpen the tips to very sharp points which should be grinded flat before using. That way, when removed from the ground by a captured bear, the device does not become a source of potential injury.

Snares should be made of ¼” stainless (for black bears), uncoated, aircraft cable – some bears have actually chewed through 3/16” cable.

- Cable can be cut with an acetylene torch and the ends heated and tapped so there is no point. This prevents frays from developing which can result in injury.
- Locking mechanisms are usually a piece of angle iron on the cable that prevents a captured bear from opening the closed foot loop and escaping. Once the ¼“angle iron is cut and drilled, all edges should be rounded on a grinder to reduce injury.
- When constructing the foot loop, only high quality cable connectors should be used. When assembled, the bolts on the connectors should face outward, away from the animal to reduce injury.
- Use a “shock-absorber” in-line between the foot loop and the anchor cable to reduce the chance of injury when the bear is pulling on the cable. We like using a car hood-spring (obtained at most junk yards). This should be attached at each end to a piece of the anchor cable, forming a loop. This allows the spring to be flexed when a bear pulls on the cable. Additionally, a ½” eye-to-eye drop forge swivel should be attached to both ends using cable connectors. This takes the pressure
off the bear’s paw as it tries to escape.

- The foot loop can then be attached to one of the swivels.
- The other swivel attaches to a cable that anchors the device to a tree. We recommended this cable be long enough to wrap around a tree at least twice. This will reduce play that may develop allowing the animal to climb the tree with the snare attached.

**Tips for setting foot hold snares**
- Find a site that is shaded 24 hours a day
- Find an anchor tree that allows 360 degree movement without the bear becoming entangled on other trees or vegetation. If necessary, remove any vegetation that could result in tangling and injury.
- Once a tree is selected, remove all limbs within 7 feet of the ground. This will reduce the potential for a bear climbing and going over a limb and essentially hanging from its foot.
- Cut 9 straight, firm sticks approximately 6” long X ½” in diameter and use them to increase the stepping area within the set (remove any shoots from the sticks)
- Dig the hole just deep enough to allow the treadle on the throwing arm to fall flat. Any deeper and the
bear may be captured on the forearm resulting in an escape; any shallower and the bear may be captured by the toe(s), also resulting in an escape.

- When the throwing arm is installed and set, use the sticks you cut to increase the stepping surface area that will trigger the trap. The first stick inserted should be straight off the treadle. The remaining 8 sticks should be placed 4 on each side. Tap every stick lightly to insure you have good contact with the throwing arm with no play or bounce.
- Use a small piece of camouflage netting to cover the hole before dirt is placed on top.
- Place 3 stepping sticks; 2 on either side of the hole and 1 approximately 18 inches from 1 of the 2 sticks. These are your guide sticks that will help walk the bear into the trap.
- Spend some time camouflaging all trap parts, without reducing the force of the throwing arm or slowing down the action.
- The very last thing you should do is place the bait/lure. Place the bait lure so you don't touch any of the hardware and leave a scent that may alter the bear's movement. Hanging bait on either side of the hole will avoid non-targets and birds from removing. A cloth soaked in extract can be used as a long distance “call” lure.

**M-15 Foot-Hold Snares (Bucket Sets)**

The M-15 foot snare is another method used for capturing bears. If used properly, they are efficient and safe. The throw-arm for the M-15 resembles a modified throw-arm for a trail set (Aldrich snare) and is secured to the outside of the bucket. The concept is simple; as a bear investigates the bait placed inside the bucket it will reach through the hole cut into the bucket lid and grab the bait tied to the trigger. This releases the throw-arm which
tightens the snare cable around the bear’s leg above the paw.

Advantages of the M-15
✓ Small, lightweight and transportable.
✓ Easy to make and set
✓ The mechanics of the snare ensure a catch above the paw.
✓ Versatile.

Disadvantages of the M-15
✓ Requires initial building of the bucket and lid for the set.
✓ Bears will almost always destroy the bucket, requiring the need to have more buckets on hand.
✓ If not properly made there is the possibility of killing small bears if they stick their head in the bucket.

Tips for setting the M-15
✓ Find a site that is shaded 24 hours a day.
✓ Find an anchor tree that allows 360 degree movement without the bear becoming entangled on other trees or vegetation. If necessary, remove any vegetation that could result in tangling.
✓ Once you’ve selected a tree, remove all limbs within 7 feet of the ground. This will reduce the potential for a bear climbing and potentially going over a limb and essentially hanging from its foot.
✓ The hole in the lid should be oval shaped and roughly only 3”-4” tall by 7”-8” wide to avoid having a bear stick its head into the bucket. Round holes should be no more than 6” in diameter for black bears.
✓ Using tie-wire, connect a “nest” of wire to the trigger assembly, attaching several marshmallows to this nest to increase the chances of the bear moving the trigger enough to activate the throw-arm. Sardines can be placed in the bottom of the bucket.
as well for bait

- Place the bucket at a 45 degree angle, encouraging the bear to investigate it. They will often sit in front of the bucket to do this.
- Stabilize the bucket in between two trees (one of which is the anchor tree), using tie-wire tied to the trees or rebar placed at crossed angles. Large eye-bolts on the side of the bucket are handy for holding the rebar.
- Copper trap tags (see Appendix) are ideal for holding the snare cable to the inside of the bucket lid.
- Bend trap tags just enough to hold the snare cable without hindering or slowing the cable once the throw-arm is activated.
- Using a zip-tie or tie-wire, lightly tack the snare cable to the throw-arm preventing the cable coming off the throw-arm should the bear move the bucket substantially.
- Regardless of the type of snare you are using, use an in-line spring on your anchor cable to ensure the bear does not injure itself when caught.
- Use a cloth soaked in extract to attract bears to the set. Hang the rag with string and throw it over a high tree limb. See Appendix for extract.

HANDLING BEARS

Data Collection
Processing a bear includes everything from recording basic biological data on a road-killed bear to marking and taking samples from bears prior to release. At a minimum, when you have an animal in hand you should record sex, age class, weight (preferably
actual weight using a scale), physical condition, location and note any abnormalities. Having a biological record of animals in the state is very useful for current and future agency management decisions. Also, future research projects benefit greatly from long-term data sets. Samples you take now may be used several years down the road. Finally, marking animals helps to identify animals so you know if your management actions were successful.

Processing a bear can be time consuming, especially if you have not done it often enough to be comfortable with the procedures. Familiarizing yourself with immobilization techniques is the most important step you can take. This will insure proper induction of the drugs as well as safety for you and the animal. Once the bear is safely immobilized the rest of the processing procedure is fairly simple. You should be able to complete the most exhaustive of data collections in about 30 minutes. Pay attention to ambient temperatures, and be prepared to keep the bear cool or warm accordingly. Keep the bear close to the trap for quick loading. Before placing it on the ground, place a tarp under the animal, preferably one with handles for weighing and moving the bear. Planning ahead will reduce the chances of having a crisis later.

Be sure to record all information as you proceed, preferably on a standardized datasheet. If the bear is in a trap there is usually no hurry so have everything you will need ready to go before you immobilize the bear.

**Before you begin**

- Ensure that you are in a safe environment, for yourself and the bear.
- Maintain a quiet work area as noise may reduce the effects of the anesthesia.
- Once anesthetized, immediately ensure the bear has an unobstructed airway; lay the bear on its stomach, (sternal recumbancy) or on its side, (lateral recumbancy). Do not place bears on their back.
- Bears may lose the ability to blink while anesthetized so apply opthalmalic ointment to the bears’ eyes to avoid drying. The easiest way to do this is by lifting the eyelid up and squirting a small amount of ointment under the eye lid, then closing the eyelid and distributing the ointment using
gentle circular movements of the eyelid with your finger.

✓ Cover the bear’s eyes with a face shroud or towel to avoid unnecessary stress and to prevent debris from getting into the eyes.

✓ Obtain a baseline temperature, pulse, and respiration. This will help you throughout the immobilization.

Monitoring Vitals
The vitals should be recorded immediately upon immobilization to establish a baseline temperature, pulse & respirations (TPRs). Doing so will help you determine how the immobilization is going, warn you of potential complications, and let you know when the animal is starting to regain ambulatory movement. The importance of TPR’s cannot be overstated. They are “your eyes and your ears” during an immobilization.

Normal ranges for tranquilized bears are:

✓ Temperature of 97°-102° F. Temperatures outside of this range could indicate a problem and you should be prepared to take action should they rise 1 degree in either direction. Be prepared to warm the bear (with blankets, heat packs), or to cool the bear down (with water on armpits, groin, or a cold water enema using a syringe without a needle)

✓ Pulse rate is typically 60+ per minute for larger bears, 90+ for cubs.

✓ Respirations should be above 10 breaths per minute. 12-14 is average for larger bears. Cubs are generally higher, around 20+. This all depends on the immobilizing drugs you are using.

Physical Characteristics
Record the sex, approximate age, physical abnormalities like missing claws, broken teeth, distinct color markings (like chest blazes, etc.), and weight of each bear using a scale. It’s very easy to overestimate weight. Although the example datasheet shows a lot of data to be collected, it was provided because we believe that a good rule of thumb is to get as much data as you can while you have the animal in hand. In some instances, the data collected may not, or cannot, be collected. However, aside from being another piece of data, weighing every bear handled is one of the best ways
for a responder to become better at immobilization. Immobilizing drugs require a general weight category and it’s important to know how accurate your weight estimate was. You will quickly see that estimating weight is accomplished more efficiently when a scale is used. It also provides more accurate information to the press and the public. It is recommended that a block and tackle be kept on-hand so that larger bears can be more easily weighed.

**Marking**

- **Ear tags** – affixing an ear tag should be one of your first steps. This will assure identification of the animal, even if you are unable to complete anything else.
  - Tag should be placed so the number faces the front.
  - Using a biopsy punch will make a clean circular hole that will heal much more quickly than the hole made when you punch the tag through the ear. You'll also get a DNA sample for analysis.
  - Make the hole for the tag a little off-center and about one-third up from the base of the ear. This will avoid piercing a vein in the ear.

- **Tattoo** – tattooing, if done correctly, is a permanent way of marking the bear. You can use a livestock "punch" style tattoo pliers but we prefer the tattoo pen used by rabbit breeders. (see Appendix).
  - Typically, tattoos are applied to the upper inner lip and are placed on same side of the bear as the ear tag. Some people may choose to tattoo the ear.
Clean the area (inside upper lip) with a wet-nap or alcohol pad before proceeding.

- If using the tattoo pen take care to work slowly to ensure a complete tattoo (roughly 8-10 seconds per number).
- Wipe away any excess ink with a sterile gauze pad moistened with alcohol.
- Clean the tattoo pen or punch numbers with alcohol prior to storing.

✓ PIT tag – PIT stands for Passive Integrated Transponder. Also known as “microchips”, these tags are an additional way of permanently marking the bear by using Radio Frequency Identification technology. Each tag comes enclosed in a pre-loaded, sterile application (see Appendix)
  - Inject the tag using the implant gun.
  - Place the PIT tag between the hide and the muscle.
  - Implant the tag along the sagittal crest, in between the ears.
  - Seal the hole immediately with super glue to prevent the tag from migrating back out of the implant hole.
  - The PIT tags come with several adhesive identification tags making it easy to affix one to the capture form.
  - PIT tags can migrate considerably. When scanning an animal for a previously implanted tag be sure to scan the head, back and down the shoulders.
Biological Samples

✓ When taking samples avoid contamination and cross sampling by wearing exam gloves and completing each bear separately. Label each sample with the date, sex and ID number of the bear.

✓ Tissue samples can be used for genetics and individual ID.

✓ Hair samples are used for DNA and isotope analysis.
  ▪ Pull hair rather than cutting it to ensure you get samples of the hair’s root. Place hair sample in a small envelope and label it accordingly.

✓ Blood samples are used to answer various questions related to disease and may also be used for DNA analysis.
  ▪ Draw blood from a vein you are comfortable using.
  ▪ Attempt to draw 8-10cc, placing 3-4cc in blood tubes, typically purple-top and tiger-top tubes, but this depends on your sampling criteria. Do not force the blood from the withdrawal syringe into the blood tubes as this can damage the cells. The tubes are designed with a vacuum so they should fill automatically. Label accordingly.

✓ Tooth samples are used to age the bear (beyond field estimation).
  ▪ Only perform the procedure on a live bear if you have been properly trained and you have the appropriate equipment
  ▪ One of the first upper pre-molars is the tooth of choice for sampling.
  ▪ Contaminated equipment and improper procedures can result in needlessly exposing the bear to infection and a broken/abscessed tooth.

Morphological Measurements

✓ As a minimum, record the chest girth as a means of
estimating the bear’s weight. Measurement should be taken just behind the shoulders, and the tape should fit snug, not overly tight. Use the chest girth/weight conversion chart in the Appendix to determine estimated weight. If possible though, get an actual weight on the bear, either by weighing it in the field or driving the trap across truck scales.

✓ Other measurements may be taken if there is a specific need. These are provided in the example datasheet (see Appendix).

✓ Finally, record any other pertinent information. Mother bear or sibling ID numbers, collar frequencies, noteworthy behavior, etc. In short, anything that could potentially be used in decision making if there are subsequent captures.

Recovery
✓ Assure the bear is lying on its side or stomach and that it has an open airway.
✓ Depending on immobilizing drug used, full recovery can take up to several hours (i.e. if using Telazol®). It is best to plan on keeping the bear confined in the trap overnight and releasing it the next day (unless it’s part of a family group that were not captured). This will require a quiet, shady site and a bowl of water (if the trap is not equipped with a water trough). However, in some research settings you may not be keeping the bear confined during
recovery, and allowing it to recover from the drugs and then wander off. In these instances we recommend that you stay with the animal until such time that it can protect itself from other animals. This usually means being able to lift its head and look around freely. Also be sure to place the animal in such a way that as it regains use of its legs and wobbles around it can’t stumble into a creek or any other area where it may asphyxiate.

TIPS ON COLLARING BEARS

When fitting a radio collar it’s important to leave room for growth, but not too much because the collar can be easily removed by bears since they are dexterous and have somewhat “cone-shaped” heads.

A common explanation we have heard folks use is that researchers should use "2 or "3 fingers" when it comes to deciding on collar fit. That’s a subjective method and human fingers are not uniform in size. We suggest putting the collar on, attaching hardware in a spot that looks good, then testing it (and it takes several attempts sometimes...working gently of course) by placing both ears under the collar and trying to remove the collar over the bear’s mandible/zygomatic arch. If it comes off easily, go to the next notch tighter and repeat the process ....if it doesn't come off easily try going one notch looser and repeat the process. It is properly fitted when you get to the point of "I could get it off but it would require some work". This is where it should be secured. If it’s removed by the bear, that’s ok, we don't always have to win; always err on the side of being loose. If the bear loses the collar, you can reuse it. If it's too tight it will compromise the bear's well-being.

Cotton spacers serve a dual function on a radio collar: they are the weak-link in the collar belt that allow some stretch should a bear
gain a significant amount of weight while wearing the collar; and the spacer will rot, allowing the collar to drop off the animal in 2-3 years. This is somewhat of an ethical insurance policy that the animal would not have to wear the radio collar should it not be recaptured or the electronics in the radio collar fail. Today, many collar manufacturers are using synthetic-made belts. This new material allows the belt to be molded for a more comfortable fit for the animal. The only issue to be aware of is that these belts can last on an animal for well over a decade.

Some of the more common reasons we’ve heard for not using cotton spacers include: (1) electronic reliability within the radio collars has improved; (2) the animal will be recaptured; (3) I’m using an electronic breakaway; and (4) I don’t want to risk the collar being dropped prematurely and losing data. Responses #1-3 can be simply addressed - electronics will always fail. As researchers we need to ensure that once we release a captured and collared animal, it is 100% risk-free and we are certain that the animal will not be wearing that collar forever. Our response to Comment #4 can also be addressed by saying we don’t always have to win. If we use cotton spacers, and the cotton rots off quicker than expected, that’s ok, move on to a 3 or 4-ply rather than a 2-ply spacer; but take solace in the fact that you put the animal’s welfare above your informational needs. Finally, collar weight is an issue that should be considered very carefully. Electronic breakaways, larger batteries, and cameras are all options available for radio collars but are considerable weight additions and should be chosen cautiously. We recommend using a general rule that limits collar weight to approximately 2% of the bodyweight of the animal. See Appendix for additional information on cotton spacers.

**TIPS & THOUGHTS ON RELEASING CAPTURED BEARS**

As any professional bear manager knows, not every bear can or should be released. Conflict policies usually dictate under what circumstances a bear must be euthanized, but often times this is a grey area and the responding manager utilizes a lot of discretion in making that decision; an approach we encourage. Considerations like the behavior of the bear, location, level of human-habituation or human-food-conditioning, level of property damage, presence of cubs, and previous reports of this same bear, can all be considered
to some degree in the decision process. Regardless of the decision you make there will be proponents and opponents to what you do. If your agency’s protocol allows you to maintain consistency, and you document when and why, you will be able to back up the decisions.

We offer some risk evaluation factors to consider (see Appendix) when determining the best course of action to take in resolving human-bear conflicts. They are based on bear behavior, the level of risk in translocating bears and the potential of your success considering the amount of natural versus anthropogenic foods.

**Marking Bears**
Remember that marking bears offers the advantage of being able to track conflict behavior to know if your management actions are successful or not. Without marking you are operating without the benefit of data. Therefore we encourage marking bears captured and released.

**2 or 3-Strike Euthanization Policies**
Some jurisdictions have policies dictating if a bear involved in human conflict is caught more than once it must be euthanized. What dictates conflict behavior should be explicitly defined in those policies. In cases where the bear’s actions or behaviors are subject to the discretion of the responder, then it becomes imperative that consistency be maintained in how those decisions are made and that animals released are marked.

Some bears in certain situations may become human-food-conditioned and human-habituated as a result of countless food rewards, and thus spend little time outside of urban areas. Also female bears in those scenarios may raise young that in turn also become urban bears involved in human conflict. Sometimes, these bears can also become “well-known” to members of the community that may or may not support removal of the bear without a 2 or 3 strike policy. That’s why it is imperative that sightings be kept in a database so community trends can be monitored and preventative action, or aversive conditioning, take place prior to a bear becoming habituated. Also, marks become a part of a database for bear management programs so that factual information on each bear involved in bear-human conflict is documented. And finally, this
data can be used in education efforts to target communities that show the potential for this type of situation to occur

Choosing On-Site Release vs Translocation vs Lethal Removal
The decision of if and where to release a bear involved in human conflict can be difficult to assess because there are so many factors involved in the evaluation process. There is no steadfast rule and most agency policies rely on the experience and judgement of the responding personnel, and justifiably so. One aid that can help you determine a defensible strategy is to consider the Body Condition Score (BCS) because generally speaking bears that are higher up the ladder of conflict tend to be more human-food conditioned and therefore carrying more fat.

The Body Condition Score (BCS) scale:
- 5 – Obese (exceptional fat stores)
- 4 – Excellent (above average fat stores for the time of year)
- 3 – Good (average fat stores for time of year)
  2 – Fair (thin and/or sickly, ribs and hip bones slightly visible)
- 1 – Poor (emaciated, ribs and hip bones visible and protruding)

Scores may fall between these indices, such as 2.5

As an example, if a bear is captured and has no history of being involved in conflict one would expect a BCS between 2 and 4. In these cases a hard release on-site, or somewhere nearby if impractical, is a defensible decision. However, if the bear has a BCS of 4.5-5, indicating human-food conditioning, then a translocation in a pre-determined area away from human development is more easily justified. This gives the bear a chance to succeed rather than leaving it in a place where it will likely fail.

If you document your actions and record data like BCS then decisions following subsequent recaptures are more easily justified. For instance, a bear with an original BCS of 3 or less is recaptured in a conflict situation and has a BCS of 4-5 then it is reasonable to conclude that it has continued its conflict behavior, has become more human-food conditioned and is less likely to alter its behavior. Depending on what management decision was made following the
initial capture, translocation or euthanasia are decisions that are now more straightforward.

Keep in mind that in every case you must address the issue of attractants so as not to guarantee the bear’s failure and continue staff responding to the same sites. Additionally, aversive conditioning should be used upon release each and every time where possible. If you end up removing the bear it is recommended that you inform the media that the bear was euthanized. You have the data to justify your decision for removal, and the community needs to recognize that their actions, or lack thereof, have consequences.

KARELIAN BEAR DOG USE IN CONFLICT MANAGEMENT
If there is one tool we have available to assists agency responders in a multitude of bear management roles, it would be the Karelian Bear Dog (KBD). From tracking, locating, hazing and capturing bears, to working festivals and entering a classroom of elementary students, these dogs are unequalled in their diversity. Because of their intelligence, fearlessness and aggressive barking, these dogs are adept at locating concealed bears, helping capture bears by treeing them, performing aversive conditioning when releasing bears, locating dead animals, and even assisting biologists in locating and treeing cougars for capture-collar research. But they also have the intelligence to recognize the task they are performing and can work silently and less aggressively like when tracking a tranquilized animal on leash, finding injured or orphaned wildlife, assisting in search and rescue operations, and working at education events; which oftentimes means being surrounded by people and pets, greeted and hugged.
by children they don’t even know, and working long hours at a booth. They are intelligent, loyal, loving, quick and light-footed, persistent and fiercely independent.

Recognizing how these abilities would benefit bear managers, the breed was first brought to the United States for conflict bear work in 1990 by Carrie Hunt of the Wind River Bear Institute (WRBI). Since that time these dogs have become a staple in several agency bear programs in the U.S. and Canada. When bears are candidates for capture and release, the KBD is a great resource to help make the bear more wary of humans and dogs, and to teach people how to prevent the repeat performance.

**KBD’s and Aversive Conditioning**

We use KBD’s as a method of deterrent when releasing or hazing bears. Note: Although we use the term *aversive conditioning* if reference to altering behavior of released bears, what managers are usually doing is hazing the bear, as aversive conditioning technically requires consistent and repeated interactions with the bear.

Typically, we set up the bear release with the door-opening facing the direction we want the bear to run. Then agency staff and KBD’s on-leash assemble in a “delta-wing” pattern on opposite sides of the door so the bear can see the dogs and people behind them (the dog on
an extended leash should be 5 feet behind the opening of the trap). That way, as the bear emerges and peeks its head around to see where the threats are it knows it has the space to run away from the dogs and the people. As a bear exits a culvert trap, the dogs become very excited and begin barking. When the bear exits the trap and begins to run staff fire bean-bag rounds or rubber buckshot at the bear. At this point, depending on the dog handler, the species of bear, and the level of habituation, the KBD’s may chase the bear off-leash. Working the bear off-leash allows the dog to use its natural instinct and get in close, barking within a couple feet of the bear, while avoiding defensive swipes and charges. And unlike typical hound dogs used for hunting bears, KBD’s will return to the handler when called. Bears should not be chased too far because they are now where they are supposed to be, in the woods. This is what WRBI refers to as teaching the bear boundaries. *Note: commonly referred to as “non-lethal rounds”, 12-gauge beanbags and rubber slugs have the ability to severely injure or kill a bear if used improperly. Know the capabilities and limitations of this equipment before using it.*

**KBD’s as Agency Ambassadors**

Public education is a main component of most agency bear management programs. As an ambassador for these programs the KBD is unmatched. They are routinely taken into schools during presentations and, because of intense socialization from birth, their loving disposition invites affection from students. After these events, children often write thank you notes to the handlers saying their favorite part of the presentation was meeting the KBD’s. The ability of these children to retain the messaging because they had the opportunity to interact with the dogs is incredible. In their notes they mention they are going to tell their parents not to leave the garbage can and bird feeder out, so they don’t attract bears, so the KBD’s don’t have to come chase the bears. They absorb the entire message of avoiding conflict because of their connection with the KBD’s. Agencies such as Washington Department of Fish and Wildlife have established community support for their KBD program resulting in 100% public-donated funding mechanism for the dog team (KBD’s); this program is a zero dollar budget item to the state. The KBD program has an annual 5K run, and the team attends numerous events every year emphasizing the non-lethal approach, how KBD’s are used in bear management and provides education
Agency KBD’s can be an integral item in a bear manager’s tool box. However, KBD programs cannot succeed in solving the conflict bear issue without staff vigilantly monitoring human food attractants. But we do believe that, just like with the children’s programs, KBD’s can assist in this aspect, by acting as both a bear deterrent and agency ambassador during a release. For example, when bears are released on-site with aversive conditioning, and residents see the dogs in action, they are often times much more likely to retain the message and act on the bear manager’s request to remove attractants and prevent future conflicts.

BLACK BEAR DEN WORK

Capturing black bears in their winter dens is something that bear managers/researchers may include in monitoring projects. The process has risk for researchers but even more so for bears, and training needs to place emphasis on avoiding these risks. The potential for den abandonment and the loss/orphaning of newborn cubs is high when dens are disturbed in winter. Therefore, the first question that must be answered is if den work is truly essential. There is abundant data in the literature documenting litter sizes, sex ratios, and recruitment levels of black bears in various habitat types throughout the country. Therefore, you may be able to obtain the information you need without entering the dens. Of course, winter dens can offer the perfect chance for researchers to change collars/batteries and maintain sample sizes.

If den work is essential, one way to accommodate it is to consider a strategy where bears are prioritized by sex & age categories, and female reproductive status and then conduct den work in a progressive manner. For example:

Replace collars on pregnant females first, prior to the litter being born (cutoff date is approximately Dec 25) to avoid potential den/cub abandonment. After the collar is replaced, a camera(s) may be placed at the den to count cubs when they emerge. A shortcoming of this method is if all or a portion of the litter is lost, sexes will be unknown. But assuming a 50/50 ratio is scientifically defensible. Next visit dens of sub-adults and males that need a collar replacement, followed by dens with yearling family groups.
By visiting these dens in the heart of winter when temperatures are coldest you minimize the chances of these bears abandoning the den. And, if den abandonment does occur and a family group with yearling(s) is split up, survival at this age is not likely to be compromised. Visit dens that have the possibility of having newborn cubs in middle to late winter, after the sow has more of an investment in the litter and is more likely to return should she leave upon your approach. Finally, visit those dens where only den characteristics are needed after the denning period is over and the bear has left the area.

The Approach to the Den
Bear behavior during the denning process can vary depending on den characteristics, snow levels, presence of dependent young and previous exposure to humans. Therefore, the techniques described here are only suggestions based on the experiences of the authors and other bear managers who contributed specifically to this section.

In general, we recommend approaching a den cautiously and quietly to limit the chances of eliciting a flight response from the bear. Most bears, if not all, will be aware of your presence long before you actually enter the den and their level of arousal will vary greatly depending on several factors mentioned earlier. Consider the following techniques when approaching a den.

- Locate the den with only one or two people earlier in the season. This allows a quicker approach when you are ready for the actual den visit.
- Approach from downwind whenever possible.
- Use hand signals, soft whistles or whispers to communicate.
- Have your tranquilizing equipment ready once you are within 100 yards of the den.
- Approach the den with only 2 people on the flanks. This allows the closest person to enter the den and immobilize with minimal disturbance and movements. It's also useful if you need to tranquilize a fleeing bear and return it to the den (only collared bears should be captured this way, otherwise you risk not finding an uncollared bear).
Since the bear was previously captured, you should have some knowledge of weight, so dose on the heavy side to make sure the drug takes effect quickly.

If you expect yearling bears, have syringes loaded with the appropriate dose ready for these bears as it is sometimes feasible to tranquilize these bears by hand if they are still in the den.

Make sure that all cell phones are turned to silent.

Avoid sunscreen, perfumes, cologne, or wearing clothes washed with fabric softeners during den work.

Sedation of Hibernating Bears

A bear’s metabolism slows down during hibernation and for this reason you cannot expect the sedation process to be the same as during the summer. Depending on the drugs you’re using, a complete induction that would take less than five minutes in the summer can take up to 30 minutes for a hibernating bear. Some things to consider are:

- Tranquilizing equipment – Most people prefer to use a pole syringe or an air-powered pole syringe. Because many bears will turn away from you after you enter the den it is not always recommended to use a dart rifle or pistol. However, modern CO2 powered pistols are very versatile, allowing for close range immobilizations without causing excessive noise or tissue damage.

- If feasible, inject the drug into the front shoulder or the lower portion of the thigh where the fat layers are at a minimum. Subcutaneous injections or injections into the thick fat layers of the hind quarters will result in prolonged induction times and often require multiple injections.

- When approached at close quarters some bears may display stress behaviors such as moaning, teeth popping or even lightly swatting at you. We advise you to be safe, but quickly proceed with the process as many of these behaviors are merely bluffs; remember that time is always against you for something to go wrong.

- Once the bear has been injected, quickly cover the den entrance with a backpack or ground/carry stretcher (the
same one you plan to lay the bears on to keep them off of the snow) and remain quiet and still. Doing so can greatly reduce a flight response from the bear.

✔ Once immobilized, make sure the bear has an open airway. Depending on the circumstances you may apply opthalmalic ointment to the eyes, place a head cover to protect the eyes and place the bear in lateral recumbancy.

✔ If the bear is in a tight den that would preclude you from entering to process the bear or monitor the breathing or other vitals you should consider abandoning the immobilization altogether.

✔ If an adult bear has left the den site before induction, we recommend following through and carrying the bear back to the original den with her offspring; a soft-carry stretcher is good to have along for these instances. There are also occasions when the den is too tight to maneuver the bear(s) out, but there is room for a researcher to get partially inside. In this case, leave the bear in the den, apply eye ointment and replace the collar if needed.

Bears with Newborn Cubs
Bears give birth to their young while in their winter dens. This can occur anytime from late December to February. Birth timing can be associated with the age and physical condition of the adult female. Generally speaking however, mid-January-February 1st is used as the birth date for all bears. If you work a bear den and newborn cubs are present here are some things to keep in mind:

✔ Cubs are born at about 1 pound.
✔ Cubs will usually open their eyes at about 2 weeks old.
✔ Cubs need to be kept warm, especially if they are removed from the den for sexing, marking, weighing, etc. It is advised that you work fast to get all bears back into the den together. A scent-free blanket can be used for warmth as can using human-provided warmth (in jackets).

✔ You can apply a few drops of cedar wood oil (Fisher Scientific) to the cub’s fur and the mother’s nose to act as a masking agent against human scents. Vick’s VapoRub© also works for this purpose.

✔ When work is complete, place the mother bear in lateral recumbancy (on her side) and put cubs close to her teats so they can continue nursing.
If a mother bear flees during your approach to the den, stay quiet, quickly sex the cubs, and leave the site immediately. Do not attempt to chase her because you will push her even further away. It can take several hours up to a 24 hours for her to return requiring you to monitor the situation from a distance using telemetry.

Depending on condition of the cubs, if she does not return in a reasonable amount of time and you are fairly certain she has abandoned the cubs it is time to rescue them and get them fostered with another mother bear or to a rehabilitation facility. Document what could’ve been done better.

Rescued cubs can be fed a warm, high quality powdered milk replacement formula (Espliac) while you are transporting. Keep in mind that they need to eat about every two hours.

Although bears will readily accept another bear’s cubs, fostering must be done with sows in dens that also have cubs of the year.

It is advised to make a quick trip to the den, place the cub just outside of the den entrance, or so the sow can at least see the new cub and the cub has the opportunity to crawl into the den, and then depart very quickly.

MEDIA RELATIONSHIPS

It is very likely you will be requested to give many interviews to the media throughout your career. Whether it is television news, a newspaper story or a radio station, people who work with bears will deal with the media because what we do is unique and interesting to the general public. However, that doesn’t mean the story will come out the way you intended or thought it would. A typical television interview of 2-5 minutes will result in about 15 seconds of
airtime. That is a very short opportunity to make your point. Below are some things to remember when talking with the media, and some tips on delivering your message in a thoughtful and thorough way

Understand the Reporter’s Motives
- News is a business, they’re job is to sell stories and get ratings
- News stories will usually focus on the negative, or at least conflict, criticism & controversy. Remembering this will make an interview less intimidating.
- Remember that interviews are confrontations not conversations

When a Reporter Calls
- Return the call as soon as possible, be courteous.
- Find out certain things from the reporter before you answer any question such as:
  - What is the story about?
  - Who else has the reporter spoke with and what other information do they have?
  - When will the story come out and when is the deadline?
- If you don’t know the answer to a question you should say so, and offer to find out and get back to them but don’t guess.

Hints for the Interview
- Always tell the truth. This builds credibility.
- Speak in sound bites of 5-15 seconds...complete sentences that stand alone.
- Anticipate tough questions and have your answers ready.
- Memorize the key points you want to make and make them repeatedly because it will only be stated once in the actual story.
- Have an alternative message to turn a negative into a positive.
- Speak to express not impress. Colorful words and analogies are okay but avoid scientific language as you will not likely make a connection with listeners.
When you have finished a statement, stop talking. Awkward silences are ok.

Make the statements you want to make and create the opportunities to make these points.

Appearance is Important
- The impression you make is dependent upon how you look and how you express your message.
- Dress appropriately, be neat and clean if possible.
- Always look at the reporter during the interview and remember that a smile builds credibility.
- Pay attention to the backdrop. Agency vehicles or signs are good choices, as are scenic backgrounds.
- Look and act professionally. Give a professional perspective and the same type of impression will follow.

Build Good Media Relationships
- Be available.
- Always appear confident and act professionally.
- Keep a file of good quotes and use them in interviews.
- If you liked the way the story ran be sure to call the reporter and thank them.

When you find reporters who understand what you are trying to do and their reporting is favorable, contact them for other stories throughout the year. This way, the articles aren’t always centered on controversy.
### Appendix 1. Example of potential actions to consider when responding to human-bear conflict.

<table>
<thead>
<tr>
<th>Risk</th>
<th>Definition</th>
<th>Possib...</th>
<th>Possible actions (act in priority order)</th>
<th>Safety or pets/livestock</th>
<th>Safety or pets/livestock</th>
<th>Safety or pets/livestock</th>
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<tbody>
<tr>
<td>High</td>
<td>Immediate threat to human safety or pets/livestock</td>
<td><strong>Provide information on wildlife conflict prevention</strong></td>
<td>Remove the attractant</td>
<td>Capture and relocate the animal</td>
<td>Issue a depredation permit</td>
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<tr>
<td>Med</td>
<td>No immediate threat to human safety or pets/livestock. BUT conflict is expected to continue and escalate to human safety or pets/livestock threat if no action is taken</td>
<td><strong>Provide information on wildlife conflict prevention</strong></td>
<td>Monitor the situation</td>
<td>Capture and relocate the animal</td>
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</tr>
<tr>
<td>Low</td>
<td>No immediate threat to human safety or pets/livestock</td>
<td><strong>Provide information on wildlife conflict prevention</strong></td>
<td>Monitor the situation</td>
<td>Capture and relocate the animal</td>
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</table>
Appendix 2. Example of bear behavior and public safety risks to consider when trapping and relocating black bears.

<table>
<thead>
<tr>
<th>Poor Safety</th>
<th>Moderate Safety</th>
<th>Good Safety</th>
<th>Excellent Safety</th>
<th>Bear's Response to People</th>
<th>Public Safety Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves trees, raises young, hrk, grr, and barks</td>
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<tr>
<td>Leaves only a very quiet hrk, grr, and barks</td>
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<tr>
<td>Leaves ground, approaches btrn hrk, brews</td>
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<td>Leaves only a quiet hrk or grr</td>
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<td>Beer's response to people</td>
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When trying to obtain food, bears should be euthanized. In our opinion, most bear-trapping methods cause significant stress and suffering, which is often fatal. If death occurs, the bear is removed from the area and disposed of properly. Determining the cause of death is important for ensuring that the bear is actually dead and has not just been temporarily stunned by the trapping process. However, some methods of trapping and relocating bears can be more humane and less stressful to the bears.
Appendix 3. Example of site factors to consider when releasing bears involved in human conflict.

<table>
<thead>
<tr>
<th>Developed High</th>
<th>Developed Semi-Rural</th>
<th>Developed Rural</th>
<th>Isolated Site</th>
<th>Safety: Human and Bear</th>
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<tr>
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<td>Broad</td>
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<td>Moderate</td>
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**Key Site Factors**

- Probability of a success: Poor
- Probability of a success: Excellent

- Animal Food: Excellent
- Availabilty: All areas Good
- Legally mandated Bear proof: None
- Few sites: Low
- Areas moderate: Low
- Mixed areas: Low
- Law with some Nixed: Moderate
- Subdivision Mostly small: Moderate
- Urban park: Developed

**Letter of site factors**

- Letters: A, B, C, D
- Numbers: 1, 2, 3, 4
- Letters: X, Y, Z
- Numbers: A, B, C, D
(modified from LeCount 1986).

**NOTE:** TOOTH WEAR CAN BE EXTREMELY VARIABLE. AGING BEARS USING THIS METHOD SHOULD NOT BE RELIED UPON FOR CALCULATING A BEARS EXACT AGE. ACTUAL AGES ARE BEST DETERMINED WITH CEMENTUM AGING TECHNIQUES.

When aging bears using teeth it is best they be divided into four categories: cubs (less than one year); yearlings (1-2 years); sub-adults (2-3 years); and adults (4+)

**4-A:** *(Permanent teeth erupt during the bear’s first year)*
Do all upper incisors & canines appear to be permanent teeth?
   - No = cub of year – <10 months
   - Yes = (See 4-B)
4-B: Do cusps on 1\textsuperscript{st} upper incisor show wear?
   No = 1-2 years old
   Yes = sub-adult or adult (See 4-C)

1-2 year old bear with permanent teeth, no wear on incisors

Cusp of 1\textsuperscript{st} upper incisor with wear, 2-4 years
4-C: Are both 1\textsuperscript{st} and 2\textsuperscript{nd} upper incisors rounded to flat with dentine spots showing in the center of crown?

No = Sub-adult 2-3 years old
Yes = Adult >4 years old (See 4-D)

1\textsuperscript{st} and 2\textsuperscript{nd} upper incisors not rounded to flat with no dentine spots showing; sub-adult

1\textsuperscript{st} and 2\textsuperscript{nd} upper incisors rounded to flat with dentine spots showing; adult
4-D: Do tips of upper canine show obvious wear?
   No = generally 4-7 year old adult
   Yes = generally >7 years old (See 4-E)

Canine tip with little obvious wear (4-7 years)

Canine tip with more obvious wear (>7 years)
4-E: Do all teeth have extreme wear with 2 or more canines broken and/or worn smooth?
   No = middle age adult – 8-15 years old
   Yes = older adult – 16+ years old

All teeth show moderate wear – age 8-15 years

All teeth show extreme wear – age 15+ years
Appendix 5. Estimating age of cubs of the year.  
(Courtesy of Bridges et al. 2002)
Appendix 6. Weight estimation using chest girth for black bears.
Appendix 7. Measuring bear paws and paw measurements
### Appendix 8. Track measurements of black bears in Arizona.

<table>
<thead>
<tr>
<th>Age Class (years)</th>
<th>Track Size (in inches, all measurements include toes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males (2 - 3)</td>
<td>2 - 3</td>
</tr>
<tr>
<td>Males (3 - 3½)</td>
<td>3 - 3½</td>
</tr>
<tr>
<td>Females (1 - 2½)</td>
<td>3 - 3½</td>
</tr>
<tr>
<td>Females (1 - 3)</td>
<td>3 - 3½</td>
</tr>
<tr>
<td>Females (3 - 4)</td>
<td>3 - 4½</td>
</tr>
<tr>
<td>Females (3½ - 4½)</td>
<td>3 - 4½</td>
</tr>
<tr>
<td>Males (4 - 5)</td>
<td>4 - 5½</td>
</tr>
<tr>
<td>Males (5 - 7)</td>
<td>5 - 7½</td>
</tr>
<tr>
<td>Males (7 - 9)</td>
<td>7 - 9½</td>
</tr>
<tr>
<td>Males (9 +)</td>
<td>9 - 10½</td>
</tr>
<tr>
<td>Cubs</td>
<td>2 - 3</td>
</tr>
</tbody>
</table>
Appendix 9. Tips for investigating livestock incidents and carnivore ID.

Bear

**Track Dimensions**
- Front - 5" wide by 4" long
- Hind - 6" wide by 8" long

**Domestic prey:**
- Goats
- Sheep
- Calves

**Hunting strategy: Ambush predator**
- Individual hunter (except a female with yearlings)
- Hunts across a variety of habitats
- Chases typically occur over short distances
- Kills may be moved or carried away from the attack location

**Common attack zones: The back**
- Back/spine
- Neck
- Skull
- Withers

**Attack characteristics: Blunt force**
- Bites to the top of the prey along spine
- Lacerations from claws to the chest and shoulders
- Wounds and lacerations will be ragged or frayed
- Skull or rostrum may be crushed

**Feeding characteristics: Messy**
- Feeding across the carcass
- Extensive crushing of bone
- Carcass turned inside-out
- Consumption of utters and other soft tissues
- Carcass may be torn, mauled, or mutilated

Notice the tissue hemorrhaging in the withers area

Notice the tissue hemorrhaging and feeding pattern on back
Coyote

**Domestic prey:**
- Sheep
- Goats
- Fowl
- Domestic pets
- Newborn calves

**Hunting strategy:** Coursing predator
- Individual or group hunter
- Hunts across a wide variety of habitats
- Potential for prolonged chase and attack
- Kills rarely moved from attack location

**Common attack zones:** Neck, Rear
- Jugular/neck (common on sheep)
- Hindquarter/groin
- Flank
- Tail

**Track Dimensions**
2 1/2” wide by 2 1/2” long
(length = claws to heel pad)

**Attack characteristics:** Maiming
- Extensive biting and hemorrhaging
- Bites and lacerations on or near hindquarters and tail
- Widespread trauma reflecting repositioning during attack
- Crushed windpipe may be present
- Trauma may be present under or behind the front legs

**Feeding characteristics:** Messy
- Feeding across the carcass, often initiated at rear
- Multiple feeding activity centers
- Chewed legs, tail, or head
- Prey remains spread across the site

Typical puncture wound caused by coyote. The intercanine distance should not be used.

Puncture marks are smaller and lacerations are narrower than a wolf, coyote, or bear would leave.
Domestic Dog

**Domestic prey:**
- Sheep
- Goats
- Fowl
- Domestic pets
- Newborn calves

**Hunting strategy:** Coursing predator
- Individual or group hunter
- Hunts across a wide variety of habitats
- Potential for prolonged chase and attack
- Kills rarely moved from attack location and may not even be fed on

**Common attack zones:** Rear half
- Hindquarter/groin
- Flank
- Tail

**Track Dimensions**
(varies)
3 ⅛” wide by 3 ⅛” long
(length = claws to heel pad)

**Attack characteristics:** Maiming
- Extensive biting and hemorrhaging
- Bites and lacerations on or near hindquarters and tail
- Ragged or frayed wounds and lacerations
- Widespread trauma reflecting repositioning during attack
- Trauma may be present under or behind the front legs

**Feeding characteristics:** Messy
- Feeding across the carcass, often initiated at rear
- Multiple feeding activity centers
- Chewed legs, tail, or head
- Prey remains spread across the site

Typical dog attack showing multiple injuries but little feeding

Dogs are rarely experienced enough to kill efficiently
Cougar

Track Dimensions
4 ½” wide by 4” long
(length = toe to heel) pad

Canine punctures on throat (may not be this obvious)

Typical fluid "cache" where remains are mostly covered up with debris

Attack characteristics: Clean, efficient
- Crushed neck, windpipe, skull,
  (occasionally the rostrum)
- Punctures and lacerations to neck, head,
- Knife-like wounds and lacerations with
  very clean edges (all claws may not
  register)
- Limited repositioning during attack
- Caching of kill

Feeding characteristics: Efficient, tidy
- Hair is removed by shearing or plucking
- Entry behind shoulder or just behind ribs
- Internal organs consumed 1” (heart, liver,
  lungs)
- Muscle tissue consumed secondarily
- Feeding activity and prey remains
  concentrated at a single location

Domestic prey:
- Goats
- Sheep
- Llamas and alpacas
- Fowl
- Domestic pets

Hunting strategy: Stalking predator
- Individual hunter (except a female with
  yearlings)
- Requires cover (e.g., understory
  vegetation, topography, trees)
- Attacks occur over a limited distance
  with little or no chase
- Kills may be drug or carried

Common attack zones: Front half
- Neck
- Throat
- Head
- Shoulder
Appendix 10. Comparison of bear paw and human hands/feet. (Courtesy of Sims 2007)

Note: We included this section for reference because there are times when members of the public find a bear carcass and may mistake it for human remains.

Skinned bear paw exhibits “finger-like” human features. Photo by Constable Timothy Anderson, Alexis Creek Detachment Royal Canadian Mounted Police (British Columbia).

Skinned bear paw (“palm up,” terminal phalanges/claws removed) that could easily be confused with human remains. Note similar size to human hand pictured, and the diagnostic deep grooves that identify the distal ends of bear phalanges. Human fingers (excluding thumbs) have three bones (phalanges) in each finger beyond the palm. The remains pictured here have two (a hint that bear claws have been removed.) Photo by Constable Timothy Anderson, Alexis Creek Detachment Royal Canadian Mounted Police (British Columbia).
Left: skeletal elements of left human hand (*Homo sapiens*, palm up). Note terminal phalanges, labeled as phalanx 3, are present (third finger “tip” bones farthest from long palm bones shown joined with wire). Right: black bear paw (*Ursus americanus*, front left), shown without terminal phalanges/claws (except digit IV) to illustrate similarity in appearance with human.

Left: Human phalanges showing slightly depressed shape of articular surface of first phalanx. Right: Black bear phalanges showing deep V-shaped groove of first phalanx, also clearly visible in the bear remains depicted in Figure 2.
APPENDIX 11. VENDOR LIST

Disclaimer: We are often asked by other biologists where to get the supplies needed, such as capture supplies, snares, or tranquilizing equipment. To that end, we have included this list of Vendors to provide managers with a starting point in looking for the equipment and supplies they need to for conflict response. This list is by no means conclusive, and the exclusion of any other name or company is inadvertent. People are encouraged to compare quality, availability and prices of several vendors. These are simply the vendors that we are familiar with and we offer no guarantee as to the reliability of any product or service.

<table>
<thead>
<tr>
<th>Vendor Name</th>
<th>Products referenced in this manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aces Animal Care Boulder, Colorado 800.338.2237 <a href="http://www.animal-care.com">www.animal-care.com</a></td>
<td>Capture supplies</td>
</tr>
<tr>
<td>Acorn Naturalists Tustin, California 800.422.8886 <a href="http://www.acornnaturalists.com">www.acornnaturalists.com</a></td>
<td>Education supplies</td>
</tr>
<tr>
<td>Allflex USA, Inc. Dallas, Texas 800.989.TAGS <a href="http://www.allflexusa.com">www.allflexusa.com</a></td>
<td>Marking supplies, ear tags</td>
</tr>
<tr>
<td>Biomark Boise, Idaho 208.275.83702 <a href="http://www.biomark.com">www.biomark.com</a></td>
<td>Marking supplies</td>
</tr>
<tr>
<td>BunnyRabbit.com Spring Branch, Texas <a href="mailto:bunnies@bunnyrabbit.com">mailto:bunnies@bunnyrabbit.com</a> <a href="http://www.bunnyrabbit.com">www.bunnyrabbit.com</a></td>
<td>Tattoo Pen (Ken Pen)</td>
</tr>
<tr>
<td>Company</td>
<td>Location</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>Communications Specialists, Inc.</td>
<td>Orange, California</td>
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<tr>
<td>Counter Assault</td>
<td>Kalispell, Montana</td>
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<tr>
<td>Dan-Inject-North America</td>
<td>Knoxville, Tennessee</td>
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<tr>
<td>Destron Fearing</td>
<td>South Saint Paul, Minnesota</td>
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<tr>
<td>F &amp; T Fur Harvesters</td>
<td>Alpena, Michigan</td>
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<tr>
<td>Fehr Bros. Industries</td>
<td>Saugerties, New York</td>
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<tr>
<td>Four Flags Over Aspen</td>
<td>800-222-9263; <a href="http://www.fourflags.com">http://www.fourflags.com</a></td>
</tr>
<tr>
<td>Company</td>
<td>Location</td>
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</tr>
<tr>
<td>Lightfield</td>
<td>Adelphia, New Jersey</td>
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<td>Margo Supplies</td>
<td>High River, Alberta, Canada</td>
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<td>Montana Canvas</td>
<td>Belgrade, Montana</td>
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<td>Mother Murphys</td>
<td>Greensboro, North Carolina</td>
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<td>Nasco</td>
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<td>Pepperball</td>
<td>San Diego, California</td>
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<tr>
<td>Pneu-Dart Inc.</td>
<td>Williamsport, Pennsylvania</td>
</tr>
<tr>
<td>Sirtrack-North America</td>
<td>North Liberty, Iowa</td>
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</table>

Note: The products and services listed are subject to change, so it is recommended to check the websites or contact the companies directly for the most up-to-date information.
<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Contact Information</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teton Welding</td>
<td>Choteau, Montana</td>
<td>406.466.2124, <a href="mailto:tetonwelding@montana.com">tetonwelding@montana.com</a></td>
<td>Culvert Traps</td>
</tr>
<tr>
<td>Vectronic-Aerospace</td>
<td>Berlin, Germany</td>
<td>+49(0)30 6789 4990, <a href="http://www.vectronic-aerospace.com">www.vectronic-aerospace.com</a></td>
<td>Radio telemetry cotton spacers for collars</td>
</tr>
</tbody>
</table>