

Emergency, Disaster And Survival Preparedness

BUG OUT BAG ENCYCLOPEDIA

SHORT, MEDIUM AND LONG-TERM BUG OUT BAGS



By Joseph Yao, M.D.

Bug Out Bag Encyclopedia

Emergency, Disaster and Survival
Preparedness

Short, Medium and Long-Term Bug Out Bags

Joseph Yao, M.D.

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COMMENTS FROM REVIEWERS OF THE BUG OUT BAG ENCYCLOPEDIA

L Jones:

“When any form of disaster occurs either by nature or mankind, preparation can make the difference between survival and failure. This is why the Bug Out Bag, or BOB for short, can be your saving grace when you have to flee your home quickly. There are three types of BOBs, which can last from days to months depending on the situation you are facing. But what should you pack so you are prepared for every eventuality? Are there some items that have many purposes? From food essentials, tools, and shelter to first aid advice and everything in between, this guide is the ultimate knowledge base. Discover the items you need, the best places to purchase them, and their cost, as well as invaluable survival techniques and advice. *Bug Out Bag Encyclopedia* by Joseph Yao is not only perfect for anyone who wants to be prepared for any eventuality but is also an essential read for those who travel and explore remote places.

”*Bug Out Bag Encyclopedia* by Joseph Yao is such a detailed and comprehensive guide on survival. I was blown away by the amount of research it must have taken to compile this encyclopedia. Everything is laid out so clearly and I loved the bullet points and diagrams. The chapters are split into sections, making it so much easier to find the information you need. The section on first aid was incredible, especially the vast amount of advice given on tourniquets. I loved how the author always suggests items that have many purposes, such as iodine, alcohol prep pads, and garbage bags for shelter. I thought the chapter on food items was so helpful; he covered absolutely everything,

from hunting, fishing, and edible plants as well as the normal food items you can purchase. My favorite chapter was regarding the use of power banks in conjunction with solar panels. I cannot stress how much guidance is included in this incredible guide - must-read for anyone with an interest in survival.”

A. Elmore:

“Discover how to build, pack, store, and use a bug out bag in the informational self-help book, *Bug Out Bag Encyclopedia* (Emergency, Disaster & Survival Preparedness) by Joseph Yao. For many of us, the recent pandemic was a wake-up call. Within a few weeks, the world experienced shortages in basic necessities like toilet paper, food, and cleaners. Stability became a thing of the past as schools and businesses closed, and people found themselves struggling to provide themselves and family with the common comforts of a roof over their heads, water, and heat. Hospitals requested that only the very sick and wounded seek their assistance. America, along with the rest of the world, was in crisis with very few truly prepared. Now more than ever, it is vital to be ready for unprecedented emergencies. A bug out bag may just save your or a loved one’s life. Building the best bug out bag for your individual needs by factoring in your health, conditions, and weight will help you stay safe and ready for anything. Learn how to select, pack, and balance your bag’s load to prevent injury or fatigue. With links to the items for your bug out bag, and descriptions explaining why they are important, this book is a go-to guide for the prepared. Are you ready for a disaster or emergency? Can you confidently say you are ready to survive without common comforts and basic necessities?

”*Bug Out Bag Encyclopedia* (Emergency, Disaster & Survival Preparedness) by Joseph Yao is complete with instructions, examples, statistics, and suggestions that will help you choose the correct items for your bag for your unique location and situation. With a chapter dedicated to the three different bug out bags that everyone should have, to personal protection items, to a chapter concerning your pets, this book is inspirational and necessary to have in your library. Beautifully organized, the author has even included a chapter on first aid that would make the Red Cross blush. With a chapter dedicated to the

different items with which to stock your first-aid kit and how best to use them, this book has already become my Bible. Prior to this book, I was unaware that there are three options for a bug out bag, each bag with a specific purpose. There is a chapter dedicated to the individual bags, explaining their purpose, how to build them, and when and how to use them. I appreciated that Mr. Yao goes above and beyond to present as much information as possible without overwhelming the reader. I was impressed that he even went as far as explaining to the reader how best to lift their pack to prevent damage to the bag and injury to themselves. While I would invest in this book just for the first-aid content, it is a must-have for anyone interested in protecting themselves and their loved ones by being prepared.”

S. Sewell:

“Have the effects of the pandemic gotten you thinking about being more prepared for unexpected disasters? Would you like to ensure that you have a way to survive if the unthinkable happens? *Bug Out Bag Encyclopedia* (Emergency, Disaster & Survival Preparedness) by Joseph Yao takes the stress and hardship out of learning how to be prepared. It is the perfect guide to help any and everyone to create a bug out bag specific for their personal needs. With natural disasters on the rise, it is always good to be ready to go in a pinch. Filled with all the particulars and details you need to build a bug out bag at your fingertips, you can use the information provided to create a little survival insurance for you, your loved ones, and your pets. If nothing else, the year 2020 has taught us that our life can change on a dime. Are you prepared to meet anything that comes your way?

”*Bug Out Bag Encyclopedia* (Emergency, Disaster & Survival Preparedness) by Joseph Yao is an exceptional self-help book with indispensable and essential information that can be lifesaving in a crisis. Cleverly organized and containing detailed lists that help even the novice discern what bug out bag works best for them in a crisis situation, it is a beneficial tool in getting prepared for any unexpected emergency. I most especially appreciated and was impressed with the first aid section that concisely describes the product and clearly explains why and how each product is used and where to purchase it. I

highly recommend this book to everyone who wants to provide a safeguard for their future.”

A. Syed:

“*Bug Out Bag Encyclopedia: Emergency, Disaster & Survival Preparedness* by Joseph Yao is a comprehensive guide for those who are thinking of putting together their first survival plan and supplies in preparation for a catastrophic event or those who may need a refresher to update plans and supplies they already have. Yao takes a no-nonsense approach with an authoritative narrative that has been earned through extensive research and bag-building experience. Nothing is withheld and the details encompass everything from the type of bag to targeted and specific guidance on what goes in it, to how many are needed for different events and stretches of limited resource availability, and the organization of all of this among many other things.

”In the interest of full disclosure, I had no concept of survival preparation, aka: 'prepping', until I married an American wife. Born and raised in San Francisco under the constant threat of the next big earthquake, this woman knew how to stock a trunk and a pantry. The reason why I share this is that after I read Joseph Yao's *Bug Out Bag Encyclopedia*, she immediately removed it from my hands and started taking notes as she read it. Notes! Two of the many things we did not know are that dryer lint can be used as kindling and that a long-term bag should include seeds and anything to assist in the successful cultivation of a farmer's garden. This isn't a book with a lot of fluff, which nobody expects in an encyclopedia anyway, but Yao is still able to impart real-world, human advice amidst the massive amount of guidance provided. Frankly, this is the only book you'll need to begin or to flesh out your own series of bug out bags.”

INTRODUCTION

What if...you had the power to choose life over death?

Disaster can take many forms including those created by nature and those by man. In addition to preparing for hurricanes, tornadoes, earthquakes, and the like, you need to also be ready for civil unrest. Even former safe havens like gated, affluent, suburban neighborhoods have been invaded by angry mobs. People are alarmed and buying firearms in record numbers, including many first-time buyers. But firearms alone are not enough.

Will you be a survivor? You can take control and choose life by taking the time now to assemble a Bug Out Bag (also known as a “BOB”) to help you survive when disaster strikes.

The key is to prepare now. When disaster strikes, it’s time to “grab and go.” There may be no time to gather things from around your house. And it will be difficult or impossible to shop for items that others who failed to prepare are also desperately trying to procure.

This book was written to save you valuable time learning how to put together your survival bag or BOB. You could research articles, books, and videos to search out this information. Or you can make it easy on yourself by reading this entire book or simply thumb through the sections of this book that address your particular needs. Chapters are organized to make it quick and easy for you to find the information you need. Those of you who already have a BOB can use this book to determine if there may be other items to consider adding to your kit or to perhaps replace existing items.

Some of the information covered in this book includes:

- The concept that three BOBs are better than one and why you should consider setting up bags to help you survive short-, medium-, and long-term emergencies
- A list of recommended items to include in each of your three bags

- A detailed list of items organized by survival category (e.g., 1st aid, water, fire, shelter, food, communication, etc) along with the size, price, and weight of each item. The items are coded to tell you which of the three bags they are best suited for.
- Specific products are presented as examples of economical and more premium alternatives to help people with different budgets.
- Learn how item selection within specific survival categories differs depending upon the anticipated duration of the disaster. For example, your choice of food items will be different for your short and long-term BOBs.
- How to organize the survival items inside your BOB for easy access and recognition
- How your BOB items will differ if you're on foot versus escaping by automobile
- Items to include for your pet
- Reference list for additional information

Once you've gone through this book, you'll have accomplished:

- Created your own personalized list of items within each survival category to put into your three customized BOBs
- You can use the detailed item descriptions to calculate an estimate of the overall price and weight for each of your BOBs based upon your item selection. You can then add or subtract items from your BOBs to optimize price and weight.

For those of you just getting started, do not feel overwhelmed. Start by putting together your Everyday Carry (also known as "EDC") kit. Then, begin building your first BOB. The Medium-Term BOB is overkill to cover short-term emergencies and it lacks some capabilities to manage long-term disasters. But the Medium-term BOB is a good place to start if you are building your first bag. You'll be limited in the amount you can carry whether you escape by vehicle or on foot. So, carefully choose what items you put into your BOBs. You most likely will not be able to add items once you begin your escape.

When feasible, you'll be better off staying in place where you'll have the benefit of your network of friends and family. And, you will have access to shelter and supplies afforded by your home or office. Under dire

circumstances, you may be forced to flee fast. The information in this book will ensure that you have the critical items necessary for you to survive whether you're able to shelter in place or if you're forced to escape to another location.

Building a BOB is your survival insurance. Like having car or medical insurance:

- You hope you never have to use it
- It's too late to get it when an emergency happens
- And, you'll be ever so happy you have it when you need it!

Life or death in the face of an emergency? The choice is yours. Empower yourself. Get started now to help ensure your survival.

HOW TO NAVIGATE THROUGH THIS BOOK

Here are some tips on how to navigate through this book in order to get the most out of it:

1. First, read sections the following chapters for an overview:
 - a. General Issues
 - b. Three Bags to Help You Survive
2. Second, you can learn what to include in your three BOBs by reading the following chapters:
 - a. Short-Term Bag Contents
 - b. Medium-Term Bag Contents
 - c. Long-Term Bag Contents
 - d. If you already have a BOB, then you can skip to the specific survival category chapters (e.g., First Aid Items, Water Items, Fire Items, Food Items, etc) for ideas of other items to include in your bag
3. Third, you can read details about the items to include in these three BOBs:
 - a. Each survival category chapter includes a discussion about pertinent survival items along with product examples
 - b. Examples of items include specific product names, price, size, weight, and comments
 - c. A hyperlink is included for each item example taking you to a commercial web page for the item
 - d. A comment is included for each item example as to which bag it is most appropriate for (i.e., Short-, Medium-, or Long-Term BOB)
4. Fourth, you can review the item lists to select items to use to customize your bags
 - a. Jump to the survival category chapter that interests you (e.g., first aid, water, food, etc)

- b. You can use the item prices and weights to help configure your bag
5. Fifth, you can refer to the Reference section if you wish to learn more

Warning

Lots of items are described in this book. The intention of this book is to provide you with ideas about the major survival categories to prepare for and to provide you with examples of items for each category. Hopefully, it will give you ideas that you may not have already considered.

Keep in mind that everyone's situation is unique and you must customize your BOB to suit your needs. Do not interpret this book to mean that you need to get *everything* mentioned herein. You need to select only those items that will help ensure your survival while keeping your BOBs to a size that is manageable and light enough for you to carry.

Note regarding lack of photos or illustrations:

I made the decision to not include photos or illustrations to limit the number of pages for this book. I realize that it would be nice to have photos next to each of the survival item examples, but there are so many items that including photos would require a huge amount of extra space. I listed hyperlinks in the descriptions of the survival items mentioned in this book, so you can view photos on those web pages.

Disclaimer:

Products, weights, and prices presented herein are current at the time of this writing but are expected change with time. Products mentioned in this book are meant to serve as examples for the reader. They are not product endorsements. The author derives no benefit, financial or otherwise, from mentioning any product in this book.

There is no "one size fits all" solution and each person must customize their BOB to suit their individual needs.

The information contained herein reflect the author's opinion. It is not meant to provide medical or legal advice. The author cannot be held responsible for any legal proceedings, injury, loss, damage, or other problems that the reader or anyone else may experience or arise from using any of the information presented in this book. Always abide by all laws and rules and do not violate

private property restrictions.

GENERAL ISSUES REGARDING BOBS

This chapter covers some general topics regarding BOBs.

Why should I spend the time and money to assemble a BOB?

An emergency or disaster can remove from us many of the protections and resources that we take for granted. Our survival may depend upon our knowledge, skills, and the resources we have available.

All of us could be confronted by an emergency or disaster at any time. Different locales may be more prone to certain disasters such as hurricanes, flooding, tornadoes, earthquakes, wildfires, volcanoes, or landslides. Any of these situations could destroy our homes and offices leaving us with only hours or minutes to grab what we can and escape. Even if there is time to go to the store, there will be chaos and stores will soon be depleted of critical supplies and equipment as the multitudes of unprepared people rush out in a panic to shop. It is crucial that you have essential items packed in a BOB ahead of time and placed somewhere you can grab it at a moment's notice.

It is often stated that a person may die if they go:

- 3 minutes without oxygen
- 3 hours exposed to environmental elements in the absence of shelter
- 3 days without water
- 3 weeks without food

A person's mental and physical abilities will decline well before those limits are reached and the chance of death increases as time passes particularly under the stress of a survival situation. By putting together a BOB, you are making a conscious choice to stack the odds in your favor that you will live instead of die.

Should I buy a ready-made BOB?

One question is whether you should buy a ready-made BOB to save time and expense. Here are some things to consider:

- What is the quality of the items in the BOB? Often, these ready-made BOBs are put together with as many items as possible at a moderate overall price, necessitating the inclusion of lower quality items.
- Even higher quality ready-made BOBs are assembled to fill the needs of the broadest number of people, so they may not be suited to your situation and needs.
- Are essential items included to help me survive? Are certain important items missing?
- How many extra items will I need to buy to “complete” the pack and how much will that cost me?
- Are items included that I do not need?

You should read about the individual items included in a ready-made pack to judge their quality and usefulness to you. You can only assess the quality of some items once you have them in your hands and give them a trial run. But do your best to get a feel for the overall level of quality of the bag and its items. You might consider getting a pre-made bag if you do not have the time or interest in researching and selecting items on your own to create a personalized BOB. You can also consider getting a pre-made bag to use as a starting point and then buy items you need that are missing. You can also buy items you like better to replace ones that came in the pre-made bag. You are better off doing the work and assembling your own BOB if you want it to be customized to your needs and contain the items you like. Creating BOBs is an evolving process and many people will find that they will want to get something new or replace something in their kit as they learn of new technology, techniques, and products to help them survive and make their kit more functional.

How much will I have to pay for my BOB?

An important issue is cost. How much will it cost for me to make a BOB? Cost varies widely depending upon a person’s circumstances (e.g., what type of disasters are most common in their area, what environment do they live in, etc) and what items they select for their BOB. This book will help you to formulate an estimated cost to create your custom Short-, Medium-, and Long-term BOBs. As you work through selecting items for your BOBs, you

can total the costs listed in this book for each so you'll come up with an overall estimated cost. The chapter entitled, "Items for Your Bag: Explanation," will show you how to do this. In general, buy the best quality items that you can afford while keeping an eye on value. With most items, there is a point of diminishing return whereby cost beyond a certain point buys less incremental increases in quality.

What do I put into my BOB?

Selecting what to put into your BOB requires some thought since each person's situation is unique. The chapter entitled, "Choosing Items for Your Bag: Explanation," will help you track items for your BOBs including their cost, size, and weight. Numerous chapters in this book will aid you in choosing specific items to cover the major survival categories such as first aid, water, food, and such. But here are some considerations to help you customize your bag so it best helps you:

- Consider your location. Are you in a big city, in the suburbs, or out in the countryside? One item that will be discussed in the chapter on water is a sillcock key with multiple heads. It can be used on water spigots located on the outside of industrial buildings and businesses. These spigots often lack valve handles and require the use of a special wrench to turn. Having a sillcock key could give you access to life-saving water in the city but would be useless in the woods.
- How long do you expect the emergency or disaster to last? Your BOB will contain fewer items if you're preparing for a disaster that occurs while you're in the office and you just need to get to your home that's located close by. You'll need to outfit your BOB with a much more comprehensive inventory of items if you expect it to help you survive through a long-term disaster. We'll discuss this issue in detail in an upcoming chapter.
- How many people are you preparing to help survive? This book is focused on preparing BOBs for you alone. BOBs you prepare when there are multiple people involved will look different since some items can be shared (e.g., high volume water filter, fire-starting tools, etc) while other items may need to be included that are unique to a particular individual (e.g., medical equipment, etc).
- Your body size and physical condition will influence how much you can carry on your person.

- Address the conflict between “More is good” and “Less is lighter.” There is merit to packing less since it will make your BOB lighter and easier to carry. The trade-off is that you will generally be limiting yourself to the bare essentials and lack some items that make surviving more convenient. You can only take your best guess as to what type of disaster may befall you. Say that you live in a big city and you prepare an urban BOB. But what if circumstances arise where you can’t hunker down in the city and you must urgently escape to the countryside? Your lightweight urban BOB will definitely be helpful, but it will lack some items that may help you survive in the countryside or the woods. There may be little time to customize a BOB when disaster strikes. So, one strategy is to pack a broader array of items in your BOB. You can grab that BOB and run with it even though it is heavier. You can discard items from this BOB once you have a chance to get to safety and better assess your needs.
- Redundancy. Pack multiple items to help you manage essential survival functions. For example, pack items that permit you different ways to start a fire (e.g., wind and waterproof matches, lighter, ferro rod, etc).
- There are extra considerations if your preparations include the possibility of escaping in a vehicle when disaster hits. A vehicle allows you to bring additional items. This will be covered in a subsequent chapter.
- Don’t forget about your pet(s). It’s important to plan ahead and prepare a BOB for them or include their survival items in your BOB. See the chapter, “Items for Your Pet.”

How much can I carry?

Here are some rules-of-thumb from a couple of sources regarding how much weight a person can carry when hiking with a backpack:

- From REI Co-op: “A loaded backpacking pack should not weigh more than about 20% of your body weight. (If you weigh 150 pounds, your pack should not exceed 30 pounds for backpacking.) A loaded day hiking pack should not weigh more than about 10% of your body weight. (If you weigh 150 pounds, your pack should not exceed 15 pounds for hiking.)”^[1]
- From preparednessadvice.com: “... an individual in good health should be able to carry about 20% of their body weight, a 40 lb. pack for a 200-pound person. More experienced backpackers should be able to carry

25% of their body weight, a 50 lb. pack for a 200-pound person. Very experienced and well-conditioned backpackers can carry 35% of their body weight – a 70 lb. pack for a 200-pound person.”^[2]

Factors that can influence how much I can carry:

- My physical condition (e.g., stamina, medical conditions, back problems)
- My experience carrying a loaded backpack
- The terrain on which I’ll be walking (e.g., flat versus hilly, dry versus slippery, smooth versus rocky)
- Weather (e.g., hot, cold, rain)
- How far will I have to walk?
- How well my backpack fits me. How comfortable is it to wear when fully loaded?

How can I reduce the weight of my BOB?

- Carefully assess all the items in your BOB. Separate them into these groups: definitely need, maybe, and don’t need. Discard items from the “don’t need” group.
- Be aware of the weight of items you add to your BOB. When faced with multiple options, choose the lighter alternative so long as its quality and function meet your needs (e.g., a down feather coat versus one made of heavy cotton).
- Consider swapping out an item for a newer one that is lighter (e.g., a tent made of lighter materials).
- Choose items that can serve multiple functions. A prime example is a multi-tool that has a knife, saw, multiple screwdrivers, file, awl, pliers, and scissors.
- Avoid bringing canned foods that are bulky and heavy. Instead, bring lightweight snacks and dehydrated or freeze-dried foods.
- Pack items that permit you to filter and purify water when going on long trips so you can carry less water.
- Discard as much product packaging as possible. Cut out and save important product information or instructions that you need for reference. You can place those in a clear, plastic, zip-lock bag and carry them in your BOB.
- Select a smaller, lighter backpack.

Should I buy Mil-Spec items?

Mil-Spec stands for Military Specification also known as Military Standard. The specifications are set up by the Department of Defense to create standardization and interoperability for products it procures. The military generally purchases products from the contractor with the lowest bid. So, while Mil-Spec products are generally of high quality and durability, they may not be the best product.

What about products labeled as Military Grade? This term can be found on many products to convey toughness and durability. They may resemble Mil-Spec products. However, Military Grade is a marketing term and has no actual meaning since the products undergo no special testing and do not have to meet any particular specifications.

There are plenty of high quality commercially produced products made for the general public. You can assemble a great BOB using these commercial products. But you need to do your research to evaluate the quality and durability of these products before you purchase them. Buying Mil-Spec products gives you the peace of mind knowing that they meet or exceed standards set by the Department of Defense. Again, you need to do your research because you may find better, lighter, and cheaper items in the commercial market. You really must make your decision on an item-by-item basis.

How do I lift and put on my fully loaded backpack without hurting myself?
The following advice is from REI Co-op.^[3]

“Avoid lifting a pack by a shoulder strap because this can damage and prematurely wear out your shoulder harness. It is also hard to control your pack by grabbing a shoulder strap as you put it onto your back. Instead, you’ll be able to smoothly hoist even a heavily laden pack from the ground to your back by using the following technique:

- Slightly loosen all of your straps to make the pack easier to slip on.
- Position your pack in an upright position on the ground.
- Stand next to the back panel with your legs well apart and knees bent.
- Grab the haul loop (the webbing loop at the top of the back panel on your pack).
- Lift and slide the pack up to rest upon your thigh while holding the haul loop for control.
- Slip one arm and shoulder through a shoulder strap until the strap rests on

top of your shoulder.

- Lean forward and swing the pack onto your back. Now slip the hand that was holding the haul loop through the other shoulder strap.
- Fasten all the buckles and adjust straps to comfortably position the pack on you.”

What are some additional points to consider?

- Put your BOB somewhere you can grab it fast, but where it is protected and preferably out of sight
- Practice wearing your pack. Check for comfort. You may need to rearrange items to change the bag’s balance and center of gravity. Adjust straps to optimize where the pack rides on your back.
- Test your BOB’s contents by living exclusively off its items for several days. That will point out to you what items you may want to add to your BOB as well as those that you can eliminate. It will also afford you the opportunity to hone your survival skills including setting up camp, hunting, and fishing.
- Periodically check your pack to remind yourself of its contents
- Periodically rotate out outdated items such as food or medications
- Stay active to maintain your physical conditioning
- Educate yourself on how to use your BOB items so you can deploy them fast in an emergency. Practice using your items. It’s not the time to learn how to apply your tourniquet when you’re bleeding out.

THREE BAGS TO HELP YOU SURVIVE

Topics covered in this chapter include:

- The concept of having three different BOBs to cover Short-, Medium-, and Long-Term emergencies
- EDC versus Short-Term BOB
- Medium-Term BOB
- Long-Term BOB

The Concept Having Three Different BOBs

One popular approach to BOBs is to build a 72-hour bag. This means that you'll have a bag that should sustain you and help you to survive for 72-hours. You can survive longer than 72-hours with that bag depending upon what items you select to put inside of it.

Having a 72-hour BOB is an important survival tool. Some people store their BOB in their cars. Many others store their BOB at home or at work, ready for them to take with them in an emergency. It is a bit large to conveniently bring with you everywhere daily. And it is useful to have extra items beyond what will fit into a 72-hour BOB if a disaster occurs that will place you without resources for a much longer period. Shelter items are an example. A simple poncho may be adequate for survival in a 72-hour BOB, but it would be suboptimal if you must be outside in the elements for weeks or months. It would be better to have a more formal shelter such as a tent in those cases.

It is difficult to assemble a single BOB to cover the spectrum of potential emergencies and disasters. Any single bag will be a compromise. Exactly what is compromised will depend upon how a particular person sets up their BOB. Items used to address specific survival categories (e.g., water, fire, food, etc) will vary depending upon the expected duration of the emergency or disaster.

The concept of having three BOBs is designed to address preparing for emergencies and disasters that last varying lengths of time and may cause you to be in different environments. You must “grab and go” during an emergency. There is no time to modify your BOB. So, you want to have your BOB set up to work best for you. If you have three different bags set up and ready to go, then you just must grab the one you want and run out the door.

The three bags are termed Short-, Medium-, and Long-Term BOBs. Here is a brief description of each type of BOB:

EDC versus Short-Term BOB:

The Short-Term BOB can be thought of as an “Extended EDC,” or Extended Everyday Carry bag. It can also be thought of as a Commuter Bag or a Get Home Bag. Everyone should carry their EDC items with them each day. Although EDC can vary from person to person, some basic items usually include:

- Wallet containing ID, credit or debit cards, cash, medical and car insurance cards
- Folding knife
- Compact flashlight
- Cell phone. You can use it to store valuable information including your medical information (history, medications, allergies), bank and credit account info, investment info, deeds/titles to property, estate planning info, Social Security card, birth certificate, etc
- Keys
- Spare pair of prescription eyeglasses in a hard case
- One day supply of your prescription medications
- Possibly a small multi-tool
- Possibly a small first-aid kit

One problem is that some people must wear certain types of clothes (e.g., surgical scrubs) during work hours that may not permit carrying very much on their person. In those cases, their EDC items may have to be kept in their office or car. There is still a limitation as to how many items a person can carry on their person even if they wear clothes with numerous pockets and use their belt to hold other items.

The Short-Term BOB consists of a bag holding items beyond what can usually be carried on one’s person daily. It contains items to cover short-

term emergencies such as a major interstate accident on the drive home. The Short Term BOB is designed to help you survive the initial emergency and the ensuing 12-24 hours. Items to consider including in this bag are described in the chapter, “Short-Term Bag Contents.”

Medium-Term BOB:

This bag is designed to help you survive two to seven days. Items to consider including in this bag are described in the chapter, “Medium-Term Bag Contents.”

Long-Term BOB:

This bag is configured to aid with surviving for weeks to months, long after the food and water you carried with you run out. Items to consider including in this bag are described in the chapter, “Long-Term Bag Contents.”

SHORT-TERM BAG CONTENTS

This chapter reviews suggestions for items to include in your Short-Term BOB, which serves as an EDC Extension Bag or Commuter Bag. It is assumed that you already have your EDC items with you (refer to the preceding chapter for a list), so those items will not be mentioned as part of your Short-Term BOB. Keep in mind:

- The items listed are just suggestions. You will need to customize your own BOB with items to suit your particular needs.
- Items are listed by their use for particular survival categories.
- A detailed description of the items along with product names as examples, weights, and prices appear in subsequent chapters organized by survival categories.
- This same method is used in the following chapters to describe item suggestions for your Medium- and Long-Term BOBs.

First Aid Items

- Band-aids, 1x3 inches
- 2x2" and 4x4" gauze sponge dressings
- Non-adherent dressings
- Chest seal
- 14 gauge Angiocath™ needle, at least 3 inches length
- 3" gauge roll
- 1" tape
- Steri-Strips™ (made by 3M™)
- Safety pins
- Non-latex disposable gloves
- Alcohol prep pads
- Iodine prep pads
- Moleskin

- Triple antibiotic ointment
- Antihistamine ointment and tablets
- Ibuprofen
- Imodium
- Tourniquet: CAT® Tourniquet (one-handed combat application tourniquet)
- Large tongue depressors
- Full-size EMT scissors

Water Items

- Bottled water
- Stainless steel water bottle (1 liter, single wall, use for boiling and transporting water) or 1-quart military canteen with nested stainless steel cup (for boiling water) in a canteen pouch
- Water filter straw. Get one that includes an activated carbon filter if you are concerned that the water may have chemicals or heavy metals.
- Chlorine dioxide water purification tablets

Fire Items

- Bic® lighter
- Stormproof matches
- Ferro rod
- Cotton balls coated with petroleum jelly

Food Items

- Fast, easy to eat items for comfort, not for survival

Shelter Items

- Compact, emergency Mylar® blanket
- Construction grade plastic garbage bag

Sleep Items

- Mezzon Emergency Sleep Bag

Hygiene

- Toilet paper (with cardboard roll removed, paper flattened)
- Soap
- Hand-wipes

Clothes

- Cap or wide brim hat
- Lightweight rain jacket

Tools

- Compact multi-tool
- Headlight
- Mini-flashlight
- Extra pair of large EMT scissors
- Optional: crowbar

Survival Knives

- Lightweight fixed blade knife

Cordage

- Duct or Gorilla® Tape
- Paracord 550, 50 feet

Navigation Items

- Compass
- Maps
- Ranger beads
- Mini-binoculars, 8x21. Alternative: monocular

Communication Items

- Writing pad (waterproof), pen
- Emergency whistle
- Signal mirror

Personal Protection Items

- Lip balm
- Sunglasses
- Mask
- Leather gloves
- Foam earplugs
- Sunscreen
- Pepper spray
- Your EDC knife and your survival knife
- Handgun, spare ammunition (e.g., extra magazines, speed- or strip-loaders)

MEDIUM-TERM BAG CONTENTS

This chapter reviews suggestions for items to include in your Medium Term BOB. Keep in mind:

- The items listed are just suggestions. You will need to customize your own BOB with items to suit your particular needs.
- Items are listed by their use for particular survival categories.
- A detailed description of the items along with product names as examples, weights, and prices appear in subsequent chapters organized by survival categories.

First Aid Items

- Band-aids, 1x3 inches
- 2x2" and 4x4" gauze sponge dressings
- Non-adherent dressings
- Chest seal
- 14 gauge Angiocath™ needle, at least 3 inches length
- 2" and 4" gauge rolls
- 1" tape
- Steri-Strips®
- Skin glue
- Skin staple gun
- Safety pins
- Triangular bandage
- Non-latex disposable gloves
- Alcohol prep pads
- Iodine prep pads
- Moleskin
- Triple antibiotic ointment
- Antihistamine ointment and tablets

- Ibuprofen
- Imodium
- Tourniquet: CAT® Tourniquet (one-handed combat application tourniquet)
- Large tongue depressors
- Tweezers
- Full-size EMT scissors

Water Items

- Bottled water
- Stainless steel water bottle (single wall, use for boiling and transporting water), 1 liter
- 1-quart military canteen with nested stainless steel cup (for boiling water and for cooking food) in a canteen pouch
- Water filter straw. Get one that includes an activated carbon filter if you are concerned that the water may have chemicals or heavy metals.
- Chlorine dioxide water purification tablets
- 4-way sillcock key or 10-way service utility key (to turn industrial water valves without spigot handles)

Fire Items

- BIC® lighter
- Stormproof matches
- Ferro rod
- Cotton balls coated with petroleum jelly

Food Items

- Fast, easy to eat food items
- Freeze-dried food to last several days to a week
- Mini-cook set (for cooking and boiling water)
- Eating utensils: Long cooking spoon. Fork
- Sponge for cleaning
- Compact stove

Shelter Items

- Compact, emergency Mylar® blanket
- Construction grade plastic garbage bags
- Poncho
- Tarp

Sleep Items

- Mezzon Emergency Sleep Bag
- Poncho liner

Hygiene

- Toothbrush
- Toothpaste
- Dental floss
- Razor
- Toilet paper (with cardboard roll removed, paper flattened)\
- Soap
- Hand-wipes
- Nail clipper

Clothes

- Wide brim hat
- Lightweight rain jacket or other location appropriate jacket
- Extra socks
- Extra underwear

Tools

- Full-size multi-tool
- Headlight
- Small flashlight
- Extra pair of large EMT scissors
- Hatchet
- Compact knife sharpener
- Charging cables and adapters for electronics
- Extra batteries
- Lithium-ion power bank
- Optional: crowbar

Survival Knives

- Lightweight fixed blade knife
- Large, strong knife to permit wood splitting, chopping

Cordage

- Duct or Gorilla® Tape
- Paracord 550, 100 feet

Navigation Items

- Compass
- Mini-binoculars, 8x21
- Map
- Ranger beads

Communication Items

- Writing pad (waterproof), pen
- Emergency whistle
- Signal mirror

Personal Protection Items

- Lip balm
- Sunscreen
- Sunglasses
- Foam earplugs
- Mask
- Leather gloves
- Insect repellent
- Pepper spray
- Your EDC knife and your survival knife
- Handgun, spare ammunition, and extra magazines, speed- or strip-loaders
- Optional: Rifle, shotgun

LONG-TERM BAG CONTENTS

Your consumable supplies will eventually run out no matter how much you carry with you even if you have the luxury of escaping in your vehicle instead of on foot. You will need a way to procure your vital necessities and that is one of the critical roles of your Long-Term BOB. Here are examples of managing issues in some of your survival categories and how that relates to your Long-Term BOB:

- **Water:** Initially, you can use the water that you carry with you. Water purification tablets will help for a while, but they will run out. Water filters will last longer and some will last a very long time if they have filters that can be cleaned in the field. The ability to boil water is critical which means having the necessary containers and fire-starting tools.
- **Food:** Once the food you bring runs out, you'll need the ability to get food on your own. A card with names and illustrations of edible vegetation in your area is helpful and takes minimal space. It is possible to fashion fishing and hunting tools by using your survival knife and things found in the wild. But, you'll greatly benefit from packing items that help you to fish, trap, and hunt animals.
- **Fire:** Matches and lighters will eventually run out. It's handy to have a Fresnel lens, but it requires sunlight. Creating fire by friction with a friction bow takes time, energy, and skill. Having redundant ferro rods will allow you to make many fires for a long time.
- **Shelter:** A tarp or tent is very handy to have. But, if the disaster that befalls you is long term, then you'll probably need to build a more durable and larger shelter. That means you'll need at least some basic tools such as a hatchet or axe, shovel, and saw. These are items that you can do without in your Short-Term Bag. They would be handy to have, but you could survive without them in your Medium-Term Bag. You

could simply use your survival knife and things found in the wild to make a long-term shelter, but it would be much more time-consuming and difficult.

This chapter reviews suggestions for items to include in your Long-Term BOB. Keep in mind:

- The items listed are just suggestions. You will need to customize your own BOB with items to suit your particular needs and to meet your space and weight limitations.
- Items are listed by their use for particular survival categories.
- A detailed description of the items along with product names as examples, weights, and prices appear in subsequent chapters organized by survival categories.

First Aid Items

- Band-aids, 1x3 inches
- 2x2" and 4x4" gauze sponge dressings
- Non-adherent dressings
- Chest seal
- 14 gauge Angiocath™ needle, at least 3 inches length
- 2", 3", 4" gauge rolls
- 1" tape
- Steri-Strips®
- Skin glue
- Skin staple gun
- Safety pins
- Triangular bandage
- Non-latex disposable gloves
- Alcohol prep pads
- Iodine prep pads
- Moleskin
- Triple antibiotic ointment
- Antihistamine ointment and tablets
- Ibuprofen
- Tourniquet: CAT® Tourniquet (one-handed combat application tourniquet)
- Large tongue depressors
- Tweezers

- Full-size EMT scissors
- Topical Hemostatic Agents: QuikClot®, Advanced Clotting Kit
- Trauma Wound Dressing with 6” hemorrhage control bandage (Israeli Bandage Battle Dressing)
- Nasopharyngeal airway

Water Items

- Plastic garbage bags
- Coffee filters (to filter water)
- Stainless steel 1-liter water bottle (single wall, use for boiling and transporting water) with 750 ml nesting cup
- Consider bringing a lightweight, larger, stainless steel pot to boil larger volumes of water and for cooking
- 2-quart military collapsible canteen in a canteen pouch
- Collapsible larger water container (e.g., 5 gals). Lightweight plastic. For vehicle or base camp.
- Water filter straw. Get one that includes an activated carbon filter if you are concerned that the water may have chemicals or heavy metals.
- Chlorine dioxide water purification tablets
- Cilantro seeds to grow plants for their leaves to remove heavy metals from water
- Ion exchange resin device if you are concerned about heavy metals in the area you are escaping to (e.g., a product such as ZeroWater® Portable Water Filtration Tumbler)
- High volume pump ceramic water filter
- 4-way sillcock key or 10-way service utility key (to turn industrial water valves without spigot handles)
- Small plastic funnel to help transfer boiled water into your water carrying vessels (e.g., canteen or water bottle)

Fire Items

- Stormproof matches (2 boxes)
- Ferro rods (3)
- Fresnel lens
- BIC® lighters (4)
- Lightweight tinder sources: Char cloth, cotton balls coated in petroleum jelly, fatwood chips or sticks

Food Items

- Fast, easy to eat food items
- Freeze-dried food to last a week
- Salt
- Olive oil in a small bottle
- Compact cook set
- 3-quart lightweight stainless steel pot (for cooking and boiling water)
- Eating utensils: Long cooking spoon. Fork, spoon
- Sponge for cleaning
- Compact stove
- Wire snares for trapping small animals
- Plastic Cuban fishing reel, fishing line, a small container of fishing tackle
- Laminated brochure with names and drawings of edible wild plants in your area
- Optional:
 - Lightweight cooking grill top
 - Fruit and vegetable seeds that will grow in your area

Shelter Items

- Construction grade plastic garbage bags
- Tarp
- Optional: Tent

Sleep Items

- Sleeping mat
- Sleeping bag
- Compact blanket/tarp
- Optional: Bivy bag, hammock

Hygiene

- Toothbrush
- Toothpaste
- Dental floss
- Razor
- Toilet paper (with cardboard roll removed, paper flattened)
- Soap
- Wipes-wipes
- Nail clipper

- Reusable cloths

Clothes

- Wide brim hat
- Jacket
- Extra socks
- Extra underwear
- Extra shirts
- Extra pants
- Lightweight waterproof pants
- Lightweight poncho
- Shemagh

Tools

- Shovel
- Hatchet
- Saw
- Sewing kit
- Charging cables and adapters for electronics
- Solar rechargeable battery pack
- Extra batteries
- Lithium-ion power bank
- Solar Panel
- Full-size multi-tool
- Headlight
- Small flashlight
- Extra pair of large EMT scissors
- Compact knife sharpener
- Optional:
 - Axe
 - Sharpening tool for hatchet and axe
 - Shoe GOO® or Barge Cement™
 - Crowbar

Survival Knives

- Large, strong knife to permit wood splitting, chopping
- Smaller knife for delicate tasks

Cordage

- Paracord 550, 200 feet
- Bank line, 100 feet
- Fishing line
- Duct tape or Gorilla® Tape
- Credit card size instruction cards with knot tying instructions

Navigation Items

- Compass (2 compasses with one as a backup)
- Mini-binoculars, 8x21
- Maps
- Ranger beads

Communication Items

- Waterproof notebook
- Pen
- Hand crank emergency radio

Personal Protection Items

- Lip balm
- Sunscreen
- Sunglasses
- Safety goggles
- Ballistic eyewear
- Mask
- Earplugs
- Leather gloves
- Insect repellent
- Pepper spray
- Knife: Your EDC knife and your survival knife
- Handgun, spare ammunition, extra magazines, speed- or strip-loaders
- Rifle, spare ammunition
- Optional:
 - Trekking poles
 - Shotgun, spare ammunition
 - Pellet air gun
 - Spare parts and cleaning supplies for your firearms
 - Bow, arrows

SELECTING A BAG

These are the topics covered in this chapter to help you select your bags:

- Type of bags
- Materials
- Fabric strength
- Bag volume or capacity (cubic inches, liters)
- Bag weights versus anticipated emergency or bug out duration
- General features to look for when selecting your BOB
- Features desirable in a Long-Term BOB
- How to fit and size a bag to you
- Internal versus external frame
- The bottom line in selecting your BOB

It's wise to carefully select your BOBs for their functionality and comfort. Consider what you will be carrying in your Short-, Medium-, and Long-Term BOBs when you choose the actual bags. It is optimal to have three separate bags, one for each of your three BOBs since each bag will be outfitted with different items and with more items carried in the longer-term BOBs.

Type Of Bags

Here are some thoughts about different types of bags and their use as a BOB:

- Duffle: We'll define these as a bag with handles for carrying. These are not ideal to use as a BOB because they require at least one hand to carry. That removes one hand from use for some other purpose. It is also tiring to hand carry a bag for a long time even if one switches back and forth between the two hands.
- Waist pack: A "fanny pack" is a recognizable example of a waist pack. Although these are available in different sizes, you'll still be quite limited in the number of items you can carry. The only place these might play a role as a BOB would be for your Short Term BOB depending upon how many items you choose to carry in that BOB.

- Messenger bag: This is a briefcase type bag that has a single strap that is placed over one shoulder for cross-carry. It may have a separate strap that goes around a person's torso to provide extra stability to the bag when carried. You'll be limited to the amount you can carry in these bags as they tend to be rather small. You could conceivably use one for your Short Term BOB.
- Sling pack: This is a small to medium size backpack with a single arm strap or "sling." You will be able to hold more in one of these than a waist pack or a messenger bag. They are not as stable or comfortable to carry over a long period or during vigorous activity as compared to a backpack with two shoulder straps. You could use this type of bag for your Short Term BOB.
- Backpack: This is the best and most versatile type of bag to use for your Short-, Medium-, and Long-Term BOBs. It comes in many sizes and configurations including multiple internal dividers and external organizing compartments or pouches separate from the main compartment. It can be equipped with an internal or external frame to aid with carrying larger loads. It has two shoulder straps at its most basic set up. But, it is available with chest and waist straps, which are particularly helpful when carrying heavier loads. A backpack provides the best stability and comfort and should be used for all of your BOBs.

Types Of Materials

Backpacks are made available in a variety of materials including:^[4], ^[5], ^[6], ^[7]

- Leather: Tanned, genuine leather is fairly light, dispelling the misconception that leather is heavy. Leather is strong and durable but requires a conditioner to prevent its eventual drying and cracking. The numerous steps used to process leather from hide to a usable material are costly making leather products expensive.
- Canvas: Canvas is made of cotton. It is heavy and less abrasion resistant and durable than nylon. It tears much more easily than nylon when tensile stress is applied to it. Wax is often applied to its surface to make it water-resistant.
- Polyester: Polyester shares similarities to nylon, but it's more expensive, absorbs slightly more moisture, is less abrasion resistant, and is less durable than nylon. Polyester is lightweight and has a smooth feel. It's more UV resistant than nylon.

- Nylon: Cheap nylon lacks durability, unlike high-quality nylon. Nylons are flexible, lightweight, strong, abrasion-resistant, resistant to chemicals, absorb little moisture, simple to clean, do not require any conditioning, and relatively inexpensive compared with other materials.
- Ripstop nylon: Thicker threads are sewn between the nylon threads to resist ripping when the fabric is punctured. It also offers better water resistance.
- Cordura® nylon: Cordura® is Dupont® premium brand name that is known for durability, strength, and abrasion resistance. It is made using an especially strong material, nylon 6.6. It does not refer to a specific fabric.
- Kodra®: It is a Korean produced fabric very similar to Cordura®.
- Ballistic nylon: This durable fabric is comprised of high denier (usually 840 to 1680D) nylon in a basket weave. It is usually heavier, has greater tensile strength and tear resistance than Cordura®.
- Polyurethane (PU) coatings: This is applied to a fabric's surface for waterproofing. It can be harmed by exposure to excessive heat and/or moisture, chlorine, salt, and bleach.

Fabric Strength

Denier (D) is often mentioned as a gauge of a fabric's strength. Denier refers to how many grams 9,000 meters of thread weighs. For example, 9,000 meters of 1000-D nylon weighs 1000 grams. A higher denier means greater strength, but it is not directly comparable between different fabrics.^[8] 500-D nylon is almost 50% stronger than 600-D 64T polyester/PVC fabric in tensile stress tests (i.e., stretched until torn). When subjected to 26,500 cycles of wear, 600-D polyester showed moderate abrasion while both 500-D and 1050-D nylon showed only very slight abrasion.^[9]

600-D is strong enough for Your Short Term BOB and should be adequate for your Medium Term BOB. But, 1050-D is better for your Long Term BOB and even for your Medium Term BOB.

The spacing between stitches affects strength. Stitching refers to the number of stitches per inch. Less than 6 stitches/inch is too weak especially around areas of high stress like where shoulder straps join with the body of your backpack. 6-10 stitches/inch is optimal while more than 10 stitches/inch can be weaker because stitches may overlap and tear one another during the

sewing process.

Bag Volume/Capacity

The size of a bag or how much it holds is often described by its volume, which is measured in cubic inches or liters. The unit of measure used varies with different literature and manufacturers making comparison shopping confusing. One liter (L) equals 61.024 cubic inches (ci). I made the conversion table below for your convenience. You can take a photo of it with your phone to bring with you when you go shopping for your bag.

10 L	610 ci
20 L	1220 ci
30 L	1830 ci
40 L	2440 ci
50 L	3051 ci
60 L	3610 ci
70 L	4201 ci
80 L	4802 ci
90 L	5402 ci
100 L	6102 ci

Here are some general guidelines for your BOBs:

- Short-Term BOB: 20-30 L
- Medium-Term BOB: 35-60 L
- Long-Term BOB: Larger than 60 L

Larger bags allow you to carry more gear but weigh more than smaller bags. The following information provides you with an estimate of how a bag's empty weight correlates with how much gear it will carry^[10]:

- 2-3 lb. pack weight = 15-35 pounds of gear
- 3-5 lb. pack weight = 30-50 pounds of gear
- 5+ lb. pack weight = 40-70 pounds of gear

Ultralight bags help to save weight, but their drawbacks as a survival BOB includes less durability, fewer compartments and external pouches, and fewer external lashing points.

General Features To Look For In Selecting Your BOB:

These are some features that are useful for all of your BOBs:

- Waterproof or, at least, water-resistant
- Proper fit to your body size and shape
- Numerous pouches and compartments to aid with organization
- Padding (shoulder and waist straps, pack's back) that is comfortably firm so it continues to function under prolonged compression
- Ventilation for your shoulder and waist straps and on the pack's back to promote airflow
- External compression straps to stabilize your bag's contents and also hold items to the outside of your pack
- External lashing points for larger items like a shovel or axe
- MOLLE® attachment points for external pouches, first aid bag
- Possibly a separate compartment to place a hydration bladder
- A carry handle at the top of the bag
- High-quality zippers. YKK® brand is the largest zipper brand and has a good reputation.
- Inconspicuous appearance to avoid attracting attention especially for your Short- and Medium-Term BOBs

Features Desirable In A Long-Term BOB:

These are some features that are especially useful for your Long-Term BOB:

- Chest and waist straps
- Rigid frame (see the section below regarding internal versus external frames)
- Zippered front (preferable) or side opening to allow access to the middle and lower parts of the main compartment of your BOB without having to search from the top opening
- A rain cover or top storm flap to keep your BOB contents dry
- Possibly an external rig to hold a rifle

How To Fit and Size A BOB To You:

A properly fitting bag is important for your comfort and ability to carry a load for a sustained period. The heavier the load you carry, the more important it is that most of the weight is borne by the top of your hips and not just on your shoulders. One rule of thumb is to have 80% of your pack's weight borne on your hips and 20% over your shoulders.^[11] The length of your BOB needs to be such that the waist belt rests on top of your hips when the shoulder straps are worn over the shoulders.^[12]

Start by adjusting your waist belt. You can find the proper location for your pack's waist belt to rest by touching the top of your bony pelvis with your fingers. This is the hard bony area on both sides of your waist about two inches above your pants beltline. These bony prominences are called your iliac crests. The pads of your waist belt should sit on top of your iliac crests and around slightly beyond the front of your iliac crests.

You can adjust the waist belt upward or downward by shortening or lengthening the shoulder straps. The location where your shoulder straps attach to your pack should be about 1.5-2 inches below the top of your shoulder as the waist strap lies on top of your iliac crest when your pack is the proper length for you.

Load-lifter straps go from the front of your shoulder straps ideally at a 45-degree angle to attach near the top of your pack's back (above the location where the shoulder straps attach to your pack). They serve to keep the upper part of your pack toward your body. This helps to keep your pack's center of gravity close to your body, in line with your spine, and over your hips. Tightening them too much will lift the shoulder straps off of the tops of your shoulders. Adjust them for comfort.

The sternum strap joins the two shoulder straps in front of your chest and should be located about 1 inch below the bottom of your clavicles or collarbones. Adjust them for comfort. The outside edges of your shoulder straps will pull forward away from your chest and you might find it difficult to breath if the sternum strap is adjusted too tightly.

If your BOB is too short, then most of the weight will be borne by your shoulders causing your shoulders to hurt. If your BOB is too long, your BOB will be located too low when the waist belt rests on your hips; this low bag position will pull you backward.

Some backpacks offer an adjustable length feature whereby the distance between the top of the shoulder straps and waist belt can be altered. This can either be done by moving a panel containing the shoulder straps up or down. The panel is connected to the back of the bag by hook and loop material. Another way the shoulder harness can be moved is by attaching it to different slots on the back of the pack. Adjustable backpacks offer a great way to customize the fit of your backpack. Their main drawback is that they are a bit

heavier than backpacks without the adjustable feature.^[13]

You can adjust your pack's straps during your trek for comfort. One technique is to loosen your waist belt while tightening your shoulder straps and periodically reverse the process. You can periodically tighten and loosen the load-lifter straps. You can place your pack's center of gravity closer over your pelvis by leaning slightly forward. Remove your pack whenever you take a break so you can give your body a rest.^[14]

Internal Versus External Frame

First, here are a few words about frameless packs. These are generally lighter and less expensive than packs with frames. The main thing is that they are for carrying lighter weights, usually no more than 20-22 pounds. These are perfect for your Short-Term BOB and most Medium-Term BOBs.

Frames are structures that support your bag and are located either hidden inside your bag (ie, internal frame) or attached to the outside of your bag (ie, external frame). Some small bags may have an internal sheet fitted inside a slot in the rear of the bag serving as a "pseudo-frame" to provide some rigidity to the pack to keep it upright when empty and to protect your back from prominent items inside your bag. These sheets may be fabricated from foam, plastics, or composites.

Frame stays are technically a type of internal frame and are comprised of pre-contoured strips of metal (often aluminum) or carbon fiber inserted into vertical slots on the back wall of your pack. Frame stays provide the following benefits^[15]:

- They serve as an interface between the contents of your bag and your back avoiding prominent objects from poking your back especially if they are combined with a sheet of padding.
- Frame stays support the bag to keep it upright even when empty. This makes it easier to pack and unpack your bag as well as to find items inside of it.
- They maintain your pack's fit to your body by keeping the distance from the top of your shoulder straps to your waist belt constant.
- They can transfer weight from your shoulders to an attached waist belt.
- They are useful for carrying weights generally up to 30 pounds.

Larger bags for carrying heavier loads (e.g., 40 pounds or more) will have

formal frames. Here are some benefits of having a frame^[16]:

- The frame serves as an interface between the contents of your bag and your back avoiding prominent objects from poking your back.
- The frame supports the bag to keep it upright even when empty. This makes it easier to pack and unpack your bag as well as to find items inside of it.
- The frame maintains your pack at a fixed height regardless of the degree to which the pack is filled. This retains the all-important fitting point, which is the distance from the top of your shoulder straps to your waist belt.
- It provides attachment points for your load-lifter straps.
- The frame helps transfer weight from your shoulders to the waist belt.
- A frame permits carrying loads of up to 100 pounds or more

Internal frames are popular and comprise most of the bags sold with frames. They are constructed of metal wire or tubes placed inside the back of the pack. These are some characteristics of internal frames (as compared with external frames):

- They tend to fit better
- The center of gravity is located lower and closer to your body making it easier scramble on uneven terrain
- Your load is usually more stable and has less tendency to shift around especially if you are scrambling off-trail on uneven terrain.
- Internal frames are lighter and more compact than external ones.
- There is no exposed frame to snag on vegetation or other objects.
- They are generally hotter since the pack rests directly on your back. There are exceptions such as packs that use concave frames that create an air space between the pack and your back, but most are not designed this way.
- More of the load is borne by your shoulders compared with an external frame pack
- They are not as good for carrying heavy loads.
- It is more difficult to attach gear to the exterior of the bag.
- They are more expensive

While internal frames have been around since 1967, external frames have been around for much longer. Here are some points to consider regarding external frame packs (as compared to internal frames):

- They are cooler because there is ventilation between the pack and your body
- The center of gravity is higher and further from your body making it more ideal for long treks on smooth, even trails.
- Your load is less stable and there is more tendency for it to shift from side to side making it more difficult to maintain balance when having to scramble on uneven terrain.
- They are heavier and bulkier than internal frame packs
- Exposed frame can snag on objects
- More of your load is borne on your hips making it more comfortable for carrying heavy loads
- Gear can be attached to the frame outside of the bag.
- There are fewer bags on the market to choose from
- They are cheaper

Author's opinion: I prefer an external frame because it's cooler, more weight is borne by your hips so you can comfortably carry heavier loads, you can lash items to your frame if necessary, and it's cheaper.

The Bottom Line In Selecting Your BOB

I'll distill what I believe are the key features for you to look for in selecting your BOB:

- Type of bag: Backpack with 2 shoulder straps
- Material: Nylon
- Fabric strength: Minimum 600-D nylon. 1000-D (or greater) nylon is better.
- Bag volume or capacity: 20-30 L for Short-Term BOB, 35-60 L for Medium-Term BOB, and 60 L or larger for Long-Term BOB
- General features to look for when selecting your BOB: Refer to the section above on this topic
- Features desirable in a Long-Term BOB: Refer to the section above on this topic
- Make sure that the bag is the right size for you and that it is adjusted properly
- External frame design for your Long-Term BOB

I will provide you with some examples of bags for your Short-, Medium-, and Long-Term BOBs in the next three chapters.

SHORT-TERM BAG EXAMPLES

Your Short-Term BOB is your Get Home Bag, your bag to help you survive 12-24 hours. It does not have to be very large or fancy since it is going to hold the fewest items for the shortest length of time compared to your Medium and Long Term BOBs. A 20-30 liter bag should be able to hold all of your items. If you're on a budget, you can use any backpack you might have already (e.g., school or work bag) as long as it is durably constructed so it does not fail on you. If your budget permits, then you can buy a more mission-specific bag that is more durable, has better shoulder straps, a sufficient number of compartments, etc. Here are some examples of backpacks in a variety of price points that you can consider for your Short-Term BOB:

Item name: Mardingtop 25L Tactical Backpacks

Vendor: Mardingtop Outdoor Equipment Co., Ltd on Amazon.com

Webpage URL: <https://amzn.to/2WQGWYO>

Price: \$35.99

Weight: 1.72 lb

Size: 4.87x11.8x17.0 inches

Volume: 25 L

Material: 600-D Water-resistant Polyester

Number of external compartments, pouches: 3

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: No

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: Yes

Adjustable length: No

Frame: None

Appropriate for which BOBs: Short-Term

Comments: It has a fairly plain appearance even though “tactical” is in its name. YKK zippers.

Item name: OutdoorMaster 25L HYDROBACK Hydration Backpack

Vendor: Outdoor Master on Amazon.com

Webpage URL: <https://amzn.to/2JljmjM>

Price: \$39.99

Weight: 1.95 lb

Size: 6.5x8.8x17.9 inches

Volume: 25L

Material: Water-resistant, anti-rip nylon (denier not listed)

Number of external compartments, pouches: 3 compartments, 2 mesh pouches

External compression straps: Yes

MOLLE® attachment points: No

Load-lifter straps: No

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: Yes

Adjustable length: No

Frame: None

Appropriate for which BOBs: Short-Term

Comments: Includes a 2 L BPA-free water bladder

Item name: SOG Ninja Daypack

Vendor: GlobalEcom on Amazon.com

Webpage URL: <https://amzn.to/3rtALih>

Price: \$39.99

Weight: 2.37 lb

Size: 6.1x11.1x17.1 inches

Volume: 24.2 L

Material: Polyester (denier not listed)

Number of external compartments, pouches: 2 compartments, 1 side elastic pouch

External compression straps: Yes

MOLLE® attachment points: No

Load-lifter straps: No
Sternum strap: Yes
Waist belt: No
Hydration bladder compartment: No
Adjustable length: No
Frame: None
Appropriate for which BOBs: Short-Term
Comments: Manufacturer's lifetime warranty. From the maker of SOG Knives.

Item name: MOLLE II 3 Day Assault Pack

Vendor: Fort Bragg Surplus
Webpage URL: <https://bit.ly/2JJPqUH>
Price: \$89.99 used (Author's note: It is possible to find used packs for a lower price, but the condition of the used packs is variable.)
Weight: 4 lb
Size: 7x12x20 inches
Volume: 30 L
Material: High-Quality Water Resistant Canvas
Number of external compartments, pouches: 1 front pouch
External compression straps: Yes
MOLLE® attachment points: No
Load-lifter straps: No
Sternum strap: Yes
Waist belt: Yes
Hydration bladder compartment: Yes
Adjustable length: No
Frame: Yes. Removable foam and plastic back support
Appropriate for which BOBs: Short-Term
Comments: Durable, US military bag. Heavy-duty zippers and buckles.

Item name: Falcon-II Backpack

Vendor: Maxpedition
Webpage URL: <https://bit.ly/3pr7NXF>
Price: \$184.99
Weight: 3.2 lb
Size: 9x10x18 inches
Volume: 23 L

Material: 1050-D water and abrasion-resistant lightweight ballistic nylon.
Triple polyurethane coated for water resistance
Number of external compartments, pouches: 3
External compression straps: Yes
MOLLE® attachment points: Yes
Load-lifter straps: Yes
Sternum strap: Yes
Waist belt: Yes
Hydration bladder compartment: Yes. Can hold a 3 L water bladder.
Adjustable length: No
Frame: None
Appropriate for which BOBs: Short-Term
Comments: CCW pocket that fits large pistols. Teflon® fabric protector.
Self-repairing YKK® zippers. Well constructed of high-quality materials.

Item name: TRIDENT-21 (Gen-3) Backpack

Vendor: Vanquest

Webpage URL: <https://bit.ly/3nWAOKK>

Price: \$209.99

Weight: 4.10 lb

Size: 8x11x18 inches

Volume: 21 L

Material: 1,000-D Mil-grade Cordura® fabric on the bottom and 500-D for the body treated with durable water repellent coating

Number of external compartments, pouches: 3 compartments. Collapsible water bottle side pouch.

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: No

Sternum strap: Yes

Waist belt: Yes. 2 inches. Removable.

Hydration bladder compartment: Yes

Adjustable length: No

Frame: None

Appropriate for which BOBs: Short-Term

Comments: Total 32 organizing compartments and slots. ITW/Duraflex™ hardware, and lockable YKK® zippers. Top or left side access to main

compartment. Main compartment has three configurable dividers.

MEDIUM-TERM BAG EXAMPLES

Your Medium-Term BOB is configured to help you survive two to seven days. You'll be best served with a bag somewhere in between the sizes of your Short and Long-Term BOBs. A bag with a capacity of 35-60 liters should be able to hold all the items you'll require for medium-term survival. Some examples of such bags with different price points are shown below:

Item name: REEBOW GEAR Military Tactical Backpack 3 Day Assault Pack Army MOLLE® Bag Backpacks Rucksack 35L

Vendor: CASJ on Amazon.com

Webpage URL: <https://amzn.to/3hl6Tcw>

Price: \$31.99

Weight: 3 lb

Size: 11.2x12x18 inches

Volume: 35 L

Material: "Durable high density-material." It appears to be nylon in the product photos. Denier is not listed.

Number of external compartments, pouches: 1 large and 2 smaller front compartments

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: No

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: Yes. Accommodates a 2.5 L hydration bladder (not included)

Adjustable length: No

Frame: None

Additional front or side zippered access: No

Appropriate for which BOBs: Medium-Term
Comments:

Item name: 4 in 1 50L MOLLE Tactical Military Backpack

Vendor: Mo Duo on Amazon.com

Webpage URL: <https://amzn.to/3hmsdP1>

Price: \$52.24 plus \$10.32 shipping

Weight: Not specified

Size: 8.66x11.81x19.68 inches

Volume: 50 L

Material: 600-D nylon

Number of external compartments, pouches: 2 detachable side pouches. 1 large front compartment. 1 detachable large pouch with 4 separate zippered compartments.

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: No

Adjustable length: No

Frame: None

Additional front or side zippered access: No

Appropriate for which BOBs: Medium-Term

Comments: None

Item name: US GI Military Surplus Used Medium Complete Olive Drab
Alice Pack

Vendor: Army Surplus World

Webpage URL: <https://bit.ly/3aSQudY>

Price: \$99.99

Weight: 9 lb

Size: 5.5x13x20 inches

Volume: 40 L

Material: Water-resistant, 420-D nylon duck material

Number of external compartments, pouches: 3

External compression straps: No. But, the two top flap straps will provide some compression.

MOLLE® attachment points: No
Load-lifter straps: No
Sternum strap: No
Waist belt: No
Hydration bladder compartment: Yes
Adjustable length: No
Frame: Yes. Aluminum. The bag can be worn with or without the frame.
Additional front or side zippered access: No
Appropriate for which BOBs: Medium-Term
Comments: Designed to hold up to 50 lbs. Extremely durable. Straps have little padding and are uncomfortable. Heavy.

Item name: MT Military Surplus MOLLE® Medium Rucksack with Pouch Army Tactical Backpack

Vendor: MilitaryARmaxUS

Webpage URL: <https://amzn.to/2KSMRKh>

Price: \$169.99 new (Author's note: Used military versions of this bag are available at a lower cost)

Weight: 6 lb

Size: Main compartment: 7x13.7x21.6 inches. Top front compartment: 3x9x11.4 inches. Lower front compartment: 4x10x12.5 inches. Each of the 2 removable side pouches: 4x7.5x10 inches.

Volume: 50 L main bag. 2 removable side pouches (5 L each) making the total capacity 60 L

Material: 1000-D nylon, water repellent. Multicam®

Number of external compartments, pouches: 2 removable side pouches. 2 front compartments.

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: Yes

Adjustable length: No

Frame: Yes. Internal, aluminum.

Additional front or side zippered access: No

Appropriate for which BOBs: Medium-Term

Comments: Includes 4 MOLLE® clips, a Mobile Phone Case, and a Bottle Case, which can be hanged around the neck or on the hip belt. Carries up to 60 pounds. Manufacturer’s statement: “It is not made Under National Military Contract, so it does not have any Government Issue Tags or marks, but the military standard quality is guaranteed and assured.” The design is similar to the US military MOLLE II Medium Rucksack

Item name: Falcon-III Backpack

Vendor: Maxpedition

Webpage URL: <https://bit.ly/37P7gJi>

Price: \$212.99

Weight: 1.25 pounds

Size: 10x12x18 inches

Volume: 35 L

Material: 1050-D lightweight ballistic nylon. Triple polyurethane coated for water resistance.

Number of external compartments, pouches: 3 front compartments (1 large, 2 medium)

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: Yes

Adjustable length: No

Frame: None

Additional front or side zippered access: No

Appropriate for which BOBs: Medium-Term

Comments: Teflon® fabric protector. YKK® high strength zippers. UTX-Duraflex® nylon buckles. CCW pocket, with lockable zippers, fits large pistols. High tensile strength composite nylon thread (stronger than ordinary industry standard nylon thread).

Item name: Markhor-45 Backpack

Vendor: Vanquest

Webpage URL: <https://bit.ly/3pm4CAs>

Price: \$299.99

Weight: 6 lb

Size: 6x12x26 inches

Volume: 45 L

Material: 1,000-D Mil-grade Cordura® fabric on the bottom and 500-D Cordura® for the body

Number of external compartments, pouches: Dual side water bottle pockets. 2 top pockets. 1 larger bottom pocket.

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes. Removable.

Hydration bladder compartment: Yes

Adjustable length: Yes. 5 positions

Frame: Yes. Removable. Molded polycarbonate.

Additional front or side zippered access: Yes. Side access. Plus, easy “clamshell” front access to the main compartment.

Appropriate for which BOBs: Medium-Term

Comments: Unique beavertail with DAM (Durable Arms Management) design. The beavertail is double-sided, reversible, and removable, offering gear storage, attachment, and compression. It can be used to hold a rifle vertically on the back of the pack.

LONG-TERM BAG EXAMPLES

Your Long-Term BOB is configured to help you survive for weeks to months, long after the food and water you originally carried with you run out. Because of the longer time frame, you will want to have redundancy in your critical items and carry items that will make you self sufficient. Your larger Long-Term BOB will allow you to do that. Examples of some bags for this purpose are presented in this chapter. As in prior chapters, examples of bags in different price ranges will be presented to fit different budgets.

Item name: ALPS Mountaineering Zion External Frame Pack, 64 Liters

Vendor: ALPS Outdoorz on Amazon.com

Webpage URL: <https://amzn.to/2KVVm7x>

Price: \$149.99

Weight: 4.94 lb

Size: 15x33 inches (frame dimensions)

Volume: 64 L

Material: Lightweight polyester (denier not listed)

Number of external compartments, pouches: 4

External compression straps: Yes

MOLLE® attachment points: No

Load-lifter straps: No

Sternum strap: Yes

Waist belt: Yes. Adjustable range of 28 to 40 inches

Hydration bladder compartment: Yes

Adjustable length: Yes. Telescoping frame. Torso range of 17-24 inches

Frame: Yes. External. Aluminum.

Additional front or side zippered access: No

Appropriate for which BOBs: Long-Term

Comments: Limited Lifetime Warranty. Top-loading main compartment.

Sleeping bag compartment. Multiple shoulder strap positions.

Item name: ALPS OutdoorZ Commander + Pack Bag

Vendor: ALPS Outdoorz on Amazon.com

Webpage URL: <https://amzn.to/3hk4eQc>

Price: \$159.99

Weight: 7.31 lb

Size: 6x17x40 inches

Volume: 86 L

Material: Durable Nylon Ripstop fabric (denier not listed)

Number of external compartments, pouches: 4

External compression straps: No

MOLLE® attachment points: No

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes. Fits 26-40 inches

Hydration bladder compartment: Yes

Adjustable length: Yes. Frame telescopes to allow torso adjustments from 17-23 inches

Frame: Yes. External. Metal (type of metal not specified). There is a “Freighter Shelf” on the bottom of the frame.

Additional front or side zippered access: Yes. Lower front zippered access.

Appropriate for which BOBs: Long-Term

Comments: Top loading. Front lashing loops. Dropdown rifle butt holder.

Item name: Kelty Tioga 5500 Classic External Frame Backpack

Vendor: Enwild

Webpage URL: <https://bit.ly/38Bnfd2>

Price: \$167.96

Weight: 5.56 lb

Size: 16x23x31 inches

Volume: 90 L

Material: 420-D coated parkcloth with 1000-D Kodra®. Water-resistant, but not waterproof.

Number of external compartments, pouches: 4

External compression straps: No

MOLLE® attachment points: No

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: Yes

Adjustable length: Yes. Adjustable suspension system accommodates torso lengths ranging from 16-22 inches.

Frame: Yes. External. Aluminum.

Additional front or side zippered access: No

Appropriate for which BOBs: Long-Term

Comments: Spindrifft collar. Daisy chain attachment system, lash points, and an ice axe loop. Top loading with enclosed lower sleeping bag compartment.

Item name: Kelty Trekker 65 Pack

Vendor: REI Co-op

Webpage URL: <https://bit.ly/37T2oCI>

Price: \$199.95

Weight: 5.31 lb

Size: Not specified

Volume: 65

Material: 600-D Polyester w/ 600-D Polyester Small Ripstop

Number of external compartments, pouches: 6

External compression straps: Yes

MOLLE® attachment points: No

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes. Fits 32-54 inches.

Hydration bladder compartment: Yes

Adjustable length: Yes. The frame telescopes to fit 16 - 22 inches torso length

Frame: Yes. External. Aluminum.

Additional front or side zippered access: No

Appropriate for which BOBs: Long-Term

Comments: Hideaway daisy chain and handle. Ice axe/trekking pole loops. Some people find that the bag rides too high on the frame for them.

I will mention here two US military bags that you can consider when you select your Long-Term BOB. One is the old classic, the large ALICE pack. It is extremely durable, but not the most comfortable because of old-style

shoulder and waist straps with little padding. The second is the newer large MOLLE®II Rucksack. I like this bag because it is lighter, adjustable, comfortable, well made, and offers the flexibility of the MOLLE® attachment system. Here are some examples of the price ranges for new and used versions of these packs:

Item name: Large Complete ALICE pack with Frame (Note: This is a brand new genuine military item. See the next item in the list for a much cheaper new one.)

Vendor: McGuire Army Navy

Webpage URL: <https://bit.ly/3nNOdEG>

Price: \$189.99

Weight: 11.0 lb

Size: 19x20x22 inches

Volume: 65 L

Material: Water-repellent 420-D military nylon duck

Number of external compartments, pouches: 3 large and 3 small

External compression straps: No. However, 2 top flap straps attach to the front bottom of the pack and serve as pseudo-compression straps

MOLLE® attachment points: No. ALICE compatible external attachment points for extra gear/pouches

Load-lifter straps: Yes

Sternum strap: No

Waist belt: Yes

Hydration bladder compartment: No

Adjustable length: No

Frame: Yes. Steel.

Additional front or side zippered access: No

Appropriate for which BOBs: Long-Term

Comments: This bag was developed for the military in the 1970s. It is hard to find new bags. Used bags are more plentiful for purchase. These are highly durable bags. They are designed to carry up to 70 lbs. The metal frames can creak when carrying a heavy load, but that can be remedied using lubricant (e.g., CLP, “gun cleaner, lubricant, preservative,” originally developed for the military) and tape. Frame rivets can break but can be replaced. The shoulder and waist straps are not as comfortable as those on modern bags, but these can also be replaced and upgraded to newer MOLLE® straps. It may not be

worth the cost and trouble of doing these modifications on a new bag but maybe worth considering if you can find a used bag at a low price since there are people who have happily used these bags for years. Here are examples of prices on used large ALICE packs (Note: These used packs may be sold and no longer available by the time this book is published. But the listings provide you an idea about used prices.):

- eBay. \$99.99 plus \$25 shipping. <https://ebay.to/2L2CGCP>
- eBay: \$99.99, local pick up only. <https://ebay.to/2M7sLMV>

Item name: NATO Military Large ALICE Pack With Frame, MARPAT
(Unused condition)

Vendor: Coleman's Military Surplus

Webpage URL: <https://bit.ly/3mT1nPA>

Price: \$79.95

Weight: 6 lb

Size: inches

Volume: 40 L

Material: Cordura nylon (denier not listed)

Number of external compartments, pouches: 3 large and 3 small

External compression straps: No. However, 2 top flap straps attach to the front bottom of the pack and serve as pseudo-compression straps

MOLLE® attachment points: No

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: No

Adjustable length: No

Frame: Yes. Metal (Probably steel)

Additional front or side zippered access: No

Appropriate for which BOBs: Long-Term

Comments: Genuine European Military Surplus. This bag was modeled after the US Military Large Alice Pack and was made for a foreign country that backed out after placing the order. These are unused bags. The front pouches are sewn on to the front of the pack, which serves as the back wall to the pouches. The pouches are not removable. There may be slight corrosion around the frame due to long-term storage.

Item name: MOLLE® II Rucksack Backpack Assembly (ACU), Large (New condition)

Vendor: Mojave Tracker on Amazon.com

Webpage URL: <https://amzn.to/3o5GJxb>

Price: \$149.49

Weight: 8.3 lb

Size: 10x22x24 inches

Volume: 82 L (Main compartment 65.5 L. 2 side pouches each 8.2 L)

Material: 1000-D nylon

Number of external compartments, pouches: 2 side sustainment pouches

External compression straps: Yes

MOLLE® attachment points: Yes

Load-lifter straps: Yes

Sternum strap: Yes

Waist belt: Yes

Hydration bladder compartment: No

Adjustable length: Yes

Frame: Yes. Polymer

Additional front or side zippered access: Yes or No. There is a lower compartment with a zippered horizontal front access. The lower compartment can be separated from the top main compartment by a zippered divider, which, if left open, creates one large compartment.

Appropriate for which BOBs: Long-Term

Comments: Made in the USA. Comfortable when carrying heavy loads. Shoulder and waist straps are well padded. The frame in earlier versions (Generation I and II broke most easily; Generation III was stronger) sometimes broke when carrying heavy loads or when dropped onto the ground. Generation IV frames (2.2 lbs weight) are made of more durable polymer with greater impact resistance (capable of surviving 32 fps impact with concrete). Used versions of this bag are cheaper (Note: These used packs may be sold and no longer available by the time this book is published. But the listings provide you an idea about used prices.):

- Coleman's Military Surplus. \$79.95. <https://bit.ly/3hpJGWz>
- eBay: \$79.99 with free shipping. <https://ebay.to/38CLJCD>

ORGANIZING THE ITEMS IN YOUR BAG

Organizing your BOB items by survival category and placing them into separate bags or pouches makes it much faster and easier to find things when you need them. Here are some things you can use to organize your items:

- Heavy-duty, clear, zip-lock bags
- Packing cubes used for travel
- Nylon pouches and bags

Someone who calls himself “The Urban Prepper” introduced a color-coding system (<https://bit.ly/37Rna63>) to help you quickly identify the contents of your various organizational bags. His idea was used by Vanquest Gear, Inc to produce the Vanquest Prepper’s Color-Coding Kit, which sells for \$12.99 and weighs 0.7 ounces. It consists of ten strips of hook and loop material in a variety of colors that you wrap around the handles of your organizational bags. It comes with a morale patch that graphically displays the color-coding system. This patch serves as a quick reference guide and can be adhered to the outside of your backpack by hook and loop. The color codes are defined as follows:

- Red: First aid
- Orange: Fire
- Yellow: Communication and navigation
- Green: Food
- Blue: Water
- Purple: Clothes and personal
- Coyote: Shelter
- White: Hygiene
- Gray: Cookware
- Black: Tools and tactical

Listed below are examples of packing cubes and pouches to provide you with an idea about their cost and weight. The examples include lower and higher-priced products to help readers with different budgets:

Packing Cubes

Item name: Classic Packing Cubes 3Pc Set

Vendor: eBags

Webpage URL: <https://bit.ly/3nT715w>

Price: \$14.99

Weight: 0.79 lb

Size: 17.5 x 12.75 x 3.25 inches

Material: Nylon (denier not listed)

Appropriate for which BOBs: Large

Comments: These work well for larger items such as clothes. Limited lifetime guarantee. Serves as an economical example of packing cubes. (Smaller packing cubes are available.)

First Aid Pouches

Item name: Red Tactical First Aid Kit MOLLE Rip-Away EMT Tactical Medical Pouch Bag

Vendor: allstarseller2014 on eBay

Webpage URL: <https://ebay.to/2W0EqTa>

Price: \$10.99 plus \$2.99 shipping

Weight: Approx 0.4 lb

Size: 3.6x6x8 inches

Material: 900-D anti-abrasion nylon, water-resistant

Appropriate for which BOBs: Small, Medium, Large

Comments: First Aid bag, good value and size. Nice fold out zippered mesh zippered pouch. Well made.

Item name: FATPack 4X6 (Gen-2): First Aid Trauma Pack

Vendor: Vanquest

Webpage URL: <https://bit.ly/3hnebwd>

Price: \$34.99

Weight: 0.37 lb

Size: 3x4.5x6 inches

Material: 1000-D Cordura® fabric with water repellent DuPont® Teflon® fabric protector

Appropriate for which BOBs: Small, Medium, Large

Comments: Well made First Aid Bag. Premium quality, higher price.

Item name: NEW Military MOLLE IFAK Pouch ACU Medic UNIVERSAL First Aid Kit with Insert

Vendor: alleghenyoutlet on eBay

Webpage URL: <https://ebay.to/3psV6vG>

Price: \$15.90

Weight: 0.33 lb

Size: 2.25x5x7 inches

Material: Cordura® nylon (denier not listed)

Appropriate for which BOBs: Small, Medium, Large

Comments: Genuine military issue. Well made. Removable insert with elastic loops.

General Organizer Pouches

Item name: EDCM-HUSKY 2.0: EDC Maximizer Organizer

Vendor: Vanquest

Webpage URL: <https://bit.ly/3hpKDhB>

Price: \$32.99

Weight: 0.47 lb

Size: 2x6x8 inches

Material: 1000-D Cordura® fabric with water repellent DuPont Teflon fabric protector

Appropriate for which BOBs: Small, Medium, Large

Comments: High quality. Higher price.

Item name: Coyote MOLLE® Utility Pouch USMC Military Surplus

Vendor: ronnie8987 on eBay

Webpage URL: <https://ebay.to/38EXo44>

Price: \$14.95

Weight: Approx 0.6 lb

Size: 4x6x9 inches

Material: Double layer 1000-D Cordura® nylon

Appropriate for which BOBs: Small, Medium, Large

Comments: Good value

Item name: Taigear MOLLE® Black EMT Pouch Bag Military Tactical Gear

Vendor: americanonlineproducts on eBay

Webpage URL: <https://ebay.to/3hn1die>

Price: \$11.75

Weight: Approx 0.4 lb

Size: 2.5x5x7 inches

Material: Polyester with PVC coating (denier not listed)

Appropriate for which BOBs: Small, Medium, Large

Comments: Although it's called an EMT pouch, it is more of a nice general use pouch

Item name: Orca Tactical MOLLE® Horizontal Compact EDC Utility Pouch Bag

Vendor: orcatactical on eBay

Webpage URL: <https://ebay.to/2WKEPFY>

Price: \$15.99

Weight: Approx 0.5 lb

Size: 3x5x9 inches

Material: 600-D polyester with sturdy double stitching

Appropriate for which BOBs: Small, Medium, Large

Comments: YKK® zippers. 4 MOLLE straps on the back. MOLLE® webbing on the front.

HOW TO PACK YOUR BOB

How do you optimally pack your backpack?

There is a nice description of this topic from REI Co-op:[\[17\]](#)

How you pack your backpack will determine how much you can pack into it and also how easy it is to access your items. Determining the optimal way to pack your bag involves some trial and error to see where items fit the best. Place your items into your backpack in layers. Make sure the weight of your items is equally distributed on the right and left sides so your backpack is stable and well balanced. You can pack your items inside one or more construction-grade garbage bags placed inside your BOB to keep them dry. Once packed, cinching your pack's external compression straps will compact your pack and help to prevent your items from moving around.

As you pack your backpack, think of it as having three main horizontal zones or layers along with supplemental storage areas:

- Bottom layer: Good for bulky gear and items not needed until camp.
- Core or middle layer: Good for your denser, heavier items.
- Top layer: Good for bulkier essentials you might need on the trail.
- Accessory pockets or pouches: Good for essentials you'll need urgently or often.
- Tool loops and lash-on points: Good for bulky or extra-long items.

Bottom Layer

Generally, place bulky items here that you do not need to access quickly. Some backpacks have zippers on the sides or on the bottom of the pack to provide another way to access items at the bottom of the pack. These items tend to be compressible and soft providing cushioning for the rest of the items higher up in your backpack. Examples include:

- Sleeping bag
- Sleeping pad
- Clothes that you do not immediately need

- Camp shoes or down booties

Middle Layer

Items to pack in the middle layer include heavy, dense gear you do not need to access during your hike. Placing heavy items here affords the benefit of shock absorption from being on top of the bottom layer items. Avoid placing heavy items in the top layer because that makes your bag top-heavy and compromises your balance. Middle layer items can include:

- Food (entrees, not snacks)
- Cook kit
- Stove
- Water reservoir

Top Layer

Light, bulky items are packed into the top layer:

- Insulated jacket
- Fleece jacket and pants
- Rain jacket
- First-aid kit (this can also be attached to the outside of your pack for rapid access)
- Water filter or purifier
- Toilet supplies
- Tent: Permits quick access in case you encounter a rapidly approaching storm

Accessory pockets or pouches

Backpacks vary in the number and location of accessory pockets or pouches that they provide. They may be located inside the main compartment, on the sides, in the front, or beneath the top cover flap. These storage areas are handy for packing smaller items that you would like to access quickly without having to open your main compartment.

- Map
- Compass
- GPS
- Sunglasses
- Sunscreen
- Lip balm
- Headlamp

- Bug spray
- Snacks
- Water bottles
- Rain cover
- Car keys (look for a clip inside one of the pockets)
- ID and cash stash

Tool loops and lash on points.

Attaching items to the outside of your backpack can increase your carrying capacity, but be aware that these items can snag against vegetation and other objects. These items are also more vulnerable to damage than those kept inside your backpack. Some items to consider carrying on the outside of your pack include:

- Trekking poles
- Tent poles
- Large sleeping pad
- Rope
- Hatchet or axe
- Shovel
- Rifle

CHOOSING ITEMS FOR YOUR BAG: EXPLANATION

Chapters following this one will provide detailed descriptions of items to consider including in your BOBs:

- There are chapters for each major survival category with general information about that category
- The price of each item is listed
- Weight is listed for each item
- Specific product names are offered as examples
- Items are marked to tell you whether the item fits into your Short, Medium, or Long Term bags.

You can select items from each major survival category to customize your bags and to help make sure that you have each major category (e.g., water, shelter, food, etc) covered:

- Jump to the item category that interests you (e.g., 1st aid, water, food, etc)
- You can use the item prices and weights to help configure your bags and provide you with an estimate as to their total price and weight
- The items described in this book may include things you might not have previously considered. You may choose to select some of the items listed as examples or use them as a launching pad to search out a similar item on your own if a particular item looks like it will be useful to you.
- Hopefully, you already have a BOB. You can compare your items to the various survival item categories to be sure that you have items to address each category. You might find some areas where you might consider adding an item.
- Here are the major survival categories to consider:

- First Aid
- Water
- Fire
- Food
- Shelter
- Sleep
- Hygiene
- Clothes
- Tools
- Survival knives
- Cordage
- Navigation
- Communication
- Personal protection
- Pet care items
- Extras you might include if you're escaping by vehicle

As you select items for your BOBs, keep some of these general points in mind:

- It impossible to prepare for every possible type of emergency or disaster
- Consider your individual circumstances including what disasters you are most likely to face in your area. Prepare accordingly.
- Be realistic about how much you can carry with you.
- Do not overpack your bag
- Select multiple items that provide you with different options for your essential emergency category needs (e.g., have more than one way to start a fire)
- Select items to provide redundancy (backups) for the essentials (e.g., have more than one ferro rod in your Long-Term BOB)
- Select items that can perform more than one function
- Assembling your BOBs is a balance between choosing items you need with the amount you can carry. Stop and think whether you really need a particular item before you include it in your BOB.

How assemble your BOBs:

- Set a realistic target for how much you want your bags to weigh. Be sure to include the weight of your actual bags along with all of the items you select.

- Set an overall limit on the amount you want to spend on your BOBs.
- Consider each BOB separately (i.e., Short-, Medium-, and Long-Term BOBs). Repeat the following process for each of your BOBs:
 - Make a spreadsheet with headings for each major survival category. Create rows beneath each category heading so you can list each item on a separate line. You'll easily see if you have deficiencies that need to be addressed by adding items or if you have excessive redundancies that require eliminating some items.
 - Make columns in your spreadsheet so you can record the weight, size, and price for each item you select. You'll also be able to determine the overall weight and cost of your BOB by adding up the figures in your weight and price columns. If needed, you can either eliminate certain items or select items of similar function that weigh or cost less, so you can meet your weight and cost goals.
 - It is much more difficult to get a precise estimate of the overall volume of all of the items you select. But, the sizes listed in the product examples throughout this book will give you a rough idea about the size of different items as you ponder whether to include them in your BOBs.
 - Here is an example of a portion of a spreadsheet:

Category/Item	Weight (lbs)	Size (Width x Depth x Length in inches)	Price (\$)
Tools			
● Saw: Brand, model	xx	xx	xx
● Hatchet: Brand, model	xx	xx	xx
● EMT scissors: Brand, model	xx	xx	xx
Navigation			
● Compass: Brand, model	xx	xx	xx
● Maps: Brand, model	xx	xx	xx
● GPS device: Brand,	xx	xx	xx

model			
Communication			
● Signal mirror: Brand, model	XX	XX	XX
● Whistle: Brand, model	XX	XX	XX
● Hand crank emergency radio: Brand, model	XX	XX	XX
(Note: Keep adding more categories and items to this spreadsheet)			
Totals	XXX	XXX	XXX

FIRST AID ITEMS

The following items will be discussed in this chapter:

- Band-aids, 1x3 inches
- 2x2" and 4x4" gauze dressings
- Non-adherent dressings
- Chest seal
- 14 gauge Angiocath™ needle, at least 3 inches length
- 2", 3", 4" gauge rolls
- 1" tape
- Steri-Strips™
- Skin glue
- Skin staple gun
- Safety pins
- Triangular bandage
- Non-latex disposable gloves
- Alcohol prep pads
- Iodine prep pads
- Moleskin
- Triple antibiotic ointment
- Antihistamine ointment and tablets
- Ibuprofen
- Tourniquet: CAT®Tourniquet
- Large tongue depressors
- Tweezers
- Full-size EMT scissors
- Topical Hemostatic Agents: QuikClot®, Advanced Clotting Kit
- Trauma Wound Dressing with 6" hemorrhage control bandage (Israeli Bandage Battle Dressing)
- Nasopharyngeal airway

The items discussed in this chapter are for inclusion in your First Aid Kits. In

some quarters, these are referred to as Individual First Aid Kits or IFAKs. You can make one First Aid Kit and remember to take it along with whichever BOB (i.e., Short-, Medium-, or Long-Term BOB) you are escaping with depending upon the emergency that confronts you. Or, you can make separate First Aid Kits that you keep with each of your three BOBs. Making three different First Aid Kits gives you the flexibility to customize their contents. Refer to the following chapters for suggestions about items to include in each of these three First Aid Kits:

- Short-Term Bag Contents
- Medium-Term Bag Contents
- Long-Term Bag Contents

Band-aids

Band-aids come in numerous sizes and shapes with common varieties ranging from 7/8-inch diameter spot to 3x4 inches. You can buy variety packages that include different sizes of band-aids. My preference is to stock my First Aid Kits with 1x3 inch band-aids since I feel that they are the most versatile.

Item name: Band-Aid® Adhesive Bandages, Flexible Fabric, All One Size 1" X 3", 100 Count (Pack of 2)

Vendor: MedicalRite

Webpage URL: <https://amzn.to/37WgW4V>

Price: \$16.31

Weight: 7.68 ounces for the entire package of 200 adhesive bandages

Size: 1x3 inches

Material: Not made with natural rubber latex

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes 2 boxes containing 100 individually wrapped band-aids each. Stretchable, comfortable fabric moves with you to fit better. The absorbent pad won't stick to the wound for gentle removal. Unique adhesive and more durable fabric help bandage stay in place longer.

2x2" and 4x4" Gauze Sponges

These gauze sponges can be used to help:

- Clean wounds (along with saline, hydrogen peroxide, or iodine solutions)
- Place over wounds as a dressing
- Pack open wounds. In a survival setting, it will probably be difficult to

thoroughly clean-contaminated wounds. Infection risk is lessened by cleaning these wounds as best possible and then packing them open rather than closing them (e.g., with sutures, glue, or adhesive strips). The wounds are then allowed to heal from their depths outward to the skin surface.

- A stack of them can be placed over bleeding wounds and either taped or wrapped in place to serve as a pressure dressing to help stop active bleeding.
- Used gauze sponges can be saved to use as tinder for fire starting.

They are available in different sizes. If you only pack one size, then the 4x4' gauze sponges are the most versatile. It is handy to also pack a few of the smaller 2x2' gauze sponges. They are available both nonsterile and sterile. Sterile gauze sponges are best for dressing or packing wounds. Nonsterile gauze sponges are handy for pressure dressings because you can grab a stack of them fast and place them over a wound as compared with removing each sterile sponge from its package.

Item name: Band-Aid® Brand First Aid Products Tru-Absorb Gauze Sponges for Cleaning Wounds, 4 in x 4 in, 50 ct (sterile)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3rz0xuC>

Price: \$5.97

Weight: 1.6 ounces for the entire box

Size: 4x4 inches

Material: Low-linting gauze

Appropriate for which BOBs: Short, Medium, Long

Comments: This box contains 25 individually wrapped packages each with 2 sterile gauze sponges. These first aid supplies feature a special low-linting design which helps provide cleaner wounds and may help prevent irritation. Each large gauze sponge measures 4 inches by 4 inches in size, making them the ideal first aid coverings for minor cuts, scrapes, and burns. Sterile sponges feature eight double-thick layers for soft cushioning providing extra comfort when cleaning dirt and contaminants from the injured area. Use these first aid gauze sponges for cleaning and prepping wounds, or for applying medication. They can also be used as an absorbent wound dressing.

Non-Adherent Dressings

These are dressings that you apply directly over a wound to prevent the covering dressing (e.g., 4x4" gauze sponge, etc) from sticking to the wound. Some common non-adherent dressings include:

- Telfa™
- Petrolatum gauze
- Xeroform™ Petrolatum gauze
- Oil emulsion

The problem with the above four types of non-adherent dressings is that they tend to retain moisture. My preference is Adaptic™ which is flexible and mesh-like so fluids can easily pass through it to be absorbed by the overlying dressing (e.g., 4x4" gauge sponge). It can be easily trimmed smaller if necessary. It is easy to remove from wounds when you change dressings.

Item name: Adaptic™ Non-Adherent Dressing 3" x 3" (Box of 50)

Vendor: Honest Medical on Amazon.com

Webpage URL: <https://amzn.to/3nSH7P7>

Price: \$26.16

Weight: 0.48 ounces

Size: 3x3 inches

Material: Flexible, Cellulose Acetate Coated with Silicone

Appropriate for which BOBs: Short, Medium, Long

Comments: The product is categorized as a contact layer dressing. A primary non-adherent wound contact layer is designed to protect the wound and to allow free passage of exudates into a secondary dressing. The silicone is designed to allow the wound contact layer to gently stick to peri-wound skin unassisted to allow for easy application of the secondary dressing. Flexible, open-mesh primary wound contact layer comprised of cellulose acetate coated with a soft tack silicone.

Chest Seal

These are special dressings used to close sucking chest wounds, which are holes entering the chest cavity and created by penetrating trauma (e.g., bullet, knife, etc). Normally, diaphragm muscles contract and move downward producing negative pressure in the chest when a person inhales. That draws air into the lungs as they take a breath. Penetrating trauma enables air from the outside to enter the chest cavity between the chest wall and the lung. Now, as a person takes a breath and their diaphragm moves downward, the

negative pressure sucks air into their chest cavity through the penetrating wound instead of expanding their lung. The tissues around the penetrating wound act like a partial or complete flapper valve permitting air to enter the chest cavity as the person takes a breath, but blocking some or all of the air from coming back out of the hole when they exhale. The result is that more and more air is pumped through the penetrating wound into the chest cavity placing pressure on the lung. The result is a collapsed lung (also known as pneumothorax) on the side of the chest where the penetrating wound is located. The pressure inside the injured side of the chest cavity can be so great that everything is forced over to the opposite, uninjured side of the chest cavity. So, now there is one collapsed lung and the lung on the uninjured side of the chest is also being compressed so it cannot expand normally when the person takes a breath. Their lungs' ability to oxygenate their blood becomes severely compromised. This life-threatening condition is called a tension pneumothorax and can quickly result in death if not corrected.

The penetrating wound must be closed off to prevent additional outside air from being sucked into the chest. This can be accomplished by placing an air-tight barrier over the wound. You can use kitchen plastic wrap, place it over the hole, and tape it on three sides to hold it in place while leaving the fourth side open to permit air to escape when the person exhales. The plastic is sucked up against the wound sealing it when they inhale preventing outside air from entering the hole. There may be cases where air does not exit the wound on exhalation (i.e., when you breathe out or exhale) to adequately remove air from the chest cavity. The lung remains collapsed in this case and the lung on the other side of the chest may be compressed. You must emergently get the pressurized air out of the injured side of the chest cavity to allow the lungs to inflate so they can oxygenate the blood. This can be done by inserting a needle into the injured side of the chest cavity so air can escape through it to decompress the chest cavity (See the next section, "Angiocath™ Needle.").

A chest seal is a commercial product that is placed over a sucking chest wound to seal it off preventing the entry of outside air into the chest. It is sterile and has adhesive so it sticks to the skin. Some come with one-way valves to permit air to exit the chest through the wound when the person exhales.

Item name: North American Rescue Genuine NAR HyFin Vent Compact Chest Seal Twin Pack

Vendor: Best Glide ASE

Webpage URL: <https://amzn.to/34OP6pb>

Price: \$15.75

Weight: 1.6 ounces

Size: Folded: H 6.5 in. x W 3.875 in. x D 0.25 in. Unfolded: L 6.5 in. x W 7.75 in. x D 0.13 in. Chest Seal Size When Deployed: H 4.75 in. x W 4.75 in.

Material: Does not contain natural rubber latex

Appropriate for which BOBs: Short, Medium, Long

Comments: 3-channel pressure relief vents that allow air to escape the chest cavity during exhalation but prevents airflow from entering through the injury site during inhalation. Two Chest Seals for the treatment of entry/exit or multiple penetrating wounds. Advanced adhesive gel for superior adhesion, even to sweaty or hairy chests. Red-Tip Technology single step, peel and apply application that also allows for burping the wound if necessary. Packaged in a rugged, easy-to-open foil pouch, the perforated packaging allows users to open only one dressing at a time as needed. Its small packaging is ideal for low profile kits as you do not have to fold it to get it to fit in your kit, go-bag, cargo pocket, or body armor.

14 Gauge Angiocath™ Needle

These needles are used to allow air trapped in the chest cavity to escape thereby decompressing a tension pneumothorax (see above in the “Chest Seal” section). A sucking chest wound serves as a one-way valve introducing air into the chest cavity, pressurizing that air, and collapsing the lung. A chest seal placed over the wound prevents further air from getting into the chest cavity. But, the air already inside the chest cavity will probably not exit through the wound or fail to escape fast enough to remedy this emergent situation. A needle can be inserted into the chest cavity allowing the trapped air to escape similar to popping a balloon.

An Angiocath™ is a hollow tube made of a fluorinated ethylene propylene (FEP) polymer that is somewhat soft and flexible.^[18], ^[19] It comes sterile packaged with a hollow needle nested inside of it with the needle tip protruding slightly beyond the end of the FEP tube. Angiocaths™ are commonly used to achieve intravenous access for delivery of medications, fluids, and blood transfusions. The needle with its sharp tip is used to

introduce the Angiocath™ into the interior lumen of a vein. Once positioned inside a vein, the needle is removed, leaving the FEP tube within the vein.

A large-bore 14 or 16 gauge Angiocath™ can be inserted into the traumatized side of the chest in the case of pneumothorax. The Angiocath™ is inserted between the 2nd and 3rd ribs (i.e., the 2nd intercostal space) along an imaginary line drawn downward from the center of the collar bone (i.e., the mid-clavicular line). The needle should slide along the top of the 3rd rib (to avoid injuring blood vessels and nerves that course behind the lower part of the 2nd rib) and be directed 90 degrees to the chest wall into the chest cavity. Advance the needle until you hear the hissing sound of air evacuating from the chest cavity through the needle. Remove the needle and leave the catheter in place, securing it to the skin. The catheter may become kinked and preventing further escape of air after removal of the needle. Some sources, therefore, advise using a larger diameter 10 gauge Angiocath™ to reduce this chance of catheter kinking. Studies have demonstrated that 50-75% of times a two-inch long needle is not long enough to penetrate the chest wall into the chest cavity at the 2nd intercostal space level. Therefore, pack 3.25 or 5.25 inch long Angiocaths™ in your first aid kit. [\[20\]](#), [\[21\]](#), [\[22\]](#), [\[23\]](#)

Item name: BD Angiocath™ Peripheral Venous Catheter, 14ga x 5 1/4”

Vendor: Emergency Medical Products

Webpage URL: <https://bit.ly/3rtH6U5>

Price: \$22.50

Weight: Not specified

Size: 14 gauge, 5.25 inches long

Material: FEP Polymer. Latex and DEHP-free.

Appropriate for which BOBs: Short, Medium, Long

Comments: Manufactured by BD. Sterilized by EtO (ethylene oxide). Sterile package.

2”, 3”, 4” Gauze Rolls

Gauze rolls are useful for:

- Holding dressings (e.g., 4x4” sponges) in place over wounds
- They can be cut with scissors to varying lengths and folded multiple times to create dressings similar to 4x4” sponges
- Varying lengths can be cut to pack wounds
- A roll can be placed over an actively bleeding wound and then wrapped

- under pressure with another gauze roll to create a pressure dressing
- They can be used to wrap around rigid splints to immobilize arm or leg injuries such as fractures

Gauze rolls come sterile and non-sterile as well as in a variety of configurations:

- Non-stretch: Thinner, more stiff, tight weave, more difficult to wrap smoothly around areas with varying circumferences. Able to wrap it more tightly since there is no stretch, works well for compression dressings.
- Stretch or conforming: Slightly thicker, softer, and more loosely woven than non-stretch roll gauze. The slight stretch makes it easier to wrap around areas of varying circumferences.
- Fluff wrap (Kerlix™): Thick, bulky, soft. Looser weave. Provides cushioning. Very absorbent. More difficult to wrap tightly. Stretches.

Choose conforming roll gauze if you can only pack one type of roll gauze because it is a good balance between the amount of bulk, softness, absorbency, and ease of wrapping. 4” wide rolls are the most versatile, but take up more room in your first aid kit. You can use 4” rolls on the hand, arm, foot, ankle or leg. 5” and 6” rolls are nice to have if you have to dress a thigh wound, but they are too large to conveniently pack in your first aid kit. The 2” and 3” wide rolls are too narrow for optimal use on an arm or leg. You can cut a 4” roll in half to make two 2” rolls if you need a narrower roll to dress a finger. Non-sterile roll gauze is cheaper and adequate because it can be used to hold an underlying sterile dressing on the wound. The roll gauze is usually not in direct contact with the wound.

Item name: Conforming Stretch Gauze Bandage, Sterile, 4" x 4.1 Yards., 12 Rolls

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3prcJMd>

Price: \$5.22

Weight: 4.8 ounces

Size: 4 inches x 4.1 yards

Material: Latex-free.

Appropriate for which BOBs: Short, Medium, Long

Comments: Rayon/poly knitted stretch gauze bandage. Unique weave

construction and finished edges prevent unraveling and linting. Sterile 4" x 4.1 yards, a package of 12 individually packed rolls. Provides slight compression to the site while securely holding to any body contour. Not made with natural rubber latex.

Tape

Many types of tape can be used as part of your first aid kit. Some of these include:

- Transpore™ (3M™): Clear plastic. Hypoallergenic, latex-free. Tears easily in transverse and longitudinal directions. Porous for breathability. Water-resistant. Good skin adhesion.
- Paper tape: Latex-free, hypoallergenic. Air-permeable.
- Medipore™ (3M™):: Soft, water-resistant, breathable, excellent adhesion, good for fragile skin, easy to tear, hypoallergenic, stretches, latex-free.
- Durapore™ (3M™):: Woven silk cloth tape, excellent adhesion, good for sensitive skin, tears fairly easily, hypoallergenic, minimal stretch, latex-free, water-resistant
- Microfoam™ (3M™):: Water resistant, closed-cell foam, stretches in multiple directions, conforms well, latex-free, hypoallergenic. Works well for dressings, but it is thicker (so you get only 5.5 yards per standard roll versus 10 yards for other tapes) than other tapes making it less suitable for your first aid kit.

All of the tapes listed above work well for dressings. The tapes can be used to tape dressing to dressing (e.g., gauze to gauze) or a dressing to the skin. My personal favorite is Transpore tape. In an emergency, you can tear it quickly by hand either transversely to the appropriate length or longitudinally into narrower strips without using scissors. It adheres well and comes off without harming the skin. It is available in 0.5, 1, 2, and 3-inch widths. The 1-inch width is the most practical for your first aid kit from a space standpoint.

Item name: 3M™ 30707387065950 Transpore Surgical Tape, 1" x 10 yd, Clear (Pack of 12)

Vendor: Wiki Deals on Amazon.com

Webpage URL: <https://amzn.to/2WO3mdk>

Price: \$11.18

Weight: 1.44 ounces

Size: 0.17 inches thick x 1 inch wide x 10 yards long per roll

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: 12 rolls included in the box. Transparent, porous, perforated plastic tape; bi-directional tear; easy to handle with gloves; and has good adhesion to skin and tubing. Hypoallergenic and latex-free. Made by 3M™ in the USA.

Steri-Strips™

These are special reinforced adhesive strips that are used for wound closure. It is safer to leave a contaminated wound open and allow it to heal from its depths outward to its surface (i.e., healing by secondary intention) since closing it is associated with a high risk of infection. Also, avoid closing puncture wounds since bacteria can be trapped in the wound causing infection. But, closing a clean wound will prevent its contamination and help it to heal faster (i.e., primary healing). Steri-Strips™ are an easy way to accomplish this in less time than it takes to suture a wound closed. Steri-Strips™ will not hold a wound together as strongly as sutures or staples, so avoid using it over areas where the skin is subjected to stretching (e.g., transverse wounds located over the front of the knee or back of the elbow where bending the joint may pull the wound apart).

It is technically possible for you to suture repair a clean wound on your abdomen or legs. But, it would be painful without the aid of local anesthetics. It is also technically possible for you to suture a wound on one of your hands or arms using just the uninjured hand. But, that would be highly difficult since suturing is normally done with the non-dominant hand holding forceps to grasp the soft tissues while the dominant hand operates the needle holder instrument. It is almost impossible to tie a knot one-handed at the end of your suture line. This can actually be accomplished by using the unconventional technique of biting down on one end of the suture with your teeth to maintain tension on it while doing one-handed surgeon's knots holding the other end of the suture with your uninjured hand. You will waste a lot of suture length by doing this versus instrument tying, but it can be done.

Steri-Strips™ are a good way to close shallow wounds that extend through the full thickness of the skin. Deeper wounds are normally suture closed in layers to approximate tissues and eliminate dead space. For example, sutures are used to approximate muscle fascia if it's disrupted. Then, an additional

suture is used to approximate the subcutaneous fatty tissue. Finally, the skin is closed. If you're out in the field and have only Steri-Strips™ to use for closure of a deep wound, monitor the wound carefully to be sure that you don't develop a hematoma (i.e., collection of blood) in your wound because the un-sutured deeper tissues can be forced apart by oozing blood creating a blood-filled cavity. The best way to try to prevent slow, low volume bleeding, and hematoma formation is to apply a pressure dressing over the wound after you apply the Steri-Strips™. Significant, active bleeding must be controlled and stopped by pressure or other means (e.g., tourniquet; suture ligation, cautery, or hemostat clamping of small vessels) before simply closing a wound with Steri-Strips™.

Steri-Strips™ are best applied to dry, clean skin. They tend not to stick to a bloody skin surface. You can enhance the adhesion of Steri-Strips™ by first applying benzoin or Mastisol® to the skin before applying Steri-Strips™. Place one half of a Steri-Strip™ on the skin to one side of the wound, pressing it onto the skin with your fingers. Pull the free end of the Steri-Strip™ toward the other side of the wound and then adhere this end to the skin on the other side of the wound. You effectively "pinch" the wound edges together taking tension off of the wound by applying the Steri-Strips™ in this fashion rather than simply adhering Steri-Strips™ to both sides of the wound at the same time.

Item name: 3M™ Steri-Strip™ Reinforced Sterile Skin Closures, 10 Pack Variety Pack

Vendor: Wiki Deals on Amazon.com

Webpage URL: <https://amzn.to/3hk9hQE>

Price: \$12.43

Weight: 0.32 ounces for the package

Size: 0.5x4 inch and 0.25x3 inch strips

Material: Made of a porous, non-woven backing coated with a pressure-sensitive, hypoallergenic adhesive and reinforced with polyester filaments for added strength

Appropriate for which BOBs: Short, Medium, Long

Comments: Variety Pack of 2 sizes: 1/2" x 4" (30 strips total in 5 envelopes) and 1/4" x 3" (15 strips total in 5 envelopes). Hypoallergenic and latex-free.

The product is sterile until the envelope is opened. (Author's note: There are other brands of adhesive wound closure strips, but 3M™ Steri-Strips™ have

the best adhesion to skin. Get the 1/2” Steri-Strips™ if you’re only going to get one size because the 1/4” Steri-Strips™ are too narrow for larger wounds.)

Skin Glue

Skin glues are a quick way to close shallow wounds that do not require a layered closure (i.e., suturing of deeper layers of tissue before closing the skin). They bond the two sides of the wound together providing an immediate seal to prevent contamination of the wound and as an alternative to using sutures, staples, or Steri-Strips™. Skin glue will not hold a wound together as strongly as sutures or staples, so avoid using it over areas where the skin is subjected to stretching (e.g., transverse wounds located over the front of the knee or back of the elbow). Avoid closing contaminated wounds or ones that are actively bleeding.

Non-medical or industrial superglues (methyl-2-cyanoacrylate or ethyl-2-cyanoacrylate) can damage a wound by burning it from the heat produced by the exothermic reaction that occurs as the glue cures. Examples of industrial super glues are Super Glue™, Krazy Glue™, and Loctite®. Medical skin glue differs from industrial super glues by being more flexible and less toxic to wounds. Examples of medical skin glues include:^[24] ^[25]

- 2-octyl cyanoacrylate
 - Dermabond®:^[26] The most common medical skin glue
 - SurgiSeal®
 - FloraSeal®
- N-butyl cyanoacrylate
 - Histoacryl®
 - Indermil Flexifuze™
 - GluStitch®
 - GluSeal®
 - LiquiBand®
- 2-ethyl-cyanoacrylate
 - Epiglue®

Item name: Dermabond Advanced® Skin Adhesive DNX12

Vendor: USA Medical And Surgical Supplies

Webpage URL: <https://bit.ly/3ry7R9W>

Price: \$29.95

Weight: Not specified. Probably about 4 ounces or less.

Size: Not specified. It is approximately the size of a writing pen.

Material: Highly purified 2-octylcyanoacrylate

Appropriate for which BOBs: Medium, Long

Comments: Includes 1 applicator. Each applicator contains 0.7 mL of skin adhesive to close wounds up to 7.5 inches long. Highly purified 2-octylcyanoacrylate monomer provides strength and flexibility. Chemical initiator ensures consistent, reliable polymerization times. Formulation additives including a plasticizer and a thickener enhance strength, flexibility, and skin adherence. Compared with many other topical skin adhesives, DERMABOND ADVANCED® Adhesive provides enhancements such as single-layer application, reduced drying time, and an ergonomically designed applicator for improved handling during application. Trusted by more surgeons than any other brand. Supported by more randomized controlled trials than the alternative top 6 topical skin adhesives combined. Made by Johnson & Johnson®/Ethicon®. Note: Dermabond® is available in a smaller 0.36 mL applicator to close wounds up to 3 inches long (<https://bit.ly/3prfgWH>).

Skin Staple Gun

As mentioned above, suturing a wound closed on one of your hands or arms is next to impossible because you will have to do it with just your other hand. It takes some skill and practice to even use both hands to suture a wound closed on one of your legs or your abdomen. However, just about anyone can close a wound with a skin staple gun. Although it takes only one hand to operate a staple gun, you ideally need another hand to bring the two sides of the wound together with a pair of forceps (i.e., toothed tweezers) before the staple is deployed by squeezing the staple gun. Stapling a wound together is faster than suturing. You need a staple remover to take the staples out of the skin. Alternatively, you can use a fine tip hemostat to remove staples by placing its nose under the staple and then opening the hemostat to spread apart the staple's legs that are located beneath the skin surface. You can then lift upwards on the staple to remove it from the skin.

Item name: Sterile Skin Stapler, 35 Wide Preloaded Staples

Vendor: MedVetInternational

Webpage URL: <https://amzn.to/37Pt0EI>

Price: \$10.50

Weight: 2.4 ounces

Size: 1.18x3.15x4.72 inches

Material: Plastic housing. Metal staples

Appropriate for which BOBs: Medium, Long

Comments: AHS brand. 35 preloaded staples, 5mm width when deployed.

Disposable. Sterilized with ethylene oxide. Sterile package.

Item name: Staple Remover Kit

Vendor: Amazon.com

Webpage URL: <https://amzn.to/37T84N2>

Price: \$3.50

Weight: 0.704 ounces

Size: 0.5x3.3x5 inches package

Material: Stainless steel

Appropriate for which BOBs: Medium, Long

Comments: Contains 1 gauze sponge and 1 staple remover. (Author's note: Although these are disposable items, you can clean and reuse them.)

Safety Pins

There are innumerable things for which safety pins can be used as a part of your BOBs. Here are just some of the reasons to keep safety pins in the first aid kit of your BOB:

- Remove splinters from your skin
- Heat the tip of a safety pin and use it to create a hole in a finger or toenail plate to decompress a subungual hematoma (i.e., blood beneath a finger or toenail)
- Use to close skin wounds in place of suture or staples. Penetrate skin on one side of the wound. Pinch the wound together while pushing the safety pin through the skin on the other side of the wound bringing the wound edges together and avoiding a gap in the wound.
- Use it along with a triangular bandage to make an arm sling
- Use it to secure a gauze roll over a dressing to save tape or in the absence of tape
- Non-medical uses for safety pins include:
 - Use it to make a fishhook
 - Attach items together
 - Repair clothes, tent, etc
 - Use them with a battery to start a fire

Safety pins are usually made of brass, steel, nickel, or a combination of these metals. Nickel plating helps prevent rusting. Six standard sizes range from small Size 00 (3/4 inch) to large Size 4 (3 inches).^[27] Size 3 (Two inches) is the most versatile as a general-purpose safety pin for your first aid kit and your BOB. Smaller size safety pins are more difficult to manipulate with your fingers especially if they are cold or slippery and wet with blood.

Item name: NiftyPlaza Extra Large 2" Safety Pins - Heavy Duty, Industrial Strength, Nickel Plated, Rust Resistant (100 Safety Pins)

Vendor: NiftyPlaza on Amazon.com

Webpage URL: <https://amzn.to/37Pe75w>

Price: \$7.99

Weight: 4.8 ounces for the package of 100 safety pins

Size: 2 inches long

Material: Heavy-duty 0.040 gauge steel wire with a nickel finish to resist rust and corrosion

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes 100 industrial-strength safety pins.

Triangular Bandage

A triangular bandage is a piece of tough cloth shaped like a right isosceles triangle (i.e., a square that is cut in half). It is most commonly 40x40x56 inches. Some of its medical uses include:

- Making an arm sling: This its most common use
- As a wound dressing
- To apply compression around a wound dressing
- As a tourniquet
- To wrap and secure splints around arms and legs

Item name: First Voice TS-3680 Latex Free Triangular Bandage with Safety Pin, 56" Length x 40" Width (Pack of 15)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2WQfLO2>

Price: \$16.40

Weight: 1 ounce each

Size: 40x40x56 inches

Material: Non-Woven material. Latex-free

Appropriate for which BOBs: Medium, Long

Comments: Includes 15 triangular bandages individually poly bagged with 2 safety pins each. Muslin or equivalent high-quality construction.

Non-Latex Disposable Gloves

Including some disposable medical gloves in your first aid kit can protect your hands from coming into contact with blood, urine, feces, pus, infection-causing organisms, and chemicals. Historically, latex gloves have been used because they are inexpensive, elastic for a good fit, provide good tactile sensibility, flexible, protective, and permit good dexterity.

Latex is a milky fluid that 10% of flowering plants produce. Natural latex rubber is derived from Brazilian rubber tree latex and is used to make latex gloves. Less than 1% of the US population is allergic to latex. Allergic reactions can range from itching, skin redness, and rash to anaphylaxis resulting in death.^[28], ^[29], ^[30]

Obtain non-latex gloves for your first aid kit even if you do not have a latex allergy. You may need to assist someone else in an emergency and they could be latex allergic. Alternative glove materials include polyvinyl chloride (PVC), nitrile, and polyurethane. Nitrile gloves have a high level of tear and puncture resistance as well as strong chemical and oil resistance. Other advantages of nitrile gloves are that they conform nicely to the shape of your hand and provide good tactile sensibility.^[31], ^[32]

Item name: The Safety Zone GNEP-LG-1P Nitrile Exam Gloves - Medical Grade, Powder Free, Latex Rubber Free, Disposable, Non-Sterile, Food Safe, Textured, Indigo Color, Convenient Dispenser Pack of 100, Size Large

Vendor: PACIFIC COAST SELLERS on Amazon.com

Webpage URL: <https://amzn.to/3htsMqg>

Price: \$26.95

Weight: 3.53 ounces

Size: 2.5x4.4x7.9 inches for the box

Material: 100% nitrile

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes 100 gloves in a box. Excellent hand and personal protection. Nitrile is chemical and puncture-resistant providing a higher level of protection against liquids, gases, and sharp objects. Non-allergenic and non-irritating. Excellent fit, good sensitivity, and dexterity for fine tasks. The entire glove is finely textured (including palms and fingers) to provide

consistent grip on glass wear, small objects, instruments, and tools. Ambidextrous (fits right or left hand). Rolled cuff for easy opening, quick donning, and fast removal. Convenient dispense pack keeps gloves clean and organized while providing easy access.

Alcohol Prep Pads

The mechanism whereby alcohol kills micro-organisms is through protein denaturation. Alcohol in concentrations of 60-90% is optimal for killing microorganisms while concentrations below 50% are much less effective. Ethyl and isopropyl alcohols rapidly kill tuberculosis, fungus, viruses, and vegetative forms of bacteria (those that are alive and reproducing). Common organisms that are killed by alcohol include *Staphylococcus aureus*, *Streptococcus pyogenes*, *E. coli*, *Salmonella typhosa*, hepatitis B virus, and herpes virus. Alcohols are ineffective at killing bacterial spores (the dormant, inactive form of bacteria) and parasites. Methyl alcohol is much less effective at killing microorganisms than these other two types of alcohol. In testing, 60-95% ethyl alcohol was found to kill within 15 seconds *Serratia marcescens*, *E. coli*, *Salmonella typhosa*, *Staphylococcus aureus*, *Streptococcus pyogenes*, and *Mycobacterium tuberculosis*. Alcohol kills micro-organisms rapidly, but it has no persistent or residual killing effect because it is no longer effective after it rapidly evaporates.^[33], ^[34], ^[35]

Contrary to popular belief, avoid using alcohol to clean open wounds because it can harm tissue and delay healing.^[36], ^[37] Applying alcohol to open wounds is also painful. Like capsaicin, alcohol stimulates heat-activated VR1 (vanilloid receptors) to cause burning pain in the absence of actual heat.^[38], ^[39]

Alcohol prep pads are small, sterile, individually packaged cotton pads containing 70% isopropyl alcohol. They are usually packaged folded in half forming a 1.25-inch square. You can unfold the pad to a 1.25 x 2.5-inch size. They are often used in the medical field to clean the skin before puncturing the skin for blood tests, starting an intravenous line, injections of medications like insulin, or to check a blood sugar level.

For emergency purposes, alcohol prep pads are handy for cleaning the skin around a wound so dressing tape can adhere better to the skin. Other things you can use them for include:^[40]

- Wiping away small amounts of blood

- Reduce itching from mosquito bites
- Use it to apply alcohol to a tick to loosen its attachment to the skin of you or your pet making it easier to remove
- Place it over the bridge of your nose to reduce nausea
- Use as tinder to start a fire
- Use it to disinfect instruments like tweezers, scissors, or a knife blade
- Author's note: Since isopropyl alcohol does not kill parasites (e.g., protozoa), you should use povidone-iodine for disinfection of surfaces that come into contact with water of questionable purity (e.g., lakes, ponds). Refer to "Iodine Prep Pads" below.

They take minimal space and it is useful to have a few in your first aid kit. Be aware that these are not the same as nonsterile, larger hand wipes that are used for cleaning your hands or tabletops.

Item name: Medpride Alcohol Prep Pads| 100 pack| Medical-Grade, Sterile, Individually-Wrapped, Isopropyl Cotton Swabs

Vendor: HLmedical

Webpage URL: <https://amzn.to/3hxJ8hH>

Price: \$6.49

Weight: 3.17 ounces for the box

Size: 1.25-inch square that can be unfolded to 1.25x2.5-inches

Material: 2-ply cotton, 70% isopropyl alcohol

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes 100 pads individually wrapped in tinfoil. Soft, highly absorbent 2-ply construction that is ideal for any type of skin.

Iodine Prep Pads

Iodophors are comprised of iodine and a carrier molecule that produces a sustained, slow-release of iodine. The slow release reduces iodine's toxicity and tissue irritation while retaining its germicidal efficacy. The most common iodophor is povidone-iodine (e.g., Betadine®) which was FDA approved in December 1986. Iodine kills microorganisms by disrupting protein and nucleic acid and its synthesis. Iodophors kill bacteria, fungus, mycobacteria, protozoa, and viruses. They are not effective against spores. It is often stated that microorganisms do not develop resistance to povidone-iodine. Iodophor antiseptics (used on living tissue such as skin) contain less free iodine than iodophor disinfectants (used on inanimate objects such as tabletops).^[41], ^[42],

[\[43\]](#), [\[44\]](#)

Povidone-iodine 10% is the most common commercial version. It has no adverse effect on wound healing and no clinical toxicity when diluted to a 1% concentration or less. (Note: Povidone-iodine “surgical scrub” is meant to clean the surface of intact skin such as before a surgical incision. It should not be used in a wound because it contains a detergent.) Skin irritation to povidone-iodine is rare and most documented cases are due to povidone rather than to an allergic reaction to iodine. It is still safer to avoid using povidone-iodine on individuals with an iodine allergy particularly those with a history of severe reactions. [\[45\]](#), [\[46\]](#)

I could not find any research studies regarding how long it takes for povidone-iodine to kill microorganisms after it is applied to skin or wounds. I found only two somewhat vague references about this point:

- Povidone-iodine’s effect starts immediately after it is applied to the skin. [\[47\]](#)
- Betadine® (a brand of povidone-iodine) sore throat gargles are proven in laboratory studies to kill bacteria that cause sore throats in as little as 30 seconds. [\[48\]](#)

There is a paucity of information regarding the duration of action or half-life of povidone-iodine. [\[49\]](#), [\[50\]](#) One study compared six different antiseptics by taking cultures from hands at different time intervals following hand washing using each of the antiseptics. The study found that povidone-iodine continued to effectively kill microbes one hour after hand washing, while alcohol did not. That finding was consistent with the fact that alcohol loses its ability to kill microorganisms once it dries. [\[51\]](#) Another study about the use of povidone-iodine as a pre-procedural mouth rinse found that the concentration of microorganisms remained decreased for at least four hours. [\[52\]](#) After surgical skin prep first with detergent scrub followed by povidone-iodine application, bactericidal action persisted for up to eight hours. [\[53\]](#)

Povidone-iodine is available in sterile, individually packaged pads. These are worthwhile including in your first aid kit. They are useful for cleaning wounds. [\[54\]](#), [\[55\]](#)

- Effective against a broad spectrum of micro-organisms
- Rapid onset of action
- Its antimicrobial effectiveness persists for some time after its application

- No recorded incidence of micro-organisms developing resistance to it (although contamination of non-sterile forms of povidone-iodine by *Burkholderia cepacia* and other organisms has been reported^[56])
- No adverse effect on wound healing
- Tends not to cause a stinging or burning sensation
- Rare skin irritation
- Relatively inexpensive and readily available

Item name: PVP Iodine Wipes 100-Pack (povidone-iodine prep pads)

Vendor: MedicalRite on Amazon.com

Webpage URL: <https://amzn.to/2KY62IU>

Price: \$7.99

Weight: 4.8 ounces for the box

Size: 1.25x1.25 inches. Can be unfolded to 1.25x2.5 inches

Material: 10% povidone-iodine, equivalent to 1% available iodine, cotton pad

Appropriate for which BOBs: Short, Medium, Long

Comments: 100 individual foil packets per box.

Moleskin

Moleskin is primarily used for foot blister prevention and treatment. It has two sides. One side is soft and flannel-like while the other side is adhesive. It is available in sheets and rolls that you can easily cut to the desired size. Blisters on your feet develop because of friction from your shoes against your skin. It's easy to develop blisters when you're on your feet extensively as during an emergency escape on foot. They are painful, difficult to heal, and can become infected especially when you have no choice but to continue onward in an emergency.

You can use moleskin in a couple of ways to help prevent blisters from forming. First, you can cut pieces of moleskin and adhere them to the skin of your feet where you feel your shoes rubbing them. Walk around in your shoes and pay attention to where you may feel these hot spots. They will usually be on the back of your heel, around your toes, or at the ball of your feet. Moleskin adhered to your skin in these areas will take up the friction from your shoes and protect your skin. You can apply tape over the moleskin to further secure it in place and reduce the likelihood of it peeling off your skin while you are walking. Second, you can adhere moleskin to the inside of your shoes coinciding with the hot spots you found while doing your test

walk in your shoes. Worn areas on the insole of your shoe produce more friction against the sole of your foot. You can “refinish” your insole by adhering moleskin on top of it to create a new, smooth surface.^[57], ^[58]

It is generally better to not pop a blister because it increases the chance of infection. You can leave smaller blisters intact and protect them by creating a raised doughnut around them using multiple layers of moleskin so that their combined height exceeds the height of the blister. To make the doughnut, cut a piece of moleskin approximately 0.75 inches larger than the blister. Fold the moleskin in half and cut a half-circle out of its center such that the diameter of the half-circle is larger than the blister’s diameter. Once unfolded, the moleskin piece will have a circle in its center with a diameter larger than the blister. Make similar moleskin doughnuts and adhere them one on top of the other until the overall height of the doughnut is higher than the top of the blister. Now, use a solid piece of moleskin to cover the central doughnut hole. You can even cut a circular piece of moleskin to adhere to the center of the covering moleskin piece so its undersurface is smooth and will not rub or adhere to the top of the blister. For large blisters, puncture them with a sterile needle to drain the fluid before applying the moleskin doughnut around it. Do not adhere moleskin directly over a blister because the adhesive will tear the blister when you remove the moleskin.^[59], ^[60], ^[61]

Item name: FirstChoice Extra Durable Moleskin - 2" x 2 yards

Vendor: RadBizz on Amazon.com

Webpage URL: <https://amzn.to/38HKQc0>

Price: \$6.99

Weight: 2.4 ounces

Size: 2x3x3 inches roll. 6 feet length

Material: 100% Cotton, Latex-Free, and is backed with Premium Adhesive

Appropriate for which BOBs: Short, Medium, Long

Comments: This material is easy to cut into smaller pieces. For blisters, sores, corns, calluses, chafing, or any other issue that is friction or weight-related.

100% Money-Back Satisfaction Guarantee

Triple Antibiotic Ointment (TAO)

Preventing infection is of paramount importance during a disaster. It is helpful to include a tube of triple antibiotic ointment in your first aid kit. It can be applied to wounds to help treat minor infections. TAO is effective

against most infection causing skin bacteria and those found in wounds. Bacteria rarely develop resistance to TAOs and allergic reactions are uncommon.^[62] It can also help to prevent dressings from adhering to wounds.

TAO is comprised of these antibiotics and amounts per gram of ointment:

- Bacitracin zinc 400 units:^[63] Effective against gram-positive bacteria, particularly those causing skin infections. Susceptible bacteria include Staphylococcus aureus, Staphylococcus epidermis, and Streptococcus pyogenes.
- Neomycin sulfate 3.5 mg:^[64] An aminoglycoside antibiotic. Highly effective against gram-negative bacteria including E. coli, Proteus vulgaris, and Enterobacter cloacae. Partially effective against gram-negative bacteria.
- Polymyxin B sulfate 5,000 units:^[65], ^[66] Effective against many gram-negative bacteria bacilli (rods) including Haemophilus influenzae and Pseudomonas aeruginosa. Ineffective against gram-positive bacteria and gram-negative cocci.

TAO is ineffective in treating skin infections caused by fungi and viruses.^[67]

Methicillin-resistant Staphylococcus aureus (also known as MRSA) is becoming a more frequent bacteria involved in infections. One study found that TAO was 98% active against MRSA.^[68] Only the strain of MRSA called USA300 has been identified as being resistant to TAO.^[69]

Item name: Neosporin® Original First Aid Antibiotic Ointment (triple antibiotic ointment)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3ppTzpX>

Price: \$3.97

Weight: 0.5 ounces

Size: 1.1x3.6x4.8 inch box. The antibiotic ointment is packaged in a tube inside this box.

Material: Neomycin sulfate, bacitracin zinc, and polymyxin B antibiotic

Appropriate for which BOBs: Short, Medium, Long

Comments: #1 doctor recommended brand for treating minor cuts, scrapes, and burns. Wound care ointment is formulated with neomycin sulfate, bacitracin zinc, and polymyxin B antibiotic ingredients to provide 24-hour infection protection for minor wounds. Topical first-aid ointment nourishes skin to minimize the appearance of scars after healing. Contains HeliDerm®

Technology that provides a nourishing environment for skin to heal, resulting in healthier looking skin after use. To use, apply a small amount of the first-aid antibiotic ointment to the affected area one to three times daily. Cover the wound with a bandage for extra protection.

Antihistamine Ointment And Tablets

Diphenhydramine (e.g., Benadryl™) is a first-generation antihistamine. Others include Chlor-Trimeton™, Dimetane™, Tavist™, Unisom®, Atrarax™, Vistaril®, Phenergan™. [70] Antihistamines block histamines, [71] which are released by the body as part of an allergic reaction to an irritant or allergen. Histamines cause increased blood flow to the affected area of your body such as around an insect bite or your sinuses. Other portions of your immune system are activated to combat the irritant. Inflammation is part of this process and in the case of a skin reaction (e.g., insect bite, abrasions, poison ivy) there will be local swelling, pain, and itching. Antihistamines including diphenhydramine help to suppress this immune response and relieve the swelling, pain, and itching.

Side effects of first-generation antihistamines include drowsiness, dizziness, decreased thinking ability, and orthostatic hypotension (i.e., a drop in blood pressure when a person goes from lying down or sitting to standing) [72] The topical form is ideal for skin irritations since it avoids these problems. I always have diphenhydramine cream in a tube to use on insect bites because they create an extremely itchy, raised area like a hive that lasts three days. Diphenhydramine cream is highly effective for me and prevents me from scratching the bite areas until they are bloody.

If you suffer from “hay fever” with watering eyes, nasal congestion, running nose, and sneezing, then you will need the oral form. One way to avoid the drowsiness and other side effects of first-generation antihistamines like diphenhydramine is to use one of the “newer” antihistamines that do not cross the blood-brain barrier. This is an important advantage when you are in an emergency and need to remain mentally and physically sharp. Examples of some “newer” antihistamines include Claritin™, Allegra™, and Zyrtec™. [73]

Item name: Benadryl™ Original Strength Anti-Itch Relief Cream for Most Outdoor Itches, Topical Analgesic, 1 oz (diphenhydramine cream)
Vendor: Amazon.com

Webpage URL: <https://amzn.to/2M0E35x>

Price: \$3.97

Weight: 1 ounce

Size: Tube of cream fits inside a box measuring 1.8x3.9x4.3 inches

Material: 1% diphenhydramine hydrochloride topical analgesic and 0.1% zinc acetate skin protectant

Appropriate for which BOBs: Short, Medium, Long

Comments: This topical cream temporarily relieves itching associated with insect bites, sunburn, scrapes, minor skin irritations, burns, and cuts. It contains a histamine blocker and dries the oozing and weeping of poison ivy, poison oak, and poison sumac. Original Strength Benadryl™ Itch Stopping Cream is intended for ages two years and older.

Item name: Amazon Basic Care Allergy Relief Loratadine Tablets 10 mg, 300 Count (generic for Claritin™, antihistamine tablets)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/37Tymz4>

Price: \$24.83

Weight: 1.59 ounces for the boxed package of 300 tablets

Size: 1.63x1.69x3.25 inches in box package

Material: Loratadine Tablets 10 mg (generic for Claritin™, antihistamine tablets)

Appropriate for which BOBs: Short, Medium, Long

Comments: Compare to Claritin Tablets active ingredient. With allergy relief from Amazon Basic Care Loratadine Tablets 10 mg, you will once again be the boss of spring – and any other time when you suffer allergy symptoms, outdoor or indoor. One dose of Loratadine Tablets 10 mg provides all-day, 24-hour relief of sneezing, runny nose, itchy or watery eyes, and itchy throat or nose. The active ingredient is loratadine 10 mg, an antihistamine in original prescription strength that won't make you drowsy when taken as directed.

Ibuprofen

Ibuprofen (e.g., Advil®) belongs to the class of drugs called nonsteroidal anti-inflammatory drugs or NSAIDs. They help to treat fever, pain, and inflammation. It's useful to include it in your first aid kit to help reduce pain from sprains, strains, back pain, toothache, headache, and arthritis-related joint pain. Ibuprofen can cause bleeding stomach ulcers. It can cause liver

and kidney dysfunction. It can increase the risk of heart attack and stroke with prolonged use. Ibuprofen should not be used by people who have any of those problems. Ibuprofen inhibits platelets, one of the components of blood that is responsible for clotting, so it can lead to prolonged bleeding similar to aspirin.

Naproxen sodium (e.g., Aleve®) is another NSAID and functions similarly to ibuprofen. It has the same potential side effects as ibuprofen and the same contraindications to its use. The main advantage of naproxen sodium is that it can be taken twice daily rather than three to four times daily as for ibuprofen for maximum therapeutic effectiveness. Choosing one over the other is an individual choice because one often works better than the other for a given individual.

Acetaminophen is an alternative medication for those who cannot or should not take ibuprofen or naproxen sodium. Acetaminophen (e.g., Tylenol®) is not a NSAID and does not cause gastrointestinal ulceration or bleeding. It does not increase the risk of heart attack or stroke and it does not cause kidney dysfunction. Acetaminophen is liver toxic and caution must be used to avoid excessive use. Also, avoid any alcohol intake while taking acetaminophen because the two together further increases the risk of liver damage.

Item name: Amazon Basic Care Ibuprofen Tablets 200 mg, Pain Reliever/Fever Reducer (NSAID), 200 Count

Vendor: Amazon.com

Webpage URL: <https://amzn.to/38CerDU>

Price: \$6.15

Weight: 3.84 ounces for the entire box package

Size: 2x2.03x4.25 inches for the outside box package

Material: Ibuprofen 200mg tablets

Appropriate for which BOBs: Short, Medium, Long

Comments: 200 tablets of ibuprofen 200mg. A pain reliever/fever reducer and nonsteroidal anti-inflammatory drug (NSAID) for adults and children 12 years and over. These coated tablets temporarily relieve minor aches and pains due to headache, muscular aches, minor pain of arthritis, toothache, backache, the common cold, and menstrual cramps.

ImodiumTM[\[74\]](#), [\[75\]](#)

Diarrhea can be a particularly serious problem when you are dealing with an emergency and away from home. You may not have restroom facilities available to you. You can lose water and electrolytes with diarrhea causing you to become dehydrated and experience electrolyte imbalance.

Imodium™ (loperamide) is a medication for you to consider packing in your first aid kit to treat diarrhea. It works by reducing contractions of the muscles around your intestines thereby slowing the passage of stool and permitting more time for absorption of water and electrolytes through the intestinal wall.

Common side effects of Imodium include:

- Constipation
- Dizziness
- Drowsiness
- Stomach cramps
- Headache
- Nausea, vomiting
- Dry mouth

Potential severe complications associated with Imodium™ include:

- Paralytic ileus whereby the intestine becomes paralyzed and does not contract to move stool along.
- Overdose can result in rapid heart rate, irregular heart rhythm, death

Like all medications, there are warnings to observe with this medication.

Avoid taking Imodium™ if you have any of the following:

- Stomach pain without diarrhea
- Diarrhea and a high fever
- Ulcerative colitis
- Bacterial infection as a cause of the diarrhea
- Black, bloody, or tarry stools (indicative of a gastrointestinal bleed)
- Liver problems

Item name: Imodium™ A-D Diarrhea Relief Caplets, Loperamide

Hydrochloride, 24 count

Vendor: Amazon.com

Webpage URL: <https://amzn.to/38JPeaK>

Price: \$9.97

Weight: 0.81 ounces

Size: 1.38x3.31x3.56 inches for the box package

Material: Loperamide Hydrochloride

Appropriate for which BOBs: Short, Medium, Long

Comments: Help control your diarrhea symptoms with Imodium™ A-D Caplets. From the #1 doctor-recommended anti-diarrheal brand, Imodium™ A-D works faster than the prescription anti-diarrheal medication Lomotil®, containing diphenoxylate and atropine. Each caplet of anti-diarrheal medicine contains 2 mg of loperamide hydrochloride with a proven formula that works with your body to slow down your system and restore its natural rhythm and balance. These anti-diarrheal caplets help treat and control symptoms of diarrhea due to acute, active, and traveler's diarrhea. The convenient tear-away blister packaging makes these caplets ideal for use anywhere, both at home or on-the-go. This medication for diarrhea is suitable for adults and children ages 6 and up (for children ages 2-5 ask a doctor; do not use for children under 2 years).

CAT® Tourniquet

Lacerating a blood vessel can occur by knife, bullet, glass, tree branch, tent stake, tools, and many other means. Rapid blood loss from a major arterial injury can lead to death as a result of reduced blood supply and oxygen delivery to vital organs such as the heart and brain. Having a tourniquet in your first aid kit and knowing how to use it can save your life. An adult weighing 180 pounds has a total blood volume of approximately 1.5 gallons or 5.7 liters.^[76] Gutierrez, et al published the following information about four stages of hemorrhage, modified from the Committee on Trauma (Note: The blood volumes listed in the table are based upon someone with a total blood volume of 5 liters):^[77]

Hemorrhage Classes I-IV: Clinical findings for each class

PARAMETER	I	II	III	IV
Blood loss, ml	<750	750-1500	1500-2000	>2000
Blood loss, %	<15%	15-30%	30-40%	>40%
Pulse, beats/min	<100	>100	>120	>140
Blood pressure	Normal	Decreased	Decreased	Decreased
Respiratory rate, breaths/min	14-20	20-30	30-40	>35
Mentation	Normal	Anxious	Confused	Lethargic

The ability to palpate a pulse does not mean that a person is not already going into shock from blood loss. A systolic blood pressure of only 60 mmHg results in palpable carotid and femoral pulses.^[78] Blood pressure begins to drop and changes in mentation (i.e., anxiousness) occur with a 15% loss of blood volume (i.e., 750ml). Confusion develops after a 30% blood loss. Lethargy occurs when blood loss is over 40% of total blood volume and death can ensue if bleeding is not stopped and treatment rendered immediately. A body can compensate better for gradual blood loss than when blood loss is abrupt. A healthy and physically fit individual can also compensate better for acute blood loss.^[79] Two Canadian physicians with extensive trauma experience provided the following estimates regarding the time a person becomes unconscious or dies after an incomplete arterial transection (i.e., an artery that is not entirely cut in half into two pieces):^[80]

- Carotid artery (in the neck): Approximately 2-20 minutes
- Brachial artery (in the upper arm): Approximately 5-60 minutes
- Femoral artery (in the groin and upper thigh): Approximately 5-60 minutes
- Popliteal artery (behind the knee): Slightly less than for the femoral artery

Emergent cessation of bleeding is essential when there is acute, major arterial bleeding. A study done in 2006-2007 by the US Army Institute of Surgical Research found a 94% chance of survival if hemorrhage is stopped before 15% blood loss. The chance of survival decreased to 14% if blood loss reached 30% or more. A study involving 11 urban Level 1 trauma centers in Texas found a six-fold reduction in the mortality rate amongst people with peripheral vascular injuries when a tourniquet was used before they arrived at the hospital.^[81]

It is a proven fact that a tourniquet can save your life. Emergency use tourniquets are small and light. You should definitely include one or more of them in your first aid kit. There are four main types of tourniquets:^[82] ^[83]

- Windlass:
 - A strap is wrapped around or slid on to a limb. A stick (windlass) is twisted to tighten the strap. The stick is then locked into place with a D-ring or clip to prevent it from unwinding.
 - Easy to use one-handed
 - Easy to tighten the strap enough to provide adequate blood vessel compression

- Simple to make adjustments in tension on the strap by adding or reducing the number of twists with the windlass.
- Examples: CAT® (Combat Application Tourniquet® from North American Rescue) and SOFTT® (Special Operations Force Tactical Tourniquet® from Tactical Medical Solutions). SOFTT®-NH is 1” wide and SOFTT®-W is 1.5” wide.
- Ratchet:
 - A strap is wrapped around a limb and a lever is used to operate a ratchet mechanism to tighten the strap
 - Fairly easy to use one-handed, but the use of a bite loop with your teeth is necessary to provide counter traction when tightening the strap.
 - Packs down to a smaller size than windlass tourniquets
 - Strap material under the ratchet bunches up creating pressure areas when the strap is tightened
 - Examples: RMT (Ratcheting Medical Tourniquet® from m2® Inc) and the SATS (Self Applied Tourniquet System from Marketing Tactics, LLC)
- Elastic:
 - These are elastic bands similar to exercise bands.
 - They are intuitive to use and require little training.
 - They can be applied high in the upper arm and thigh
 - They can be applied to limbs of all sizes including small limbs on children and dogs
 - Difficult to apply with only one hand. Hard to secure the free end when starting to wrap it around a limb. Difficult to tuck the unused part of the roll under the portion already wrapped around the limb.
 - Difficult to make changes in the amount of compression. Requires at least partially unwrapping and then rewrapping the roll.
 - Least expensive type of tourniquet
 - Examples: RATS (Rapid Application Tourniquet System from ratstourniquet.com), TK-4 (Tourni-Kwik from H & H Medical Corp) and SWAT-T™ (Stretch, Wrap And Tuck Tourniquet from swattourniquet.com)
- Pneumatic:

- Similar to a blood pressure cuff
- Large, bulky
- Air bladder can be punctured
- Expensive
- Generally used in operating room setting rather than in the field

Features to look for in selecting a tourniquet for your first aid kit:^[84]

- Simple to use
- Fast to apply the tourniquet
- Adequately stops blood flow
- Can be applied with only one hand
- Durable and strong. Will not break when tightened enough to occlude blood flow
- Remains tight without slipping or loosening
- 1.5 inches minimum width to reduce pain and tissue damage under the tourniquet. In general, the wider the band, the less tension it takes to stop blood flow.
- A location on the tourniquet to write the time it was applied to help you and emergency first responders know the duration the tourniquet has been in place
- Preferably a windlass type tourniquet
- On the recommended tourniquet list from the Committee on Tactical Combat Casualty Care (CoTCCC)

The CoTCCC is a division of the Department of Defense's Joint Trauma System (JTS). It is comprised of trauma surgeons, combat medics, emergency physicians, and others who study traumatic injuries. The CoTCCC is endorsed by the American College of Surgeons and the National Association of EMTs. It tests and recommends tourniquets based upon their use in combat environments. The CoTCCC released a revised Recommended Devices & Adjuncts document on May 6, 2019, listing six non-pneumatic tourniquets:^[85],^[86],^[87]

- Combat Application Tourniquet® (CAT®) Gen 7 and Gen 6. Windlass tourniquet. Distributed by North American Rescue, LLC.
- SOF Tactical Tourniquet® – Wide (SOFTT®-W). Windlass tourniquet. Made by Tactical Medical Solutions.
- SAM® Extremity Tourniquet (SAM-XT). Windlass tourniquet. Made by SAM Medical

- Tactical Mechanical Tourniquet (TMT™). Windlass tourniquet. Made by AlphaPointe Tactical.
- Ratcheting Medical Tourniquet® -Tactical (RMT-T). Ratcheting tourniquet. Made by m2 Inc.
- TX2™ Tourniquet (TX2) and TX3™ Tourniquet (TX3). Ratcheting tourniquet. Made by m2 Inc, but marketed by RevMedX™.

There are many other tourniquets available on the market, but I will limit my discussion to those recommended by the CoTCCC. The CAT® and SOFTT® tourniquets are considered the “classics” and were on the CoTCCC’s prior recommended list as well as on the current list. The CAT® tourniquet has been studied more extensively than other tourniquets. It is a windlass style tourniquet with a strap that is about 37.5 inches long. The initial adjustment is made by Velcro, which is followed by tightening using the windlass with either one or both hands. The windlass is secured by a bi-directional clip. A Velcro strap attaches over the top of the clip’s opening preventing the windlass from being inadvertently released. The Gen 7 version offers enhancements over the Gen 6 version of the CAT® tourniquet:[\[88\]](#), [\[89\]](#)

- Single Routing Buckle
 - The Gen 6 model has a two-slot buckle. The strap can be passed through one or both slots.
 - Faster application and effective slack removal resulting in decreased blood loss and fewer windlass turns to achieve arterial occlusion
 - Simplified training with single protocol directions for all applications
- Windlass Rod
 - Increased diameter for enhanced strength
 - Aggressive ribbing for improved grip
- Windlass Clip
 - Bilateral beveled entry for rapid windlass lock
 - Bilateral buttress for added strength
- Windlass Strap
 - Sonic welded to clip for constant contact
 - Color changed to Gray for tactical considerations (Black C-A-T Only)
- Stabilization Bar

- Reinforced, beveled contact bar maintains the plate's integrity and decreases skin pinching

Both the Gen 6 and Gen 7 CAT® tourniquets are on the CoTCCC recommended list. A lab study was done comparing these two tourniquets. The Gen 7 tourniquet was found easier to use and was preferred over the Gen 6 version by the test subjects.^{[90] [91]} The Army states that both the Gen 6 and Gen 7 versions are effective and that people that have the Gen 6 version do not have to upgrade to Gen 7.^[92]

Item name: COMBAT APPLICATION TOURNIQUET® (C-A-T)

Vendor: North American Rescue, LLC

Webpage URL: <https://bit.ly/3hk1S3Q>

Price: \$29.99

Weight: 2.7 ounces

Size: 37.5 inches long. Packaged size: 1.5x2.4x6.5 inches.

Material: Not specified. Strap appears to be made of nylon and hardware made of plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: Official Tourniquet of the U.S. Army. Proven to be 100% effective in occluding blood flow in both upper and lower extremities by the U.S. Army's Institute of Surgical Research. NEW Single Routing Buckle for faster application, decreased blood loss, effective slack removal, fewer windlass turns, and simplified training with single protocol application standards. Includes reinforced windlass, stabilization plate, windlass clip, and writeable windlass security strap. Featuring NAR's signature Red Tip Technology® elliptical tab providing added visual clues during application. Patented free-moving internal band providing true circumferential pressure to the extremity. Available in black, orange, and blue colors.

The Gen 4 SOFTT®-W is also a windlass tourniquet with a strap of approximately 40 inches long. The initial adjustment is done by pulling the strap through a sliding buckle, while the final tightening is done by twisting a windlass. The windlass is secured by placing one end into a bi-directional clip (i.e., TRAC or Tourniquet Retention Assistance Clip) similar to the one on a CAT® tourniquet. The windlass can be further secured in the clip by flipping a tri-ring over the end of the windlass. It has a quick-release snap-lock hook and loop buckle that enables the strap to be rapidly converted from

a loop to a straight strap so it can be placed around a thigh without sliding the closed-loop over the foot and up the leg. It is more difficult to operate with one hand than the CAT® tourniquet.

Item name: SOF® TOURNIQUET GEN 4 (SOFTT®-W)

Vendor: Tactical Medical Solutions

Webpage URL: <https://bit.ly/38F4g1m>

Price: \$29.93

Weight: 4 ounces

Size: 1.75x2x5 inches

Material: Webbing appears to be made of nylon. Windlass handle is made of aircraft-grade aluminum that has been anodized to make it less visible. The tri-rings are molded Acetyl, a high-impact plastic.

Appropriate for which BOBs: Short, Medium, Long

Comments: The SOF® Tourniquet Gen 4 is built upon its original ruggedness and durability, which was the result of an exhaustive 24-month research initiative compiling end-user research and laboratory studies. The tourniquet is comprised of high-strength, lightweight alloy components. Its design allows the tourniquet to slide over a limb or, if the limb is trapped, the tourniquet can be rapidly disconnected and reconnected around the limb without rethreading the strap. With one application method for both the arm and the leg, the Gen 4 is the easiest tourniquet to operate under stress, which can lead to reduced levels of blood loss and ultimately better quality patient care. The Gen 4 still maintains its true 1.5" tourniquet strap, providing a wider compression pattern than most standard tourniquets or tourniquets with a 1" constricting band moving through a 1.5" sleeve. The wider compression pattern results in additional arterial compression and increased patient comfort. Additionally, each tourniquet is shipped with two UV-resistant black rubber bands for mounting to your equipment. The SOF® Tourniquet Gen 4 is approved for use by the Department of Defense, approved for use by the Committee on Tactical Combat Casualty Care, and the tourniquet of choice for the American Red Cross. It is used by everyone from elite military operators around the world to the largest police departments in the country to fire and EMS paramedics on the streets to civilians in everyday public places just trying to be prepared. The SOF® Tourniquet Generation 4 (SOFTT®-W) is a true generational upgrade to the most effective windlass tourniquet on the market featuring 4 key upgrades: (1) TRAC - Tourniquet Retention

Assistance Clip: The TRAC assists in applications by providing a temporary control point to hold the windlass while engaging the tri-ring, resulting in faster application times and doubling the security of the device in combination with the tri-ring during patient movements. This is especially helpful in one-handed applications and for those who do not have much experience applying tourniquets. The TRAC is an optional accessory for application, and the windlass must still be secured in the tri-ring for proper use. (2) 5.5" Windlass: The increase in length eases the process of securing the windlass into the clip and tri-ring, increasing the effectiveness of the dual retention system. It still maintains its distinct conical ends while being machined from a single piece of aircraft-grade aluminum bar stock and anodized to minimize the product's signature in a tactical environment. (3) Quick-Compression Buckle: The Quick-Compression Buckle, added to the tourniquet last year, allows for smoother buckle manipulation due to its rounded edges. This also allows for easier one-handed application and overall faster application time. (4) Reinforced Material: Yes, we found a way to make the strongest tourniquet even stronger. Available colors: Black, orange, tan, red, blue.

There are some differences between the CAT® and the SOFTT® tourniquets: [\[93\]](#)

- Width: CAT® is 1.5" wide. The original SOFTT® is only 1" wide. The upgraded SOFTT®-W 1.5" wide.
- Material: CAT® is made from Velcro-backed webbing. SOFTT® is made of thicker webbing.
- Weight: SOFTT® is heavier at 4 oz (vs. 2.7oz) because of its thicker webbing and heftier hardware.
- Buckle: CAT® has a traditional buckle with a slot that the strap passes through. The SOFTT® employs a rigid, hook and loop quick release buckle allowing quick disconnect and reconnect to place the strap around a limb rather than pulling the looped strap over the foot and up the leg.
- Windlass lock: CAT® uses a bi-directional hook system topped with a Velcro strap for retention. SOFTT® uses a bi-directional hook system plus a D-ring for retention. The bi-directional hook or windlass clip to accommodate twisting the windlass in either a clockwise or counterclockwise direction.

The CAT® and SOFTT® windlass tourniquets have been recommended by the CoTCCC since 2004. The SAM Extremity Tourniquet (SAM®-XT) and Tactical Mechanical Tourniquet (TMT™) are two other windlass tourniquets that were added by CoTCCC to their recommended list in 2019. The SAM®-XT (\$37.95 MSRP) tourniquet functions similar to the CAT® tourniquet whereby the windless rod is secured in a bi-directional clip that is topped by a Velcro retention strap. The TMT™ tourniquet (\$29.60 MSRP) uses a unidirectional clip to secure the windlass rod after it has been twisted in a clockwise direction. (Note: All of the other windlass tourniquets on the CoTCCC recommended list allow locking of the windlass whether it is twisted in a clockwise or counter-clockwise direction.) The rod is twisted slightly counterclockwise and pushed into the open end of the clip. The open end of the C-shaped clip has a downward directed prominence that prevents the windless rod (called a torsion bar by the manufacturer) from slipping out of the clip once it is pushed inside of the clip. The windlass rod can be released by lifting upwards on the open end of the clip and twisting the rod out in a clockwise direction. More detailed product information can be found for these two tourniquets at their manufacturer's websites:

- SAM®-XT: <https://www.sammedical.com/products/sam-xt>
- TMT™: <https://www.alphatactical.com>

Most research studies have been done on the CAT® tourniquet. A Hong Kong study found that commercial tourniquets including the CAT® are useful to prevent exsanguination in patients being transported by ambulance to a hospital. Those researchers advised the use of the CAT® tourniquet because of its proven effectiveness in prior studies although their study was inconclusive as to whether it was better than other commercial tourniquets.^[94] Kragh, et al, compared the performance of the SAM®-XT to the CAT® on mannequins and found better results with the CAT® concerning time to bleeding stoppage, ease of use, mannequin damage, blood loss rate, and pressure. The differences in these measures were small between the two tourniquets.^[95]

Gibson, et al, did a comparison study of the TMT™ and CAT® tourniquets on mannequin thighs. They also included the popular Rapid Application Tourniquet System (RATS) elastic tourniquet, one that is not on the CoTCCC recommended list. All three were capable of controlling hemorrhage. The CAT® was better than the RATS for the metrics of time to hemorrhage

control, speed of application, and simulated blood loss. The CAT® was able to apply more pressure than the TMT™, but those two were otherwise similar in other performance metrics tested. The authors concluded that the RATS and TMT™ did not provide any improvement over the CAT®.^[96] Beaven, et al, also did a head-to-head study of the TMT™ and CAT® tourniquets. They found no significant difference between the two in terms of time to achieve complete arterial occlusion, pain score, or self-application success/failure rate. They concluded that the TMT™ offered no advantage over the CAT®.^[97]

For those who prefer a tourniquet with a ratchet mechanism, the m2 Inc Ratcheting Medical Tourniquet -Tactical (RMT-T®) is recommended by the CoTCCC. The Tactical version is 1.5 inches wide. There is a fabric loop on the end of the Ladder Strap opposite from the Ratcheting Buckle. A finger can be placed through the fabric loop or teeth can bite down on it to apply counter traction as the free end of the strap is pulled to remove slack from it. The strap passes through textured double rectangular rings to prevent it from slipping once it is tensioned. The ratchet is then used to tighten the tourniquet. The ratchet has a lever that is manipulated up and down to move the ratchet along a Ladder Strap having evenly spaced, transverse notches on it. The ratchet is self-locking and will maintain the final degree of tightening without needing any additional retention devices. To release the tourniquet, pull upwards on the tab located in the center of the cutout in the ratchet lever. Pulling up on this tab disengages the ratchet from the notches of the Ladder Strap allowing the ratchet to slide freely. The RMT® tourniquet comes in:^[98]

- 3 Civilian versions
 - <120 lbs: 1.5” wide strap. 0.75” Ratcheting Buckle and Ladder Strap. 3 ounces. \$39.95
 - >120 lbs: 2” wide strap. 1” Ratcheting Buckle and Ladder Strap. 5.2 ounces. \$37.95
 - XL: 3” wide strap. Extra-long (60”). 1” Ratcheting Buckle and Ladder Strap. 9.6 ounces. \$44.95
- 3 Military/Law Enforcement versions
 - Tactical: 1.5” wide strap. Smallest and lightest Military/Law version with 0.75” Ratcheting Buckle and Ladder Strap. 3.6 ounces. \$35.96
 - Paramedic: 1.5” wide strap. Larger than Tactical version, with 1” Ratcheting Buckle and Ladder Strap. 4.6 ounces. \$36.95

- 2": 2" wide strap. 1" Ratcheting Buckle and Ladder Strap. 5 ounces. \$39.95

Item name: Ratcheting Medical Tourniquet® (RMT) – TACTICAL version

Vendor: M2inc.

Webpage URL: <https://bit.ly/3pqKnSj>

Price: \$35.95

Weight: 3.6 ounces

Size: 1.5x2.5x4.4 inches folded

Material: Not specified

Appropriate for which BOBs: Short, Medium, Long

Comments: 0.75" buckle and ladder strap with 1.5" webbing. Ratchet mechanism. Pull or bite loop to aid with tightening the strap. Proven Technology since 2002. Simple, intuitive 'glove' operation. Applies precise mechanical pressure. The system is self-locking. Easily applied with one hand. Requires only 'gross' motor skills to operate. Ratcheting sound when activated. Compact, lightweight, and durable, and rugged. Instructions are clearly printed on RMT™.

Besides the RMT-T® tourniquet, the CoTCCC recommends two other ratcheting tourniquets: the TX2™ Tourniquet (TX2) and TX3™ Tourniquet (TX3). These are made by m2® Inc, the same company that makes the RMT-T®, but they are marketed by RevMedX. These three tourniquets are very similar in design, which is not surprising since they are all made by the same company. I could find no research studies comparing these three ratcheting tourniquets. I could only find one study comparing the RMT® to the CAT® and its finding was that laypeople were able to successfully apply the RMT® in a greater percentage of cases than the CAT®.^[99]

It is important to select a tourniquet that allows easy and fast adjustment of vessel compression by modifying the amount of tension on its strap or elastic band. There are times when the tourniquet must be tightened after its initial application:

- If the initial tightening was insufficient and bleeding persists. The tourniquet needs to be tightened more. (Note: In rare cases, bleeding will persist despite maximally tightening a tourniquet. Consider applying a second tourniquet above the first one to gain greater compression. This usually occurs in limbs with a large

circumference^[100], a high percentage of adipose tissue, and in limbs with peripheral vascular disease where arteries are less compressible. It can also occur when a person's blood pressure is exceedingly elevated.

- If bleeding ceases initially but then resumes later. This can occur if the victim's blood pressure rises after the tourniquet was initially applied (e.g., due to pain and ischemia from prolonged tourniquet pressure on the limb).^[101] The tourniquet needs to be tightened more.
- If a "venous tourniquet" situation develops as a result of the tourniquet providing compression sufficient to block venous blood return back up the limb, yet insufficient to totally occlude arterial blood flow down the limb. There will still be enough blood flow through collateral vessels to fill the limb below the site of injury even if a major artery is entirely transected. A substantial amount of bleeding can occur depending upon the degree of venous tourniquet effect.^[102] Two things can be done:
 - The tourniquet can either be tightened more or,
 - The wound can be packed with sponges, manual pressure applied to the wound, the tourniquet released, the limb elevated to allow venous drainage via gravity, and the tourniquet tightened again with greater tension on the strap than initially.

The stoppage of blood flow into a limb by a tourniquet causes tissue ischemia, which produces tissue damage and eventually necrosis. It is also important that a tourniquet can be loosened periodically and then tightened again to allow the limb to reperfuse (i.e., to allow blood to flow back into the limb) and prevent tissue injury. Numerous studies have been conducted to determine a "safe" upper limit to tourniquet compression time.

- Estebe, et al, stated that 3 hours of continuous ischemia will not result in permanent damage to healthy muscle, but it does cause diffuse sublethal cellular injury. They also cited that reperfusion after 2 hours (range 60-90 minutes) worsens muscle injury. They advised that a tourniquet be released for at least 10 minutes after it has been in place for 1 hour.^[103]
- Kumar, et al, cited that a 1-3 hour safe tourniquet compression time has been described. They recommended the following tourniquet guidelines in the operating room:^[104]
 - After a tourniquet has been in place for 2.5 hours, release it for 10 minutes. If the tourniquet has to be tightened again, then

- release it for 10 minutes after every 60 minutes thereafter.
- In children, release the tourniquet after 75 minutes for lower extremities.
- Sharma, et al, also notes that a 1-3 hour safe tourniquet compression time has been described. They recommended the following for tourniquet usage in the operating room:^[105]
 - Use the lowest effective tourniquet pressure to minimize tissue injury
 - After 1.5 hours of upper extremity surgery, deflate the tourniquet for 10 minutes
 - After 2 hours of lower extremity surgery, deflate the tourniquet for 10 minutes
 - Absolute maximum tourniquet inflation time of 3 hours

Lee, et al, noted that most studies on tourniquets have been done in the operating room on people with normal blood pressures undergoing elective surgery using pneumatic tourniquets. The authors posited that research findings based upon these operating room studies might not apply to the use of non-pneumatic tourniquets in the field on hypovolemic trauma victims. They referenced a study by Lakstein that found a 5.5% incidence of nerve injury out of 110 pre-hospital tourniquet applications with tourniquet times ranging from 109 to 187 minutes. The average tourniquet time resulting in no nerve complications was 78 minutes.^[106]

Generally, the complication rate with tourniquet use is low. One study of 68 patients found no complications from tourniquets. Another study found a 1.7% incidence of nerve palsy, no amputations, and a high survival rate. Some reported complications associated with using tourniquets include:^[107],^[108], ^[109]

- Compartment syndrome,
- Reperfusion injury: Additional ischemic tissue damage occurs after the tourniquet is released. Can result in adult respiratory distress syndrome (ARDS), venous embolism, and sometimes-fatal kidney and heart injury.
- Nerve damage: One in 6,200 upper extremity and one in 3,700 lower extremity tourniquet uses
- Muscle injury
- Vascular injury: Uncommon. Most often occurs in children, obese,

- elderly, and peripheral vascular disease
- Skin necrosis

So, what do you do when you are faced with a major bleed during an emergency and there is no formal medical help nearby?

- Try applying pressure to the wound first to see if you can stop the bleeding. You can do this by placing a dressing over the wound and applying manual pressure over it or wrap something over the wound and around the limb to provide compression
- Something we will discuss later is the use of hemostatic agents to promote clotting of blood to aid with stopping bleeding. You can use this if pressure alone does not stop the bleeding.
- Apply a tourniquet around the limb (at least two to three inches above the wound) if manual pressure does not stop the bleeding. Note: An exception to this treatment algorithm of applying pressure first is if you deem the bleeding to be imminently life-threatening. In these cases, apply a tourniquet immediately if the bleeding site is in a location where a tourniquet can be used.^[110]
- You are in a limb saving or life-saving situation if you have to resort to using a tourniquet. You cannot worry about the possible complications that may occur using the tourniquet. Your main concern is to stop the hemorrhage before you lose consciousness.
- Tighten the tourniquet until bleeding ceases. Then, monitor the wound for recurrent bleeding, which would necessitate further tightening the tourniquet.
- Keep track of the length of time the tourniquet has been in place. Apply a compression dressing to the wound and then release the tourniquet for ten minutes after every two hours of tourniquet time in the lower extremity and after every 1.5 hours of tourniquet time in the upper extremity. This will allow the limb to reperfuse and decrease ischemic tissue damage.
- Each time you release the tourniquet, take some pressure off of your pressure dressing and see if bleeding has stopped or at least slowed down to the point it can be controlled by the pressure dressing alone. If so, then you can leave the tourniquet around your limb in a loosened state to allow perfusion to the limb but to be available to immediately tighten again if bleeding recurs.

- Pack at least two tourniquets in your first aid kit:
 - You may need to use “stacked” tourniquets with them placed side-by-side if the initial tourniquet does not stop the bleeding
 - You may need a tourniquet for two separately injured limbs
 - You may need to use the tourniquets to help others

The bottom line regarding which tourniquet to get for your first aid kit:

- Windlass tourniquets:
 - CAT®: Easiest to use with one hand, an advantage if it has to be applied by yourself to an injured arm
 - SOFTT®-W: The quick release snap-lock hook and loop buckle enable the strap to be rapidly converted from a loop to a straight strap so it can be placed around a thigh without sliding the closed loop over the foot and up the leg.
 - SAM®-XT and TMT™ offer no advantages over the CAT®
 - All of the windlass tourniquets are fast and simple to either tighten for more compression or loosen to allow limb reperfusion
- Ratchet tourniquets:
 - The three approved by the CoTCCC (i.e., RMT®-T, TX2™, TX3™) are all made by the same manufacturer and are very similar.
 - The RMT® can be successfully applied more often than the CAT® tourniquet according to one study
 - The strap can bunch up beneath the ratchet when it is tightened.
 - The ratchet is self-locking and prevents the strap from slipping
 - It is fast and easy to add extra tension to tighten the strap by operating the lever of the ratchet
 - It is fast and easy to completely release the tourniquet by pulling upwards on the release tab to reperfuse the limb
- ***Overall first choice: CAT® tourniquet
 - A long record of successful use by the military, law enforcement, and emergency medical personnel
 - It has been the most studied tourniquet. Studies have demonstrated its effectiveness. Newer windlass tourniquets offer no advantages over the CAT®
 - Its windlass mechanism provides reliable compression to stop a hemorrhage

- It is the easiest to use with only one hand
- Folds down compactly and deploys rapidly

Tourniquets are fairly simple devices, but one study of three common commercial tourniquets found that laypeople applied them improperly in a shockingly high percentage of cases. Successful tourniquet application was accomplished in only 16.9% of CAT®, 23.4% of RAT, and 10.6% of SWAT-T™ tourniquets. The most common mistakes people made when applying tourniquets were:^[111]

- Insufficient tightness 74.1%
- Improper placement 44.4%
- Incorrect positioning 16.7%

The take-away message from the Ross study is that simply carrying a tourniquet with you is not enough. You need to learn how to properly use it and then practice using it. Practice applying it to your upper and lower extremities using your dominant and non-dominant hands. It is best to use a spare tourniquet for practice rather than your emergency carry tourniquet so you are not subjecting it to repeated cycles of high tension as you tighten and release it.

What if you need to apply a tourniquet to a small child’s limb? Ross, et al, reported on the upper and lower limb circumferences in different locations in children from newborn to 12 months of age:^[112]

Location	Age (months)	Circumference (in)
Forearm	0-3	4.4
	10-12	5.5
Upper Arm	0-3	4.3
	10-12	5.8
Mid-Thigh	0-3	7.0
	7-9	8.9

Ross’ paper states that the CAT® tourniquet (Gen 6 and 7) are effective for limbs with circumferences from 5 to 35 inches. The RMT® tourniquet comes in a children’s version (i.e., CHILD/Pediatric RMT®) that is effective for limbs as small as 2.5 inches in circumference. Other studies have addressed tourniquet use in children:

- Gen 7 CAT® was effective in occluding arterial flow in the upper and

- lower extremities of children from 6 to 16 years old.^[113]
- Gen 7 CAT® was effective in occluding arterial flow in the upper and lower extremities of children from 2 to 7 years old.^[114]
 - CAT® was tested on a simulated 3 to 5-month old infant-sized limb with a 5.25-inch circumference. It was easy to apply the tourniquet but required a modification of the retention band that spans over the opening of the windlass clip.^[115]
 - Gen 6 CAT® was effective in controlling hemorrhage from wartime trauma in children from 4 to 17 years old.^[116]
 - 9 commercial tourniquets were tested on 6 different sized mannequins simulating children's arms:^[117]
 - The Stretch Wrap And Tuck (SWAT™), TacMed™ K9 (TMK9), and Rapid Application Tourniquet System (RATS) stopped the flow of water (use to simulate blood) on all of the sizes of mannequins. (Note: These are all elastic type tourniquets. None of these 3 tourniquets is on the CoTCCC recommended list.)
 - The Child Ratcheting Medical Tourniquet (CRMT®) was the only mechanical advantage tourniquet that stopped the flow of water on all of the sizes of mannequins.
 - The CAT®, SAM®-XT, TMT™, and SOFTT®-W tourniquets all failed on arms with a 2-inch circumference. (Note: This is not clinically applicable because the average circumference of an infant aged 0-3 months old is 4.3-4.4 inches for the upper arm and forearm.)

The bottom line regarding tourniquet use for children:

- The Stretch Wrap And Tuck (SWAT™), TacMed™ K9 (TMK9), Rapid Application Tourniquet System (RATS), and Child Ratcheting Medical Tourniquet (CRMT®) are effective for children of all ages.
- The Gen 7 CAT® is effective for the upper and lower extremities of children 6 years and older according to two studies. And, it is probably effective for children as young as 10-12 months based upon Ross' findings that it is effective for limbs as small as 5 inches in circumference.

Tourniquets for dogs are covered in the chapter entitled, "Items For Your Pet."

Counterfeit tourniquets are prevalent in the marketplace and there are numerous articles about how to spot a fake one.^[118], ^[119], ^[120] They can be dangerous because they are of poor quality and constructed of inferior materials that can fail when you tighten them while you try to stop a hemorrhage. Their failure could result in your death or the death of the person you are trying to help. Many of the fake tourniquets are of the CAT® design since that is the most popular. Here are some of the reported failure points that have occurred with these fakes:^[121], ^[122], ^[123]

- Windlass breaks or bends so it does not lock into the windlass lock
- Windlass lock bends
- Buckle breaks
- Stitching comes apart

The CoTCCC is an official government agency that recommends tourniquets after they are subjected to a rigorous testing protocol. They periodically publish an updated list of recommended tourniquets. Unscrupulous makers of counterfeit or low-quality tourniquets may market them as “TCCC Approved,” a for-profit trademark that is not the same as CoTCCC recommended.^[124], ^[125]

Some counterfeit tourniquets look very similar to the genuine article and it may be difficult to tell them apart. One red flag signaling a counterfeit is a price that is significantly lower than the genuine product. Your safest route to getting a genuine product is to buy directly from the manufacturer. The list of CoTCCC approved tourniquets cited earlier also lists the name of the manufacturer of each of these tourniquets.

Tourniquets are not damaged from the heat inside a vehicle.^[126] Davinson, et al, studied the CAT®, SOFTT®, and RMT® tourniquets in a lab setting, subjecting them to 130 °F for 91 days. They found that the heat did not damage any of the tourniquets nor compromise their ability to gain control of hemorrhage or eliminate the distal pulse.^[127] UV radiation exposure should be limited particularly for elastic tourniquets. Inspect tourniquets periodically especially if they are carried in exposed locations (e.g., duty belts, on the outside of vests, etc). Replace them if they show signs of damage or wear.^[128]

It is a good idea to carry your tourniquet in a pouch where it is immediately accessible, permits rapid deployment, and also to protect it. There are pouches specifically designed to carry particular tourniquets. It is also

possible to use other similarly sized pouches that fit your tourniquet. Avoid carrying the pouch on the shoulder strap of your backpack or on your vest near your shoulder where it may be damaged if your arm on that side is traumatized.^[129], ^[130] Here are some tourniquet carriers:^[131]

- PHLster Flatpack Tourniquet Carrier:
 - Designed for versatility, it allows you to carry a folded and staged windlass tourniquet on your belt, in a pocket, or with MALICE CLIPS® for MOLLE/PALS mounting. Easy one-handed deployment of your tourniquet.
 - Price \$24.99
 - <https://bit.ly/3rvc4LC>
- North American Rescue CAT MOLLE tourniquet holder:
 - Nylon pouch with a top flap that closes with Velcro. MOLLE strap in back with snap closure.
 - Price \$19.95
 - <https://amzn.to/2KZcbOU>
- ITS TourniQuick Rapid Deployment Pouch w/ Tourniquet (see below)

Item name: TourniQuick Rapid Deployment Pouch including a Tourniquet

Vendor: Imminent Threat Solutions (ITS)

Webpage URL: <https://bit.ly/37Sbz6M>

Price: \$54.99

Weight: 8.78 ounces

Size: 2x2.5x6.5 inches

Material: Nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: The pouch includes your choice of either a Gen 7 CAT® or Gen 4 SOFTT®-W tourniquet (both come in black, coyote, and MultiCam® choices). The TourniQuick™ features our patent-pending, 4-Way Mounting System™. The 4WMS allows you to mount the tourniquet pouch vertically on a duty belt, vertically to MOLLE® (PALS webbing), horizontally on a belt, or even vertically on a backpack strap. The mounting possibilities are truly unlimited. MALICE Clip for MOLLE® attachment available separately as an Add-On (\$4.99 for a pair). The pouch acts as a protective tourniquet pouch, reducing exposure to the elements, dirt, debris, and UV light that can degrade the life of your life-saving device. Patent-Pending Revolutionary Tourniquet Pouch Deployment System. Rapidly Access and Deploy Your

Tourniquet, Saving Valuable Time. Reduces Time from Deployment to Application.

Tongue Depressor

A standard, wooden tongue depressor is flat, light, inexpensive, and a useful item to pack in your first aid kit. Here are some things you can use them for:

- Finger splint
- Scrape off a bee sting
- Apply topical ointment (e.g., antihistamine, antibiotic) to the skin
- Applying and spreading glue
- Make into tinder for a fire
- Use as kindling for a fire
- Leg splint for your dog

Item name: 100 Sterile Tongue Depressors

Vendor: medicalproductsdepot

Webpage URL: <https://ebay.to/37PZAGA>

Price: \$7.25

Weight: Not specified

Size: 0.75x6 inches

Material: Wood

Appropriate for which BOBs: Short, Medium, Long

Comments: Individually packaged, sterile tongue depressors. For medical use. 100 tongue depressors.

Full-Size EMT Scissors

Please refer to the section on “Cutting Tools” in the chapter entitled “Tools” in this book for a discussion about full-size EMT scissors and a product example.

Tweezers

Including tweezers in your first aid kit can be useful for numerous things including:

- Removing splinters (i.e., metal, wood, glass, etc) from your skin
- To hold thread to aid with threading it through the eye of a needle
- Removing small bones from fish

Tweezers are made in two ways. The first method is to fuse two pieces of metal at one end leaving the other end open to create two grasping tips that

can be pressed together. The second method is to fashion the tweezers out of a single piece of metal bent in its center bringing the two ends close together. Tweezers made out of a single piece of metal are less expensive to fabricate but provide less grip.^[132]

Different materials are used to make tweezers:^[133]

- Plastic: Avoid these because they lack durability and precision.
- Stainless steel: Affordable, resists rusting.
- Titanium: More expensive. Light weight. Holds its shape better and lasts longer.

Tweezers are available with a variety of different tip configurations:^[134]

- Pointed slant tip tweezers: Usually the most versatile option. They're the best bet if you plan to use your tweezers for a variety of tasks.
- Slant tip tweezers: Most common type. Good for general brow grooming and other stray hair removal.
- Pointed tip tweezers: Best choice if you plan to use them for removing ingrown hairs or very small or fine hairs. Most effective choice for removing splinters. The pointed tips must be aligned since their contact area is so small. Their minute contact area limits their versatility for multiple function use.
- Round tip tweezers: Ideal to remove coarse hair.
- Flat tip tweezers: Good choice if you plan to use your tweezers primarily for applying false eyelashes.

Other factors to consider when choosing tweezers:^[135]

- Tip width: More pointed tips permit more precise work, but reduce the available pinch surface and pulling force.
- Overall length: Longer than 3.5 inches is easier to use than shorter tweezers
- Protective case: Helps to keep tweezers tips sharp and aligned.
- Angled or curved (commonly at a 45-degree angle from the handle): Generally used for application purposes (e.g., applying false eyelashes, rhinestones, etc)

Item name: Surgical Tweezers for Ingrown Hair - Precision Sharp Needle Nose Pointed Tweezers for Splinters, Ticks and Glass Removal

Vendor: Majestic Bombay on Amazon.com

Webpage URL: <https://amzn.to/34NRHzE>

Price: \$9.97

Weight: 0.71 ounces

Size: 0.39x0.39x4.33 inches

Material: Stainless steel

Appropriate for which BOBs: Short, Medium, Long

Comments: Premium perfect ultra-strong fine-tip tweezers. "Professional Grade," well-made, precise tweezers tips are super strong with hand-calibrated ends. And, needlepoint precision for wood splinters, ticks, and ingrown hairs. Tips are perfectly aligned, pointed, and sharp. LIFETIME GUARANTEE: If you are not satisfied, contact us and we will give you a full refund or a replacement. Available in black, green, and yellow. Also, available with a pointed, slant tip for the same price.

Topical Hemostatic Agents (THA)

THAs are substances that are placed directly into a wound to aid with the cessation of bleeding. Situations where they are useful include:^[136]

- When direct pressure to a wound fails to control bleeding
- When a bleeding site is located somewhere that a tourniquet cannot be used (i.e., in the shoulder or groin, chest, abdomen, etc)

THAs help the blood to clot by two general mechanisms:^[137]

- Some THAs adhere to the wound, rapidly absorb blood, plasma, and other tissue fluids from the wound. This concentrates the blood cells making the blood clotting process more effective. The absorption of fluid by the THA converts them into a gel, which creates a mechanical seal for the wound including sealing blood vessels.
- Some THAs can activate different parts of the body's normal coagulation cascade to promote blood clotting.

There are numerous THAs available on the market. The following three THAs are approved by the CoTCCC:^[138] ^[139]

- Combat Gauze (CG) Z-Fold (QuikClot® Combat Gauze)
 - Manufacturer: Z-Medica Corporation
 - Intended for use as a topical dressing for local management of bleeding wounds such as cuts, lacerations, and abrasions. It may also be used for temporary treatment of severely bleeding wounds, such as surgical wounds (operative, postoperative, dermatological, etc.) and traumatic injuries.

- Mechanism of action: Nonwoven gauze impregnated with kaolin, an inert mineral that does not contain animal or human proteins or botanicals. The intrinsic blood-clotting pathway is initiated by Kaolin, which promotes the activation of Factor XII (FXII) in the presence of kallikrein and high molecular weight kininogen. Activated FXII initiates the intrinsic clotting pathway via the activation of platelet-associated Factor XI (FXI). Activated FXI continues the coagulation pathway that ends with the formation of a fibrin clot.
- Sterility expiration date: 5-years^[140]
- Celox™ Gauze, Z-Fold 5'
 - Manufacturer: Medtrade Products, Ltd.
 - Indicated for temporary external treatment for controlling moderate to severe bleeding
 - Mechanism of action: It is a high-density gauze, impregnated with the proven Celox™ granules (chitosan). Chitosan absorbs fluid, swells, and forms a gel. Celox™ electrostatically attracts red blood cells and forms a gel-like plug. Does not rely on the body's clotting mechanism. No heat generated
- ChitoGauze®
 - Manufacturer: TriStar Wellness Solutions
 - Indicated for use as a hemostatic dressing for the external, temporary control of severely bleeding wounds.
 - Mechanism of action: Works by becoming extremely adherent when in contact with blood. This adhesive-like action seals the wound and controls bleeding. Fabricated from chitosan, a naturally occurring, biocompatible polysaccharide. Because chitosan has a positive charge, it attracts red blood cells, which have a negative charge. The red blood cells create a seal over the wound as they are drawn into the bandage, forming a very tight, coherent seal.

QuikClot® is the best known of the hemostatic agents. In 2008, after extensive testing, the CoTCCC chose QuikClot® Combat Gauze as the only hemostatic dressing used by all branches of the US military for compressible hemorrhage not amenable to tourniquet use or as an adjunct to tourniquet removal if evacuation time was expected to be more than 2 hours.^[141] Animal

studies showed that survival times were significantly higher with QuikClot® Combat Gauze than with other hemostatic agents tested including Celox®, HemCon® (ChitoGauze®), or TraumaStat™.^[142]

Item name: QuikClot® Combat Gauze - Z Fold

Vendor: Live Action Safety

Webpage URL: <https://bit.ly/3aLJ4cw>

Price: \$36.21, shipping \$3.43

Weight: 0.8 ounces

Size: 3 inches x 4 yards. 1x4x6 inches packaged size.

Material: Sterile, nonwoven gauze impregnated with kaolin

Appropriate for which BOBs: Short, Medium, Long

Comments: Hydrophilic gauze impregnated with kaolin. Does not contain animal or human proteins or botanicals X-ray detectable strip. Rapid deployment Z-Fold. The QuikClot® Combat Gauze Z-Fold is even easier to apply since the gauze is in a z-fold format, which makes packing wounds easier and eliminates the risk of the roll falling away and getting contaminated. The vacuum-packed feature of the QuikClot® Combat Gauze Z-Fold makes it much more compact, saving room. Packaged in a vacuum-sealed military grade foil pouch and is indicated for the temporary external control of traumatic bleeding. Like all of the QuikClot® gauze products, it is flexible and pliable and contours to all wounds.

Item name: QuikClot®, Advanced Clotting Kit

Vendor: Tall Ridge on Amazon.com

Webpage URL: <https://amzn.to/2KVTtHY>

Price: \$19.99

Weight: 1.36 ounces

Size: 0.62x5.5x5.5 inches package size

Material: Kaolin-impregnated gauze

Appropriate for which BOBs: Short, Medium, Long

Comments: 2 pieces of 3x24 inch QuikClot® gauze come in 1 resealable pouch that easily fits in any first aid kit, suture kit, medical kit, IFAK pouch, EDC pouch, and survival kits. Nonallergenic first aid gauze accelerates natural blood clotting and stops bleeding within minutes. Used by hospitals, EMS/first responders, military, law enforcement, the general public, and outdoorsman. In vitro testing showed that clot formation occurred in < 2 minutes with QuikClot® gauze as compared to > 10 minutes with gauze

without a hemostatic agent.

Trauma Wound Dressing with 6” hemorrhage control bandage (Israeli Bandage Battle Dressing)

Application of pressure to a wound is an important component of stopping hemorrhage. A large amount of pressure is necessary to stop major bleeding and accomplishing that with manual pressure is fatiguing and also takes away the ability for one or both of your hands to perform other functions. It is better to apply a pressure dressing that can maintain pressure over a bleeding wound. This can be done by packing a wound or placing a dressing over a wound and then tightly wrapping it with a gauze roll or elastic bandage. This can be accomplished more quickly and easily with a trauma wound dressing such as an Israeli Bandage, which offers several advantages:

- You only have to open one package instead of multiple packages (e.g., bandages, gauze roll, or elastic bandage)
- It is more compact and you have less to carry and pack into your first aid kit
- It can be applied with one hand
- Its pressure bar can be used if necessary as a windlass to achieve greater compression on the wound by functioning as a pseudo-tourniquet
- It has a closing bar that permits one hand to secure the end of the bandage without additional supplies such as tape or the need to tie a knot or tuck the end beneath prior rolls around the limb.

The Israeli Bandage was invented by Bernard Bar-Natan, an Israeli military medic and it has been available since 2000. It is currently used by the military around the world including the US. It is available in 4, 6, and 12-inch widths. Some of its features include:[\[143\]](#), [\[144\]](#)

- A sterile dressing is attached to one side of a roll of elastic material. The dressing is placed over the wound.
- A pressure bar that comes attached to the elastic wrap applies pressure over the wound.
- The elastic material is wrapped around the injured limb and then fed through the horizontal, open slot in the pressure bar, which serves as a sliding anchor point for the elastic material.
- The elastic material is pulled in the direction opposite to its original direction thereby compressing the pressure bar against the underlying elastic material and wound

- The elastic material is wound around the limb until its end is reached.
- A closure bar having a slotted opening is located at the end of the elastic material. The closure bar captures the previously wrapped elastic material securing the free end to it.
- If more compression is necessary, then the pressure bar can be used as a windlass to twist the elastic material in a tourniquet fashion to generate up to 30 pounds of pressure. Once twisted, the remaining elastic wrap is wound around the pressure bar and then wrapped around the limb. The free end is secured by the closure bar.

The T3 Bandage is a new, improved version of the Israeli Bandage. It has the same pressure bar and closure bar as the original Israeli Bandage. It includes the following new features:^[145] , ^[146]

- Expandable sterile pad. Large, sterile dressing pad with one half of it attached to the elastic roll material and one half of it unattached to the elastic material. This large dressing can be folded in half for a double-thick dressing. It can be left attached and used unfolded to cover a larger area; the elastic roll can be wrapped around the entire large dressing. Or, it can be torn in half with one half remaining attached to the elastic material and the other half used to dress a second wound in a different location.
- Detachable sterile pad. It can be removed and used as a separate dressing.
- Folded gauze that can be used to clean the wound, as a wound packing, or dressing.
- 8-year shelf life before expiration

Item name: Persys Medical T3 Tactical Trauma Treatment Israeli Bandage

Vendor: Botach

Webpage URL: <https://bit.ly/3pryf3E>

Price: \$6.98

Weight: 3 ounces

Size: Elasticized leader: 4x145 inches. Expandable pad: 4x7 inches.

Detachable pad: 4x7 inches. Folded gauze: 4x29.5 inches.

Material: Not specified

Appropriate for which BOBs: Short, Medium, Long

Comments: Adopted by military and civilian organizations worldwide. In addition to treating conventional wounds, abdominal and large wounds, amputations, entrance/exit wounds, and more, the bandage facilitates the

cleaning, packing, covering, and compressing of single and multiple wounds. Non-adherent pads eliminate removal pain and wound re-opening. Integral pressure applicator exerts immediate direct pressure on the wound. Built-in closure bar, no pins, no clips, no tape, no hook-and-loop, no knots. Compact, durable, lightweight, waterproof, vacuum-sealed packaging. Sterile, long shelf life up to 8-years expiry.

Nasopharyngeal Airway (NPA)

Tilting a person's head backward while lifting their chin forward can help to move their tongue out of the way and help to straighten the path of their airway. If this head tilt-chin lift technique is ineffective or contraindicated (i.e., in case of cervical spine injury), then an alternate measure must be employed to provide an open airway for them to ventilate. An oropharyngeal airway (OPA) passed through the mouth, over, and behind the tongue can be used in an unconscious person. But, an OPA cannot be used in a conscious person because it will stimulate their gag reflex. An NPA is a soft, flexible, rubber tube that is introduced through a person's nostril and with one end located behind their tongue to keep their airway open while the other end is flared and remains outside their nose. It is also called a nasal trumpet because of the appearance of the flared end. NPAs can be used in conscious and unconscious individuals. [\[147\]](#)

To insert an NPA, first, lubricate it with a water-soluble gel. Pass it into one nostril and direct it in the plane of the roof of the mouth and angle it toward the back of the opposite eyeball. Advance the NPA until you detect air flowing in and out of it. [\[148\]](#)

Traditional teaching advised selecting the size NPA based upon the size of a person's small finger. However, studies have demonstrated that the length of the NPA is more important than its diameter. An NPA that is too short will not pass far enough back to separate the soft palate from the pharynx thereby failing to open the airway. An NPA that is too long may both stimulate coughing and gag reflexes or its tip may be pushed up against soft tissue, which serves to plug the NPA preventing airflow through it. The tip of the NPA should ideally be located 1cm above the epiglottis. Research has shown that the optimal NPA length correlates with a person's height. Using the figures of 163cm (64 inches) and 178cm (70 inches) as the average heights for females and males, respectively, the following recommendations have

been made for NPA size based upon an individual's height.^[149]

Subject Height	NPA Size (Portex Size)
Short female	6 (130mm long)
Average female, short male	6 (130mm long)
Tall female, average male	7 (150mm long)
Tall male	8

Despite the literature that supports selecting NPA size based upon length, almost all commercial NPAs are sold by diameter measured in French (Fr). Here are some general guidelines based upon a person's height:^[150]

Height	Size (French)	External Diameter (mm)
Small Adult	18-21	6-7
Regular Adult	21-24	7-8
Large Adult	24-27	8-9

There are circumstances when an NPA should not be used including:^[151], ^[152]

- Traumatic brain injury or central facial fractures: These injuries can cause cerebral spinal fluid (CSF) to leak from a tear to the brain's dura out through the nose. Insertion of an NPA can introduce infection into the CSF, cause fracture displacement, or further soft tissue injury.
- Basilar skull or cribriform fractures: Insertion of an NPA can lead to the tube passing through the fracture into the anterior fossa of the brain.
- Anticoagulation therapy: Individuals taking anticoagulants (e.g., aspirin, warfarin, heparin, etc) are more likely to develop a nosebleed during insertion of an NPA.
- Coagulation disorders: These individuals may bleed profusely if soft tissues are scraped during NPA insertion.

Item name: Nasopharyngeal (Nasal) Airway Kit, 6 pieces

Vendor: Lightning X Products, Inc on Amazon.com

Webpage URL: <https://amzn.to/3mSUFsX>

Price: \$18.99

Weight: 6.56 ounces

Size: 2.99x4.45x9.8 inches for the package of 6 NPAs. Includes 6 sizes from 22 to 32 Fr diameter

Material: Latex-free plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: Sterile. Individually wrapped. Comes with 6 small individual packs of lubricant.

WATER ITEMS

Topics covered in this chapter include:

- Water: A critical necessity for survival
- List of water items to include in your Short, Medium, and Long Term BOBs
- Bottled water
- Sports drinks and electrolytes
- Water containers
 - Bottled water
 - Nalgene® bottles
 - Metal bottles
 - Canteens
 - Hydration bladders
 - Larger, collapsible containers
- Water filtration versus purification
- Water filters
 - Coffee filters and other items to use as coarse filters
 - Activated carbon (charcoal) filters
 - Filter straws
 - High volume water filters: gravity, pump mechanisms
 - Portable desalinators
- Water purification
 - UV light
 - Boiling
 - Chemicals
- Removing heavy metals from water
- Tools
 - Funnel
 - Service utility key
 - Shovel
 - Plastic sheet

- The Bottom Line: Best ways to remove contaminants from water

Water: A Critical Necessity For Survival

Water is a critical necessity that you must have covered since humans can survive only three days without it. And, you'll need water before that length of time if you're to function at your maximum capability during a stressful emergency. So, why is water so essential for survival? About 60% of an adult's body is comprised of water. Some tissues like the brain and muscle are composed of 75% water.^[153] We lose water from our bodies by various means including water vapor when we exhale each breath, perspiration, urination, and defecation. Our rate and amount of water loss increase at higher ambient temperatures and the more we are physically active. On average, the daily water requirement is three liters (3.2 quarts) for an adult male and 2.2 liters (2.3 quarts) for an adult female.^[154]

Dehydration occurs when you do not have adequate water intake. Some of the things that happen with dehydration include:^[155], ^[156], ^[157]

- Thirst
- Fatigue
- Reduced sweating resulting in increased core body temperature, over-heating
- Headache
- Confusion
- Dizziness
- Cardiac arrhythmia
- Reduced circulating blood volume leading to decreased blood pressure and hypovolemic shock
- Kidney failure
- Cerebral edema
- Unconsciousness
- Seizures
- Death from causes including cardiac arrhythmia, kidney failure, liver failure

A person will deteriorate quickly without water. In the absence of water, thirst and slight sluggishness on the first day will progress to organ failure and death on the third day. The rapidity of a person's demise may be affected by their age, health status, activity level, and environmental conditions.^[158]

^[159] From a survival standpoint, do not make your plans thinking that you can do without water for three days. Your mental and physical function will become impaired even during the first day without water. Your ability to concentrate will be reduced after a 2% decrease in your body's water level. You will experience a 25% reduction in energy level after just a 5% decrease in your body's water level.^[160] A 10% loss of your body's water level constitutes a medical emergency. Death results after a 15% loss of your body's water level.^[161] You need to prioritize getting drinkable water fast.

Water Items To Include In Each Of Your 3 BOBs

How you deal with your water needs will vary depending upon the anticipated duration of your emergency and will influence what you pack in each of your BOBs. It's important to build some redundancy into your water kit since water is so essential. Include multiple ways to carry and store your water as well as multiple ways to filter and purify your water. Boiling water is always a possibility if you lack other means to purify water, but it's energy and time-consuming. Be prepared by having other methods besides boiling water available for you to use.

The list below provides some examples of items to include in your BOBs. The list is followed by a discussion of the items along with illustrative product examples of the items.

- Water Items—Short-Term BOB (for 12-24 hours survival)
 - Bottled water
 - Stainless steel water bottle (1 liter, single wall, use for boiling and transporting water) or 1-quart military canteen with nested stainless steel cup (for boiling water) in a canteen pouch
 - Water filter straw
- Water Items—Medium-Term BOB (for 2-7 days survival)
 - Bottled water
 - Stainless steel water bottle (1 liter, single wall, use for boiling and transporting water), or a 1-quart military canteen with nested stainless steel cup (for boiling water and cooking food) in a canteen pouch
 - Water filter straw
 - Chlorine dioxide water purification tablets
 - 4-way sillcock key or 10-way service utility key (to turn

- industrial water valves without spigot handles)
- Water Items—Long-Term BOB (for weeks to months survival)
 - Coffee filters (to filter large particulates from water)
 - Stainless steel 1-liter water bottle (single wall, use for boiling and transporting water) with 750 ml nesting cup
 - Consider bringing a lightweight, larger, stainless steel pot to boil larger volumes of water and for cooking
 - 2-quart military collapsible canteen in a canteen pouch
 - Collapsible larger water container (e.g., 5 gals). Lightweight plastic. For vehicle or base camp.
 - Water filter straw
 - Chlorine dioxide water purification tablets
 - High volume pump ceramic water filter
 - 4-way sillcock key or 10-way service utility key (to turn industrial water valves without spigot handles)
 - Small plastic funnel to help transfer boiled water into your water carrying vessels (e.g., canteen or water bottle)

Bottled Water

It's a good idea to pack a couple of bottles of water with each of your BOBs. That way, you'll have water available immediately for your short term water needs. You can bring some extra water bottles if you're escaping by vehicle. Bottled water is readily available, inexpensive, and simple to store. Watch the expiration date, so you can cycle out and use the water before then and substitute it with new water bottles. Do not discard your empty plastic water bottles because you can use them later to transport water and also for UV water purification (see the section below about "Solar Water Disinfection or SODIS").

Just having some bottled water with you should take care of your Short-Term BOB water items. However, you can include some backup water items such as a water-filled stainless steel water bottle (1 liter, single wall, use for boiling and transporting water) or water-filled 1-quart military canteen with nested stainless steel cup (for boiling water) in a canteen pouch. You can also consider including a water filter straw as a backup since it's light and compact.

Water is heavy and bulky, so you can only carry limited amounts of water

with you. You'll eventually deplete the supply of water you bring with you and you need to have other ways to provide yourself with drinkable water.

Sports Drinks And Electrolytes

Escaping during an emergency can involve sustained periods of strenuous physical activity. Sweating is a way your body cools down as your core temperature rises. Sweating increases with greater duration and intensity of exertion, higher ambient temperature, higher humidity, and the type and amount of clothes you wear. Water and electrolytes such as sodium, potassium, and magnesium are lost through sweat. Vomiting and diarrhea are other ways water and electrolytes may be lost either through illness or after eating something improper during an emergency survival situation.

Published research about sweating and fluid/electrolyte replacement has focused on athletes. Sweat varies greatly between individuals^[162], ^[163]:

- **Sweat rate:** This reflects how much a person sweats and is measured in liters per hour (L/hr). The sweat rate can vary up to five to six-fold amongst athletes. Sweat rates frequently range from 0.5 to 2.0 L/hr.
- **Sweat concentration:** This refers to the amount of electrolytes lost in sweat and is measured in milligrams per liter (mg/L). Electrolyte loss is comprised primarily of sodium and chloride. Other electrolytes are lost in much smaller quantities (e.g., potassium, calcium, magnesium). Sweat concentration can vary up to ten-fold amongst athletes with the average loss approximating 950 mg/L. You may notice a white powdery residue on the inside of your cap or the surface of your skin if you have a high sweat concentration. The white residue represents electrolytes after the liquid part of sweat has evaporated. This residue tastes salty if you lick it because it consists primarily of sodium chloride (NaCl) or salt.

Data in this table demonstrates how sodium and chloride are the electrolytes lost in the greatest amounts in sweat^[164]:

Electrolyte	Average Concentration in Sweat
Sodium	35 mEq/L
Chloride	30 mEq/L
Potassium	5 mEq/L
Calcium	1 mEq/L

Magnesium	0.8 mEq/L
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Sports drinks were developed to help replenish fluid and electrolytes lost during physical exertion. In addition to containing water and electrolytes, sports drinks also include sugar (i.e., carbohydrate) in the form of glucose, high fructose corn syrup, or sucrose (note: sugar-free versions are available). The average sugar content is 26%, which is less than the amount of sugar in sodas. Some also include Vitamin B, amino acids, and other ingredients. The Academy of Nutrition and Dietetics and the American College of Sports Medicine recommend sports drinks only for intense exercise lasting over one hour. [\[165\]](#)

Sugar in sports drinks slows gastric emptying thereby slowing the movement of water through the stomach into the small intestine where the vast majority of fluid is absorbed into the body. Increasing the amount of sugar in sports drinks increases the amount of sugar absorbed by the body while reducing the rate of water absorption in the small intestine. [\[166\]](#), [\[167\]](#) This relationship between sugar concentration and the rate of water absorption has led to the development of sports drinks with varying amounts of sugar resulting in drinks with different levels of tonicity. Tonicity refers to the concentration or amount of dissolved substances (e.g., sugar, electrolytes) in a solution (e.g., water). Sugar is the substance present in the greatest quantities in sports drinks, so it has the greatest effect on tonicity. Drinks can be divided by tonicity into three groups [\[168\]](#), [\[169\]](#):

- Isotonic drinks:
 - Tonicity or concentration of dissolved substances is similar to tonicity of human blood which is approximately 285 mOsm/kg (milliosmole per kilogram)
 - Includes common sports drinks such as Gatorade®, Powerade, Lucozade Sport
 - Contain approximately 6-8% sugar which is 1.5-2 times more than found in most hypotonic drinks
 - Useful for short duration, intense exercise where the goal is rapid delivery of sugar with less importance placed upon rapid fluid absorption through the gut.
- Hypotonic drinks:
 - Tonicity is lower than human blood
 - Lower sugar content (i.e., generally less than 6%)

- Provide less energy since they contain less sugar
- Best for hydration because fluid absorption through the small intestine is the fastest
- Hypertonic drinks:
 - Tonicity is higher than human blood.
 - Contain large amounts of sugar
 - Maximize sugar absorption with the trade-off being slower fluid absorption across the small intestine.
 - Useful for maximal energy delivery for high-intensity activities
 - Not optimal when hydration is the primary goal

In addition to tonicity, the amount of salts in water also influences the degree to which the intestine absorbs water^[170]:

- Water without any salts (i.e., distilled water) is 59% absorbed by the intestine
- The percentage of water absorbed by the intestine progressively increases as the water's salt concentration increases
- Water absorption reaches a maximum of 95% with water containing 0.4-0.7% NaCl.
- Water absorption through the intestine decreases with higher concentrations of NaCl because the resultant osmotic gradient causes a reverse flow of fluid from the body into the intestine.

In an emergency survival situation, the main goal is to prevent dehydration and therefore prioritize hydration over energy delivery. The electrolytes contained in sweat are predominantly sodium and chloride with other electrolytes present in much smaller quantities. Thus, you can compensate for heavy sweating by adding simple table salt (consists of 97-99% NaCl^[171]) to water. Maximal intestinal water absorption occurs with solutions of 0.4-0.7% sodium chloride (ie NaCl) as previously noted. To make a solution of 0.5% NaCl one must add 5 gm of NaCl to 1000 ml of water.^[172] One teaspoon of salt contains 6 grams of salt, which includes 2,400 mg of sodium.^[173] So, add approximately 0.8 teaspoons of salt to one liter of water to make a 0.5% NaCl solution to replenish your fluids and electrolytes during your bid for survival.

The bottom line regarding fluid and electrolyte replacement in survival situations:

- Including sports drinks with your BOBs is optional, but not a necessity.

- It is fine if you want to include a couple of bottles of sports drinks and perhaps more if you are escaping by vehicle.
- When choosing a sports drink, select one that is hypotonic for the fastest fluid absorption through the intestine. Avoid hypertonic drinks since they are associated with the slowest fluid absorption. Prioritize hydration over energy delivery (ie, choose drinks with lower sugar content) for your survival drinks. You can fulfill your energy needs by eating solid foods.
- Any liquid is heavy and bulky to carry. So, you can take only a limited amount of sports drink with you.
- You will soon run out of all the sports drinks you bring with you.
- It is more practical to carry simple table salt with you so you can mix your own electrolyte drink by adding it to water for those times you sweat profusely. Table salt is cheap, readily available (if you get it before an emergency), light, and compact as compared to sports drinks. Pack some of it in your Medium and Long-Term BOBs.
- Recipe for making your electrolyte drink: 0.8 teaspoons of table salt in one liter of water
- Plain water (with no added electrolytes) is adequate for hydration in the vast majority of situations.

Water Containers

Water containers can serve two purposes:

- Transporting and storing water: Bottles, canteens, hydration packs
- Water purification
 - Sunlight: Clear bottle
 - Boiling: Metal bottle

These are some water containers that you can consider carrying with you:

- Bottled water: Save the plastic bottles after you finish drinking the water. The bottles can be used to transport water, purify water by sunlight, connect to a filter straw to collect and store purified water.
- Nalgene®, BPA free bottles: Advantages include lightweight, durable, leak-proof, wide mouth, standardized thread pattern, compatible with many water filters.
- Metal bottles: Get single wall, non-insulated metal bottles so you can boil water in them in addition to transporting water. Some bottles come nested in a metal cup (adds a little extra weight, but takes up almost no

- extra space) that can be used for boiling water, cooking, and drinking.
- Canteens: They come in metal and rigid or collapsible plastic. Standard sizes are one and two-quart. The one-quart canteens are available with nested stainless steel or aluminum cups that can be used to boil water or cook food.
- Hydration packs: These are rubber or plastic reservoirs (bladder) with a filler port and a valved tube. Make sure that the bladder is made from BPA and phthalate-free food-grade materials. Bite valves permit hands-free drinking. Push/pull valves require the use of your hands to push them closed. Bladders fill either with a screw cap filler port or through an open-top slide closure. The opening should be large enough to facilitate cleaning the inside of the bladder. Open top bladders allow you to get your hand inside and some can be turned inside-out for cleaning and drying. Volume capacity ranges from 0.5-3 liters.^[174], ^[175], ^[176] The most practical size for survival purposes is two to three liters; larger is generally better because you have the option of not filling it maximally. They're usually packaged in a backpack or waist pack. Just buy a hydration bladder to put inside your BOB since you will not need the outside carrier.
- Collapsible larger containers: These are lightweight plastic usually with a filler cap and dispensing valve. A common size is a five-gallon capacity. You can consider these if you are escaping by vehicle or for your base camp.

Item name: Nalgene® Tritan Wide Mouth BPA-Free Water Bottle, Grey w/Black Cap, 32 oz

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3pshrcy>

Price: \$11.99

Weight: 6.25 ounces

Size: 3.5-inch diameter, 8.25-inch height. 32-ounce volume

Material: BPA-free Tritan

Appropriate for which BOBs: Short, Medium, Long

Comments: Available in 25 different colors. The original. Nalgene®'s BESTSELLING water bottle for more than 30 years. Impact-resistant.

Completely leak-proof, made of virtually indestructible BPA-free Tritan, easy to clean, and dishwasher safe on the top rack. Suitable for both warm and

cold beverages (-40 to 212 °F). Wide mouth makes cleaning and adding ice cubes easy. Free of BPA, BPS, and phthalates. The opening accommodates most water filters. It is marked with milliliters and ounces for easy measurement. 32-ounces. Easy to use screw top lid is secure when packed. Loop-top can be clipped to a bag or harness.

Item name: Klean Kanteen Wide Mouth Single Wall Stainless Steel Water Bottle with Leak Proof Stainless Steel Interior Cap, 27 ounces (800 ml)

Vendor: Apple Green Baby on Amazon.com

Webpage URL: <https://amzn.to/37Tg8xi>

Price: \$19.95.

Weight: 8.1 ounces

Size: 9.9 inches height, 2.9 inches wide. 2.125-inch opening

Material: Stainless steel bottle. Polypropylene #5 cap with stainless steel insert.

Appropriate for which BOBs: Short, Medium, Long

Comments: Lightweight SINGLE WALL, non-insulated water bottle design. LEAK PROOF loop cap made from BPA-free, leach-free, polypropylene #5. Cap has a stainless steel bottom insert creating an ALL STAINLESS STEEL interior so your liquid doesn't touch plastic. Large 2.125 inch (54 mm) opening fits ice and is easy to fill and pour. All stainless steel SINGLE WALL water bottle construction with no coatings means it can be used to boil water when needed for sterilization. All seams, threads, and stainless steel finishes are smooth and easy to clean. LIFETIME WARRANTY.

Item name: Pathfinder H006 32 Oz Bottle and Nesting Cup Set with Stainless Steel Construction

Vendor: Knife Country USA

Webpage URL: <https://bit.ly/3nUox9o>

Price: \$40.00

Weight: Bottle 8.1 ounces with cap. Cup 7.1 ounces with lid.

Size: Bottle: 8" tall, 3-³/₄" diameter (with cap). Cup: 4 ¹/₂" tall, 3 ³/₄" diameter

Material: 304 stainless steel, 0.5mm thick

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes 32oz wide-mouth bottle with ABS lid and silicone seal; 25oz cup with batwing handles; and cup lid with straining holes and D-Ring.

Cup has laser-etched graduations. Designed to hold exactly 32oz of liquid.

The reason: Purification tablets are typically added to 32oz of water. That

being the case, you can simply fill your bottle and add the tablets. No more measuring, no more worry. Can be used to boil water.

Item name: TargetEvo Stainless Steel Military Canteen 1QT Portable with 0.5QT Cup and Green Cover

Vendor: Xiangqu on Amazon.com

Webpage URL: <https://amzn.to/3nNFK4p>

Price: \$26.99

Weight: 1.1 lb

Size: Canteen Size: 5.1x3.1x7.3". Mouth 0.8-inch diameter. Cup Size: 5.2x3.1x3.9", Thickness: 0.24".

Material: Stainless steel canteen and cup. Plastic canteen cap with chain attachment.

Appropriate for which BOBs: Short, Medium, Long

Comments: Stainless steel canteen nests inside the cup. Cup has a folding handle and it can be used to boil water and for cooking. Snap closure pouch, detailed construction with a tough heavyweight nylon bag.

Item name: G.A.K 90026 G.I. Type, U.S Made 1 QT Canteen (rigid plastic) with New Stainless Steel Cup and G.I. Military ACU MOLLE® II Pouch KIT

Vendor: Allegheny Surplus Outlet, Inc. on Amazon.com

Webpage URL: <https://amzn.to/3pugvES>

Price: \$27.55

Weight: 1 lb, 3 ounces

Size: Not specified. Canteen measures approximately 3.1x5.1x7.3 inches.

Cup measures approximately 3.1x3.9x5.2 inches.

Material: Rigid, BPA-free, plastic canteen. Stainless steel cup. Nylon canteen pouch.

Appropriate for which BOBs: Short, Medium, Long

Comments: Brand new US Military 1-quart canteen, US made. Brand new military-style (brushed matte finish) stainless steel cup with butterfly handle, imported. Genuine used G.I. Surplus, ACU MOLLE® II (2 attachment straps) Pouch Kit. Some might have some spots and some markings but they are all functional and in good condition.

Item name: Olive drab 2qt Canteen and Desert Tan 2qt Canteen Cover w/ Strap and ALICE Clips.

Vendor: Ozark Outdoorz, LLC

Webpage URL: <https://amzn.to/37PKVLt>

Price: \$17.25

Weight: 1.05 lb

Size: 2-quart canteen volume. 2.7x8.7x14.1 inches.

Material: Collapsible plastic canteen. Nylon canteen cover.

Appropriate for which BOBs: Medium, Long

Comments: Canteen and cover are genuine US Military issue, made in the USA. New, unused condition. This Canteen Holds Twice as much water as the traditional 1-Quart Canteen and can be carried over the shoulder or worn on the belt. Mask drink cap. LC Alice Clips on the back and detachable shoulder strap make this canteen a vital piece of field gear. Durable double hook plastic snap closure on the case and a small front pocket with Velcro closure designed to carry salt tablets to prevent dehydration. Includes 2-quart collapsible canteen, nylon case, and detachable, adjustable shoulder strap.

Item name: Platypus Big Zip Water Reservoir for Hydration Backpacks, 3-Liter, LP with Standard Valve

Vendor: BJB Fulfillment on Amazon.com

Webpage URL: <https://amzn.to/38BCOBu>

Price: \$47.49

Weight: 6.7 ounces

Size: 9x17.2 inches

Material: Food-grade, BPA-free, BPS-free, phthalate-free materials. The bladder is made of a 2-layer polyethylene material; the inner layer ensures that the water is taste-free while the outer layer is more robust and provides durability. Furthermore, the inner layer is silver-ion treated and thus protects the reservoir from bacteria and mold.

Appropriate for which BOBs: Medium, Long

Comments: Premium taste-free, leak-proof reservoir. Embedded silver-ion to protect clean water from mold and bacteria. All materials are certified food-grade, BPA-, BPS-, phthalate-free, and taste-free for a clean taste. Open top with Secure Slide Lock slides both ways to open the reservoir easily and close it securely. Low-profile design with a center baffle helps the reservoir ride flat in a pack. Features Standard Valve (bite valve) with 1/4-inch drink tube. 3.0-Liter (also available in 1.5 and 2-liter versions). Made in the USA. Limited lifetime warranty.

Item name: WaterStorageCube® BPA-Free Collapsible Water Container with Spigot, 5.3 gallons (20 liters)

Vendor: WaterStorageCube® on Amazon.com

Webpage URL: <https://amzn.to/3prZvyV>

Price: \$10.24

Weight: 12 ounces

Size: 3.5x9.8x10.2 inches

Material: Food Safe BPA-Free LDPE Plastic

Appropriate for which BOBs: Medium, Long

Comments: Foldable space-saving design store away easily. Remains soft and flexible even when cold yet retains shape and is easy to fill, dry, drain, and reuse. Soft, molded handles make holding and transport easy. Reusable. Custom made lid and spigot with gasketless design means no leaks or parts to replace. Good spigot water-flow. A thicker lid to withstand heavy pressure. Easy on/off spigot with controllable flow. 1-piece design with no seams to leak or handles to break. Durable and dependable. SATISFACTION GUARANTEE: If for any reason within 30 days you're not satisfied, simply return for a refund or replacement.

Water Filtration versus Purification

The water you find in your environment during a survival situation is almost always contaminated with microorganisms. Protozoa (e.g., Cryptosporidium, Giardia, etc) and bacteria (e.g., E. Coli, Salmonella, etc) are most often found in water in locations where there is little human contact. Those microorganisms along with viruses (e.g., Hepatitis, cholera, etc) are common in the water where humans frequent.^[177] Drinking contaminated water will cause illness often including stomach cramps, nausea, vomiting, diarrhea, fever, weight loss, and sometimes, even death.^[178]

Water filtration and purification are two methods to make water safe to drink. We will discuss filtration first. Different types of filters can be used to filter water:^[179]

- Mechanical: Remove particles from water by passing it through a barrier.
- Adsorption: Activated carbon or charcoal is used most often because its extensive internal labyrinth of crevices “traps” contaminants in water. Carbon in filters may be in granular (GAC or granular activated carbon) form or more expensive blocks. Carbon may be made from wood or coconut shell (more effective, more expensive).

- Ion exchange: Used in water softeners to remove magnesium and calcium from hard water by replacing them with sodium or hydrogen ions.
- Reverse osmosis: Pressure forces water through a membrane serving as a filter. Offers the best level of filtration, but is the most expensive. Usually combined with a mechanical and an absorption filter.

For survival purposes, water is filtered by mechanical and adsorption methods. Mechanical water filtration involves removing particles from water by passing it through a permeable, pore-filled barrier (i.e., a filter). The pore size determines a filter's effectiveness. Filters having large pores can be useful for removing sediment or dirt. Mechanical filters for survival purposes are effective for filtering bacteria, mold, and protozoa, but will not filter out viruses. Mechanical filters will also not remove toxins produced by bacteria nor heavy metals (e.g., lead, mercury).^[180]

The following information provides some context as to the sizes of various contaminants that may be present in water. Sizes are listed in microns. One inch equals 25,400 microns:^[181]

- Bacteria (e.g., E. coli, Salmonella, Cholera, Shigella, coliform)): 0.2-60
- Mold: 3-12
- Mold spores: 10-30
- Protozoa (e.g., Cryptosporidium, Giardia, cyclospora): 1-200,000
- Viruses (e.g., Hepatitis A, norovirus, rotavirus): 0.005-0.3
- Beach sand: 100-10,000
- Fertilizer: 10-1,000
- Insecticide dusts: 0.5-10
- Lead: 0.1-0.7
- Pesticides and herbicides: 0.001
- Pollens: 10-1,000

Survival filters are effective at removing bacteria, mold, and protozoa. But, they generally do not remove viruses because they are much smaller than the pore size of filters. One exception is the MSR Guardian Purifier (\$349 at MSR: <https://bit.ly/2JtqdrG>) that uses an Advanced Hollow Fiber filter with a pore size of 0.02 microns, small enough to remove viruses.

Water purification is different than filtration:^[182]

- Purification:

- Methods of purification include UV light, boiling, and chemicals
- Eliminates micro-organisms from water including bacteria, protozoa, and viruses
- Takes time for purification to be effective:
 - UV light pen: 90 seconds for 32 ounces of water
 - Solar Water Disinfection (SODIS): Six hours to two days depending upon the intensity of sunlight
 - Boiling: Rolling boil one to three minutes depending upon elevation
 - Chemicals: 30 minutes to four hours
- Does not remove chemicals, heavy metals, sediment, or debris from the water
- Often combined with the use of a mechanical filter
- Mechanical filtration:
 - Eliminates bacteria and protozoa, but not viruses (because viruses are smaller than the pore size of most filters). One exception is the aforementioned MSR Guardian that uses Advanced Hollow Fibers with pores so small that viruses are also filtered.
 - Removes sediment and debris from the water
 - Filtration works instantly, but it takes time to filter large volumes of water
- Filtration plus purification
 - Filtration alone: Unable to remove viruses. Does remove bacteria, protozoa, and particulates.
 - Purification alone: Unable to remove particulates. Does remove bacteria, protozoa, and viruses.
 - Filtration plus purification: Removes bacteria, protozoa, viruses, and particulates

Viruses enter water primarily through contamination by human feces and sometimes, animal feces. Virus contaminated water is rarely found in glacier melt or moving streams. It is also not common in the United States or Canada backcountry. Although mechanical filtration alone is usually sufficient for safe drinking water in these areas, it is still a good precaution to utilize purification techniques on the filtered water. [\[183\]](#)

Water Filters

You can use material with a large pore size to provide initial filtering to remove suspended debris such as dirt, leaves, and sand from your water before boiling it. This initial filtering can also help to reduce clogging if you are using a small pore, final filtration system. Initial filtration is important if you are relying upon UV light to purify your water since particulates in water can reduce UV light's effectiveness.^[184], ^[185]

- Commercial coffee filters: Lightweight, folds flat, inexpensive
- Clothing items: Bandanna, shemagh, shirt. Folding these items will make them more effective since the water will pass through multiple layers of fabric.
- Make a survival water filter using a container (e.g., two-liter plastic bottle), charcoal, and items found in nature (e.g., grass, sand, gravel of varying sizes).^[186]

Activated Carbon (also known as Activated Charcoal)

Activated carbon (also known as activated charcoal) is commonly used as a filtration material because of its high surface area and surface attraction properties. It is created by burning carbon-rich materials (e.g., wood, coconut shells, coal, etc) at high temperatures to form charcoal powder. Increased surface area is created by making fine pores within this powder through treatments including charring with chloride salts followed by acid washing and then exposure to an oxidizing gas or carbon dioxide. Surface area ranges from 600-1,200 sq meters/gram. One pound of activated carbon is about 1 quart in volume and, at 1,200 sq meters/gram, has a total surface area of 125 acres.^[187], ^[188]

Activated carbon removes contaminants from water by drawing them into and trapping them inside its vast network of pores. It also facilitates chemical reactions such as converting chlorine to chloride. Carbon is electrically neutral or non-polar, carrying neither a positive or negative charge. It works well to attract non-polar substances like organics (e.g., pesticides, herbicides). It's effective in adsorbing taste and odor-causing compounds.^[189] Activated carbon also effectively removes from water:^[190], ^[191]

- Perfluorooctanesulfonic acid (PFOS, a synthetic chemical compound that is a health hazard)
- Polychlorinated PCBs
- Trihalomethanes (THMs)
- Mercury

- Radon gas
- Phosphate
- Chlorine
- Chloride
- Lithium
- Block form activated carbon will remove: Arsenic, asbestos, lead

Activated carbon will not remove from water:[\[192\]](#), [\[193\]](#)

- Radionuclides
- Most microorganisms (an exception is activated carbon with a pore size of < 1 micron can filter protozoa and some bacteria): Bacteria, protozoa, viruses
- Significant amounts of heavy metals, copper, iron
- Fluoride
- Nitrate
- Calcium
- Potassium
- Magnesium
- Significant amounts of hydrocarbons or petroleum distillates
- Granular activated carbon (GAC) will not remove: Arsenic, asbestos, lead

Activated carbon filters do not function well as mechanical filters because they function by adsorption. Therefore, activated carbon filters are often combined with mechanical filters that utilize membranes or ceramic. Activated carbon filters need to be periodically replaced. Over time, the pores within the filters will become full. Water with a higher concentration of contaminants will exhaust a carbon filter more quickly. Eventually, collected particles will shed from within the pores and flow into your water supply.[\[194\]](#)

Filter Straws

Filter straws are a popular type of water filter for emergencies and survival because they are lightweight, compact, and inexpensive. They are easy to use and have a long usage cycle before they need to be replaced. They are cylindrical devices usually made of plastic that have an internal filtration system that can include a coarse filter screen, fiber membrane, and activated carbon. You use them by placing one end into your water source and your mouth on the other end. Water is pulled up through the straw by suction your mouth creates just like drinking with a regular straw. The more effective

filters require more suction to draw water through them.

Filter straws generally filter particulates down to the 0.05-0.2 micron range, which means that they will eliminate bacteria, mold, and protozoa. However, they will not filter out viruses. It's best to get a filter straw that filters down to 0.1 microns to be extra safe since bacteria can range down to the 0.2 microns size. Filter straws are convenient and will provide you with water to drink right away, but they will not provide high volumes of water quickly. They are easy to clean by blowing through the mouthpiece reversing the direction of flow. Here is some information about commonly available filter straws:

Product	Size (in)	Weight (oz)	Lifespan	Pore Size (micron)	Price
Sawyer MINI Water Filter Straw	1.25x5.5	2	378,549 liters (100,000 gallons)	0.1	19.97
LifeStraw Personal Water Filter Straw	1x9	2	4,000 liters (1,057 gallons)	0.2	\$17.47
Membrane Solutions Water Filter Straw	1.1x6.7	6	1,500 liters (267 gallons)	0.176	\$9.99
Survivor Filter, Replaceable Carbon Filter	1.38x7.09	3.53	Membrane filter 100,000 liters (26,417 gallons). Carbon filter 1000 liters (264 gallons)	0.05	\$30.00

Item name: Sawyer Products MINI Water Filtration System

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3psKXyU>

Price: \$19.97

Weight: 2 ounces

Size: 1.25x5.5 inches

Material: Plastic housing. Hollow fiber membrane filter.

Appropriate for which BOBs: Short, Medium, Long
Comments: High-performance 0.1 Micron absolute inline filter. Sawyer's water filters are comprised of tiny hollow fiber membranes that allow water to enter into their core through tiny micro-pores. Thicker fiber walls combined with a smaller inner diameter make Sawyer fibers 75% stronger than typical hollow fiber membranes, giving you a fast flow and enabling the filter to be continually back-washed forcefully to restore up to 98% of the original flow rate. Attaches to included drinking pouch, standard disposable water bottles, hydration packs, or use the straw to drink directly from your water source. Removes 99.99999% of all bacteria (salmonella, cholera, and E. coli); removes 99.9999% of all protozoa (such as Giardia and Cryptosporidium); also removes 100% of microplastics. Filter rated up to 100,000 gallons; Includes one Sawyer MINI filter, 16-ounce reusable squeeze pouch, 7-inch drinking straw, and cleaning plunger. Note: You can use an empty plastic water bottle to collect and store water filtered by squeezing water from the included pouch through the filter. It does not filter heavy metals or chemicals.

Item name: LifeStraw Personal Water Filter

Vendor: Amazon.com

Webpage URL: <https://amzn.to/34NQLuX>

Price: \$17.47

Weight: 2 ounces

Size: 1x9 inches

Material: Plastic housing. Hollow fiber membrane filter. BPA-Free materials.

Appropriate for which BOBs: Short, Medium, Long

Comments: LifeStraw's membrane microfilters are made of hollow fiber membranes. Filters up to 1,000 gallons (4,000 liters) of contaminated water without iodine, chlorine, or other chemicals; does not require batteries and has no moving parts. Removes minimum 99.9999% of waterborne bacteria, 99.9% of waterborne protozoan parasites, microplastics, and filters to 0.2 microns; surpasses EPA filter standards. High flow rate for drinking from the source. Comes in a sealed bag. It does not filter heavy metals or chemicals.

Item name: Survivor Filter - 0.05 Micron Portable Water Filter Straw with a Cleanable UF Membrane, Replaceable Carbon Filter (Reduces Metals and Improves Taste) and 6 Cotton Pre-Filters

Vendor: Kaspien on Amazon.com

Webpage URL: <https://amzn.to/2M7I5cp>

Price: \$30.00

Weight: 3.53 ounces

Size: 1.38x7.09 inches

Material: Plastic outer housing. Three internal filter stages.

Appropriate for which BOBs: Short, Medium, Long

Comments: Proven protection against tested virus, bacteria, and Staph.

Bacteria will never get into the mouthpiece of your device thanks to our proven 0.05 Micron filtration and the Special Flip Top and Mouthpiece. Use as a squeeze system with the Survivor Filter Canteens, Screws into most standard Water Bottles (such as a Dasani or smartwater®) or drink directly from freshwater source like a straw. We cover all manufacturing and other defects with our Lifetime Warranty. Three Removable Internal Filter Stages:

- Stage 1: Cotton Pre-Filters which last 264 gallons per filter (Five Extra Cotton Pre-filters included). This section is placed directly in contact with the fresh water source and provides the first line of defense to remove large particles.
- Stage 2: Ultra Filter. The 0.05 Micron Ultra Filter acts as a barrier to help remove pollen, algae, large particles, Giardia, E.coli, protozoa, cysts, Cryptosporidium, toxins, and heavy metals. Independent tests have shown that the ultra filter can also filter out 99.999% of virus, bacteria, and Staph. The Ultra Filter can be easily cleaned after every trip and reused up to 100,000 liters (26, 417 gallons).
- Stage 3: Carbon Filter Mouthpiece. Made from food-grade coconut shells, the carbon filter mouthpiece is designed to reduce heavy metals and chemicals that made it through stages 1 and 2 as well as improve water taste. The carbon filter can be reused up to 1,000 liters (264 gallons).

High Volume Water Filters

Filter straws are something to consider including in all of your BOBs, but they are low volume water filtration systems. You might consider a high volume water filtration device for your Long Term BOB. Their main drawback is that they can be heavy and bulky. Two types of systems rapidly provide high volumes of water:

- Gravity: These consist of two bags connected by tubing with an inline filter. The top bag is filled with water and suspended from a height and water flows through the filter by gravity into a lower bag, bottle, or

another container.

- Manual pump: These generally use ceramics for mechanical filtering and may also include carbon for absorptive filtering. A lever is used to manually pump water from an intake tube through the filter out to a container.

Item name: Katadyn Gravity BeFree 3.0L Water Filter, Fast Flow, 0.1 Micron EZ Clean Membrane (Gravity Water Filter)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/34MGcsm>

Price: \$59.95

Weight: 6.8 ounces

Size: 9x17.6 inches

Material: Durable BPA-free Thermoplastic Polyurethane

Appropriate for which BOBs: Long

Comments: Just fill up the flask and let the gravity do the work through the EZ-Clean Membrane™. Maintain the EZ-Clean Membrane™ quickly and easily for a longer life and more enjoyment. Simply fill the flask with water, attach the cover and shake free the debris. Or, remove the filter from the flask and swish in any lake, river, or stream. And when you're ready to hit the road, the collapsible flask packs small to fit into tight spaces. Just smash, stash, and go! Hydrapak® Soft Flask is longer-lasting, rugged, high-tech, flexible, BPA-free. No back-flushing and no clumsy tools. Simply shake or swish the EZ-Clean Membrane™ in the water and be on your way. 0.1-micron hollow fiber technology. removes harmful organisms like bacteria 99.9999% and protozoa like Giardia and Cryptosporidium 99.9%, surpassing EPA standards. For solo or group use. Suitable for cloudy water. Lightweight and portable. Flow Rate: Two liters per minute. Tested to 1000 L, depending on water quality.

Item name: Katadyn Hiker Microfilter Water Filter (Manual Pump Water Filter)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2Md6LjV>

Price: \$69.95

Weight: 11 ounces

Size: 2.4x3x6.5 inches

Material: ABS plastic

Appropriate for which BOBs: Long

Comments: Filter physically removes particles, protozoa, and bacteria down to 0.2 microns in size, including Giardia, Salmonella, Cryptosporidia, and others. Glass-fiber element is pleated for increased surface area to handle silt and muddy water. Activated-carbon core adsorbs chemicals and pesticides to improve the taste of water. Approximately 48 strokes per min. provide 1 liter of clean drinking water. Pump force 8 pounds. Pre-filter at hose inlet filters to 150 microns, removing larger contaminants before they reach the main filter to increase its life span. The included adapter allows the filter output hose to attach to the quick-connect fitting built into some hydration reservoirs (reservoir not included). Katadyn Hiker water filter includes a carry sack and bottle adapter that fits most water bottles. The cartridge can clean up to approximately 200 gallons (750 liters) of water, depending on the condition of the water. Note: Replacement cartridges costs \$49.95

(<https://amzn.to/2JmL6Vg>)

Portable Desalinators

Desalinators remove salt from saltwater converting it to drinkable fresh water. They are a consideration for only a very few people as an emergency item. It may be an important item if you plan to escape a long distance by ocean-going boat or if you're heading to an island with limited access to fresh water. Or, perhaps you escape to a coastal area with unlimited seawater, but you're unable to go inland to procure fresh water.

Desalinators force saltwater under pressure through a membrane that allows water to pass through it while preventing the passage of salt, debris, most bacteria, parasites, viruses, and other dangerous contaminants like heavy metals and chlorinated pesticides. This process is called reverse osmosis. It does not remove most pesticides and herbicides. ^[195], ^[196] Large scale desalinization units operate by electricity, diesel, or solar power. Portable desalinators for emergency purposes are available that are hand-powered. ^[197], ^[198]

The following two products exemplify hand-operated desalinators. They require a lot of your energy to operate.

Item name: Katadyne Survivor 06 (Portable Desalinator)

Vendor: Survival Warehouse

Webpage URL: <https://bit.ly/3mVQbl4>

Price: \$995.00

Weight: 2.5 lb

Size: 2.5x5x8 inches

Material: Not specified

Appropriate for which BOBs: Long

Comments: Provides 0.89 liters of water per hour. Salt rejection 99.4% average (95.3% minimum). Average pump rate of 40 strokes/minute. It is the smallest hand-operated emergency desalinator in the world. Compact and lightweight. Trusted by militaries and individuals around the globe.

Approved by the US Coast Guard. Katadyns' Energy Recovery system takes advantage of stored energy in the high pressure reject water that is typically wasted. The pressurized reject water is recirculated to the backside of the piston to aid the next stroke. This energy is kept in the system, resulting in less work to achieve fresh water. Long life, compact, and simple to use. For water needs of 1-6 persons to survive. Replaceable reverse osmosis membrane.

Item name: Katadyne Survivor 35 (Portable Desalinator)

Vendor: WaterCheck.biz

Webpage URL: <https://bit.ly/3rq7GgS>

Price: \$2,495.00

Weight: 7 lb

Size: 3.5x5.5x22 inches

Material: No specified

Appropriate for which BOBs: Long

Comments: It is the world's highest-producing manual desalinator. Makes seawater into safe drinking water. Reverse osmosis technology. Salt Rejection: 98.4% average (95.3% minimum). Water Temperature: 33° to 120 °F. Meets U.S. Military and Coast Guard specs. Makes 4.5 liters (1.2 gallons) per hour. Recommended for a 12-person life raft. Replaceable reverse osmosis membrane.

Water Purification

Water purification can be accomplished by several means:

- UV light
- Boiling water
- Chemicals

Water Purification: UV Light

UV (ultraviolet) light can be used to sterilize water by killing microorganisms without leaving any residual chemical or radiation. It does not affect the taste of the water. UV light's mechanism of action is to damage the DNA of microorganisms preventing DNA replication and causing their death and inability to cause infection. Organisms have some ability to repair damaged DNA. But, if exposed to enough UV light, so much DNA damage occurs that it overwhelms the organism's ability to repair the damage. UV light harms all organisms including bacteria, viruses, algae, protozoa, and mold. The amount of UV light exposure (i.e., UV dose) required to kill varies with the type of organism. Killing viruses requires extremely high amounts of UV light.^[199],^[200],^[201]

UV light has a shorter wavelength than visible light. The UV light spectrum is divided into 5 parts based upon wavelength:^[202],^[203],^[204]

- UV-A: 315-400 nm. Penetrates to the skin's dermis and hypodermis.
- UV-B: 280-315 nm. This causes skin to tan.
- UV-C: 200-280 nm. Germicidal. Most effective for disinfecting because 260 nm is the wavelength that DNA absorbs maximally.
- Far-UVC: 207-222 nm. Germicidal. Effective for disinfecting.
- VUV Far-UV: 100-200 nm. It cannot penetrate beyond the outer layer of human skin, but it can deactivate bacteria and viruses.

UV light does not remove chemicals, heavy metals, or particulates from water. Filter water to remove particulates before treating it with UV radiation.

Commercial Portable UV Water Purifiers

Commercial UV water purifiers are available. They are battery-operated, compact, lightweight, and rapidly kill microorganisms in water.

Item name: Katadyn Steripen Adventurer Opti UV Water Purifier

Vendor: REI Co-op

Webpage URL: <https://bit.ly/2KEJEOH>

Price: \$99.95

Weight: 3.8 ounces with batteries

Size: 1x1.5x6.1 inches

Material: BPA free

Appropriate for which BOBs: Medium, Long

Comments: Included CR123 battery treats 50 liters of water. Rechargeable

RCR123 battery treats 30 liters of water. Treats 32 ounces of water in 90 seconds. Easy to use: Simply click the button to activate, place in water and stir; when water is purified, the UV lamp turns off, and an indicator signals. Ultraviolet UV-C light rays safely sterilize clear water by destroying 99.99% of protozoa, including Giardia, Cryptosporidia, bacteria, and even viruses. UV-C purification of clear water helps protect you from risks that cause botulism, cholera, dysentery, typhoid, and more. Optical sensor doubles as a convenient LED flashlight. UV lamp life: 8,000 treatments.

Solar Water Disinfection (Solar Disinfection = SODIS)

UV radiation from sunlight can be used to purify water in a survival situation. All it takes is a clean, clear bottle. SODIS reduces viruses, bacteria, and protozoa in water, but it does not remove chemicals, heavy metals, or particulates. UV radiation's effectiveness is reduced with greater depth and particularly when there are suspended particulates in the water. Therefore, SODIS is most effective when used with small bottles and with water that has been filtered to remove particulates. Limit bottle size to two liters at most. The Center for Disease Control and Prevention recommends leaving your bottled water under the sun for 6 hours under sunny conditions and for two days under cloudy skies. [\[205\]](#)

You can use plastic bottles from bottled water for SODIS. These are made of polyethylene terephthalate (PET) and are recyclable. UV light transmission through PET bottles is equal to that for commercial glass bottles. You can also use a clear, Nalgene® bottle for SODIS if you're carrying one as a "canteen." [\[206\]](#)

The steps involved in SODIS to create drinkable water include: [\[207\]](#)

- Use a clear bottle that ranges in volume from 0.3 to 2 liters.
- Clean the bottle as well as possible
- Find a source of water
- Filter the water to remove particulate matter
- Fill your clear bottle 75% full with your filtered water leaving space for oxygen-containing air
- Vigorously shake the bottle to get as much of the oxygen from the empty part of the bottle into the water to oxygenate it.
- Fill up the rest of the bottle with your filtered water.
- Cap the bottle

- Place the bottle directly in the sun's rays
- Disinfection occurs three times faster once the temperature of the water exceeds 122 °F
- Optional: Place a material or object behind the bottle to reflect the sunlight back through the water in the bottle
- Let the water cool before drinking
- Be sure that the threads on the bottle's mouth are clean because they will not be exposed to the sun's UV radiation and could harbor microorganisms from originally pouring water from its source into the bottle.

Boiling Water

Boiling water is a reliable method of killing disease-causing bacteria, viruses, and parasites. Similar to UV water purification, boiling will not remove chemicals or particulates from water. Remove particulates by filtering water before boiling it.

The following guidelines are provided by the Centers for Disease Control and Prevention (CDC) and the National Park Service (NPS) for boiling water to make it safe to drink:[\[208\]](#), [\[209\]](#)

- Pre-filter the water if it is cloudy (e.g., clean cloth, paper towel, or coffee filter) or allow particulates in the water to settle at the bottom of your container
- Draw off the clear water
- At elevations below 6,500 feet: Bring the clear water to a rolling boil for one minute
- At elevations above 6,500 feet: Bring the clear water to a rolling boil for three minutes
- Store the boiled water in clean, sanitized containers with tight covers

You will need a metal container to boil water. The type of container that you pack in your BOB will depend upon the anticipated duration of your emergency escape. Some examples include the following:

- For your Short-Term BOB (12-24 hours):
 - It is optional to carry a container for boiling water for an emergency lasting 24 hours or less. You can survive this length of time without any water. But, it is better if you have access to water. You can bring some bottled water with you. Or, you can

- bring some chemicals for water treatment or a water filter straw.
- Some lightweight options that enable you to boil water include packing a stainless steel water bottle (one liter, single wall, use for boiling and transporting water) or a one-quart military canteen with nested stainless steel cup in a canteen pouch
- For your Medium-Term BOB (two to seven days):
 - It is unlikely that you can pack enough water to last you seven days unless you are escaping by vehicle. It is a good idea to have the ability to boil water in addition to having some water purifying chemicals and a water filter straw.
 - Consider packing a stainless steel water bottle (one liter, single wall, use for boiling and transporting water) or a one-quart military canteen with nested stainless steel cup (for boiling water and for cooking food) in a canteen pouch
 - You can also use a mini-cook set for boiling water and cooking food (see the “Food Items” chapter for an example)
- For your Long Term BOB (weeks to months):
 - You will be unable to bring enough water to last this length of time even if you are escaping by vehicle. So, you must have ways to purify water. Since water is essential for survival, you should have multiple ways to purify water. You should have a way to boil water in addition to having some water purifying chemicals and water filters.
 - Some of the items you can use for boiling water include a stainless steel one-liter water bottle (single wall, use for boiling and transporting water) with a 750 ml nesting cup or a cooking set.
 - Most compact cook sets include relatively small cooking vessels limiting the amount of water you can boil. You might consider bringing a lightweight, larger, stainless steel pot to boil larger volumes of water; it can also be used for cooking.

Water Purification Using Chemicals

There are several different chemicals commonly used for water purification. They vary in their ability to kill microorganisms. Chemicals are available in solid (e.g., tablet) or liquid form. Both forms are effective. One consideration for survival purposes is that tablets are lighter and occupy less space than

liquid water purification chemicals. Chemical purification does not remove chemicals, heavy metals, or particulates. Filtering water to remove particulates should be done before adding chemicals for purification.

Common types of chemicals used for water purification:[\[210\]](#), [\[211\]](#), [\[212\]](#), [\[213\]](#)

- Chlorine dioxide:
 - Used in most water purification tablets. This is the only one of the commonly used water purification chemicals that kills *Cryptosporidium*
 - They do not leave a bad aftertaste as do iodine and chlorine-based chemicals
 - 15 minute wait time for bacteria and viruses
 - 30 minute wait time for *Giardia*
 - Four hour wait time for *Cryptosporidium* due to its protective shell
 - Dosage of one tablet per quart of water
 - 5-year shelf life
 - Product example: Katadyn Micropur MP1 Purification Tablets
- Sodium hypochlorite:[\[214\]](#)
 - Found in household bleach
 - Use unscented chlorine bleach that contains 6% or 8.25% sodium hypochlorite
 - Dosage: 8 drops of 6% bleach or 6 drops of 8.25% bleach per gallon of water. Double the amount of bleach if the water is cloudy, colored, or very cold. Stir and wait for 30 minutes. Repeat the dosage and wait another 15 minutes before use if water does not have a slight chlorine odor.
 - Shelf life: One-year if the bottle is unopened
- Chlorine (sodium dichloroisocyanurate):
 - 30 minute wait time for bacteria, viruses, *Giardia*.
 - Ineffective against *Cryptosporidium*
 - Dosage of one tablet per two quarts of water
 - Five-year shelf life
 - Product example: Aquatabs® AQT100 Water Purification Tablets
- Iodine (tetraglycine hydroperiodide):
 - Available as a liquid, crystal, and tablet

- 35 minute wait time for bacteria, viruses, Giardia
- Ineffective against Cryptosporidium
- Dosage of two tablets per quart of water
- Less effective in cold temperatures or cold water
- Four-year shelf life if the bottle is unopened. One-year shelf life if the bottle is opened.
- Product example: Potable Aqua Water Purification Treatment

Item name: Katadyn Micropur Purification Tablets - Package of 30 (chlorine dioxide tablets)

Vendor: REI Co-op

Webpage URL: <https://bit.ly/3mT0YN9>

Price: \$13.95

Weight: 0.9 ounces

Size: Not specified

Material: Chlorine dioxide tablets

Appropriate for which BOBs: Short, Medium, Long

Comments: Features the same proven technology used in municipal water supplies, Micropur tablets are effective against viruses, bacteria, Giardia, and Cryptosporidium. Destroys viruses and bacteria in 15 min., Giardia in 30 min. and Cryptosporidium in four hrs. Use 1 tablet per quart of water. Meets the US Environmental Protection Agency purification guidelines; active ingredient is chlorine dioxide. Each tablet is individually wrapped and sealed. While a four hr. wait time may be inconvenient, alternative disinfectants do not claim to destroy Cryptosporidium. Made in the USA. Five-year shelf life.

How To Remove Heavy Metals From Water

Heavy metals that can be found in water include: [\[215\]](#)

- Lead
- Mercury
- Arsenic
- Cadmium
- Nickel
- Chromium
- Copper
- Tin
- Beryllium
- Antimony

- Silver
- Lithium

Heavy metals can find their way into water through:[\[216\]](#)

- Lead plumbing
- Heavy metals that are naturally present in the earth can enter underground water sources
- Farm chemicals containing heavy metals entering above ground and underground water sources
- Industrial and mining waste containing heavy metals can enter above ground and underground water sources through intentional dumping and accidental spills

Some of the ill effects produced by the ingestion of heavy metals include:[\[217\]](#)

- Nausea, vomiting
- Cramping
- Headache
- Vertigo
- Bone marrow loss
- Tremor
- Memory difficulty
- Kidney failure
- Nerve damage
- Heart damage

Of concern is that you cannot tell if water is contaminated with heavy metals since they generally have no taste or odor. Laboratory testing is necessary to confirm their presence and concentration. It is best to assume that water contains heavy metals especially if you have escaped to an area near to or downstream from factories, mines, or farms.

Here are some ways that you can remove heavy metals from water:

- Reverse osmosis membranes:[\[218\]](#), [\[219\]](#) Water is forced under pressure through a membrane with extremely small pores. Water passes through the membrane while larger molecules including heavy metals are filtered out of the water. Desalinators operate using reverse osmosis (see the prior section about Portable Desalinators).
- Distillation:[\[220\]](#) Simply boiling water will concentrate heavy metals in the water remaining after evaporation through the generation of steam. You

need to use tubing to collect the pure water in the steam generated by boiling water and transfer it into a second container. Heavy metals will remain in the first container while water in the collecting container will be free of heavy metals.

- Cilantro:^[221] When dried, cilantro leaves are potent bioabsorbents and remove heavy metals from water. It is easy to grow cilantro plants and they can be sun-dried to use in this capacity. The dried leaves can be placed inside a tube for water to run through or they can be placed inside a tea bag (you can use a commonly available metal tea ball or mesh infuser ball) and allowed to sit in a pitcher of water for a few minutes to remove heavy metals.
- Ion exchange resin:^[222], ^[223] Replaces heavy metals with benign ions having a similar electrical charge. Product example: ZeroWater® Portable Water Filtration Tumbler (see below)
- Black Berkey® Purification Elements:^[224], ^[225] These are proprietary filters comprised of high-grade coconut shell carbon mixed with 5 other media. It functions by using micro-pores to trap harmful contaminants (e.g., bacteria, viruses) along with material having adsorption and ion exchange properties to attract molecules (e.g., heavy metals, pesticides, inorganic minerals, volatile organic compounds, and viruses). Product example: Travel Berkey® Water Filter (see below)

Item name: ZeroWater® Portable Water Filtration Tumbler (Ion Exchange Technology)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3poKii0>

Price: \$18.13

Weight: 0.89 lb for plastic tumbler plus filter. 1.65 pounds for the tumbler and the 3 included filters

Size: 3.75x3.75x10.25 inches

Material: Plastic tumbler.

Appropriate for which BOBs: Long

Comments: Tumbler has 0.75-liter (26 ounces) capacity. 3 filters included.

Exclusive color-changing filter technology that indicates the appropriate time to replace your filter. Unique 5-Stage Ion Exchange technology compared to conventional 2-Stage filtration. Enjoy the purest tasting water with a filter that removes 99.6% of TDS (total dissolved solids) from your tap water, such

as Aluminum, Zinc, Nitrate, Fluoride, and more! It is the only water filter that meets FDA standards for TDS in purified bottled water. Replacement filters are available for \$11.99 each (<https://amzn.to/2KHpO5t>). Premium 5-Stage Filtration:

Stage 1: Removes suspended solids such as dust and rust that make your water appear cloudy

Stage 2: Removes additional suspended solids

Stage 3: Removes organic contaminants; pesticides, herbicides, mercury, chlorine, chloramine, and stops bacteria from growing

Stage 4: Removes inorganic compounds i.e. metals, nonmetals, and radiological contaminants.

Stage 5: Removes remaining suspended solids, holds the resin in place

**Author's note: People who have used this product comment that the plastic tumbler is fragile and breaks easily.

Item name: Travel Berkey® Water Filter System

Vendor: Berkey® Filters

Webpage URL: <https://bit.ly/3ho1uSc>

Price: \$249.00

Weight: 6.0 lb

Size: 7.5x7.5x11.0 inches nested. 7.5x7.5x19.0 inches with the two chambers/containers stacked one on top of the other.

Material: High polish 304 stainless steel lid and upper and lower containers.

Spigot material: BPA free, FDA approved, high impact polypropylene.

Appropriate for which BOBs: Long

Comments: Includes 2 Black Berkey® filters. Filtered Water Capacity: 1.5 Gallons. Filter up to 2.75 gallons of water an hour. Lifespan: 3,000 gallons of water per filter. Removes from water >200 contaminants including Viruses (99.999%), Pathogenic bacteria (99.9999%), Chloramine (below lab detectable limit), Trihalomethanes (99.8%), Pharmaceuticals (99.9%), Most heavy metals, Pesticides (below lab detectable limit)

Tools

Some tools can help you with the process of getting drinkable water in a survival situation:

- Funnel: A simple plastic funnel is lightweight and will help reduce the loss of precious water as you transfer it from your boiling vessel into your drinking and/or transport container (e.g., canteen, water bottle).

- 4-way sillcock key: Some business and industrial buildings will have exterior water faucets without valve handles to prevent unauthorized access to water. These faucets require the use of special keys. A 4-way sillcock key has 4 heads of different sizes to fit most of these faucets giving you access to water in an urban setting.
- Shovel: Can be used to dig at the bottom of a canyon to search for water or dig a hole to make a solar still (See Tools chapter for discussion about shovels and product examples)
- Plastic garbage bag: Can be used to collect rainwater, make a solar still, transport water, etc. (See Shelter Items chapter for a discussion about garbage bags)

Item name: Cobra Products PST154 4-Way Sillcock Key

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2JnNCdT>

Price: \$4.26

Weight: 0.38 lb

Size: Approx 0.5x4x4 inches

Material: Steel

Appropriate for which BOBs: Short, Medium, Long

Comments: Used to open and close sillcocks or spigots; used in place of sillcock handles. 4-way key fits 1/4", 9/32", 5/16" and 11/32" stems. Durable steel construction

The Bottom Line: Best Ways To Remove Contaminants From Water

It is difficult or impossible to totally remove all contaminants from the water you find during survival situations because you are limited in what you can carry with you. The closest thing to a single solution from a technology standpoint is the Travel Berkey® Water Filter System (see above), but its size and weight (6 pounds) make it impractical for most people unless you are escaping by vehicle. Here is a list of common contaminants in water and ways to remove them:

- Bacteria, mold, protozoa (excluding Cryptosporidium):
 - Survival filters including the MSR Guardian Purifier filter
 - UV light (commercial portable UV water purifiers, solar water disinfection)
 - Boiling
 - Chemicals (e.g., chlorine dioxide, sodium hypochlorite, chlorine,

iodine). Note: Chlorine dioxide is the only common water purification chemical that is effective in killing *Cryptosporidium*

- Distillation
- Portable desalinators (reverse osmosis)
- Black Berkey® filters (see above)
- Viruses:
 - UV light (commercial portable UV water purifiers, solar water disinfection)
 - Boiling
 - Distillation
 - Chemicals (e.g., chlorine dioxide, sodium hypochlorite, chlorine, iodine)
 - Portable desalinator (reverse osmosis)
 - Black Berkey® filters (see above)
 - MSR Guardian Purifier filter (see above)
- Particulates (e.g., sediment, debris, etc):
 - Survival filters including the MSR Guardian Purifier filter
 - Portable desalinator (reverse osmosis)
 - Distillation
 - Black Berkey® filters (see above)
- Chemicals (e.g., pesticides, herbicides, chlorine):
 - Activated carbon (charcoal)
 - Ion exchange resins^[226]
 - Black Berkey® filters (see above)
- Heavy metals:
 - Portable desalinator (reverse osmosis)
 - Distillation
 - Ion exchange resins
 - Cilantro (dried leaves)
 - Black Berkey® filters (see above)

The goal during a survival situation is to have safe, drinkable water. The following is a suggested strategy for accomplishing this while keeping necessary items to a manageable level.

For your Short-Term BOB:

- Bottled water
- Survival filter straw. Get one that includes an activated carbon filter if you

are concerned that the water may have chemicals or heavy metals.

- Metal vessel for boiling water (e.g., single wall stainless steel bottle or 1-quart canteen nested inside a metal cup)
- Chlorine dioxide tablets

For your Medium-Term BOB:

- Bottled water
- Survival filter straw. Get one that includes an activated carbon filter if you are concerned that the water may have chemicals or heavy metals.
- Metal vessel for boiling water (e.g., single wall stainless steel bottle, one-quart canteen nested inside a metal cup, or a mini-cook set)
- Chlorine dioxide tablets. Save these and do not use them immediately just for convenience. They may be handy to have if your survival filter straw breaks and you are too tired or cannot find the wood necessary to make a fire to boil water.
- Service utility key
- Funnel (optional)

For your Long-Term BOB:

- Bottled water
- Prefilter
 - Unless the water is clear, it is important to prefilter it to remove particulates (e.g., sediment and debris)
 - Sediment and debris in water will more quickly clog the pores of your definitive filter device and will render UV purification less effective.
 - Particulates will remain after boiling water
 - Prefilters can include disposable coffee filters, clothing fabrics
- Survival filter straw. Get one that includes an activated carbon filter if you are concerned that the water may have chemicals or heavy metals.
- Consider bringing a high-volume water filter
- Metal vessel for boiling water (e.g., single wall stainless steel bottle, cook set, and/or a larger pot)
- Clear plastic or Nalgene® bottle to use for solar disinfection (optional)
- Cilantro seeds to grow plants for their leaves to remove heavy metals from water
- Ion exchange resin device if you are concerned about heavy metals in the area you are escaping to (e.g., a product such as ZeroWater® Portable

Water Filtration Tumbler)

- Chlorine dioxide tablets. Do not use them immediately just for convenience. Save them for a time when other alternatives are not convenient or are unavailable.
- Service utility key
- Funnel
- Shovel
- Plastic garbage bags

FIRE ITEMS

Topics covered in this chapter include:

- Starting a fire
- Commercial survival fire starting kits
- Fire starters
 - Wind and waterproof storm matches
 - BIC® lighter
 - Ferro rod
 - Magnifying lens of compass base
 - Fresnel lens
 - Flint and steel
- Tinder
 - Char cloth
 - Dryer lint
 - Cotton balls (even better if covered in petroleum jelly)
 - Wood shavings from a pencil sharpener
 - Fatwood chips or sticks
 - Jute, burlap
 - Magnesium block
 - Others: #0000 steel wool, potato chips, Purell®
 - Natural sources: dried leaves and grass, bird nests, dandelion seed heads, dry pine needles, tree bark
- Kindling
 - Fatwood
 - Natural sources: twigs, small branches, pine cones, pine sap

Having the ability to start a fire is crucial in survival situations. Fire is essential for:

- Boiling and sterilizing water
- Cooking food including killing disease-carrying organisms
- Providing warmth
- Providing light

- Providing a way to get the attention of others
- Keeping predatory animals away

Starting a fire generally requires the following:

- A fire starter: These are used to ignite a combustible material (e.g., tinder) to start a fire. Examples include a bow drill, matches, lighter, ferro rod.
- Tinder: A material that catches fire easily, burns for a relatively short time, and is used to ignite kindling. Examples include char cloth, petroleum jelly coated cotton balls, dry grass, birch bark, fatwood
- Kindling: It is larger than tinder and more difficult to ignite directly with a fire starter. Burning tinder is used to ignite kindling. Kindling is small and light enough that it will not smother the tinder fire. It burns longer than tinder and is used to ignite larger pieces of wood (more difficult to catch on fire), which serve as fuel for your fire. Examples include dry, small twigs, fatwood, and dry, tree bark
- Wood: Dry, wood serves as the fuel to sustain your fire.

It is important to include items in your BOBs that enable you to start a fire. Most fire-starting items are lightweight and compact making it easy to assemble a kit. The items in your kit will vary for each of your BOBs (i.e., Short-, Medium-, and Long-Term). For example, you might only include a BIC® lighter, some weatherproof matches, a ferro rod, and some petroleum jelly coated cotton balls in your Short-Term BOB since it needs to help you survive for only 24 hours or less. You might add another BIC® lighter, additional weatherproof matches, an extra ferro rod, and a magnesium block to your Medium-Term BOB. Your Long-Term BOB is designed to help you survive for weeks to many months, so you will want to build in more redundancy to cover the possibility of lost or exhausted items (e.g., BIC® lighter, waterproof matches, etc). You might add some extra tinder (e.g., char cloth, fatwood chips), extra ferro rods, and a Fresnel lens.

It is possible to start by purchasing a commercial fire starting kit. There are many available on the market. Here is an example of one:

Item name: Fire B.O.S.S.Off Grid Tools Survival Fire Starting Kit - Bug Out Bag Ready Fire Kit Includes 33 Fire Starting Items.

Vendor: Nifty Home on Amazon.com

Webpage URL: <https://amzn.to/3pq5q7r>

Price: \$29.99

Weight: Not specified

Size: 2.25x4.5x7.75 inches

Material: Plastic ziplock bag

Appropriate for which BOBs: Short, Medium, Long

Comments: 1 Lighter, Waterproof Matches, Ferro Rod and Striker, Pocket Fresnel Lens, 6 Magnesium Capsules, Steel Wool, 4 pieces Char Cloth, 2 Tealight Candles, 1 oz. Fatwood Sticks, Foil Paper, Pencil Sharpener, 6 Tinder Tabs, 10' Jute Twine, Waterproof Tinder Ball, Wire Saw, 6' Kevlar Thread (for fire bow/drill), 1 Flange Bearing (for fire bow/drill), 1 Folding Knife, and 1 waterproof survival instruction sheet

Rather than buying a commercial fire starting kit, you can put one together yourself. You can make one, all-purpose, fire starting kit, place it in a small bag, and then put that bag into whichever BOB (i.e., Short-, Medium-, or Long-Term) that you grab for your particular emergency. Or, better yet, you can make a more mission appropriate fire-starting kit for each of your three BOBs based upon the time frame they are designed to help you survive. Doing that will allow you to select items specific to each BOB and also obviate the need to remember to grab your one and only, all-purpose fire starting kit to put into the BOB you take with you in an emergency. Include fire starting and tinder items in your fire kit. You can gather kindling and fuel (e.g., wood) for your fire from your environment, so there is no need to pack those items.

Fire Starters

Fire starters are the items you use to ignite a fire. You can use your survival knife to fashion a bow drill out of wood and cordage in the wild.^[227] It takes skill, energy, and time to effectively use a bow drill to start a fire through friction. It's much easier and more efficient to bring some fire starters with you. Commonly available fire starters include:

- Wind and waterproof storm matches: These wooden matches can light in rain or even after being submerged underwater because of a protective paraffin wax coating. They can also light in heavy wind.
- BIC® lighter: Plastic, disposable. Full-size versions are capable of up to 3,000 lights (according to the FAQ page of the BIC® company web site). Protect the thumb “button” to prevent its accidental depression from depleting the fuel. When the fuel is depleted, you can still spin the metal wheel against the flint to create a spark for fire starting.

- Ferro (ferrocium) rod:^[228] ^[229] Man-made of iron and the rare earth element cerium. Often coated to prevent oxidation because of iron content. Useful as a fire starter because of its brittleness and low autoignition temperature. Small fragments are created when it is struck by a rough surface (e.g., metal striker, knife blade spine, rock). Those fragments are rapidly oxidized and spontaneously ignite when exposed to oxygen in air producing sparks that can reach a temperature of 5,400 °F. Creates sparks in the wind, rain, cold temperatures, and after being submerged underwater. Rapid corrosion occurs if rods are exposed to saltwater. Ferro rods create sparks but do not burn. Rods made of at least 21% iron and 41% (>53% in better ones) cerium will last longer than those made with lower amounts of these components. Larger rods will last longer than smaller ones of the same composition. Rods hardened with iron oxide and magnesium oxide create hotter sparks. Low-quality rods are softer and require more strikes to produce sparks adequate to start a fire.
- Magnifying lens of compass base: Some compasses include a magnifying glass (see the “SUUNTO Compass with magnifying glass” product example in the Navigation Items chapter). The convex shape of a magnifying lens focuses sunlight’s photons (and their heat energy) into a concentrated, 450 °F beam that can be used to start a fire. You would focus the sun’s light with a magnifying glass on to tinder to ignite it in a survival situation. It’s easier to start fires with larger lenses. The convex lenses in binoculars can also be used to start fires.^[230]
- Fresnel lens: These lenses are flat on one side while the other side has concentric ridges of varying angles that function like prisms to focus light into a concentrated central beam much like a magnifying lens. Their advantage is that they can be made essentially flat using much less material than standard lenses. Fresnel lenses made for survival purposes are the size of a credit card, cost about \$1-2 each, and typically come in 2-3x magnification. Some are available in 4-5x magnification and make it easier to start fires.^[231] ^[232]
- Flint and steel: Natural flint rock (which is harder than steel) striking high carbon steel skives off iron particles that oxidize when exposed to oxygen in the air resulting in spontaneous ignition, producing sparks of about 800 °F.^[233] ^[234]

Item name: NEW UCO Stormproof Matches 50-Pack w/Strikers Windproof Waterproof Survival Gear

Vendor: beagleoutdoors on ebay.com

Webpage URL: <https://ebay.to/2KT8Lgt>

Price: \$9.99

Weight: 1.6 ounces for a pack of 50 matches

Size: 2.75 inches long each match

Material: Wooden matches

Appropriate for which BOBs: Short, Medium, Long

Comments: Windproof and waterproof matches. Matches are easy to light and will relight after being submerged in water. Up to 15 second burn time. The extended length of the match allows for added safety to keep from burning fingertips.

Item name: BIC® Classic® Lighter, 12 lighters

Vendor: BIC®

Webpage URL: <https://bit.ly/3aJMTyS>

Price: \$13.74

Weight: 0.89 ounces

Size: 1x3.25 inches for each lighter

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: 2 packages of 6 lighters each. Assorted colors. Child-resistant, safe, and reliable, 100% Quality Inspected. Up to 2 times the lights vs. the next full-size leading brand. Each lighter provides up to 3,000 lights. Every BIC® lighter undergoes more than 50 separate, automatic quality checks during the manufacturing process.

Item name: Überleben Hexå Fire Starter | 1/2" Thick Hexagon Bushcraft Fire Steel | 3" or 6" Lengths | 20,000 Strikes | Survival Ferro Rod | Multi-Tool Striker and Full Grain Leather Lanyard

Vendor: Modern Outdoor Life on Amazon.com

Webpage URL: <https://amzn.to/3rtq0FY>

Price: \$32.00 for 6-inch long rod, \$18.00 for 3-inch long rod

Weight: Not specified

Size: 0.5-inch diameter. Available in 3 and 6 inch-lengths.

Material: Ferrocium

Appropriate for which BOBs: Short, Medium, Long

Comments: The hexagon shape provides flat striking surfaces. Überleben's Sånft-korr ferrocerium is the perfect balance between softness and durability, consistently outperforming the leading fire starters. Easily throw a 5,500°F shower of molten sparks in any weather (waterproof), at any altitude. The 6-inch long Hexå will yield 20,000+ strikes with absolute confidence. Full-grain leather lanyard. Multi-tool striker (straight-edge spine, concave tinder scraper, map scale, ruler, hex wrench... and most importantly, bottle opener). HASSLE-FREE GUARANTEE. If for any reason you're not absolutely thrilled with your Hexå, let us know. We'll fix it.

Item name: FOSTAR 2PCS Upgrade Ferro Rod Flint Fire Starter, 1/2 Inch X 5 Inch Thick Fire Steel Rod with a Scraper, Drilled Lanyard Hole

Vendor: Fostar on Amazon.com

Webpage URL: <https://amzn.to/3nSEsFl>

Price: \$12.99

Weight: 4 ounces

Size: 0.5x5 inches each rod. 2 rods included

Material: Ferrocerium

Appropriate for which BOBs: Short, Medium, Long

Comments: It can strike up to 15,000 times with super hot sparks, designed to make fires in any conditions, at any altitude. Windproof & weather resistant.

4mm Lanyard Hole and one carbon steel scraper included. 100%

SATISFACTION OR MONEY BACK GUARANTEE.

Item name: DOSMAMZ 5pcs Premium Ferro Rod Scraper, Ferro rods Magnesium Rods Striker, Adapt for All Kind Ferrocerium Rods

Vendor: Dosmamz on Amazon.com

Webpage URL: <https://amzn.to/3rEupWT>

Price: \$5.65

Weight: Approximately 0.4 ounces for each striker

Size: 0.0625x0.75x3.0 inches for each striker

Material: Premium high carbon steel

Appropriate for which BOBs: Short, Medium, Long

Comments: Multifunction emergency tool Includes concave serrated end, hex wrench, bottle opener, and ruler. It can produce extreme sparks from any ferro rod.

Item name: Best Glide ASE Credit Card Size Fresnel Lens Fire Starter and

Magnifier Lenses (3 Pack - Green)

Vendor: Best Glide ASE

Webpage URL: <https://amzn.to/3mVTMQ6>

Price: \$5.99

Weight: 0.19 ounces

Size: .02x2.125x3.375 inches

Material: Optical PVC

Appropriate for which BOBs: Short, Medium, Long

Comments: Up to 4x magnification (many Fresnel lenses offer only 2x magnification) which starts fires faster. Can be used to read small print and small objects. They are thin, extremely light, flexible, and about the size of a credit card. They will fit in your wallet, purse, backpack, first aid kit, and go bag without weight or taking up space. Keep one handy in multiple locations for quick use. Each lens comes with a protective sleeve.

Item name: ACVCY Flint and Steel Fire Starter Kit

Vendor: ACVCY Sport on Amazon.com

Webpage URL: <https://amzn.to/2X1vl9H>

Price: \$14.99

Weight: 6 ounces

Size: 1.5x3.7x5.1 inches for the metal box container.

Material: Flintstone and carbon steel

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes Flintstone, carbon steel striker, jute tinder, carbon char cloth, metal telescoping blow tube, metal storage box.

Tinder

As described earlier, tinder is a material that catches fire easily, burns for a relatively short time, and is used to ignite kindling. It's an essential ingredient to assist you in starting fires. You can find natural tinder such as dry grass or leaves, birch bark, cedar bark, fatwood, dry pine needles, pine resin, Spanish moss, cattail fluff, dandelion clock, and bird nests. In an urban survival situation, you can look for tinder such as shredded paper or cardboard, steel wool, plastic or rubber that you can dice into small pieces, tobacco from cigarettes or cigars, cigarette filters, animal dung, plastic bags, shoe polish, tampons, and diapers. ^[235]

It's a good idea to pack some tinder in a waterproof container for each of

your BOBs. You may be in a situation where it's hard to find dry tinder in your surroundings. Even if tinder is available to find, it is much faster and will save you energy if you have some tinder with you ready to use whenever you need to start a fire in a hurry or when you are tired. You can replenish your tinder as needed, so you'll always have a supply with you. If you buy a commercial fire starter kit, it will usually include some tinder items. You can also compile custom tinder items including some of the following items:

- Char cloth: It is any fabric made from plant fiber (e.g., cotton, jute) that is charred, but not burned. It is readily ignited by a spark creating an ember. You can buy it or make it yourself. [\[236\]](#)
- Dryer lint
- Cotton balls: Cotton balls are cheap and easier than collecting dryer lint. Cotton balls covered in petroleum jelly will provide waterproofing and also burn longer. You can pack them in a small plastic bag.
- Wood shavings from a pencil sharpener: A small pencil sharpener is cheap and small. You can use it to create shavings from small twigs. (Note: You can use your survival knife instead of packing a pencil sharpener.)
- Fatwood chips or sticks: Coniferous trees (e.g., spruce, fir, cedar, Boswellia, etc) secrete thick, sticky resin (also known as pitch) on their bark. Deciduous trees (e.g., ash, birch, blue beech, ash, white oak, etc) do not make resin. [\[237\]](#) The resin contains terpene, which is highly flammable. Fatwood is the resin-saturated wood found in the center of the stumps of dead trees. You can harvest fatwood yourself or you can purchase fatwood in chip or stick form. [\[238\]](#) Fatwood ignites easily and burns for an extended time even when wet.
- Jute, burlap: Jute is a long fiber that comes from the jute plant. There are two main types of jute plants, white and tossa jute. The fibers are used to make a strong coarse thread, which is used to make burlap. [\[239\]](#) Jute thread or burlap can be pulled apart to make tinder that easily ignites.
- Magnesium block: Magnesium burns, but requires an ignition source. Create shavings off the block and then ignite them with sparks (e.g., from a ferro rod). Creates a flame that burns hotter than 4000 °F. It works even when wet. Some magnesium blocks come with a metal scraper to scrape shavings off of them and with a ferro rod to ignite the shavings. [\[240\]](#)
- #0000 steel wool: Steel wool is comprised of fine strands of metal (usually carbon steel, but may be made of aluminum or stainless steel). Finer

steel wools have a large surface area of metal and ignite more easily by a spark or by electricity (e.g., contact with a battery). Use extra fine or thin steel wool for tinder. ^[241] Steel wool is very light and can be compressed down into a small size.

- Others: Potato chips and Purell® hand sanitizer ignite easily

Item name: Char Cloth Fire Starter

Vendor: stevkaese-7 on ebay.com

Webpage URL: <https://ebay.to/3poLZMo>

Price: \$8.79

Weight: Not specified

Size: 5 rolls of 2x18 inch char cloth

Material: 100% natural 15 oz cotton duck

Appropriate for which BOBs: Short, Medium, Long

Comments: Char Cloth (5) 2in wide x 18in long, total of 90 inches. Each roll comes in an individual waterproof reusable zip lock bag. Starts with a spark from ferro rod. Starts 90 fires. No chemicals are used. American made 100% natural 15 oz cotton duck. What does that mean? The heavier the material the hotter burning and longer-lasting. Our char cloth is the hottest burning char cloth you can buy.

Item name: Manual Pencil Sharpeners, 4 PCS

Vendor: Aipker on Amazon.com

Webpage URL: <https://amzn.to/3nV9lc9>

Price: \$6.99

Weight: 0.35 ounces

Size: 1x1.57x2 inches

Material: Plastic body, carbon steel blade.

Appropriate for which BOBs: Short, Medium, Long

Comments: 4 sharpeners are included. 2 different sized holes which allow it to accommodate standard to large sized pencils. Carbon steel blade. Spill-proof design and a transparent shavings receptacle, so you will know exactly when to empty the easy-to-clean shavings tray. Includes sharpeners in one of each of the following colors: orange, blue, red, and green. These sharpeners are useful for making tinder out of small branches. The shavings receptacle collects the shavings. You can put one sharpener in each of your 3 BOBs and have an extra for backup. (Author's note: Pencil sharpeners are optional because you can use your survival knife to make tinder.)

Item name: 5 + 5 Free 10 Large Bags Fatwood Shavings Chips Tinder Fire Starter

Vendor: NancyBTown on Amazon.com

Webpage URL: <https://amzn.to/34NbmQ4>

Price: \$9.99 plus \$4.99 shipping

Weight: Not specified. Sold By: Volume, Not By Weight

Size: 2x3 inches resealable bags

Material: Pine Fatwood Shavings, Chips, Powder, and Dust

Appropriate for which BOBs: Short, Medium, Long

Comments: 10 bags included. Ignite with a Flint Striker / Ferro Rod, Matches, any Flame, Charcloth, etc. Because of the system we use to fill the Bags, the Bags have 2 times the amount as others. If you take the Fatwood out of the Bag you will not be able to get it all back into the bag.

Item name: PBL Fatwood 20 Sticks Firestarters in Tin

Vendor: STEVE KAESER PHOTOGRAPHIC LIGHTING & ACC on Amazon.com

Webpage URL: <https://amzn.to/3hlRXe5>

Price: \$9.59

Weight: 6.03 ounces

Size: 7/8 x 3-5/8 x 4-1/2 inches hinged tin can. 4-inch long Fatwood sticks (20)

Material: Fatwood sticks

Appropriate for which BOBs: Short, Medium, Long

Comments: Twenty (20) Fatwood Sticks 4in long naturally rich in resin, makes it easier to light a fire. Start a fire anywhere, in snow, rain, or wind.

Item name: Perfin 328 Feet Natural Jute Twine, 3mm 4Ply

Vendor: Perfin Shop on Amazon.com

Webpage URL: <https://amzn.to/2WMUVz5>

Price: \$5.99

Weight: 7.58 ounces for the roll

Size: 328 feet long (100 meters). 0.12-inch (3mm) diameter

Material: 100% natural jute

Appropriate for which BOBs: Short, Medium, Long

Comments: Handmade. Biodegradable. Natural brown color. 100% Customer Satisfaction Guarantee. 30-day money-back guarantee.

Item name: LaRibbons 3" Wide Burlap Fabric, 10 yards

Vendor: Laribbons on Amazon.com

Webpage URL: <https://amzn.to/37PIoRu>

Price: \$6.90

Weight: 4.8 ounces

Size: 3 inches wide, 10 yards long

Material: 100% burlap

Appropriate for which BOBs: Short, Medium, Long

Comments: Comes in a roll (3.1 inches wide, 6.1 inches diameter). Sewn edges without fraying.

Item name: HTS 222B0 Magnesium Block Fire Starter with Flint and Striker

Vendor: HTS USA on Amazon.com

Webpage URL: <https://amzn.to/2W00XPN>

Price: \$5.95

Weight: 1.8 ounces

Size: 0.33 x 1 x 3 inches

Material: Magnesium block. Ferrocium rod. Steel striker.

Appropriate for which BOBs: Short, Medium, Long

Comments: 3" x 1" x 3/8" magnesium block with attached ball chain.

Ferrocium flint sparking rod and steel striker. Striker can be used to shave magnesium slivers. Shavings burn at approximately 5,400°F / 2,982°C; will burn in wet and windy conditions. Magnesium is waterproof and fire-resistant in block form.

Item name: Homax 10120000 Steel Wool, 12 pad, Super Fine Grade #0000, Rhodes American, Final Finish

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3mT3cvZ>

Price: \$3.78

Weight: 2.08 ounces

Size: 2.91x4.37x9.06 inches for the package of 12 pads

Material: Steel wool

Appropriate for which BOBs: Short, Medium, Long

Comments: Steel wool super fine grade #0000.

FOOD ITEMS

Topics we'll cover in this chapter include:

- What you pack will vary for each BOB (i.e., Short-, Medium-, and Long-Term BOBs)
- Short-term food items: Energy bars, snacks
- Medium-term food items: Energy bars, snacks, emergency ration bars. Freeze-dried foods and meals.
- Long-term food items: Energy bars, snacks, emergency ration bars. Freeze-dried foods and meals.
- Food preparation items: Cook sets, utensils, seasonings
- Stove
- Long term food procurement items: Fishing, hunting, trapping items. Seeds. Edible plants.
- Edible plants guide
- Fishing
 - Emergency survival fishing kits: Ready-made commercial kits versus custom homemade kits
 - Fishing tackle: Fishing line, sinkers, hooks, swivels, bobbers, lures, etc.
 - Trotline fishing
 - Hobo fishing reel
 - Cuban Yo-Yo fishing reel
- Hunting: Handgun, rifle, shotgun, pellet air gun, bow and arrows
- Trapping
- Seeds

An often-cited rule-of-thumb is that you can survive for three weeks without food.^[242], ^[243], ^[244], ^[245] You'll die way before that time, usually by three days, if you have no access to water. But, with water, it is possible to survive longer than three weeks without any food. Published literature varies in terms of how long a person can live without eating. Most information comes from observations of people on hunger strikes and voluntary total fasting. For

example, fasting had to be stopped because of being “unwell” by a monk after 36 days, four adults after 38-40 days, and 33 prisoners after up to 28 days in three separate papers. These people did not fast until death. Those who did die from fasting succumbed between 45-61 days.^[246] Another article suggests that a person may survive 8-21 days without food or water and up to two months without food if water is available.^[247] It is important to keep in mind that all of these reports dealt with people who were sedentary and not involved in the highly physical activities involved in emergency and disaster situations. Starvation ultimately leads to death from causes such as convulsions, organ failure, and cardiac arrest.

You might survive without food longer than the three weeks commonly cited in numerous publications. But, you’ll need food much sooner to maintain the ability to function optimally in an emotionally and physically stressful emergency. Significant impairment of cognitive function occurs when you eat 50% or less of the amount your body requires particularly when you are subjected to physical exertion and sleep deprivation.^[248] Physical dysfunction associated with starvation includes fatigue, dizziness, hypotension, and cold intolerance.^[249]

Your food needs differ depending upon the duration of your survival situation and hence, the food items that you pack will vary for your Short, Medium, and Long Term BOBs.

Items To Include In BOB	Short-Term BOB, 12-24 hours of survival	Medium-Term BOB, 2-7 days of survival	Long-Term BOB, Weeks to months of survival
Purpose for your food items:	Comfort and energy. Not essential for survival.	Comfort and energy. Not essential for survival.	Food essential for survival.
Foods that pack easily, require no preparation, quick and easy to eat:	Energy bars, sports gels, jerky, tuna pouches, trail mix, nuts, dried fruit, crackers with cheese or peanut	Energy bars, sports gels, jerky, tuna pouches, trail mix, nuts, dried fruit, crackers with cheese or peanut	Energy bars, sports gels, jerky, tuna pouches, trail mix, nuts, dried fruit, crackers with cheese or peanut

	butter. Optional: Emergency ration bars.	butter. Emergency ration bars.	butter. Emergency ration bars.
Freeze-dried food (Light, compact):	XXX	Bring 5-7 day supply	Bring as much as you can carry
Food preparation items, utensils:	XXX	Mini-cook set (for cooking and boiling water). Utensils.	Compact cook set. Larger cooking items if you have the space to carry them. Utensils. Salt, sugar, and spices.
Stove:	XXX	Mini-stove.	Mini-stove. Optional grill top to use over campfire.
Items to procure food once the food you pack in your BOB is depleted:	XXX	XXX	Fishing, hunting, trapping items. Vegetable and fruit seeds. Local edible plants guide.

Foods That You Can Pack And Take With You

Since your Short-Term BOB is meant to help you survive for 24 hours or less, you do not have to bring any food items. You will easily survive without food during this short time frame. However, you'll be much better off and more comfortable if you bring some snacks that are compact as well as fast and easy to eat on the run. Examples include energy bars, sports gels, jerky, tuna pouches, trail mix, nuts, dried fruit, and crackers with cheese or peanut butter. Some common energy bars include:

Item name: PowerBar® Protein Plus (Energy Bar)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2KYns1M>

Price: \$21.99 for 15 bars

Weight: 2.11 ounces per bar

Size: 2.7x6.55x8.6 inches for a box of 15 bars

Material: Power Bar® Tri-source™ Protein Blend (Soy Protein Isolate, Calcium Caseinate, Whey Protein Isolate), Maltitol Syrup, Coating (Sugar, Fractionated Palm Kernel Oil, Whey, Nonfat Milk, Cultured Whey, Soy Lecithin, Natural Flavor), Oligofructose (From Chicory Root), Fructose, Nonfat Milk, Cane Invert Syrup, Water, High Oleic Canola Oil, and less than 2% of Soy Lecithin, Ground Almonds, Partially Defatted Peanut Flour, and Natural Flavor.

Appropriate for which BOBs: Short, Medium, Long

Comments: Flavors include Chocolate Peanut Butter, Cookies and Cream, Peanut Butter Cookie, and Vanilla. Gluten-free. 20g protein and 4g fiber per bar. PowerBar® Protein Plus Tri-Source™ Protein Blend contains all nine essential amino acids. No artificial flavors or colors.

Item name: Cliff® Bars (Energy Bar)

Vendor: Zenesty on Amazon.com

Webpage URL: <https://amzn.to/38DdivM>

Price: \$14.58 for a box of 12 bars

Weight: 2.4 ounces per bar

Size: Not specified

Material: A mix of fast-acting and longer-lasting carbohydrates from sugars and organic rolled oats, along with smaller amounts of good fats and plant-powered protein

Appropriate for which BOBs: Short, Medium, Long

Comments: Flavors include Blueberry Crisp, Caramel Toffee, Chocolate Chip, Chocolate Chunk, Peanut Butter Honey, and Peanut Toffee Buzz.

Contain 9–10 grams of plant protein alongside fast-acting and longer-lasting carbohydrates, making them a perfect way to fuel up before or during long, moderate-intensity activities. Made with 70% organic ingredients. While it isn't gluten-free, it is non-GMO and free of high-fructose corn syrup and artificial flavors. 9-11g protein per bar.

Your Medium-Term BOB is designed to get you safely through two to seven days of survival. You can pack the same snack items as you do for your Short-Term BOB. However, you might consider adding calorie and nutrient-dense emergency ration bars to provide you with more calories in a small package. Most of these contain 2400 to 3600 calories per pack. Here are two examples of emergency ration bars:

Item name: DATREX Emergency Food Ration Bars

Vendor: FHS Retail on Amazon.com

Webpage URL: <https://amzn.to/2KDpuVj>

Price: \$11.98 for one pack of 12 bars

Weight: 16.9 ounces for one pack (12 bars)

Size: Not specified. Each bar is about the size of a fig bar.

Material: Each bar contains 3g protein, 26g carbohydrate (5g sugar), 9g fat.

Appropriate for which BOBs: Short, Medium, Long

Comments: Each pack (2400 total calories) contains 12 bars (200 calories per bar). 5-year shelf life. Approved by US Coast Guard.

Item name: Millennium Energy Bars (Emergency Food Ration Bars)

Vendor: FHS Retail on Amazon.com

Webpage URL: <https://amzn.to/37QpEBj>

Price: \$58.95 for a box of 36 bars

Weight: 7.6 lb for a box of 36 bars

Size: 5.6x10.3x10.5 inches for box of 36 bars

Material: Each bar contains 8g protein, 18g fat, 53g total carbohydrates, 1g fiber

Appropriate for which BOBs: Short, Medium, Long

Comments: 5-year shelf life. Approved by US Coast Guard. 400 calories per bar. A variety of Lemon, Vanilla, Raspberry, Cherry, Apricot, Orange, Coconut flavored bars.

You will not die of starvation even if you do not include any food items in your Medium-Term BOB since you should theoretically survive three weeks without food. You can certainly survive fine for up to one week if you simply pack snacks (including energy bars) and/or emergency ration bars. But, once you eat those bars for a couple of days, it will be much nicer if you have some food that resembles a regular meal. Pack the most compact and light food available. Avoid bringing heavy and bulky canned or bottled foods. Military MREs (i.e., Meals Ready To Eat) are a good source of survival food, but they come with a lot of packaging and things besides food (e.g., napkin, moist towelette, seasoning, salt, pepper, sugar, instant coffee, flameless ration heater, spoon) creating more bulk to carry.

The lightest form of food to bring with you is freeze-dried food. These come in single-serving or multiple-serving sealed packages and have a long shelf

life, some lasting more than 25 years. They rehydrate with the addition of water and retain almost all of their nutritional value while having decent taste and texture. The commercial process for producing freeze-dried food involves first cooking the food and then placing it on trays inside a freezer to freeze the food. The trays of frozen food are transferred into a vacuum chamber where they are subjected to low heat, causing water in the food to vaporize away (sublimate), dehydrating the food. The now freeze-dried food is placed into impermeable bags along with an oxygen-absorbing packet and then sealed airtight. Some manufacturers flush the bags with nitrogen to drive out oxygen before sealing the bags. Removing oxygen prevents food oxidation thereby prolonging its shelf life.^[250]

Purchasing commercially freeze-dried foods is expensive. There are ways that you can freeze dry foods at home. The cheapest and simplest way is to use your refrigerator freezer or a deep freeze. However, only the most superficial layers of food will sublimate this way because there is no vacuum. You can only process the thinnest of foods and it will take a long time (i.e., weeks to months). Using dry ice or liquid nitrogen is more effective than using a standard freezer, but it is difficult to process significant volumes of food this way. Buying a home freeze-drying machine is the best method, but those machines are expensive with prices starting at about \$2,500.^[251] ^[252]

Dehydrated foods are cheaper than freeze-dried foods. The simplest method is to dry food under the sun. Dehydration removes water from food through evaporation, but some water is retained in the food making it slightly heavier than freeze dried food. Its shelf life is also shorter at one to five years. The dehydration process results in the loss of approximately 40% of a food's nutritional value. Upon rehydration, the food retains its taste but takes on a mushy texture.^[253] ^[254]

Reconstituting freeze-dried food usually involves adding hot water directly to the pouch of single-serve meals. Packs containing multiple servings need to be rehydrated in a separate container since these pouches are thinner and lighter. You can rehydrate freeze-dried food using cold water if you have no way to heat water. Freeze-dried food is ready to eat about ten minutes after rehydration using hot water and 45 minutes after using cold water. You can even eat freeze-dried food straight out of the package without rehydration if you have no access to water. The food will crumble when handled and it will

“melt” in your mouth when it contacts your saliva.^[255], ^[256], ^[257]

The “tastiness” of commercially available freeze-dried meals varies greatly even amongst offerings from the same manufacturer. Some meals rank highly in taste while others taste bad. You’ll need to try out various freeze-dried foods to see which appeal to your taste before stocking up on large quantities of food that you might not like. It is important to realize that what manufacturers consider one serving consists of limited calories. Breakfast, lunch, and dinner consisting of one serving each of commercially packaged food provide a daily total of about 900-1200 calories, roughly half of a person’s basal caloric needs. Your energy expenditure and caloric needs will most likely increase significantly when you’re in an emergency survival situation. You will slowly starve to death if over the long term you eat only a manufacturer’s described three servings per day. You will realistically have to eat at least two servings of freeze-dried food per meal to meet your daily caloric requirement.^[258] Keep that in mind when you pack freeze-dried food in your BOBs or at home for a “hunker down at home” emergency. You can stock up on much lower cost food options for your “stay at home” preparedness, things like canned foods (e.g., vegetables, tuna, chicken, etc), bulk rice, bulk dried beans, and bulk oatmeal. Common brands for emergency freeze-dried foods include Mountain House, ReadyWise (formerly Wise Company), My Patriot Supply, Augason Farms, Legacy Food Storage, and Valley Food Storage. Here are some examples of popular freeze-dried meals:

Item name: Mountain House Classic Bucket | Freeze Dried Backpacking and Camping Food | 24 Servings

Vendor: 24-7 Shopping on Amazon.com

Webpage URL: <https://amzn.to/2JqARiQ>

Price: \$138.59

Weight: 5.7 lb

Size: 10x12x12.31 inches plastic bucket

Material: Freeze-dried food assortment

Appropriate for which BOBs: Medium, Long

Comments: Easy to carry bucket consisting of 12 total meal pouches that are loaded with unbelievable flavor. This bucket contains 24 total servings of freeze-dried backpacker favorites. Meals included are (3) pouches of Beef Stew, (3) Beef Stroganoff, (2) Granola with Milk and Blueberries, (2) Classic

Spaghetti with Meat Sauce, and (2) Chicken Fried Rice. Just add hot water to the pouch and eat in less than 10 minutes, with no cleanup. This pouch is wider and shorter, providing a great bowl-like experience. To prepare all meals in this bucket, 18 cups of water will be needed. Meals are freeze-dried to lock in nutrients and freshness and reduce weight. Longest proven shelf life in the industry! Backed by a 30-Year Taste Guarantee.

Item name: Augason Farms 30-Day 1-Person Emergency Food Supply
Freeze-Dried Food

Vendor: Amazon.com

Webpage URL: <https://amzn.to/37P6Fav>

Price: \$143.99

Weight: 24 lb

Size: 12x12x20 inches plastic bucket

Material: Assorted freeze-dried foods

Appropriate for which BOBs: Medium, Long

Comments: Pail includes enough food for one person for thirty days or a family of four for one week. The survival food is secured in a watertight, easily transportable 8.5-gallon pail that's perfect for storing at home and office for unexpected emergencies. Quality Survival Standards (QSS) advise that you have a minimum of 1,800 calories and 40 grams of protein per person, per day. This emergency food supply provides more than that with a total of 1,854 calories and 47 grams of protein per person, per day. With nourishment like this, you're in a better position to survive and thrive during a crisis—something very few emergency food storage kits can claim. Majority of meal pouches up to 25 years; bananas up to 10 years. Includes cheesy broccoli rice and creamy chicken flavored rice, macaroni and cheese, hearty vegetable chicken soup and creamy potato soup, maple brown sugar oatmeal, morning moo's low-fat milk alternative, instant potatoes, banana chips. 30-Day and 45-Day Meal Planner. In an emergency, it is critical that food is carefully prepared to ensure you have a balanced number of calories each day for an extended period. If there's a chance an emergency might go beyond 30 days, the 45-day planner is an important tool to help you spread the food across additional days. It's safe to say this meal planner could be a lifesaver.

Item name: My Patriot Supply 2-Week Emergency Food Supply (1,500+ calories/day) Freeze-Dried Food

Vendor: My Patriot Supply

Webpage URL: <https://bit.ly/37RpIRu>

Price: \$157.00

Weight: 14.15 lb

Size: 8x9x13.5 inch plastic bucket

Material: Assorted freeze-dried foods

Appropriate for which BOBs: Medium, Long

Comments: Up to 25-year shelf life. Resealable zipper-top heavy-duty 4-layer pouch packaging. 4.3 Gallons of water are needed to prepare the entire kit.

Includes 4 servings of Traveler's Stew, 8 servings of Creamy Chicken Flavored Rice, 4 servings of Mac and Cheese, 20 servings of Long Grain White Rice, 20 servings of Buttermilk Pancakes, 8 servings of Southwest Savory Rice, 16 servings of Maple Grove Oatmeal, and 12 servings of Homestyle Potato Soup.

Food Preparation Items and Utensils

You will need a way to boil and sterilize water for your Medium- and Long-Term BOBs. That means having a metal container, which can also be used for food preparation. A couple of examples of compact metal containers that can be part of your Medium-Term BOB for this purpose include a canteen nested inside a metal cup and a mini-cook set (These are satisfactory for short term food preparation, but you need something larger for your Long-Term BOB.):

Item name: G.I. Style Stainless Steel 1qt. Canteen with Cup and Vented Lid.
With Used Very Good Condition G.I. Issue ACU COVER

Vendor: warren575757 on eBay.com

Webpage URL: <https://ebay.to/3aHBtMd>

Price: \$34.95 plus \$8.75 shipping

Weight: Approximately 1.8 lbs.

Size: Approximately 6x6x8 inches

Material: Stainless steel

Appropriate for which BOBs: Short, Medium, Long

Comments: New GI style 1-quart stainless steel canteen with vertically folding handle cup. Stainless steel vented lid for the cup. Used, very good condition, surplus genuine GI issue (ACU) canteen cover with MOLLE® II attachments.

Item name: Stanley Adventure Camp Cook Set - 24oz Stainless Steel Kettle

with 2 Ceramic Cups

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2WLqclO>

Price: \$13.55

Weight: 7.5 ounces for kettle and lid. 13.9 ounces total including the 2 ceramic cups.

Size: 4.3x5.8 inches

Material: Stainless steel kettle and lid. Ceramic cups (2)

Appropriate for which BOBs: Short, Medium

Comments: A vented stainless steel lid for the kettle to let steam escape or strain liquid. The locking handle extends for stable cooking but folds over the lid to save space. The kettle/coffee maker is constructed with 18/8 stainless steel and features two insulated ceramic portable 10oz/295mL tumblers to enjoy hot and cold beverages. The entire kit is made with BPA free materials. The kettle has graduated marks going up to 20oz. Lifetime warranty.

Item name: TOAKS Titanium Long Handle Spoon with Polished Bowl

Vendor: REI Co-op

Webpage URL: <https://bit.ly/3mTbmnK>

Price: \$10.95

Weight: 0.7 ounces

Size: 8.6 inches long

Material: Pure titanium

Appropriate for which BOBs: Medium, Long

Comments: A long handle spoon is handy for cooking and eating. Pure titanium construction resists corrosion, withstands high temperatures, and eliminates metallic aftertaste. The polished head allows for a smooth touch while the matte-finish handle offers a solid grip. Dishwasher safe.

A single, small metal container can work for food preparation for your Medium-Term BOB since its purpose is to help you survive for up to one week. Food preparation will be easier and more convenient if you can make room for some larger cookware for your Long-Term BOB because you'll use them to prepare food for weeks to months. You can pack a single-person cookware mess kit if you want to be a minimalist. One example of this is a GI mess kit:

Item name: Rothco GI Type Stainless Steel Mess Kit

Vendor: SPLG Products on Amazon.com

Webpage URL: <https://amzn.to/3nUpZsz>

Price: \$15.99

Weight: 14.39 ounces

Size: 2.5x7.5x7.5 inches

Material: Stainless steel

Appropriate for which BOBs: Medium, Long

Comments: Frying pan with folding handle. The bottom of the lid is divided into two spaces and can serve as a cover for the frying pan, as a plate for your food, or as a separate container for cooking food. The lid and pan are placed together and secured by folding the long handle over the two. The pan and the lid are shallow, so they are not practical for boiling water in any significant quantity.

A compact cookware mess kit is a step up from the GI Mess Kit and provides you with some more cooking options while taking up little extra space:

Item name: Texsport 5 pc Stainless Steel Camping Cookware Outdoor Mess Kit

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3mStgXR>

Price: \$17.48

Weight: 1.32 lb

Size: 2.5x6.5x6.75 inches

Material: Polished stainless steel with copper bottoms

Appropriate for which BOBs: Medium, Long

Comments: High-Quality Polished Stainless Steel 5 Pc. Cooking Set with Copper Bottoms that CONDUCTS HEAT QUICKLY. FIVE PIECE SET Includes 6¾" and 6½" fry pan plus a ¾ Qt. Boiling Pot (with pivoting metal C-handle) with Lid and one 8 oz. Plastic Cup. Interchangeable handle for frying pans. All pieces next together in a small bundle for convenient carry.

Item name: Snow Peak Personal Cooker 3 Cookset

Vendor: REI Co-op

Webpage URL: <https://bit.ly/3rzIYuv>

Price: \$29.95

Weight: 1 lb 4.5 ounces

Size: 3.2x5.9 inches

Material: Stainless steel

Appropriate for which BOBs: Medium, Long

Comments: Cookset includes 2 pots with folding handles; 1 lid; 1 plate; 1 bowl; 1 fry pan. Pieces store inside each other and fit easily in the included nylon carry sack.

A barbecue grill grate is a handy item to have if you have space to carry one, especially if you're escaping by vehicle. You can either grab the one off of your home barbecue or purchase a replacement grill grate. A grate provides you with a level surface to place your cooking pans and pots on to and you can adjust its height above your fire or coals by placing stones beneath them. You can also cook your fish and game directly on your grate, something especially useful if you have more to cook than will fit inside the smallish pans included in compact cookware kits. Grates are round or rectangular and come in various sizes. They are flat, so they take up little space. But, they are heavy since they're made of metal. Cheaper ones are lighter but less durable.

Item name: Onlyfire BBQ Stainless Steel Cladding Rod Cooking Grate Fits for Char-Broil Grill2Go X200 Gas Grill

Vendor: Onlyfire Outdoor LLC on Amazon.com

Webpage URL: <https://amzn.to/34Km0r2>

Price: \$10.99

Weight: 2.14 lb

Size: 11.81 x 17.25 inches

Material: Stainless steel

Appropriate for which BOBs: Long

Comments: The cooking grate is large enough to fit 12 hamburgers. Retains heat and delivers professional searing, prevents sticking, and allows for easy clean-up, much longer life than porcelain grates.

Food preparation is a big component of your long-term survival. Other items that will make cooking faster and easier are larger pans and pots. A larger frying pan will allow you to cook more food at one time than the small frying pan that's included in compact cookware kits. A larger pot provides a way to boil more water at one time than a metal water bottle, the metal cup that comes nested with a canteen, or the small pots that are included in a compact cookware kit. It makes water sterilization much more efficient saving you time and also reduces the work (gathering and preparing wood, etc) of

maintaining a fire for this purpose. You can also use the larger pot for cooking food and for carrying water from a stream to your campfire. Whether you can include these larger convenience items in your vehicle or Long Term BOB depends upon your particular circumstances and what else you pack.

Item name: GSI Outdoors Glacier Stainless Frypan - 10 in.

Vendor: REI Co-op

Webpage URL: <https://bit.ly/2KWjHtV>

Price: \$39.95

Weight: 1 lb 7.5 ounces

Size: 2.7x10.5x11 inches

Material: 18/8 stainless steel exterior surrounds a heavy-gauge, clad aluminum core

Appropriate for which BOBs: Long

Comments: Quick heating and the unrivaled durability only stainless steel can provide. Durable, laser-etched nonstick surface offers excellent food release and easy cleanup. Exclusive SureLock folding handle.

Item name: Stainless Steel Pot 3QT Camp Pot with Lid and Mesh Carry Bag

Vendor: allamericanoutdoorscom on eBay.com

Webpage URL: <https://ebay.to/3aMXHfY>

Price: \$19.99

Weight: 1 lb 3 ounces

Size: 4.25x8.5 inches

Material: 18/10 stainless steel

Appropriate for which BOBs: Long

Comments: Holds 3 quarts or 2.8 liters. The pot has a metal C-handle that can be used to carry or hang the pot.

Your short-term snacks and freeze-dried foods will be tasty and convenient. But, long term, you'll have to forage for vegetation and catch fish or game to feed yourself. Packing some spices will make your meals much more enjoyable. The example below enables you to pack six different spices. You can also consider bringing small plastic bottles of cooking oil with you.

Item name: GSI Outdoors Waterproof Spice Rack

Vendor: Montaro on Amazon.com

Webpage URL: <https://amzn.to/2WLXiCb>

Price: \$12.95

Weight: 3.5 ounces

Size: 1.5x2.8x4.7 inches

Material: Copolyester (BPA free plastic)

Appropriate for which BOBs: Medium, Long

Comments: Three waterproof, 2 sided, clear bottles attached by a removable, loopable bandolier. Space for 0.8 ounces each of 6 different spices. 18 removable, pre-printed spice labels and 4 additional customizable labels are included. Each container has removable screens for easy refilling, with both large and small screens to dispense different kinds of spices. Lifetime warranty.

Stove

Having a stove is a convenience since you will not have to take the time and go through the work of making a campfire. Except for a wood-burning stove, all of the other stoves require a fuel source that will eventually run out making it necessary for you to build fires. So, be sure that you have sufficient means to start fires (see the Fire Items chapter). You can carry enough fuel in your Medium-Term BOB to carry you through intermediate duration emergencies if you chose to do so. What you carry is all about prioritizing an item's importance to you since you have only a limited amount of volume and weight you can bring with you. You might choose to bring extra ammunition or more fishing tackle instead of a stove for your Long-Term BOB. The choice is yours.

Here is a rundown on different types of stoves based upon the fuel they use:

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- Wood stoves: These are essentially a framework into which you place wood to burn. Heat is directed upwards. Your cooking vessel is placed on top of the frame. A simple improvised version can be made by removing the top from an aluminum soft drink can and cutting an opening in the can's side for inserting wood. Commercially available stoves include sheet metal frames that fold flat. Temperature regulation is accomplished by varying the amount of wood placed inside the stove. Side openings permit the addition of wood without removing your cooking vessel to add wood from the top. Example: Emberlit
- Woodgas stoves: These are more efficient than simple wood stoves because they burn wood and then also burn the combustible gases that form from the burning of wood. So, you get a secondary burn from the

original wood. This is accomplished by burning wood inside a can with a perforated bottom and vent holes at its top to permit airflow. This inner can is placed inside a larger outer can that also has vent holes to permit air circulation. These stoves have to be designed properly to function and they are expensive. Example: Solo Stove

- Liquid fuel stoves: These stove generally employ white gas (also known as Coleman fuel, 5-7 year self-life) as a fuel, although some can also use kerosene or unleaded gasoline. They are readily available. They work well in cold temperatures. Have replacement O-rings or gaskets available. Exercise caution when lighting these stoves because a large flame can arise. Example: MSR Whisperlite™
- Alcohol stoves: These stoves are simple to use and simple in design with no moving parts. Denatured alcohol or the gas additive, HEET, are common fuels for this type of stove. Simply pour in a bit of fuel and light it to use the stove. Alcohol vaporizes poorly in low temperatures, so it may not be possible to ignite a flame. These stoves take longer than other stoves to boil water. More alcohol is required to provide the same degree of burn as compared with other fuels, so you'll need a greater quantity. Example: White Box Alcohol Stove
- Canister stoves: These stoves screw on to canisters filled with pressurized gas (the type of gas varies with different manufacturers, shelf life > 3 years). The couplings (i.e., Lindal valve meeting the EN417 specification) are standardized so stoves and canisters can be intermixed. These stoves start up immediately with full power and do not require priming. Example: Jetboil
- Butane burner stoves: These are single burner stoves that generally burn 1.5-2 hours on an 8 ounce can of butane fuel. They function as a gas range stove and are the largest practical survival stove. Example: Sterna® brand stoves
- Solid fuel stoves: These stoves use a solid manufactured fuel that is manufacturer specific to a particular stove. Examples of solid fuel include Stove in a Can (wood chips embedded in wax disks), Esbit (trioxane or hexamine chemical pellets), and Sterna (jellied alcohol). Heat generation is less than for liquid fuel stoves and it's harder to vary the heat intensity than with other stoves. Solid fuel has a long shelf life, but it's expensive. These stoves are for short-term use. Example: Sterna solid fuel stove

Butane burner stoves are the least optimal as your survival stove because of their size and weight. Any of the other stoves along with their fuel would work for your Medium-Term BOB if you decide to pack a stove. Alcohol stoves are popular, compact, and lightweight. Alcohol is an inexpensive fuel source and has an almost indefinite shelf life.

Item name: White Box Next Generation Alcohol Stove

Vendor: Campsaver

Webpage URL: <https://bit.ly/2Jo6BFj>

Price: \$16.96

Weight: 1 ounce

Size: 2.25x2.25 inches

Material: Aluminum

Appropriate for which BOBs: Medium

Comments: Boil time of 5 minutes for 2 cups of water. Uses denatured alcohol or methyl alcohol (HEET in yellow bottles). Holds up to 2.5 ounces of fuel and burns up to 20+ minutes. Boils up to 8 cups of water on one fill of fuel. Designed to be used with pots that have a diameter of 5 inches or wider. An optional windscreen is available at extra cost.

A wood or woodgas stove is more practical for your Long-Term BOB because they will continue to operate after other stoves are depleted of the manufactured fuel that you bring with you. A simple wood stove packs down smaller than a woodgas stove although it is not as efficient at generating heat. A simple wood stove is your lightest, most compact, and the cheapest alternative.

Item name: Emberlit Stainless Steel Stove (wood-burning stove)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/37PtkTY>

Price: \$44.99

Weight: 11.45 ounces

Size: 4x5.5x6 inches

Material: 304 stainless steel

Appropriate for which BOBs: Medium, Long

Comments: Impervious to corrosion and is remarkably strong. Will hold the weight of any pot or pan that will sit securely without wobble. Side opening for adding wood. Comes with a lifetime guarantee because you are never

going to wear it out. Packs flat for storage. Boils water in 10 min.

Long-Term Food Procurement

You'll eventually run out of the food you pack in your BOBs no matter how much you bring with you. At some point, you will have to procure food to feed yourself. You can do this by foraging, fishing, hunting, trapping, and farming. It's wise to begin procuring food for yourself before you deplete the food that you bring with you so that food can be kept in reserve to eat during times your food procurement efforts are unsuccessful. You may go hungry if you do not try to procure food until the food you brought with you runs out since there is no guarantee that your efforts will be immediately rewarded. You'll want to be as efficient as possible in procuring food for yourself because energy and calorie conservation is crucial when you're in survival mode.

Foraging can include removing edible items from garbage cans in the city or collecting edible plants in the wild. A useful item for your Long-Term BOB is a plastic laminated card with a description and drawing or photograph of edible and poisonous plants in the area where you plan to escape. These cards can help you avoid eating plants that may make you ill. They are compact and generally cost less than \$10. Here is an example:

Item name: Edible Wild Plants: A Folding Pocket Guide to Familiar North American Species (Outdoor Skills and Preparedness)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3ru1zbn>

Price: \$7.94

Weight: 1.31 ounces

Size: 0.71x3.75x8.25 inches

Material: Laminated with clear plastic

Appropriate for which BOBs: Medium, Long

Comments: 12-page pamphlet. Some wild edible plants have poisonous look-alikes, and it is important to know the difference when harvesting. Edible Wild Plants is a simplified guide to familiar and widespread species of edible berries, nuts, leaves, and roots found in North America. This beautifully illustrated guide identifies over 100 familiar species and includes information on how to harvest their edible parts. It also includes a section on dangerous poisonous plants to avoid that have contact poisons that can blister skin.

There are some nutrients that you will be missing eating a plant-based diet:
[\[260\]](#)

- Vitamin B12 (also known as cobalamin): Present in fish, meat, dairy products, and eggs. Plays a role in red blood cell formation as well as nerve and brain function. Deficiency causes weakness, fatigue, neurological and psychiatric disorders, megaloblastic anemia.
- Creatine: Sourced from meats. Stored in muscle and brain. Serves as an energy source for muscle. Made by the liver. Eating only vegetables results in lower amounts in the muscle. Supplements given to vegetarians can improve physical performance and brain function.
- Carnosine: Sources include meat, poultry, and fish. It's an antioxidant found mainly in human and animal muscles and brain. Non-essential because humans can fabricate it from the amino acids histidine and beta-alanine. However, carnosine muscle levels are lower in people that eat only vegetables. Beta-alanine supplements in vegetarians can raise carnosine muscle content improving endurance and increasing muscle mass.
- Vitamin D3 (also known as cholecalciferol): Most rich sources are fatty fish and egg yolks with lesser amounts found in cod liver oil, milk, and enriched cereals. Humans can generate Vitamin D3 when their skin is exposed to sunlight. Vitamin D3 deficiency is associated with decreased bone mass and increased fracture risk, cancer, heart disease, impaired brain function, muscle wasting, reduced strength. (Note: Vitamin D2, also known as ergocalciferol, is found in plants)
- Docosahexaenoic acid (DHA): Sourced from fatty fish, fish oil, certain microalgae. Humans can manufacture clinically insignificant amounts of DHA by eating flax seeds, chia seeds, and walnuts. DHA is an essential omega-3 fatty acid. Important for normal brain development and function.
- Heme iron: Found only in meat, especially red meat. Iron deficiency leads to anemia. Heme iron is more readily absorbed through the intestines than plant-based non-heme iron. Heme iron is not affected by anti-nutrients found in plants, which inhibit intestinal absorption of non-heme iron. If you're limited to eating only plants, you can avoid anemia by eating those that are high in non-heme iron such as soybeans, lentils, beans (i.e., lima, white, red kidney, navy), chickpeas, black-eyed peas, nuts, seeds (e.g., pumpkin, sesame, flax seeds), leafy green vegetables

(e.g., spinach, kale, Swiss chard, collard, and beet greens), potatoes, white and oyster mushrooms, palm hearts, olives.

- Taurine: Sourced from fish, seafood, meat, poultry, and dairy products. It's a sulfur compound found in brain, kidney, and heart. It appears to aid with muscle function, bile salt formation, and antioxidant defenses. Humans produce small amounts of taurine, but taurine levels are lower in people eating only vegetables compared with meat-eaters.

Fishing

Eating only wild plants can temporarily sustain you, but will be insufficient for the long term. Fishing can be an important way for you to feed yourself depending upon your escape destination. You can make fishing hooks and line from items you scavenge or find in the wild. But, it takes skill and time to do this. It is best to pack some fishing hooks, fishing line, and sinkers as a very minimum. You can use as live bait anything you can find such as worms, grubs, crickets, or flies. You can use pieces of fish as bait once you begin catching fish.

Lots of survival fishing kits are available for purchase and many are small enough to fit into a cargo pants pocket. These offer an easy way for you to bring items to cover your basic fishing needs. Pre-packaged kits vary in the number of items they include and usually come in metal or plastic containers or zip-lock plastic bags. The most basic kits will include at least 25 feet of fishing line, sinkers, and a bobber along with other items.

Item name: Uncle Flint's Survival Fishing Kit

Vendor: Uncle Flint's Outdoor on Amazon.com

Webpage URL: <https://amzn.to/3rwJg5p>

Price: \$28.95

Weight: 5.61 ounces

Size: 1x3x4.5 inches

Material: Assorted materials

Appropriate for which BOBs: Medium, Long

Comments: Steel storage tin with hinged lid. Survival Fishing Kit consists of over 63 pieces of essential survival fishing supplies. Survival Fishing Kit easily fits in the pocket of a coat, small pack, vest, etc. Contains 50 ft. 20 lb test monofilament line, 50 ft. 40 lb test monofilament line, floating jig head lure size small, floating jig head lure size medium, floating jig head lure size

large, artificial fly lure, 6 plastic twist tail lures, 1 spinning lure, 1 spoon lure, 3 size 4 baitholder hooks, 3 size 6 baitholder hooks, 3 size 8 baitholder hooks, 2 size 12 panfish hooks, 4 size 2/0 Tru-Turn® catfish hooks, 2 size 1 treble hooks, 2 size 2 circle hooks, 2 size 3 snap swivels, 2 size 6 snap swivels, 2 size 8 snap swivels, 2 size 10 snap swivels, 2 steel leaders 20 lb test, 2 steel leaders 40 lb test, 10 size 5 split shot sinkers, 2 size 3/4 inch plastic bobbers, 4 large safety pins, MiniScraper™ single edge razor blade and plastic holder, heavy-duty aluminum foil - folded - 1 piece approximately 12" x 24", basic fishing knot tying instruction sheet.

There are a couple of things to keep in mind. You can substitute or add items to a pre-packaged fishing kit. Be sure to pack some small hooks because they can be used to catch large fish, but large hooks cannot be used to catch small fish. Also, pack items that will be most appropriate for the area you anticipate escaping to taking into consideration its environment and types of fish. You can also forgo a pre-packaged kit and put together one of your own giving you the ability to customize it to your liking. Common items to consider including in your survival fishing kit: [\[261\]](#), [\[262\]](#), [\[263\]](#), [\[264\]](#), [\[265\]](#)

- **Fishing line:** It is ideal to match the weight (measured in test pounds) of your line with the type of fish you plan to catch. But, for your BOB, you'll want to have your fishing line packed and ready to go. Too light a line will break more easily. Too heavy a line is more visible to fish making it harder to catch them. Packing 12-20 pound test line will provide good versatility and is a good compromise between strength and visibility to fish. (See the Cordage chapter for more detailed information about fishing line.)
- **Sinkers:** These are weights attached to your line to aid with casting your line and for making your line sink. Sinkers begin at about BB size (e.g., 1/4 ounce) and progress upwards in weight. Split shot sinkers are round with a side slit for inserting your line. The shot is squeezed to trap the line inside the slit. Some of these are removable and reusable by opening the split to extract the line. Other types of sinkers have an eye for attachment to your line. Slip sinkers are threaded onto your line so they can slide back and forth on the line. You can pack different types of sinkers to serve a variety of purposes. There are bank sinkers (to keep your line vertical in the water column), bell sinkers (prevents snagging the bottom), pyramid sinkers (for sandy bottoms), and others.

- **Hooks:** It's helpful to pack a variety of different types and sizes of hooks. Barbed hooks have a portion at the point that is directed backwards to make it harder for a fish to become unhooked. Unbarbed hooks are easier to remove and are used for catch-and-release but are not optimal for survival purposes because it's easier for fish to slip off these hooks. There are many variations in the shapes of the eye, shank, and bend (the U-portion) of a hook. Hook size is denoted by the numbers 32 to 1 followed by 1/0 to 19/0, progressing from smallest (32) to largest (19/0). Hooks with a single eye can come with one (single), two (double), or three (treble) shanks, bends, and points. Smaller hooks are needed when you fish for smaller fish like bluegill and crappie while using small baits like grubs and pieces of worms. Larger hooks are useful for larger fish like bass, walleye, trout and pike while using baits like whole earthworms, minnows, and shad.
- **Swivels:** These are small, metal devices that swivel or rotate in their central part and with eyes on either end for connecting a lure or leader to your main line to prevent twisting of your line. Three-way swivels include a third rotating arm with an eye and can be used to attach a sinker or bobber. Stainless steel swivels are stronger than those made of brass. They are available painted dark gray or black to make them less visible. Snaps can be connected to swivels for rapidly connecting and disconnecting components from one another.
- **Snaps:** These are small, metal, safety pin type devices that are used to quick-connect lures and hooks to your line.
- **Leaders:** This is a length of wire or fishing line placed between your main line and your hook or lure. It serves to increase the line's resistance to abrasion and breakage. (See the Cordage chapter for more detailed information about leaders.)
- **Bobbers:** These are flotation devices that are round or cigar-shaped. Clip-on bobbers attach to your main line by a metal spring clip allowing adjustment of the depth of your hook beneath the surface. They are usually brightly colored so you can see them "bob" and get pulled under the water when fish bite your hook or lure. That's your signal to pull on your line to set the hook in the fish's mouth. Slip bobbers are threaded onto your line and are designed to slide along your line. Some of these are clear to make them less visible to fish and these are filled with water to add casting weight, which is helpful when using extra

light bait or lures.

- Lures: It's handy to include some lures in your custom kit. While live bait can be cast and allowed to rest in place, lures need to be reeled back creating some action to attract fish.

As a supplement to live bait, there are many types of lures and you can customize your survival fishing kit by selecting those that are most appropriate for fishing in your locale.^[266]

- Jigs: These lures have heads of metal providing weight. They have tails comprised of animal hair, flexible plastic, feathers, or rubber. Bait can be attached to its hook.
- Poppers: The front of these lures has a concave depression that gives them action when pulled through the water with spin-casting tackle.
- Spoons: These versatile lures are metal and come in different colors depending upon the fish you are trying to attract. Their movement resembles baitfish or minnows. Different designs vary in their action in the water.
- Plugs: These have a plastic or wood body and are either designed to float on the surface (topwater or floating plugs) or dive to a certain depth (diving plugs).
- Spinners: One or more blades spin around a straight wire shaft on these lures. Some also have tails composed of soft plastic or animal hair.
- Surface lures: These are made of wood or plastic and have one or two treble hooks. They remain at the surface and mimic frogs, large crawling insects, small fish, and the like. They derive their action from a concavity in the front of the lure's body or blades attached to the body.
- Soft, plastic baits (e.g., worms, grubs, etc): These come in a wide range of colors and sizes. Some are scented to attract fish. They can be used with weights, jigs, or spinners by attaching them to the hooks.

You can buy individual items for your custom fishing kit. Or, you can purchase a freshwater fishing tackle assortment kit as an easy and economical way to have a range of items to select from for your personalized survival fishing kit:

Item name: TOPFORT 187/230pcs Fishing Accessories Kit

Vendor: Topfort US on Amazon.com

Webpage URL: <https://amzn.to/3rw3X1f>

Price: \$21.99

Weight: 8.8 ounces

Size: 1.2x3.9x4.7 inches

Material: Anti-Corrosion Stainless Steel, plastic, ABS, PP, etc.

Appropriate for which BOBs: Medium, Long

Comments:

- ABS plastic case.
- Head Jigs Fishing Hooks *4 pieces
- Jig Hook 1# 2# 2/0# 1/0# *5 pieces
- Sinker weights 5g/7g *2 pieces
- Spoon lure *4 pieces
- Fishing Leaders *4 pieces
- Fishing lure Hooks Keeper *1 piece
- Removable split Shot 0.8g/1.0g/1.2g/1.5g /10 pieces
- Split Rings *10 pieces
- Night Luminous Beads *30 pieces
- Heart-Shaped Plastic Sheet *10 pieces
- Space Beans *4 pieces

Item name: 16 Fishing Bobbers for Fishing

Vendor: Big Worm Fishing on Amazon.com

Webpage URL: <https://amzn.to/3py6OoV>

Price: \$6.97

Weight: 3.99 ounces

Size: 1, 1.25, 1.5, and 1.75-inch diameter bobbers

Material: Plastic and metal

Appropriate for which BOBs: Long

Comments: Round bobbers are white and red.16 pack of fishing bobbers.

Sizes included: 4 (1-inch Bobbers), 4 (1.25-inch bobbers), 4 (1.5-inch bobbers) and 4 (1.75-inch bobbers). This pack of fishing gear bobbers have a specially designed top and bottom that will allow you to easily secure the fishing line. Designed to work on multiple sizes of fish.

You can use your fishing tackle to make a trotline.^[267], ^[268], ^[269] There are a wide variety of ways to set up a trotline. It is comprised of multiple droplines and hooks that are all attached to a main line. Examples of some trotline setups include:

- The main line can be strung from trees or stakes on both banks of a stream. In this case, you can use paracord or tarred bank line (see Cordage chapter for details about these lines) for your main line if it is tensioned to lie above the water. You can use a heavy fishing line for your main line if you make it droop underwater in a U or V shape presenting your hooks on their droplines at different depths.
- The main line is attached to a tree or stake on one bank and the other end is attached to a sinker. This places your main line at an angle presenting your hooks at different depths.
- The main line is attached to a tree or stake on one bank and the other end is attached to a bobber on the water's surface. Your hooks are all at the same depth providing the droplines are of the same length.
- You can also use a tree branch as your "main line" and simply hang multiple droplines with hooks off of it.

It takes some work to set up a trotline, but the advantage in a survival situation is that you have multiple hooks in the water and you can leave it unattended while you either rest or work on other things such as setting up shelter. You periodically check your lines to see if you've caught any fish.

You probably will not have space to carry your rod and reel in an emergency unless you are escaping by vehicle. In a pinch, you can do handline fishing using just your hands to handle your fishing line. You can usually create a makeshift fishing rod by tying a fishing line to the end of a small tree limb or a branch. You can make an improvised spindle by spooling fishing line around available items including empty aluminum cans or a piece of a tree branch. A couple of compact, more formal devices that you can consider including in your Long-Term BOB include a hobo fishing reel or a Cuban Yo-Yo hand reel.

You can make a hobo fishing reel on your own or purchase a ready-made one. It consists of a hollow cylinder usually made of wood and sealed on one end. The other end has a removable plug in it. Your fishing tackle fits inside the cylinder. Fishing line is spooled around the cylinder on the side with the sealed end. There are two raised ridges to contain the line similar to a spool used to hold sewing thread. Kevin shows how you can make a hobo fishing reel out of a wooden pepper mill on his Laplander's Natural Lore Blog. [\[270\]](#) Daggerfish Gear sells a professionally made Hobo fishing kit:

Item name: Daggerfish Portable Fishing Kit

Vendor: Daggerfish Gear on Amazon.com

Webpage URL: <https://amzn.to/3aPDLZF>

Price: \$60.00

Weight: 5 ounces

Size: 2.2x2.3x10.7 inches

Material: Hollow wood handle

Appropriate for which BOBs: Long

Comments: Hand-carved from solid wood for superior durability in wet conditions, and hollowed out for increased storage. Complete lead-free tackle kit inside includes hooks, sinkers, swivels, jig head, rubber grubs, and a float. Additional storage space in the handle and reel for other favorites. Includes 25 yards of 6-lb monofilament line. Can be refilled with other lines, as well. Can be used for freshwater, lake, pond, creek, stream, backcountry, survival, bushcraft, spin fishing, spin casting, and wet-fly fishing. Easily packable. Designed and handmade in the USA by a master craftsman and fisherman.

A Cuban Yo-Yo hand reel is cheap, light, and simple. Commercial versions are made of plastic of varying diameters and they look like yo-yo's with a wide central depression with thin sidewalls to contain your fishing line. One sidewall is usually lower and more tapered than the other taller, more vertical sidewall. The reel is held in one hand and the fishing line is cast and unspooled out of the side of the reel with the lower, more tapered sidewall. All you need to catch fish in a wide range of sizes is a Cuban Yo-Yo reel, fishing line, a sinker, and a hook for the most basic setup. ^[271]

Item name: 1 Hand Reel Cuban YOYO Cubano Fishing cast Manual Kite line Plastic RED 6 1/2"

Vendor: Vidi-Shop on Amazon.com

Webpage URL: <https://amzn.to/34Q7Moy>

Price: \$10.84

Weight: Approximately 4 ounces

Size: 6.5 inches diameter, approximately 2 inches wide

Material: Plastic

Appropriate for which BOBs: Long

Comments: Red color

There are several tools to have in your pack to help you with fishing. Other

tools in your BOB should serve these same functions obviating the need to bring extra tools:

- Needle nose pliers: These can be used to remove hooks from a fish's mouth. Those with longer points can reach further into a fish's mouth if necessary. They can also be used to crimp and remove split shot sinkers from your fishing line. Although there are needle nose pliers made especially for fishing, you can use those that come with your multi-tool (see the Tools chapter for more about multi-tools).
- Scissors or nail clippers: These can be used to cut your fishing line including the free end after knot tying. Some multi-tools come with scissors and many of them come with wire cutters that can be used for cutting fishing line. Or, you may have a nail cutter as part of your hygiene kit that can be used to cut fishing line.
- Fillet knife: To save space and weight, use your smaller survival knife instead of bringing a fillet knife (see Survival Knives chapter for information about your small and large survival knives).
- Also, bring sunscreen, insect repellent: See Personal Protection chapter for information about these items

Hunting

Hunting fowl and game is another way to add protein to your diet keeping you alive for the long term. You can fashion some primitive hunting tools if you find yourself without other resources. For example, you can bind your survival knife to a branch to make a spear. Or, you can use your knife to sharpen one end of a branch into a point to serve as a spear. You can also use your knife to construct a bow and arrows. You can use these tools to hunt and fish. But, your effective hunting range will be short, they are difficult to deploy with accuracy, and the lethality of these tools is limited. Your survival knife is one of your most important survival tools. You risk damaging your knife if you're repeatedly throwing it with force as part of a spear in your quest for food.

Since this is a book about disaster and emergency preparation, I encourage you to give this thought and formulate a plan now as to how you plan to hunt for your food. Now is the time to decide what tools work best for you and to get them ready to grab in a hurry when disaster strikes.

You can use the following items to protect yourself and also for hunting,

some to better effect than others. I'll just mention them here since a complete discussion about them along with examples and recommendations can be found in the Personal Protection Items chapter:

- Handgun
- Rifle
- Shotgun
- Pellet air gun
- Bow and arrows

Author's tip: Don't run through all of your ammunition hunting. Always save some ammunition so you will be able to use it for personal protection purposes.

Trapping

Traps are another way to catch animals for food. It takes experience and it is time-consuming to set up traps. You need to set up multiple traps because trapping is a numbers game. You'll generally achieve greater success catching animals if you set up more traps at the same time. Traps are somewhat similar to trotline fishing in that you can leave them unattended and either take time to rest or accomplish something else. You just have to check your traps periodically for trapped animals and make sure you get them before another predator does. You may have to resort to trapping in an extremely long-term survival situation where you've depleted your ammunition and fishing supplies. So, it's good to pack some trapping supplies and learn how to use them.

First, become familiar with the animals in the area you'll be escaping to and learn their habitats, habits, and food preferences. Small animals are usually creatures of habit, active in the early morning and early evening, travel the same paths often along edges of open ground, using dense vegetation as cover. Learn to recognize their tracks. Try to locate their dens and nesting areas. Set your traps right in the middle of the paths frequented by your target animals, near watering and feeding sites, and by their nesting and den sites. Select a bait that appeals to your targeted animals. Peanut butter and salt often work well. Scatter small bits of bait around your trap for the animal to taste piquing its interest in the bait in the trap.^[272], ^[273] Try to avoid leaving your scent at the site of your traps.^[274]

There are many different types of traps. They fall into the following general

categories:[\[275\]](#), [\[276\]](#)

- Pit traps: These are covered holes that animals fall into and cannot get out of. These are easier to dig if you have a survival shovel (see the Tools chapter)
- Dead fall traps: A heavy object (e.g., stone or log) falls on top of the animal crushing it after the animal releases a trigger.
- Snares: An animal is trapped by a noose that goes around its neck. The noose tightens as the animal tries to get away.

Some traps (e.g., dead fall trap, twitch-up snare) can be made using only items found in the wild such as rigid branches, flexible branches, vines or roots to serve as cordage, and rocks or heavy logs. Other traps can consist of things you pack with you such as lightweight rat traps (i.e., larger versions of spring-loaded wooden mouse traps) to catch muskrats, squirrels, and birds.

[\[277\]](#)

Item name: Victor Metal Pedal Rat Trap (Pack of 12)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2WMD4bc>

Price: \$26.35

Weight: 0.3 lb

Size: 1.1x4.1x10.2 inches

Material: Wood-based wire snap trap with metal trip pedal

Appropriate for which BOBs: Long

Comments: Made in the USA using environmentally friendly wood harvested from FSC certified wood. It is the world's No. 1 selling rat trap with over 1 billion sold. Trusted to control rats for over 100 years. Designed for indoor and outdoor use. Victor rat traps are the professionals' trap of choice.

Snares are usually made of braided, galvanized or stainless steel cable.

Stainless steel is stronger than galvanized and it will not rust. They come in different lengths and gauges depending upon the game you're targeting.

Although strong, they are usually single-use items because animals will twist and ruin them. You can buy pre-made snares for simplicity (see the Vigilant Trails Pocket Survival Snare Traps product listing below as an example). Or, you can buy snare wire in bulk along with some component parts and then make your own snares more economically (see the Super Special Kit product listing below as an example).

Item name: Vigilant Trails Pocket Survival Snare Traps. Includes 3 Locking Small Game Snares

Vendor: Vigilant Trails on Amazon.com

Webpage URL: <https://amzn.to/3ho8ezu>

Price: \$19.95

Weight: 3.49 ounces

Size: 1.14x4.09x6.26 inches

Material: Snares are made of High-Grade Aircraft Cable

Appropriate for which BOBs: Long

Comments: Intended for Most North American Small Game Species Under 20-25 Pounds. Includes Three Small Game Snares with Micro Locks, Three Individually Cut Anchor Wires, One Metal Carry Case, and Instructions. Easily Carried and Packed. Weighs Less Than Five Ounces, Fits Into A Shirt Pocket. Made of High-Grade Aircraft Cable and Metal Components. Hinged All Metal Carry Case Keeps Your Gear Safe, Organized, and Always Available.

Item name: Super Special Kit = Makes 100 Swiveled Snares

Vendor: The Snare Shop

Webpage URL: <https://bit.ly/3mTpVYK>

Price: \$77.14

Weight: Not specified

Size: 1x19 1/16" cable. Other available cable size options include 1x19 3/32" (\$104.12), 1x19 5/64" (\$89.83), 7x7 1/16" (\$92.74), 7x7 3/32" (\$102.87), 7x7 5/64" (\$96.44)

Material: Galvanized steel aircraft cable. Steel cable ends.

Appropriate for which BOBs: Long

Comments: This kit includes: 500' of cable, 200 steel ends, 100 micro locks, 100 twist-on support collars, 100 #9 swivels, swivel washers, 100 deer stops, and a sample snare. This is enough to make 100 5' snares. The tools you will need are a hammer, cable cutter, and pliers. This pack has Steel Cable ends instead of Aluminum Stops and Double Ferrules. These ends are annealed non-cracking nuts that you will be able to smash with a hammer and no special crimper is needed. The cable cutters are for cutting the cable in the lengths you prefer and the pliers are for the bend in the cable by the lock.

Here is some information to help you select what type of snare cable to purchase. ^[278] There are three main considerations regarding cable: Type of

construction, diameter, and length. Your cable choice will depend upon the animals you want to trap.

- Cable construction:
 - 7x7: Less flexible. Most popular for snares.
 - 7x19: Extremely flexible. The strongest of the three constructions listed here. It's not as prone to kinks. Usually used for large animal foot snares (bear, hog), downers, and extensions. Usually not used for neck snares because it forms a teardrop loop due to its high flexibility.
 - 1x19: Stiff, smooth, strong cable. Kinks somewhat easily. Used mainly for dispatch snares. It's very fast when "loaded". Its strength allows you to choose a smaller diameter cable and still be able to hold the bigger animals.
- Cable diameter:
 - 1/32" - Squirrel, Pine Marten, etc
 - 3/64" - Mink, Squirrel, Rabbit, etc
 - 1/16" - Bobcat, Fox, Rabbit, Ground Hog, Opossum, etc
 - 5/64" - Bobcat, Fox, Raccoon, Coyote (1x19), etc
 - 3/32" - Raccoon, Coyote, Fox, Beaver, Badger. This is the most popular size for snaring.
 - 7/64" - Coyote, Bear Cub, Small Alligator, Wild Hog, Wolf
 - 1/8" - Coyote, Bear, Alligator, Wild Hog, Wolf
 - 5/32" - Bear, Alligator, Wild Hog
 - 3/16" - Large Bear
- Cable length: Smaller animals require smaller loops and the cable can be quite a bit shorter.
 - 30" - Mink, Squirrel, Rabbits, etc
 - 33" - Beaver or fox.
 - 42" - 48" - Raccoon, Fox, Bobcat, Badger, Rabbit, Opossum, Ground Hog
 - 5' - Raccoon, Fox, Beaver, Coyote. This is the most popular length.
 - 7' - Coyote, Beaver, Wild Hog
 - 8' - Wolf, Wild Hog
 - 10' - Bear, Alligator, Wild Hog

There are some other components you will need to buy besides cable if you

are making your own snares:

- Lock: Prevents the snare loop from opening after the animal is caught in the loop.
- Support wire: 14 to 9 gauge wire (stiff, yet bendable - you can also use a metal clothes hanger) that attaches to your anchor (e.g., tree trunk or stake) and supports your snare cable. The support wire is bent to place your snare loop in the most optimal position.
- Support collar: This piece attaches to the cable and provides a connection site for your support wire. You can bend your support wire to hold up your cable without using a support collar.
- Steel cable ends or aluminum stops: These are located at each end of the snare cable and hold everything together.
- Swivels: These permit the cable to twist around the swivel thereby preventing kinks in the cable as the trapped animal struggles to get away.
- Deer stop: These prevent the snare loop from closing completely, so a deer can remove its leg from the loop to escape

To set up a basic snare:^[279]

- Select the location where you want to set up your snare.
- Secure the anchoring end of your snare cable and also your support wire to your anchor (e.g., tree trunk or stake, etc).
- Adjust the loop in your snare cable to the appropriate diameter for the animal you want to trap.
- Connect your support wire to your snare cable either using the support collar if available or by bending the support wire to cradle the cable.
- Bend the support wire to position your cable in the proper location and height above the ground in the center of the animal's path. The height of the loop above the ground will depend upon the size of the animal you want to trap. You are creating a hangman's noose for the animal to walk into.

Dyann Joyce wrote an article with illustrations that nicely details numerous snare techniques.^[280] Here are a couple of books that provide more information about trapping for survival:

- Angier, Bradford and Young, Jon. "How to Eat in the Woods: A Complete Guide to Foraging, Trapping, Fishing, and Finding Sustenance in the Wild." Black Dog and Leventhal. New York City, New York. March

15, 2016.

- Livingston, Eustace Hazard. “The Trapper’s Bible: The Most Complete Guide on Trapping and Hunting Tips Ever.” Skyhorse Publishing. New York. 2012.

Seeds

Including seeds in your Long-Term BOB is something for you to consider to cover the possibility that an emergency becomes extended. Seeds are compact, lightweight, easy to transport, relatively inexpensive, have a long shelf life, and can provide you with a long-term food source. Seeds provide you with the ability to grow a survival garden to satisfy your nutritional needs for vitamins, carbohydrates, and protein. They can help feed you during times when your hunting and fishing efforts are unsuccessful. And, you can use them to barter with other people for supplies.

There are different types of seeds:[\[281\]](#), [\[282\]](#)

- Open-pollinated seeds: These are seeds from plants that are naturally pollinated with the help of pollinating insects, wind, rain, or in some cases by self-pollination. Harvesting these seeds permits new growth identical to the parent plant (“true to type”) year after year. Cross-pollination between two different open-pollinated plants occurs in nature.
- Hybrid seeds: Most seeds today are hybrids formed by the manual pollination of two parent plants of the same species to develop a plant with desired characteristics. Most hybrids are sterile and do not form seeds. Those that can reproduce produce plants that are not “true to type” meaning that they differ from the parent plant. Hybrids are denoted by F1, F2, F3, etc where the number refers to the generation with F1 being the direct product (first generation) of the parent plants.
- Heirloom seeds: These seeds pass through multiple generations spanning at least 40 years using open pollination. The plants naturally develop favorable characteristics over this time such as the ability to thrive in certain climates and environments as well as resistance to diseases and insects. These seeds can be planted year after year and they often taste better and are hardier than other seed types. They are never hybrids or GMO’s. They tend to be less costly than hybrid seeds. If you plan to save seeds from heirloom plants, be sure to avoid planting them near other plants because cross-pollination can occur through open

pollination.

- GMO (Genetically Modified Organisms) seeds: GMO's are created by gene splicing in the lab for large volume commercial use. The plants are engineered to have certain desirable traits like drought tolerance and resistance to insects. They are made to be sterile forcing farmers to buy new seeds every year. These seeds are expensive and only available in bulk quantities.

You'll want open-pollinated seeds for your survival purposes so seeds from each crop can be saved and planted for upcoming seasons resulting in the same yield and quality. That means you'll want open-pollinated or heirloom seeds.^[283] An alternative is to store seeds of perennials, which grow back on their own annually. Examples include Asparagus, Jerusalem artichokes, horseradish, garlic, and herbs.^[284] You can collect your own seeds and then process and store them. You have an endless supply of seeds if you collect seeds from your own garden each year. Place your seeds into individually sealed and labeled bags. Store them in a cool, dark location. You can store them in your freezer to increase their longevity. The germination rate (i.e., the percentage of seeds in a given batch that grow) for your seeds steadily decreases during storage. Keep your seeds fresh by rotating them out regularly with new seeds of the same variety.^[285], ^[286]

You can buy a commercial survival seed bank if you prefer not to harvest your own seeds or if you currently have no garden to harvest. Popular brands include:

- Open Seed Vault Survival Garden 32 Variety Pack Heirloom Vegetable Seeds (see below)
- Heritage Survival Seed Vault Heirloom Seeds (\$129.99 on Amazon.com)
- Survival Essentials 135 Variety Heirloom Survival Seed Bank (\$140.94 on eBay)

Some of these seed banks include seeds that can grow in a variety of regions and climates. They are packaged in Mylar® bags or plastic containers. They will last about five years in storage if kept cool and dry. They will last even longer in a freezer. Once you plant your seeds, they will produce more seeds that you can harvest and replant. You can repeat this process over and over again to maintain a continual supply of food.^[287], ^[288], ^[289]

Item name: Item name: Survival Garden 15,000 Non-GMO Heirloom

Vegetable Seeds, 32 Variety Pack by Open Seed Vault

Vendor: Open Seed Vault on Amazon.com

Webpage URL: <https://amzn.to/34Jvna7>

Price: \$49.95

Weight: 3.2 ounces

Size: 5.5x8.25 inches

Material: Assorted seeds.

Appropriate for which BOBs: Short, Medium, Long

Comments: 32 Varieties of All Natural Vegetable Seeds: Non-hybrid, Non-GMO, Heirloom. 100% Naturally Grown and Open Pollinated seeds with high Germination Rate. Vegetable Growing and Seed Harvesting Guide Included with Seeds Tested for Maximum Germination and Yield. USA Seeds Stored in Air Tight, Moisture Proof Resealable Bag for Safer, Long Term Storage. Carefully Selected Seed and Vegetable Varieties to Provide a Well Balanced Healthy Diet. EACH PACK CONTAINS THE FOLLOWING 32 SEED PACKETS:

1. Tomato Beef Steak ~ 180 seeds
2. Eggplant Black Beauty ~ 80 seeds
3. Green Bean Tendergreen Improved ~ 20 seeds
4. Zucchini Black Beauty ~ 25 seeds
5. Lettuce Buttercrunch Butterhead ~ 2280 seeds
6. Lettuce Ruby Leaf ~ 2280 seeds
7. Lettuce Black Seeded Simpson ~ 2280 seeds
8. Brussels Sprouts Long Island ~ 230 seeds
9. Bell Pepper California Wonder ~ 40 seeds
10. Radish Cherry Belle ~ 180 seeds
11. Okra Clemson Spineless ~ 50 seeds
12. Beet Detroit Dark Red ~ 180 seeds
13. Onion Evergreen Bunching ~ 200 seeds
14. Cabbage Golden Acre ~ 280 seeds
15. Corn Golden Bantam ~ 45 seeds
16. Cantaloupe Hales Best Jumbo ~ 20 seeds
17. Watermelon Sugar Baby ~ 30-35 seeds
18. Kale Vates Blue Scotch ~ 280 seeds
19. Lima Henderson ~ 15 seeds
20. Swiss Chard Giant Fordhook ~ 90 seeds
21. Cucumber Marketmore ~ 40 seeds

22. Spinach Bloomsdale ~ 130 seeds
23. Carrot Scarlet Nantes ~ 1750 seeds
24. Turnip Shogoin ~ 430 seeds
25. Pumpkin Sugar Pie ~ 15 seeds
26. Cauliflower Snowball Y ~ 280 seeds
27. Pea Sugar Daddy ~ 25 seeds
28. Broccoli Waltham ~ 330 seeds
29. Winter Squash Waltham Butternut ~ 25 seeds
30. Sunflower Mammoth ~ 20 seeds
31. Parsnips All American ~ 250 seeds
32. Celery Tall Utah Improved ~ 3000 seeds

Here are some factors to consider when choosing what seeds to store:[\[290\]](#), [\[291\]](#), [\[292\]](#)

- Which are the plants that grow best in the area?
- How long is your gardening season?
- What is your experience level? Some plants are easier to grow than others.
- Focus on plants that deliver calorie-dense foods.
- Select seeds that produce food that provide you with adequate vitamins, protein, carbohydrates, and fat.
- Select plants that produce food in the shortest time and in the smallest space.

Seeds yield foods with different magnitudes of calorie density:[\[293\]](#)

- Green beans: 140 cal/lb (calories per pound)
- Acorn squash: 220 cal/lb
- Peas: 330 cal/lb
- Corn: 340 cal/lb
- Potatoes: 340 cal/lb
- Yams: 460 cal/lb
- Pinto and navy beans: 570 cal/lb

Here are some tips to fulfill your nutritional needs when you select your seeds:[\[294\]](#)

- Protein sources: Beans, peas, and grain
- Carbohydrate sources: Starchy vegetables (e.g., potato, sweet potato, corn, peas, pumpkin, winter squash)
- Fat sources: Oil seeds (e.g., sunflower, soybean)

- Fiber: Beans, peas, potatoes

If you are an inexperienced gardener, stock seeds of some favorite beginner garden varieties like radishes, Swiss chard, lettuce, carrots, squash, zucchini, cucumbers, cabbage, and beans. Here is a list of some seeds for you to consider adding to your seed vault. They offer you good nutritional value and are easy to grow. There is probably something here for just about everyone's taste, so survival does not have to mean deprivation:[\[295\]](#), [\[296\]](#), [\[297\]](#), [\[298\]](#)

- Allium varieties: Examples include onion, garlic, scallion, shallot, and leek. Provide fiber, vitamin B6, vitamin C, folate, and potassium
- Berries: Rich in antioxidants, vitamin C
- Beans: Beans are very high in fiber, calcium, vitamins A, C, and K. They are a good source of proteins. They store easily for long periods. Common varieties of beans include pole, kidney, and bush beans. Pole beans produce almost twice the yield of bush beans. Bush beans yield about two months after planting. Pole beans take longer to yield but continue to yield for a longer duration.
- Beets: Multiple plants can be located inches from one another. This cool-season vegetable can survive frost and it's ready to harvest two months after planting. They provide 20% of your folate and 14% of your manganese daily requirements.
- Broccoli: It's a good source of protein, vitamins A and K, and carbohydrates. It yields vegetables three months after planting. It can be planted one per square foot. Yield is extended by smaller heads arising from every side after the main head is harvested.
- Carrots – It's a good source of carbohydrates, vitamin A and C. Yields food 2.5-3 months after planting. They can be harvested year-round if you stagger the timing of planting the seeds.
- Corn: It's a warm-weather crop and it is a good source of proteins, carbohydrates, and calcium. It provides greater yield than small grains like wheat. Each stalk produces 1-2 ears of corn. You can store sweet corn for up to 3 years.
- Grains: They're a good source of carbohydrates, fiber, and manganese
- Kale: Excellent source of vitamins A, C, K, folate, and riboflavin. Also, a rich source of calcium, iron, and manganese. It grows well in all kinds of soils. Yields about two months after planting.
- Lettuce: Rich in vitamins A and K. Provides moderate amounts of vitamin

C and folate. Can be grown anywhere. Yields fast after planting. There are several types of lettuce, each with different nutritional characteristics.

- Peanuts: Protein and fat-rich legume. Good source of folate, niacin, pantothenic acid, pyridoxine, thiamin, vitamin E, copper, iron, magnesium, phosphorous, and zinc. Can be planted six inches apart. Yields four months after planting. Grows well in the warmer Southern states
- Peas: Green peas are a good source of fiber, protein, carbohydrates, iron, manganese, zinc, pyridoxine, folate, niacin, thiamin and vitamins A, C, and K. They are one of the easiest vegetables to grow. They can be planted at the same time as potatoes, and they are resistant to frost. Most varieties of peas are fast-growing and high-yielding. They're ready to harvest two months after planting. Being cool-season crops, snow peas can be grown in winter and spring.
- Peppers: High in vitamins A and C. They grow well in warmer months and are ready to harvest 2-3 months after planting.
- Potatoes: Good source of carbohydrate, potassium, and vitamins B6, C. It's a calorie-dense food and provides a moderate amount of fiber and protein as compared to other vegetables. A single plant yields about 4-5 small potatoes. Store some of the best potatoes in a cool, dark place to serve as seed stock for another batch of potatoes next season.
- Pumpkin: Excellent source of fat, protein, and fiber. Rich in copper, iron, magnesium, manganese, phosphorus, zinc, and vitamin E. Also, provides a good amount of folate, niacin, pantothenic acid, riboflavin, thiamin, and potassium. Substantial yield 3-4 months after planting. Stores well.
- Radish: Fast-growing, ready to harvest 20-30 days after planting. High in vitamin C while providing a moderate amount of vitamin E.
- Soy: Rich in protein, omega-3 and omega-6 fatty acids, fiber, folate, riboflavin, thiamin, potassium, copper, and vitamin K. Also, high in pyridoxine, pantothenic acid, and calcium.
- Spinach: High in vitamins A and C, iron, thiamine, and folate. Moderately high in potassium, pyridoxine, riboflavin, and vitamin E. Grows in cool temperatures and requires regular moisture.
- Sunflower: Excellent source of fat and calories. Provides a good amount of protein and fiber. Rich in pyridoxine, thiamin, and vitamin E. High

in folate, niacin, pantothenic acid, riboflavin, and potassium. They are low-maintenance. Capable of growing in poor soil as long as they receive adequate sunlight. Plant in springtime. The large seed heads of each plant will give a substantial quantity of tasty seeds.

- Swiss chard (silverbeet): Extremely rich in vitamins K and A. Also, a good source of vitamins C and E, copper, iron, magnesium, and manganese. Fast-growing. Tasty leaves. Ready to harvest two months after planting.
- Tomatoes: Tomatoes are a good source of vitamin A and C. Provides smaller amounts of manganese, iron, phosphorus, folate, niacin, pyridoxine, and vitamin E.
- Winter squash: They include pumpkin, acorn squash, butternut squash, spaghetti squash, and buttercup squash. Low in calories and fat. Rich in vitamins A, B6, C, and E, magnesium, potassium, and manganese. These are harvested in the fall, but will keep through the winter. High-yield and easy to grow. Can be stored for an indefinite amount of time if dried and placed into water-tight containers.

Here are some places you can buy heirloom seeds for individual plants if you want to customize your survival seed collection rather than buying a commercial seed vault:[\[299\]](#), [\[300\]](#)

- Baker Creek: <https://www.rareseeds.com>
- Seeds Savers Exchange: <https://www.seedsavers.org>
- Johnny's Seeds: https://www.johnnyseeds.com/vegetables/?prefn1=prod_feature_seed_type&prefv1=4

You can employ intercropping, which is the technique of growing different plants together rather than in separate plots of land. It improves yield especially when space is limited. It serves as “insurance” because of the likelihood that something will grow to provide you with food even if some plants do not survive. Corn, beans, and squash are known as “The Three Sisters” and mix cropping with them began possibly 5,000 years ago.[\[301\]](#)

The nutrients required by all plants include:[\[302\]](#)

- Nitrogen
- Potassium
- Phosphorus
- Other important nutrients that crops may require include: Magnesium,

sulfur, calcium, iron

Compost is a means to maintain a continuous supply of nutrients in the soil. You can create a compost pile using discards from your cooking and thereby make one of the most popular natural fertilizers for your garden. Some animal-based natural fertilizers include bone meal, fish meal, blood meal, and chicken meal.

In a mass disaster, there will most likely be many others like you who will be escaping their environs. Many of you may end up in the same area. Some of the people that are inclined to steal from others during normal times may escape to somewhere near you. They may scout the area looking for food or other items to take for themselves. Rick Austin's book, "Secret Garden of Survival" details how you can camouflage your garden making it blend into its surroundings and protect it from looters and thieves. [\[303\]](#)

All of your survival gardening work will be made easier if you have a shovel. That is one more reason why you should consider including a survival shovel with your Long-Term BOB. You should also keep one in your vehicle so you'll be able to access it even for your short-term survival needs. You'll find information about survival shovels at the end of the Tools chapter.

SHELTER ITEMS

Items covered in this chapter include:

- Garbage bags
- Plastic painting dropcloth
- Solar blanket
- Emergency blanket/tarp
- Poncho
- Bivy sack
- Tarp
- Tent
- Hammock
- Mosquito Nets

Shelter items are essential for your BOBs. It's frequently stated that you can survive only 3 hours without shelter if exposed to nature's elements. Three hours is a short time. How can that be? You can quickly die from hypothermia or hyperthermia.

Hypothermia occurs when your core body temperature drops to 95 °F or lower. It occurs when your body loses more heat than it can generate. You experience shivering initially and difficulty with fine motor skills. You progress to fatigue, confusion, loss of consciousness, and death. Hypothermia occurs more quickly when you're exposed to wind and rain. Being wet drastically increases heat loss. Wet clothing results in five times greater heat loss while being immersed in water results in a 25 times increase in heat loss compared with being dry. You may work up a sweat even in cold temperatures while physically exerting yourself in a survival situation. It is important to dress in clothes that wick perspiration away from your skin as well as wear outer layers of clothes that allow water vapor to escape so you stay dry. [\[304\]](#), [\[305\]](#)

On the other extreme from hypothermia, you can die from over-heating in a

hot environment especially if you are vigorously active trying to survive. You can initially develop heat exhaustion as your core body temperature rises. You may experience headache, nausea, vomiting, fatigue, and muscle cramps. This progresses to heat stroke or hyperthermia when your core body temperature reaches 105 °F. At that point, you'll suffer from confusion or unconsciousness followed by tissue destruction damaging vital organs including the heart. The end result is death.^[306] Your risk of developing hyperthermia increases as the temperature rises. A shelter that provides you with shade is important because the heat index value can be up to 15 °F greater under direct sunlight compared with being in the shade.^[307]

It's often stated that you can survive three days without water and three weeks without food. So, you can even perish faster if you lack shelter than if you're without water or food when faced with extreme environmental conditions. You can build a shelter from materials you find in your environment. Make your shelter small since it takes less time to build and will retain your heat better than a larger shelter. Any shelter you have to build will take valuable time and energy; you want to conserve both in an emergency. So, everyone must pack some shelter items to help them survive. What you choose to pack will depend upon your circumstances. The most simple shelter items are the clothes you wear (e.g., hat, jacket, gloves, etc) and those are discussed in the Clothes chapter. Here, we'll review some common shelter items beginning with the most basic and then progressing to more formal shelters.

Garbage Bag

The most basic shelter items are the clothes you're wearing. Beyond that are things that you place over yourself for protection against the elements including sun, wind, rain, or snow. If you are escaping with a very light pack, then you might consider bringing one or two construction grade 42 to 55-gallon garbage bags to serve as a minimal shelter item. They are light and take up very little space in your pack. Of course, higher mil bags will be heavier and take up more space than lower mil bags. If weight and space are a priority, then you can select a lower mil bag, but you'll be giving up strength and durability. Garbage bags are rated by their thickness in mil (1 mil equals 1/1000 inch thickness) with higher mil equating to higher strength. Here is a rundown on available bags^[308]

- Standard strength: 0.7-1.1 mil. For general food and office waste.

- Heavy strength: 1.2-1.7 mil. For everyday trash. Puncture resistant (e.g., sticks, items with sharp corners)
- Extra heavy strength: 2.0-2.7 mil. For heavy trash. Resists tears from sharp edges (e.g., broken glass)
- Contractor strength: 3.0-6.0 mil. For super heavy rough trash (e.g., construction debris). Great tear resistance.

You might consider carrying garbage bags as your stand-alone shelter item for your Short-Term BOB. Garbage bags are still worthwhile to include in your Medium- and Long-Term BOBs because they have many other uses besides for shelter. However, it is better to also pack more substantial shelter items with your longer-term bags.

Ways you can use garbage bags for shelter include (some techniques work better if you combine 2 garbage bags):

- Making a rain poncho (Note: Garbage bags are impermeable to water and water vapor, so they can make you wet by not permitting water vapor to escape if used as a rain poncho or a sleeping bag.)
- Create a sleeping bag
- Covering your pack
- Making an overhead cover either by draping it over branches or using a ridgeline
- Making a tube tent
- Making a lean-to

Item name: 55-60 Gallon Contractor Bags

Vendor: Plastic Place

Webpage URL: <https://bit.ly/38Thesz>

Price: \$46.79 for 1 case containing 50 bags

Weight: 7 ounces

Size: 38x58 inches

Material: 3.0 mil of low-density plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: Low-density resins are both strong and flexible, and at this thickness, bags can cope with anything from nails to jagged glass or splintered framing. Each bag is sealed with a carefully reinforced gusset seam. Bag volume capacity 55-60 gallons. Standard, twist-tie.

Plastic Painting Dropcloth

Plastic painting dropcloths are inexpensive, compact, and lightweight. They have numerous applications when you are in a disaster situation including keeping your woodpile dry, collecting rainwater, forming the top of a solar still, and creating the walls of a greenhouse. They can also be used to create temporary shelters if you need to put together something fast that is waterproof. One specific type of shelter they can be used for is to create the front of a super shelter (greenhouse principle of retaining heat in an enclosed structure with a transparent wall) as described by Mors Kochanski.^[309] ^[310]

Plastic painting cloths consist of a polyethylene film and are usually clear or black. They generally range from 3-6 mil in thickness and common sizes are 10x25 feet and 20x25 feet.^[311]

Item name: Plastic 10-ft x 25-ft Drop Cloth

Vendor: Lowes

Webpage URL: <https://low.es/2KDruwM>

Price: \$11.98

Weight: Not specified

Size: 10x25 feet

Material: Plastic sheeting

Appropriate for which BOBs: Short, Medium, Long

Comments: 3.5 mil clear sheeting. 250 square feet.

Emergency Solar Blanket

There are lots of emergency solar blankets on the market. They are made of Mylar® which consists of a thin plastic sheet on to which vaporized aluminum is deposited creating a reflective surface. It was designed for use by NASA in 1973 to direct the sun's heat away from the orbiting Spacelab space station. It functions in a survival situation by reflecting from 70-90% of your body heat back toward you. Some reasons why they are so popular as survival items include:^[312]

- They are inexpensive. You can buy a basic one for under \$1.00. More durable versions are available at extra cost.
- Lightweight: 2-2.5 ounces for the basic style
- Compact: About the size of a deck of cards when folded. Basic ones are 52-54 inches wide and 82-84 inches long unfolded.
- Waterproof
- Windproof

Some disadvantages of these emergency blankets include:

- Fragile. Tear easily. For short-term use as a blanket.
- Moisture does not permeate through them, so you can become damp or wet when wrapped beneath them
- Noisy
- The aluminum coating can wear off

There are numerous ways an emergency solar blanket can be helpful as a part of your survival shelter:

- As ground cover beneath your sleeping bag to protect against moisture and cold
- As the back wall to your shelter to reflect heat on to you from your body and a fire built in front of your shelter
- As a covering over your makeshift shelter to offer protection against wind and rain
- As a covering over your shelter to reflect the sun's heat
- Placed beneath your hammock to serve as insulation from drafts and cold air
- Placed on the outside of your shelter, it will make your shelter more visible to rescuers
- Use to collect rainwater

Item name: Science Purchase 73MYLARPK20 Emergency Mylar Thermal Blankets, 54" x 84" (Pack of 20)

Vendor: Electronix Express on Amazon.com

Webpage URL: <https://amzn.to/34O0xgD>

Price: \$17.99 for a package of 20

Weight: 1.44 ounces

Size: 54x84 inches unfolded size for each blanket

Material: Mylar

Appropriate for which BOBs: Short, Medium, Long

Comments: Consistently Retains and Reflects 90% of Body Heat.

Individually Sealed Packaging. Folded to Compact Wallet Size For Easy Storage.

Emergency Blanket/Tarp

While emergency space blankets are cheap and almost one-time use items, emergency blankets are a step up in durability and cost. Emergency blankets

are thicker, heavier, and stronger than emergency space blankets. They usually include grommets at each corner and sometimes along the sides, so they can be tied down to function as a small tarp (see the section below about Tarps). They can perform all of the functions of an emergency space blanket, but they are durable enough to be reusable.

Item name: UTOOL Extra Large Heavy Duty Emergency Blanket,
Waterproof Insulated Tarp

Vendor: UtoolDirect on Amazon.com

Webpage URL: <https://amzn.to/34NbzTD>

Price: \$19.97

Weight: 1.25 lb

Size: 60x84 inches

Material: Three layers consisting of nonwoven fabric on the outside surface (for heat retention), polymesh in the middle (increases tensile strength drastically, reduces tearing), and aluminized Mylar® on the inside surface (gas and moisture-proof, heat retention and reflection, impact-resistant)

Appropriate for which BOBs: Short, Medium, Long

Comments: 3-layer thickened materials, reusable and tough enough under the heavy rain or wild wind even for first aid. Four reinforced grommets at the corners + waterproof and windproof, functions as a lean-to shelter, tarp or ground cover. 93% heat retention, reflects the sunlight for a signal and keeps warm. Four metal stakes are included. 100% money-back guarantee.

Poncho (also mentioned in the Sleep and Clothes chapters)

Military ponchos can play an important role in your BOBs. Besides serving as a raincoat, they can be used for many other things including ground cover, sleeping bag, tarp, water carrier, stretcher, collect rain, carry satchel, protect you from the elements (sun, rain, wind), hammock, blanket, pillow, make a solar still, sling, hold cold water or snow to make a cold compress, or use as a sail. ^[313]

Be sure that you get a poncho that has:

- Snaps on its sides joining the front and back halves together. Unsnapping the poncho will allow it to open up and serve as a tarp. You can also snap multiple ponchos together to create a larger shelter.
- Grommets on its hem. The grommets permit you to tie down your poncho when it is unsnapped and opened up.

- Ripstop nylon fabric to make it harder to tear.
- Waterproof coating.
- Large enough to cover you while you're carrying your backpack on your back. Most ponchos come in one size. Select the most optimal size for you if there are size options.

Note: Poncho liners are discussed in the Sleep Items chapter.

All you need is some cordage and you can use your poncho to quickly make a simple shelter:^[314], ^[315]

- Basic lean-to
- Ridgeline lean-to
- A-frame
- Plow point

Some downsides to a poncho:

- Most of them do not breathe well, so moisture will accumulate beneath them
- They can flap around and be blown upwards by wind. A drawstring around the waist will limit the amount the poncho will flap upwards

Item name: Mil-Tec Ripstop Wet Weather Poncho, Multi-Use Bivouac Sack, Emergency Shelter Tent

Vendor: Military_1st on Amazon.com

Webpage URL: <https://amzn.to/3nRSF5u>

Price: \$40.95 plus \$4.99 shipping

Weight: 1.72 lb

Size: 56x90 inches

Material: 100% Polyester waterproof ripstop, polyvinyl chloride coated

Appropriate for which BOBs: Short, Medium, Long

Comments: Drawcord hood, Matching carry pouch. Six Brass Eyelets and Press Studs. Available in seven different colors and patterns.

Bivy Sack

A bivy sack refers to bivouac, which is a temporary encampment usually in an area without shelter. It's also known simply as a bivy. They started as waterproof sleeping bag covers. Over time, bivies have transformed into more formal compact shelters akin to short height tents. They can increase your warmth by 5-10°F. Bivies protect you from rain and insects. A bivy's

bottom is usually waterproofed by coating nylon with urethane similar to the floor of a tent. The top of bivies is generally constructed of ripstop nylon treated with a waterproof, breathable laminate (e.g., Gore-Tex®). Some have an enlarged, enclosed head area. The main advantage of bivies is that they are compact and easy to pack. The main disadvantage is that they are very small with space only enough for you and your sleeping bag. Even your backpack will have to be kept outside your bivy. Bivies are most appropriate for short escapes. Some factors to consider when you select a bivy include:^[316], ^[317], ^[318]

- Size and weight. A head hoop adds weight and bulk.
- Waterproof
- Good air circulation. Higher breathability sacrifices some degree of waterproofing.
- High-quality materials
- Rain and weather-resistant
- Multiple zippers that allow armhole openings and multiple ventilation options
- Sleeping pad stabilization straps
- Price

Item name: Outdoor Research Alpine Bivy

Vendor: REI Co-op

Webpage URL: <https://bit.ly/3hoi9EQ>

Price: \$250.00

Weight: 1 lb 5.5 ounces

Size: 26 inches shoulder width, 84-inch length

Material: 3-layer GORE-TEX® Respiration Positive fabric.

Appropriate for which BOBs: Medium, Long

Comments: 3-4-season. Protects from rain and snow without collecting interior condensation. All seams are taped to ensure waterproofness.

Overlapping zipper-opening lets you breathe freely without letting in the weather. A single pole can be used to create overhead space or left at the trailhead to save weight.

Tarp

A tarp is simple, inexpensive, compact, lightweight, and has a multitude of uses. It is something to consider for your Medium- and Long-Term BOBs. It can be used for all of the things previously described for emergency solar

blankets and emergency blanket/tarps, but it's larger and more durable. A tarp for a single person used as a shelter should be 8x8 feet or larger. Tarps are lighter, smaller, less expensive, and can be used for more purposes than a tent. In a survival situation, tarps can be used to construct a life-saving shelter much faster than utilizing things you find in nature. The downsides of using a tarp as a shelter as compared with a tent are that you'll be more exposed to weather, there is no inherent protection from the ground, it requires more skill to set up as a shelter, and you'll be exposed to insects and snakes.

The reference list in the back of this book lists the following additional references that provide you with information about using tarps to create shelters:

- Jardine, Ray. "The Ray-Way Tarp Book Essential." AdventureLore Press. Danville, New Hampshire. 2011.
- Stewart, Creek. "Pocket Field Guide: Survival Tarp Shelters." Dropstone Press. Anderson, Indiana. 2016.

Tarps are made of a variety of materials including:^[319], ^[320]

- Plastic: Most common. Relatively inexpensive. Waterproof. Generally, UV treated. Strength and durability vary. Usually have a polyethylene film and more layers provide greater durability.
- Nylon (polyamide): Exceptionally strong, abrasion-resistant, resistant to damage from oil and many chemicals. Melts then burns rapidly. Low moisture absorbency. Light weight. Compact.
- Polyester (polyethylene naphthalate): Strong, resistant to stretching and shrinking, resistant to most chemicals, crisp and resilient wet or dry, abrasion-resistant. Melts and burns simultaneously. Quick-drying. Lightweight.
- Tyvek®: It's a plastic (flashspun high-density polyethylene fibers). Often used to protect buildings under construction. Water vapor passes through it, but liquid water does not. Resists tearing. Lightweight, chemical resistant. Opaque. Looks like paper.
- Visqueen: A brand of polyethylene plastic sheeting (typically low-density polyethylene). Often used for painting drop cloths, to line ponds, and for greenhouses. Available in clear, opaque, blue, and black.

Sheets of Tyvek® and Visqueen are inexpensive, but they do not come with grommets. Survival tarps need to have grommets or tie-out loops as tie-down

sites. You need a tarp that is strong and durable. Grommets may tear out. Tie-down loops are sewn often with reinforcing fabric to distribute tension from a rope over a broader area reducing the chance of tearing. It's important that there are tie-downs along all of the edges and not only at the corners. Tarps often come with a waterproof coating, which can wear off over time creating water leaks. Square tarps can be used for more types of shelters than rectangular tarps. You want to strike a balance between compactness, weight, and durability. Generally, lighter tarps will be less durable.^[321]

Item name: AquaQuest Safari Tarp

Vendor: Gear Out Here USA on Amazon.com

Webpage URL: <https://amzn.to/3rv1t3p>

Price: \$109.99

Weight: 2.1 lb

Size: 10x13 feet open. Packed size 4x5x11 inches. Compressed size: 2x5x5 inches.

Material: 70D nylon fabric + Non-toxic dual Silicone and PU coating

Appropriate for which BOBs: Medium, Long

Comments: 100% WATERPROOF - The AquaQuest Safari tarp will keep you completely dry, even in extreme weather. 5000mm waterproof rating. With dual coatings of non-toxic Polyurethane and Silicone you can be absolutely certain that not a single drop of water will get through your tarp. LIGHTWEIGHT and COMPACT - At only 2.1 lbs, you'll hardly notice you're carrying it. The Safari packs up so small that you can fit it in almost any space. Complete with its own convenient stuff-sack. 19 reinforced webbing tie loops in and around the perimeter, 2 lantern loops, and a total coverage of 122 sq ft. The AquaQuest Safari gives you the perfect balance; it is very lightweight, yet also durable and resilient to the forces of nature. It is essentially a cross between two of Aqua Quest's best-selling tarps - the ultralight 'Guide' and the heavy-duty 'Defender'. AquaQuest products are backed by a Lifetime Warranty.

Tent

A tent will provide you with the best protection against weather, insects, and snakes. A tarp will serve you adequately as a means of short-term shelter and should therefore be a serious consideration for your Medium Term BOB. An experienced survivalist can use a tarp for long-term survival and create a more permanent shelter out of items found in nature. A tent is an easier and

more comfortable long-term shelter. In an extended survival situation, a tent will eventually break down, but it should last plenty of time to permit you to build a more permanent shelter out of items found in your locale. As an aside, it is worthwhile packing a tarp (if you have space) even if you bring a tent because a tarp has so many uses including serving as a backup shelter.

Tents have three major configurations:[\[322\]](#), [\[323\]](#)

- Freestanding tents: These tents stand up on their own without needing to be staked out. Stakes are still a good idea so your tent will be anchored to withstand wind. Rain flies must generally be staked to create a vestibule. Support is derived from tent poles. These tents can be lifted and moved around while maintaining their shape. Most of these tents have a separate outer, waterproof rain fly over an inner, breathable (but, not waterproof) tent body, which means that they have a double wall. The double wall and pole support combine to provide the best protection against wind and rain. A few of these tents are designed with a single, waterproof wall; these tents have low breathability.
- Non-freestanding tents: These tents need to be staked out first and then one or more poles are used to prop them up. They require fewer pole sections. Most are single wall, lightweight, and compact. Some have double walls. They provide less headroom and weather protection than freestanding tents.
- Semi-freestanding tents: These tents are less common than the other two types of tents. A pole similar to freestanding tents supports them, but they also need to be staked out for the tent to reach full size and to achieve a rigid frame.

Tent manufacturers list two weights:[\[324\]](#), [\[325\]](#)

- Packaged weight: Includes tent body, rain fly, poles, footprint, stakes, guylines, stuff sack, and anything else in the manufacturer's package.
- Minimum weight (also known as trail weight): Includes tent body, rain fly, and poles. Does not include stakes, guylines, or stuff sack.

Your tent usually weighs more than anything else you pack. Some generalizations for 2 person tents are as follows:

- Heavy/midweight: >4.5 pounds. Most room. Most durable. Does not utilize the lightest weight materials. Cheaper. 4 season tents fall in this weight range.

- Lightweight (also known as backpacking tents): 3-4.5 pounds. Full features. Thinner, lighter materials. More costly. Mostly for 3 season use
- Ultralight: 2-3 pounds. Less interior space. Tapered dimensions, simplified pole structures, lower head height, smaller vestibules, fewer features.
- Crazylight: Less than 2 pounds. Thinnest materials. Non-freestanding, single wall designs.

Factors to consider when choosing your tent:[\[326\]](#), [\[327\]](#), [\[328\]](#), [\[329\]](#), [\[330\]](#), [\[331\]](#), [\[332\]](#)

- Weather protection: Taped seams provide protection. Freestanding tents are better at protecting against wind and rain because most are double-walled with an outer rain fly. A rain fly is a fabric cover that goes over your tent to provide wind and rain protection. It can be full or partial coverage. Full coverage is better at blocking wind and rain. Rain flies are commonly made of nylon or polyester. Nylon is cheaper, but it absorbs more water and is heavier when wet. Polyester is more expensive, absorbs less water making it weigh less when wet, and dries faster when wet. Stronger poles and many guylines provide wind resistance.
- Waterproof: Waterproof rating of at least 2000mm means the tent can withstand 2000mm of water on top of it before it begins to leak. It can tolerate most storms.
- Footprint: Most water leakage comes from the ground at the bottom of the tent. A footprint is a waterproof material that is placed between the ground and your tent to keep water out. It also provides insulation and protection against puncture or tearing of your tent's floor. Be sure to get one designed for your tent so it matches the shape of your tent and its grommets will directly attach to the tent's poles. You can use a tarp or section of Tyvek® or Polycryo material if you do not have a formal footprint.
- Ventilation: Double-wall tents have an inner wall made of breathable mesh fabric, which allows these tents to breathe much better when the rain fly cover is opened. Rain flies are waterproof and have low breathability. Ventilation can be improved by having rain fly vents at the top of the roof and also space between the lower edge of the rain fly and the tent body. Single wall tents must be made of waterproof

fabrics, which are less breathable.

- Shape and color: Low profile aerodynamic shape is best for windy locations. Natural color or camouflage is best if you want to blend into your surroundings. A bright color is better if you want to be seen by rescuers
- Weight and packed size: Non-freestanding tents weigh much less and pack much smaller than freestanding tents. Ultra-light models cost more and are less durable. Lighter is better even if you are escaping by car since you may have to leave your car on foot at some point. Try to get a tent in the 3-5 lb range.
- Appropriate for your locale's climate: You can get a lighter two or three season tent versus a four season tent if your locale does not become very cold in the winter.
- Winter tent (four seasons): Made of thicker materials. Insulation. Removable rain fly to make it cooler in the summer. They have stronger frames. They can hold up to high winds and snowfall. They have angled sides to shed snow. They have vents to release water vapor. They are heavier than three season tents.
- Interior space: Some tents are narrower and lower at the feet than the shoulders (referenced with a person lying down) to save space and weight. Most backpacking tents have a peak height of around 40-42 inches. The walls of newer freestanding tents have a more vertical profile due to their pole design pulling the fabric outward. Ultra-light, non-freestanding, and cheaper tents have a more A-frame profile that results in much reduced interior volume.
- Number of occupants. You can get a two-person tent just for yourself so you have room for your gear. The trade-off is extra weight.
- Durability: More durable tents are made of heavier, thicker fabrics that have higher denier (D) ratings). Thinner fabrics are lighter but less durable. Adding multiple layers of silicone is an expensive method that increases strength without significantly increasing fabric thickness or weight. High denier floors that extend up against the wall helps prevent leaks and tears. (Note: Do not wear shoes or boots inside your tent. Dirt and debris on shoes will abrade and accelerate wear to the tent's floor.) Greater durability at the expense of extra weight is a consideration if you anticipate a prolonged survival situation.
- Doors: Tents may have one door. A single door located at the head is more

convenient than a side door so you don't have to climb over your gear or partner when you go in and out of the tent. Tents for two or more people may have two doors, each with a vestibule.

- Vestibule: Provides a protected place outside the tent for storage. Keeps your items dry and leaves more room for you inside the tent. This is an option for freestanding and non-freestanding tents. They range from about 8 SF (square feet) single vestibules to two-door tents with two vestibules having a total of 22 SF.
- Internal organization: Pouches (solid or mesh) or hang loops for suspending a light.
- Tent poles: Almost all quality tents use aluminum poles. They are fairly inexpensive, lightweight, and will flex considerably before breaking. There are some quality carbon fiber poles.
- Tent stakes: Most tents come with four stakes, one for each corner. They come with two extra stakes for the vestibule. However, you should bring more stakes and cordage to serve as guylines to deal with winds, provide greater stability, and keep the rain fly fabric taut. Quality aluminum stakes include:
 - DAC (<https://amzn.to/3pqbwLr>). \$12-58 for eight stakes. Available in four different sizes.
 - MSR Groundhog stakes (<https://amzn.to/37Rss1e>). \$20 for six stakes. Available in two sizes.
- Setup: Freestanding tents can easily be moved around once they are set up. Non-freestanding tents have to be disassembled and reassembled to change their location. You can assemble a non-freestanding tent in the rain without getting its interior wet since its single wall is waterproof. The inside of a double-wall tent will get wet until the rain fly is installed when setting up in the rain since the inner wall (i.e., the tent body) is not waterproof. You want a tent that a single person can set up and take down easily and quickly. Speed is critical in survival circumstances.
- Flexibility: Non-freestanding tents generally have only one configuration. Freestanding tents offer more flexibility. You can leave off the rain fly and use just the breathable bottom wall of a freestanding tent on a warm, dry day.
- Price: Freestanding and non-freestanding tents vary greatly in price and quality. Generally, lighter tents are more expensive since they use more

advanced components.

Here are a few examples of tents that favor durability over lightweight since durability is a priority in a potentially long-term survival situation. You may not be able to stay in one place and benefit from constructing a long-term shelter using things available in your environment. A tent shelter is highly useful if you have to pack up and move quickly from place to place.

Item name: REI Co-op Passage 2 Tent with Footprint

Vendor: REI Co-op

Webpage URL: <https://bit.ly/34KUj14>

Price: \$159.00

Weight: Minimum Trail weight 4 lbs 2 oz. Packaged weight 5 lb 10oz

Size: Packed size 8x18 inches. Floor dimensions: 52x88 inches. Peak height: 40 inches. Vestibule area: 19 SF

Material: 75-D polyester canopy, floor, and rain fly

Appropriate for which BOBs: Medium, Long

Comments: Freestanding design in an X-pole configuration. Easy to set up. 8.5mm diameter aluminum poles. 2 doors. 2-person sleeping capacity. 3 seasons. 2 twin stake-out vestibules provide large covered areas for gear storage. Adjustable ceiling vents help reduce condensation by moving moist air outside. Fly doors roll up over the roof for a clear view of the sky, improved venting, and reduced condensation. A symmetrical, rectangular floor provides an efficient, comfortable layout. Internal pockets and gear loops help organize your essentials. Includes footprint, stuff sack, stakes, and guylines with tighteners.

Item name: REI Co-op Half Dome 2 Plus Tent

Vendor: REI Co-op

Webpage URL: <https://bit.ly/3aK0rKX>

Price: \$229.00

Weight: Minimum trail weight 4 lb 14 oz. Packaged weight: 5 lbs 5 oz.

Size: Packed size 7x20.5 inches. Floor dimensions: 56x92 inches. Peak height: 44 inches. Vestibule area: 22.5 SF

Material: Canopy Fabric: 40-denier ripstop nylon/20-denier nylon mesh.

Floor Fabric: 70-denier taffeta nylon. Rainfly Fabric: 40-denier nylon

Appropriate for which BOBs: Medium, Long

Comments: Freestanding design. 2-person design. 1 hubbed poleset

simplifies set up. Improved pole architecture boosts livable space; vertical sidewalls provide generous head and shoulder room. Mesh panels in the upper portion of the tent improve ventilation and views; ripstop panels in the lower portion provide privacy, reduce drafts, and exposure to blowing dust and dirt. REI Exclusive tension-truss architecture creates stable vertical sidewalls for generous space and plenty of headroom. 2 large doors and 2 vestibules offer easy access and additional covered storage. Pockets and hang loops help organize the interior. When zipped open, doors stash out of the way in pockets just inside the door opening. Fly design allows sides and ends to be rolled up to maximize views and airflow; everything also rolls down quickly if a storm blows in. Fly has 4 ceiling vents that provide airflow to prevent condensation buildup. Includes guylines with tighteners, pole-repair tube, pole bag, 8 stakes, and stake bag. Footprint not included. Inducted in the Editors' Choice 25th Anniversary Hall of Fame by Backpacker magazine (2018).

Item name: Kelty Dirt Motel 2 Tent

Vendor: Kelty

Webpage URL: <https://bit.ly/2KZH8CB>

Price: \$259.95

Weight: Minimum weight: 4 lbs 4 oz. Packaged weight: 4 lbs 13 oz

Size: Dimensions (LxWxH): 84x50x42.5 inches. Floor area: 28 SF. Vestibule area: 2x8.9 SF

Material: Wall material: No-See-Um Mesh. Floor material: 70-D Nylon / 3000 PU coating. Fly material: 40D Siliconized Nylon Ripstop / 1500mm
Appropriate for which BOBs: Medium, Long

Comments: Freestanding design. 3 seasons. Number of poles: 3. Pole type: DAC Pressfit™ - Aluminum. A compact hubbed aluminum pole set for easy packing and lightning-fast setup. Number of doors: 2. Number of vestibules: 2. Capacity: 2. Stargazing Fly™ that can be open/closed from inside the tent. Oversized doors and super-spacious interior. Compact and lightweight.

Hammock^[333], ^[334], ^[335], ^[336], ^[337], ^[338], ^[339]

A hammock is something many people do not think to include in their BOB. There are some advantages to hammocks that may sway you to consider getting one:

- Lightweight.
- Compact. About the size of a softball or cantaloupe when packed. This is a

big plus since sleep and shelter items take up the most space in a BOB.

- Inexpensive
- High-quality versions are durable
- Simple and fast to set up and take down
- Can protect you from insects, sun, rain if you include an insect net and rain fly
- Comfortable. Lets you sleep off of the hard ground
- No need to worry if no flat ground is available to set up your sleep area
- It can serve as a blanket

Here are some features to consider when choosing a hammock:

- General types of hammocks:
 - Simple, unstructured, gathered ends: Attached at both ends. The amount of droop can be adjusted by altering the tension on the support ropes or straps. Cheapest.
 - Hammocks with integrated ridgelines. A line is attached to both ends of the hammock serving to suspend an insect net and/or rain fly. It also creates a fixed droop regardless of the amount of tension in the support ropes or straps.
 - Spreader bar hammocks. A rigid bar oriented perpendicularly at both ends of the hammock holds the sides apart. Spreader bars add weight and bulk. These hammocks can twist to the right or left side causing a person to fall off.
 - Thru-hiker hammocks. Most durable. For long-term use. Comfortable. Many have integrated insect nets and rain flies. Heavy and expensive.
 - Hammock tent. Can be suspended or used on the ground like a tent. Comfortable. Heavier, expensive.
 - A hammock can be created using your BOB tarp and cordage (e.g., 550 paracord)
- Material:
 - Most are made from lightweight 300D nylon or polyester parachute material. Avoid cotton, which is heavier and absorbs moisture.
 - Ripstop stitching to resist tearing and stretching
 - Fast drying
- Construction:

- Reinforced seams
- Double or triple stitched at corners and support joints
- Hardware:
 - A carabiner is less likely to slip than an S-hook at the ends of the hammock for attachment of ropes or straps
 - If your hammock comes with S-hooks, it's easy to replace them with carabiners.
 - Double-sided, paired zippers that can be operated from inside or outside and from either end of the hammock.
- Hanging cordage:
 - Most hammocks include either rope or webbed nylon straps on either end
 - You can use 550 paracord if your hammock does not include hanging cordage
 - Straps are more convenient to use than rope. Many straps come with daisy-chained loops so you can easily adjust the tension on the strap by attaching the carabiner to loops in different locations on the strap. Multi-loop straps are heavier than those with single loops.
 - You can buy strap or rope cover sleeves to protect tree bark. Some straps are designed to avoid tree bark damage.
- Size:
 - Single or double for one or two people.
 - Longer and wider hammocks are more comfortable, but are bulkier and weigh more
 - If you have the space to carry it, you can get a two-person hammock for just yourself.
 - Ultra-light hammocks are less durable and less comfortable
- Weight capacity: Maximum weight that the hammock can support
- Integrated insect net with zipper closure
- Integrated rain and sun cover (fly)
- Complete sleep system hammocks include insect net and rain fly
- Some hammocks are double layered so a sleeping pad can be placed for insulation between the two layers. Even without a sleeping pad, the double layer will protect you from insect bites that can occur through hammocks with only a single layer of fabric.

Here are some common issues associated with using a hammock and how to overcome them:

- Lying on a concave surface causing your back to be flexed forward. This can be avoided by simply lying diagonally on your hammock with your head at 1:30 and your feet at 7:30 if you consider the head and foot of the hammock to be at 12 and 6 o'clock, respectively. Lying at an angle allows you to sleep comfortably in a flat position.
- Becoming cold because the hammock's thin fabric is all that separates you from the air beneath the hammock. This can be remedied by:
 - Placing your sleeping bag over an insulating material such as a sleeping pad (discussed in the Sleep Items chapter) or blanket. These can shift around.
 - Using an underquilt that goes beneath the hammock.^[340] Bulkier, more to carry. This can be combined with a top quilt or blanket instead of a sleeping bag.
- Insects. You can either get a hammock with an integrated insect net or add an insect net as an add-on.
- Rain and sun. You can either get a hammock with an integrated rain fly or make one using a tarp placed over a ridgeline located above your hammock.
- Concern about falling out of the hammock. Avoid spreader bar hammocks which are less stable than simple hammocks with or without integrated ridgelines.
- No place to store your gear in a hammock. You can keep some small items in the hammock with you. But, your pack and other larger items will need to go elsewhere:
 - Beneath your hammock. Dig trenches around your pack to divert rainwater away from it.
 - Hung from a tree
 - Hung from a ridgeline placed over your hammock
 - Hung from your hammock suspension ropes or straps
 - Place your pack inside a waterproof cover if you're hanging it somewhere it's exposed to rain
- What if there are no trees to use to suspend your hammock? No problem if you're packing a hammock-tent that can be set up on the ground. The drawback with these is that they are heavier and bulkier.
- A hammock is not ideal for multiple people even if you get a two-person

hammock. Getting separate single person hammocks for each person or using a tent are better alternatives.

Item name: ENO - Eagles Nest Outfitters Atlas Hammock Straps, Suspension System

Vendor: thePruneDanish on Amazon.com

Webpage URL: <https://amzn.to/2JoA6qz>

Price: \$29.94

Weight: 11 ounces

Size: 1-inch x 9 feet, each strap

Material: Durable polyfilament (nylon/polyester) webbing

Appropriate for which BOBs: Medium, Long

Comments: Two straps each 9 feet long, allowing you to wrap them around big trees. Each strap has 15 adjustment points. Support up to 400 pounds. Easy on the bark of trees.

Item name: Active Roots Double Camping Hammock with Tree Straps (budget simple hammock)

Vendor: Active Roots on Amazon.com

Webpage URL: <https://amzn.to/2WOghvL>

Price: \$39.99

Weight: 2.1 lb

Size: 0.1x78x118 inches

Material: Nylon parachute fabric

Appropriate for which BOBs: Medium, Long

Comments: Double camping hammock supports up to 500 pounds. Highest quality tree straps (that DON'T harm trees), carabiners, and stuff bag included. The full setup will take you less than three minutes. 100% MONEY BACK GUARANTEE. Does not come with an insect net or rain fly.

Item name: Eagles Nest Outfitters JungleNest™ Sleep System (hammock, insect net, and rain fly)

Vendor: Eagles Nest Outfitters, Inc.

Webpage URL: <https://bit.ly/2WNB7LJ>

Price: \$109.95

Weight: 32 ounces

Size: 57x112 inches

Material: 210-D ripstop nylon taffeta base with no-see-um mesh on top

Appropriate for which BOBs: Medium, Long

Comments: Supports 400 pounds. Complete sleep system includes insect net, rain fly, straps, aluminum carabiners, and aluminum stakes. Full-length side zipper for ease of getting in and out. Internal hanging loops, an organizer pocket, and internal ridgeline height adjustment. Attached stuff sack. Suspension system sold separately

Item name: Lawson Hammock Blue Ridge Camping Hammock and Tent (Rainfly and Bug Net Included)

Vendor: Kaviso Outdoors on Amazon.com

Webpage URL: <https://amzn.to/3psbEUx>

Price: \$199.00

Weight: 4.25 lb

Size: 6x22 inches packed size. 42x90 inches interior dimensions.

Material: Waterproof ripstop nylon and polyester. Aluminum poles.

Appropriate for which BOBs: Medium, Long

Comments: Weight limit of 275 pounds. Hanging straps are sold separately. The patented design allows for use suspended, as a hammock or on the ground, as a tent. Built-in no-see-um bug net and attachable rainfly. Strong spreader bars and shock-corded aluminum arch poles are used for the rock-solid canopy. Unique spread bar system, which is attached to the ropes at the ends of the hammock and spreads the support ropes over a flatter area. This keeps the floor more stable in the air as well as reduces the hammock sag. Provided stuff sack for easy packing. Two interior storage pockets for cell phone, etc. Two ceiling O-rings for attaching reading light, etc.

Item name: Hammock Gear Economy Phoenix (budget hammock underquilt)

Vendor: Hammockgear

Webpage URL: <https://bit.ly/2WO84Yv>

Price: \$109.95

Weight: 13.78 ounces

Size: 44x52 inches

Material: 20-D Calendared Nylon Taffeta fabric. 800-fill power DWR Treated Grey Duck Down.

Appropriate for which BOBs: Medium, Long

Comments: 40-degree temperature rating. 3/4 length (from shoulders to below knees). Ergonomically shaped to reduce weight and provide a more secure wrap around the hammock eliminating drafts. Shock cord suspension

system. Includes a complimentary cotton storage sack and a nylon stuff sack. It is also available in temperature ratings of 0, 10, 20, and 30°F. There is a full-length version called the Incubator.

Mosquito Nets

Insects including mosquitoes can be a bother and disrupt your ability to rest and get essential sleep to recharge yourself. They can also cause allergic reactions and transmit diseases such as West Nile virus. You'll be exposed to insects if you're:

- Sleeping unprotected on the ground
- Using a tarp as a shelter
- Using a hammock without an integrated insect net

You'll have protection from mosquitoes and other insects under the following if you are using:

- Bivy sack
- Tent
- Hammock with integrated insect net
- A mosquito net beneath a tarp shelter

Mosquito nets are a lightweight item to include in your BOBs. They will protect you from flies, moths, ticks, and other insects besides mosquitoes. Here are some things to consider when selecting a mosquito net:^[341] ^[342] ^[343]

- Size: Large enough to cover all of you with additional netting to slide beneath the edges of your sleeping bag. (Note: Some nets come with pegs to secure its edges to the ground.)
- Design: Hanging nets can be suspended by hooks or cordage. Pop-up nets are self-supporting.
- Easy and fast to use
- Weight: Some are lighter than others
- Mildew resistant
- Insecticide-treated mesh
- Breathable mesh
- Reinforced corners and hanging points
- Durability

Item name: COGHLANS 9640 32x78 Mosquito Bed Net

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2WQBkOu>

Price: \$13.99

Weight: Not specified

Size: 59x63x78 inches

Material: Fine white 180 mesh polyester netting

Appropriate for which BOBs: Medium, Long

Comments: Rectangular double-wide mosquito net provides fully enclosed protection against biting insects and mosquitoes when sleeping outdoors or indoors. Fine white 180-mesh polyester netting with floor base completely covers two single sleeping bags or cots. Six reinforced metal tie tabs at corners and sides; anchor four corners into the ground, hang top corners from tree or posts. Durable mildew resistant polyester netting packs in the easy enclosing carrying bag. Includes 4-1 inch nails, 4- 1/4 inch hooks, 4 wall anchors, and 78 inches of white cord.

When you are moving around, it is handy to have a mosquito head net that you place over your head. You can combine that with wearing a long sleeve shirt and long leg pants tucked into your boots for protection.

Item name: Mosquito Head Net Mesh

Vendor: Tough Outfitters on Amazon.com

Webpage URL: <https://amzn.to/3aLss4T>

Price: \$10.95

Weight: 1 ounce

Size: 1.89x2.99x5.2 inches package size

Material: Polyester mesh fabric

Appropriate for which BOBs: Short, Medium, Long

Comments: Wear alone or with a hat. Adjustable drawcords to keep the head net in place and bugs out. Protects down to your shoulders. Free carry pouch.

SLEEP ITEMS

Various items related to your survival sleep module will be discussed in this chapter. You can review the list and select those items for your BOB that suit your circumstances and fit in with your space and carrying capacity. When on foot, it's desirable to bring a sleeping bag and sleeping pad that together weighs less than five pounds. You can configure your escape plan to include additional items to bring with you if you're able to escape in your vehicle rather than on foot. Topics covered in this chapter include:

- Sleeping pads
- Poncho and poncho liner
- Emergency sleeping bags
- Sleeping bag
- Sleeping bag liner

Sleeping Pads

Sleeping pads are more than a comfort item. They do provide cushioning so you are not sleeping on a hard surface. But, they also help provide an insulating layer between you and the ground, particularly important in cold climates. The amount of insulation provided by a sleeping pad is reflected by its R-value, with one representing minimal and ten being maximal insulation. An R-value of 1-3 is fine for summertime while you'll need a pad with an R-value of greater than 5 for snow. [\[344\]](#), [\[345\]](#)

You can create a makeshift sleeping pad by piling up dry leaves beneath you. Or, you can stuff dry leaves into a heavy plastic garbage bag to serve as a sleeping pad. Your sleeping bag goes on top of the sleeping pad.

Sleeping pads are constructed in a variety of ways. [\[346\]](#), [\[347\]](#), [\[348\]](#)

- Closed-cell foam pads
 - Inexpensive (\$10-\$50)
 - Durable. Don't have to worry about them deflating. Less likely to tear than other types of pads.

- Lightweight
- Bulky and harder to pack
- Poor at insulating
- The least comfortable type of pad
- Air pads
 - Inflate by breath or built-in pump
 - Intermediate price (\$25-\$125)
 - Lightest option
 - Most compact option
 - Good insulation provided by bonded insulation or baffling
 - Comfortable
 - Can adjust the firmness by varying amount of inflation
 - Can be noisy
 - Can tear or get punctured and deflate
 - Difficult to repair
- Self-inflating pads
 - Combine open-cell foam with compartments that automatically fill with air when a valve is opened.
 - Expensive (\$75-\$300)
 - Heavier and less compact than air pads
 - Best insulation of the different pad types
 - More durable than air pads.
 - Can adjust the firmness by varying amount of inflation
 - Can tear or get punctured. The foam provides some padding even when the pad is deflated.
 - Easier to repair than air pads

Factors to consider when choosing a sleeping pad: [\[349\]](#), [\[350\]](#), [\[351\]](#)

- Length
 - Full length (72-80 inches). Provides cushion and insulation for legs and feet.
 - 3/4 length (48 inches). Leg and feet are off of the pad. The pad is lighter, more compact
- Width
 - Standard: 20 inches wide
 - Extra-wide: 25-30 inches wide. For larger people and those who turn while sleeping

- Shape
 - Rectangular
 - Mummy: Wider at the shoulders, narrower at the feet. Lighter.
- Thickness
 - Need at least two inches thickness for comfort. Some pads go up to five inches in thickness.
 - Thicker pads are heavier
- Weight
 - Lighter pads are less durable
 - Best pad options with current technology and good insulation and comfort come in the 12-18 ounce weight range.
- Packed size
 - Depends upon pad type, the magnitude of insulation, and fabric thickness.
 - Uninsulated or lightly insulated air pads are the most compact
- Durability
 - Denier is a measure of a fabric's strength. The higher the denier, the stronger, more durable, and more puncture-resistant the pad.
 - Higher denier fabrics will be heavier
- Valve type
 - Old style twist-stem valve. Comes on some inexpensive pads. Air passes freely in both directions, so air escapes from the pad in between filling breaths. The stem is prominent. Deflates slowly.
 - Flat valves. Low profile. A valve flap prevents the escape of air between filling breaths. There may be separate inflation or deflation valves or combination valves for both inflation and deflation. Deflates fast. Valves are not replaceable.
 - WingLock™ valves on Therm-a-Rest pads prevent the escape of air between filling breaths. Air released by twisting the side wings. Deflation is not as fast as for flat valves. The valve is replaceable.
- Textured pad. The textured surface of the pad reduces sliding of your sleeping bag on the pad.

You can consider bringing a foam pad to place on the ground and then place an air pad on top of it for extra insulation and cushioning if you have the extra space (i.e., escaping by vehicle). Pack a patch kit to repair punctures

and tears if you have an air or self-inflating pad.

Item name: NEMO Switchback Sleeping Pad (closed-cell foam)

Vendor: REI Co-op

Webpage URL: <https://bit.ly/37PAQOS>

Price: \$39.95

Weight: 14.5 ounces

Size: 5x5.5x20 inches packed size. 0.9x20x72 inches unpacked size

Material: Closed-cell Foam

Appropriate for which BOBs: Medium, Long

Comments: Highly efficient hexagonal nesting pattern allows for taller, wider nodes, providing great plushness without increasing packed size. Taller nodes create 20% more space for uncompressed sleeping bag insulation, trapping more warmth around your body. Premium dual-density, abrasion-resistant Axiotomic™ foam offers a supple top layer for comfort and a resilient lower layer for premium support and years of adventures. Metalized thermal reflective film reflects heat back to your body and is durable, use after use.

Item name: Klymit Insulated Static V Lite Sleeping Pad (air pad)

Vendor: Klymit Store on Amazon.com

Webpage URL: <https://amzn.to/3o68xBz>

Price: \$99.99

Weight: 19.6 ounces

Size: 5x8 inches packed size. 2.5x23x72 inches unpacked size

Material: 30-D polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: 4 season camping pad. Inset FLIP valve style inflation port. Inflates in 10-15 breaths. V-chamber design and Klymalite™ synthetic lofted insulation to limit air movement and heat loss (R-Value of 4.4). Side rails to help keep you on the pad. Stuff Sack and Patches included

Item name: REI Co-op Camp Bed Self-Inflating Sleeping Pad

Vendor: REI Co-op

Webpage URL: <https://bit.ly/3ru5EfH>

Price: \$69.89 (regular size), \$83.29 (XL size)

Weight: XL: 5 lbs. 4 oz., Regular: 3 lbs. 10 oz

Size: Packed size XL: 8.5 x 30 inches, Regular: 5.5 x 26 inches. Unpacked size XL: 78 x 30 x 2.5 inches, Regular: 72 x 25 x 2.5 inches

Material: Soft, stretch polyester fabric on top. 150-D polyester bottom resists wear.

Appropriate for which BOBs: Short, Medium, Long

Comments: Pad Thickness XL: 2.5 inches, Regular: 2.5 inches. Rectangular shape. Open-cell foam insulation. A high-flow valve allows for easy inflation/deflation. All seams are welded for leakproof strength. This pad has an R-value of 7.6, which makes it best for adventures in extremely cold conditions; it provides high levels of insulation from the ground. Stuff sack included.

Poncho And Poncho Liner

A military poncho (discussed in the Shelter chapter) can be worn as a raincoat or used to make a shelter (e.g., lean-to, plow point, standard inverted-V tent, etc.). But, it can also be folded in half and joined together at its edges to create a lightweight sleeping bag.

A poncho liner is also called a woobie and it is not meant to line the inside of a poncho that is serving as a raincoat. The poncho liner has no hole for your head to pass through. (Some people cut a hole in the center of the poncho liner and then stitch around the holes edges to make an opening for their head to pass through. The poncho and liner can then be used together as an insulated raincoat.) Poncho liners have ties that are tied into a poncho's grommets to join them together. The poncho is folded in half and the snaps on the sides are snapped together to create a sleeping bag.

A woobie can also serve as a blanket by itself. Or, it can serve as a sleeping pad or a liner for a hammock. You can also use it to make a bed for your dog if you have one traveling with you.

You can purchase ponchos and poncho liners separately or together as a unit.

Item name: Mil-Spec Plus G.I. Style Poncho + Liner Combo

Vendor: Combat Sport Supply

Webpage URL: <https://bit.ly/34Pofct>

Price: \$59.95

Weight: Approx 3.4 lb

Size: 56x86 inches poncho and 56x86 inches poncho liner

Material: Poncho: 100% waterproof ripstop nylon. Poncho liner: Outer shell 100% nylon. 100% polyester fill.

Appropriate for which BOBs: Short, Medium, Long

Comments: Available in 8 different colors/patterns. Mil-Spec. Use poncho as a waterproof ground cloth, or as a two-person shelter by simply snapping two ponchos together. The full cut (56" x 86") covers both you and your pack. Brand New.

Emergency Sleeping Bags

Emergency sleeping bags are lightweight, compact tools for short-term survival use. They are worthwhile keeping in your vehicle and your Short- and Medium-Term BOBs since they are relatively inexpensive and take up very little space.

Some of these bags are made of Mylar® which reflects body heat back towards you. But, Mylar® does not breathe, so moisture accumulates inside the bags. It is better to get a bag that breathes to avoid this problem.

Many of these bags are difficult to repack once they are opened up and used. Most are waterproof. Some are fragile and for single use. Others are more durable, tear, and puncture-resistant. These can be reused and often come with a stuff bag for storage. Emergency sleeping bags can be used alone or inside a poncho liner or regular sleeping bag to provide more warmth. They can also be used outside of your sleeping bag.

Item name: Survive Outdoors Longer S.O.L. 70% Reflective Escape Bivy, Orange

Vendor: S.O.L. Survive Outdoors Longer Store on Amazon.com

Webpage URL: <https://amzn.to/3aLZLVe>

Price: \$59.95

Weight: 8.5 ounces

Size: 31x84 inches unpacked. 4x6.25x8.5 inches packed.

Material: Proprietary spun-bonded olefin fabric with a metalized coating

Appropriate for which BOBs: Short, Medium

Comments: Reflects 70% of your body heat back to you to prevent heat loss and trap warm air. Waterproof seams and drawstring hood lets you seal out the elements. Zipper. Mummy bag shape. Features a quiet, tear-resistant material that won't shred to pieces if punctured. A reusable bivy can easily be used as a sleeping bag or emergency blanket. Breathable fabric prevents condensation from forming keeping you dry. Good for temperatures above 50 degrees Fahrenheit.

Sleeping Bags

There are numerous factors to consider when selecting a sleeping bag for your BOB:[\[352\]](#), [\[353\]](#), [\[354\]](#), [\[355\]](#), [\[356\]](#), [\[357\]](#)

- **Weight:**
 - Budget bags: Over three pounds
 - Lightweight: Two pounds or less. Two to three season use.
 - Ultra-lightweight: Can weigh as little as 15 ounces. Expensive.
 - Weight is reduced by using thin shell fabric and zippers, narrower shape, and high fill power down.
 - Lighter bags generally less warm. Can maximize warmth by using high fill power down insulation.
 - Generally, down bags weigh one to three pounds while synthetic-filled bags weigh two to four pounds.
- **Shape:**
 - Rectangular: Least insulated. More space. Bulkier.
 - Semi-rectangular: Narrower around legs and feet for better heat retention. Lighter and more compact than rectangular bags.
 - Mummy: Maximum insulation. Least moving space. Lighter.
- **Length:**
 - Short (also known as women's length): 66 inches
 - Regular: 72 inches
 - Tall: 78 inches
 - Longer bags: More expensive, heavier, larger packed size
- **Temperature rating:**
 - The rating refers to the lowest comfortable temperature the bag can be used for.
 - Three season bags are rated 20-32°F. Sleep comfortably 20-40°F. These are the most common and popular.
 - Summer bags start at a 32°F rating. Sleep comfortably 40-50s°F. Lighter weight. Compact.
 - Winter bags are rated 20°F and below.
 - EN (European Norm) and the newer ISO (International Organization for Standardization) are attempts by the sleeping bag industry to provide a uniform method for comparing temperature levels across different bags. The ratings tend to be 10°F lower than realistic. Printing EN and ISO ratings on bags is voluntary, so they do not appear on all bags.

- You need the insulation afforded by a sleeping bag pad to realize the full benefit of a bag's temperature rating.
- Insulation:
 - Duck or goose down: Better insulation. Insulating ability degrades when wet. Down treated with hydrophobic polymer repels water, now commonly available; can handle minor moisture but still gets wet when exposed to a lot of water. Lighter weight. Higher fill power equals a better insulation-to-weight ratio. Packs more compactly. More expensive.
 - Synthetic insulation: Polyester fibers. Much better than down at insulating when wet. Fast-drying. Non-allergenic. Not as insulated as down. Cheaper.
 - Insulation is more effective the more snugly your bag fits around you.
- Packed volume:
 - Measured in liters
 - Compact bags are less than three liters packed
 - Volume does not always correlate with the weight of the bag.
 - Down packs smaller than synthetic-filled bags
 - High fill power down compacts more than low fill power down
 - Bags with less insulation, thinner shell fabric, and narrower shapes will pack more compactly
 - A compression sack can optimize the compactness of your bag versus the non-compressible stuff bag that comes with the bag.
- Shell:
 - The outside layer of the bag
 - Water-resistant coating: Durable water repellent (DWR) coating applied to the outside of the shell
 - Hydrophobic material: Repels water
 - Durability: Measured by denier (D). Ultra-light bags 7-D, three season bags 10-30-D, heavy-duty bags up to 70-D.
- Baffles: Stitches are sewn to create compartments to contain insulation and prevents its migration. Serves to prevent cold spots.
- Draft collar: It is a large insulation filled baffle surrounding the bag's top opening to block out cold.
- Draft tube: An insulation filled tube or baffle that runs alongside the zipper to block out cold

Item name: oaskys Camping Sleeping Bag - 3 Season (budget sleeping bag)

Vendor: oaskys Store on Amazon.com

Webpage URL: <https://amzn.to/3rus54t>

Price: \$25.99

Weight: 3 lb

Size: 29.5x86.6 inches

Material: Outer Cover Material-premium 210T Anti-tearing Polyester Fabric which is waterproof and Breathable; Lining Material: 190T polyester pongee; Fill-Material: 100% hollow cotton.

Appropriate for which BOBs: Medium, Long

Comments: Temp Rating: 30°F. designed for 35~50°F. Can be wiped clean or machine washed. A separated zipper at the bottom can also make your feet often come out through the wind. A half-circle hood with an adjustable drawstring keeps your head warmer even in extreme conditions. Comes with a compression sack with straps, allowing for super convenient storage and easy carry maneuverability. 100% SATISFACTION: 100% NO QUESTIONS ASKED, no hassle money back or replacement.

Item name: Teton Sport Celsius XXL 0 Degree Sleeping Bag (budget cold weather bag)

Vendor: TETON Sports Store on Amazon.com

Webpage URL: <https://amzn.to/34KWemi>

Price: \$71.94

Weight: 7 lb

Size: 39x90 inches. Pack size 12.5x17 inches

Material: Taffeta Shell. Brushed Poly-Flannel Liner. SuperLoft™ Elite fill material

Appropriate for which BOBs: Medium, Long

Comments: Temp Rating: 0°F. Durable compression sack included. Comes in right and left-sided zipper versions. The half-circle mummy style hood keeps you warm and your pillow clean. Unzips on each side for airflow and easy access. The zipper and shoulder draft tubes, thermal enhancing, double-layer offset stitching, and innovative hollow fiberfill work together so the warmth stays in. Interior storage pocket for your wallet or keys. Hang loops for long-term storage to maintain maximum loft.

Item name: Kelty Cosmic 20 (intermediate price bag)

Vendor: REI Co-op

Webpage URL: <https://bit.ly/2WQCqK6>

Price: \$134.89 (regular length), \$142.39 (long length)

Weight: Long: 2 lbs. 10.7 oz., Regular: 2 lbs. 6.6 oz.

Stuff Sack Size: Long: 8 x 16.5 inches, Regular: 8 x 15.5 inches

Material: Shell: 20-D nylon taffeta fabric. Lining: 50-D polyester taffeta. Fill: 600-fill-power DriDown™

Appropriate for which BOBs: Medium, Long

Comments: Temp Rating: 19°F. Mummy shape. Shoulder Girth: 64" (long), 62" (regular). Hip Girth: 60" (long), 58" (regular). Stuff Sack Volume: 13.6 liters (long), 12.8 liters (regular)

Item name: Marmot Trestles 15 (budget synthetic bag)

Vendor: Marmot Store on Amazon.com

Webpage URL: <https://amzn.to/2KWFscT>

Price: \$115.00

Weight: 3 lb 6.1 ounces

Size: Interior length 85 inches

Material: Shell: 70-D polyester. SpiraFil® high loft insulation

Appropriate for which BOBs: Medium, Long

Comments: Temp EN Rating: 15 °F. Mummy shape. 14 liters pack volume.

Unique blend of large, spiral hollow fibers and small polyester fibers provides the exceptional warmth, softness, and compressibility of natural down while increasing moisture resistance. Dual-zipper design: a full-length anti-snap main zipper, plus a second fold-down zipper for added ventilation and easy access. Adjustable 3D hood. Dual hang loops, and an included stuff sack that compresses for convenient packability.

Item name: Sea to Summit Ascent AcI 25 Sleeping Bag (ultra-light bag)

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3mWT5pD>

Price: \$349.00, regular length(also available in long length, \$369.00)

Weight: 1 lb. 14 oz.

Size: Fits up to 72 inches. Shoulder girth 61 inches. Hip girth 57 inches.

Material: Shell and lining: 20-D nylon. Fill: 750-fill-power UltraDry™ Down (water-resistant)

Appropriate for which BOBs: Short, Medium, Long

Comments: Temp Rating: 25°F. Tapered rectangular shape creates the perfect balance of space and adaptable warmth. Anatomically shaped footbox retains

warmth around your feet. Vertical chest baffles prevent down migration and cold spots. Generously sized hood and dual cord adjustment offer maximum warmth retention. Lightweight 20-D nylon shell and lining fabrics offer a minimal packed size and maximum breathability. Half-zip right side; full-length, 2-way #5 YKK zip left side and separate foot zips allow maximum ventilation and use as a quilt. Includes Ultra-Sil™ compression bag for compact storage. Oversize draft tube with anti-snap materials. Oversize neck draft tube with dual adjustment system. Large internal security pocket.

Item name: US Military 4-PC Weather Resistant Modular Sleep System with Waterproof Gore-Tex Cover (new)

Vendor: Tennier Industries, Inc. on Amazon.com

Webpage URL: <https://amzn.to/2KClKmQ>

Price: \$475.00 (available used for \$225 and less)

Weight: 9.5 lb

Size: 8.8x21.1x25 inches packed. Patrol bag 37x92 inches. Intermediate cold weather bag 35x87 inches. Bivy cover 28" wide at feet, 35" wide at shoulders, and 85" length

Material: The patrol bag and intermediate cold weather bags are constructed of water-resistant rip-stop nylon. The Bivy Cover is made of durably waterproof and windproof 3-layer GORE-TEX fabric.

Appropriate for which BOBs: Medium, Long

Comments: Temp Rating: -10°F. This is a genuine U.S. Army Modular Sleeping system which is one of the best found anywhere in the world and it's rated to up to -50 degrees!! This Genuine U.S. Army Modular Sleeping System is constructed to insulate the user in environments ranging from mild weather to extremely cold weather. It includes 4 brand new items, a green patrol bag, the black intermediate cold weather bag, a woodland camo bivy cover, and a stuff sack. These two mummy-style sleeping bags can be used independently or together in colder environments. The patrol bag is rated at +30 degrees, the black intermediate cold weather bag is rated to +10 degrees and both bags can be used with the vapor-permeable bivy cover. When all three components are used together (patrol bag, cold weather bag, and bivy cover) it is rated at -10 degrees and if combined with various insulating layers of the extended cold weather clothing system, it is rated to -50 degrees. Each bag is constructed of water-resistant rip-stop nylon and is machine washable and non-flammable. The Woodland Camo Bivy Cover is made of durably

waterproof and windproof 3-layer GORE-TEX fabric and includes a snap fastener and slide fastener. This modular sleep system features an anatomically designed foot box that contains twice the insulation as the bag. Sewn-in, quilted chest collar prevents air drafts up and down through the hood. It has a reversible double-pull (opens end to end) slider that allows top or bottom ventilation. Non-locking slide fastener self-repairs if jammed or snagged. It is free from cold spots and the snaps prevent the insulation from migrating in the bag. The draft flap prevents heat loss and the hood adjusts for heat retention (includes a nylon drawcord and barrel lock.). Generous "boot box" at the bottom is designed to allow the user to keep his or her boots on. Durable YKK zippers are used on either end of the bag allowing wearers to customize the amount of ventilation. Zippers are dual-sided and can be easily accessed from the inside. STUFF SACK: Compressible to approx. one cubic foot, six 1" wide nylon webbing straps by ladder lock buckles, reinforcement webbing is sewn around the circumference of the bag, nylon draw cord closure with a barrel lock. This is a versatile and durable bag. Its main drawbacks are its size and weight.

Sleeping Bag Liner^[358]

Sleeping bag liners are bags that go inside your sleeping bag. They serve two primary purposes:

- Keep the inside of your sleeping bag clean and protected. It's easier to clean the liner than the sleeping bag.
- Provide greater temperature range flexibility for your sleeping bag by adding insulation and warmth when needed.

You can get sleeping bag liners that are made of various materials:

- Silk: Light, compact, breathable. Not very durable. Moderate to expensive
- Cotton: Strong, durable, not very light or compact. Cheap
- Fleece and microfleece: Moisture-wicking, fast-drying, bulky, and heavy. Can add up to 12°F of warmth. Moderate price.
- Synthetics (e.g., polyesters): Moisture-wicking, breathable. Moderate price
- Insulated: As an example, Thermolite® can add up to 25°F of warmth. Moderate to expensive.

Item name: Sea to Summit Thermolite® Reactor Compact Plus Sleeping Bag Liner

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3hnwlhA>

Price: \$66.95

Weight: 9.3 ounces

Size: 4x6 inches packed. 36x72 inches unpacked

Material: Polyester

Appropriate for which BOBs: Medium, Long

Comments: Mummy shape. Constructed of insulating Thermolite® fabric, a hollow-core, breathable fiber that provides extraordinary warmth for its weight. Combined with the regular 80g/m² Thermolite®, super-insulating 110g/m² Thermolite® panels provide added warmth in the torso and footbed areas. Adds up to 20°F of warmth to a sleeping bag; can also be used as a summer ultralight sleeping bag. Liner helps keep the inside of your bag clean, saving it from the wear and tear of washings. Drawcord hood with mini cordlock cinches around the face to hold warmth in. Lightweight Ultra-Sil™ stuff sack included.

HYGIENE ITEMS

The following represents a list of hygiene items for you to consider. Each person will need to prioritize and select only those items they deem most important since space is limited in your BOBs.

Oral hygiene:

- Toothbrush
- Toothpaste
- Dental floss
- Mouthwash

Toilet articles:

- Toilet paper
- Compressed toilet paper tablets
- Microfiber washcloth
- 5-gallon plastic bucket +/- toilet seat
- Garbage bags
- Shovel to bury food and human waste, to dig a latrine. (See the Tools chapter for more about shovels)

Hair, beard, nails:

- Comb
- Straight razor
- Nail clipper

Skin:

- Deodorant
- Lotion
- Lip balm

Sanitation:

- Feminine hygiene products
- Alcohol swabs

- Hand wipes
- Lime oil to remove grease, sap
- Soap
- Laundry detergent
- Solar shower bag

Here are some examples of specific hygiene items:

Item name 100 Compressed Towels Tablet Camping Toilet Wipes Wash Cloths Survival Emergency

Vendor: sgsdepot on eBay.com

Webpage URL: <http://ebay.to/2WMLuzk>

Price: \$14.99

Weight: Not specified

Size: Tablet size ¾ inch. Expanded size 9.5x10 inches. Package of 100 towels.

Material: 100% Rayon

Appropriate for which BOBs: Short, Medium, Long

Comments: To turn your tablet into a usable towel, simply add water or briefly dip in water. Allow towel to expand and unroll. Each towel is individually plastic sealed and wrapped. Unscented. Biodegradable.

Item name: Portable Camping Survival Emergency Toilet Seat Lid for 5 Gallon Buckets

Vendor: aplusurvival on eBay.com

Webpage URL: <http://ebay.to/2Mde5Mn>

Price: \$19.99

Weight: 15.5 ounces

Size: 1.5x14x15 inches

Material: Plastic

Appropriate for which BOBs: Medium, Long

Comments: Folding portable toilet seat and lid for the (Honey Bucket) Port-A-Pottie. Use with most 5 gallon buckets.

Item name: Equate Flushable Wipes, Fresh Scent, 5 packs of 48 wipes, 240 wipes

Vendor: Walmart

Webpage URL: <http://bit.ly/2KTnfNn>

Price: \$6.42

Weight: 3.43 lb for 5 packages containing 240 wipes

Size: 5.25x7 inches for each wipe

Material: The material used to make the wipes is not specified. It breaks down after flushing. Ingredients: Water, Cocamidopropyl PG-Dimonium Chloride Phosphate, Glycerin, Phenoxyethanol, Iodopropynyl Butylcarbamate, Chamomilla Recutita (Matricaria) Flower Extract, Aloe Barbadensis Leaf Extract, Tocopheryl Acetate, Citric Acid, Fragrance.

Appropriate for which BOBs: Short, Medium, Long

Comments: Easy-dispensing wipes. Resealable packs that are flat and take up little space. Alcohol-free and hypoallergenic. Good for sensitive skin.

Soothing aloe and vitamin E. 5 pack of 48 wipes each- totaling 240 wipes

Item name: ADVANCED ELEMENTS 5 Gallon Summer Shower/Solar Shower

Vendor: Advanced Elements Store on Amazon.com

Webpage URL: <https://amzn.to/2Mdenmr>

Price: \$34.99

Weight: 1 lb 4 ounces

Size: 2x6x20 inches

Material: Polyurethane laminate bag. The other components used are Polyethylene, ABS, silicone tubing, and Nylon hardware.

Appropriate for which BOBs: Medium, Long

Comments: 5-gallon outdoor shower powered by solar technology. 4-ply construction with reflector panel and insulator panel. 0.5-inch hose diameter. Easy-to-use on/off showerhead and extra-large filling valve. Side pocket for soap and shampoo; water temperature gauge. Velcro straps for washcloths. Pocket with built-in reflective mirror for all your grooming needs. Rubber handle.

CLOTHES

Topics and examples of survival clothing items covered in this chapter include:

- The concept of layering clothing
- Wool versus cotton
- Down versus synthetic insulation versus synthetic fleece
- Shorts and pants for survival
- Underwear briefs
- Socks
- T-shirts
- Long underwear
- Shirts
- Shorts
- Pants
- Convertible pants
- Vest
- Light jacket
- Windbreaker
- Rain jacket and pants (Note: Ponchos are discussed in the Shelter Items chapter)
- Waterproof, down jacket
- Wool beanie
- Wide brim hat
- Neck gaiter
- Balaclava
- Shemagh
- Belt
- Shoes, boots

You will find a list of clothes to consider for different anticipated durations of escape in the chapters Short-, Medium-, and Long-Term Bag Contents. Your selection of clothes is a very individual decision and will be influenced by

your locale, escape destination, and personal preferences. First, we'll cover some general clothing tips to consider.

Take into account how your various clothing items will “layer” together to help you adapt to varying weather and exertion levels: [\[359\]](#), [\[360\]](#), [\[361\]](#), [\[362\]](#)

- Sub Layer
 - This is the layer that contacts your skin. Its primary function is to keep you dry. Insulation is provided by the overlying layers.
 - Choose fabrics that wick perspiration away from your skin.
 - Avoid cotton for any of your layers because it soaks up perspiration and external moisture (e.g., rain) negating its insulating effect. Can cause hypothermia in cold weather.
 - COOLMAX® (proprietary polyester fabric) or merino wool (wicks well, fairly durable, cools via evaporation) socks
 - Underwear made of synthetic material (e.g., polyester, nylon, polypropylene). Synthetics are lightweight, durable, wick away moisture, and dry quickly.
 - Bra: Pullover sports bra without metal or plastic clasps that can press into your skin from the weight of overlying backpack straps.
- Base Layer
 - Hot weather: Can do without a base layer
 - Warm weather: Tanktop (synthetic fabric)
 - Cool -weather: T-shirt (synthetic fabric)
 - Cold-weather: Polypropylene or merino wool long underwear. These are available in light, mid, and heavyweight. Silk long underwear is warm and comfortable, but it is not durable enough to use for survival purposes.
- Core Layer
 - One layer in warm weather or multiple layers in cold weather
 - Shirt
 - Pants, shorts, or convertible pants/shorts
 - Fleece, synthetic insulation, down, or wool garment for extra insulation. These all come in varying “weights.”
 - Neck gaiter or balaclava made of polyester or fleece for cold temperatures
 - Shemagh scarf

- Fleece or wool beanie cap
- Wide brim hat for sun and rain protection
- Outer Shell
 - For protecting you and your underlying clothing layers against wind, rain, and snow
 - At least water-resistant. Waterproof is better
 - For warmer temperatures: Your outer shell can consist of a lightweight, water-resistant, windbreaker jacket or waterproof, breathable, rain jacket combined with rain pants
 - For cool temperatures: Your outer shell could consist of a fleece jacket (it will not be wind or waterproof)
 - For colder temperatures: Your outer shell can contain synthetic insulation or down for greater insulation. A waterproof shell is essential since synthetic insulation or down absorbs water and loses its ability to insulate when wet.
 - Should be breathable and have vents to avoid trapping in moisture and causing your underlying layers to get wet from perspiration. Inexpensive waterproof fabrics are not breathable (e.g., coated nylon) and will hold moisture in making you wet.
 - Fabrics that are both waterproof and breathable are the best but are expensive. Gore-Tex® is one example.
 - Insulated gloves
- Others
 - Belt. Gun belt level of stoutness. Enables carry of a sidearm, holster, spare magazines, knife sheath, multi-tool, etc. Can serve as a tourniquet, weapon, strop for sharpening your knife blades.
 - Shoes: Provide support. Protect your feet from rocks. Provide wet and dry traction.
 - Boots: Provide ankle support. Keeps debris out of your shoes. Protects against scrapes and bruises from bumping into vegetation, rocks.

Some layer tips:

- There are innumerable ways to configure your layering. You'll need to customize the components you use for your layering to suit your location and climate.
- You can add or remove components from your layers during your trek as

you warm-up or cool down to adjust to changes in weather and your physical activity.

- Ultraviolet sunlight protection^[363]
 - Clothes that provide better sun protection include darker fabrics with denser weaves. Polyester and nylon protect better than natural fibers.
 - Many materials offer less sun protection when wet. Polyester is an exception and may provide better sun protection when wet.
 - Loose clothing is better. Fabric that is stretched tightly provides less UV light protection.
 - Some clothing is promoted to protect you against the sun's UV radiation. Look for its stated UPF (Ultraviolet Protection Factor) rating. UPF measures the fabric's protection against UV-A and UV-B radiation. A UPF of >40 is excellent, meaning the fabric permits passage of 1/40 (2.5%) or less of UV radiation through it. Fabrics with UPF <15 (i.e., 1/15 or 6.7% of UV radiation passes through it) are not considered UV protecting. A cotton T-shirt has roughly a UPF 5 (i.e., 1/5 or 20% of UV radiation passes through it).

Choose wool over cotton for most applications: Wool fibers break after being subjected to 20,000 bending cycles compared to 3,000 for cotton fibers. This greater resistance to bending leads to better durability and is one advantage of wearing wool rather than cotton socks. Wool insulates better than cotton because of the air pockets formed between its fibers, keeping you warmer. Wool is water-resistant and can absorb water equal to 30% of its weight. However, wool still insulates when it's wet. It dries faster than cotton once it is wet. Wool wicks moisture away from your skin keeping you cooler in the summer (through evaporative cooling) and warmer in the winter (through insulation).^[364]

Down versus synthetic insulation versus synthetic fleece: Which is better for outerwear?^[365] ^[366] Down comes from geese and ducks. Its fluffiness is known as loft and makes it extremely light and compressible. Down with higher loft comes from older birds and is more expensive; the same amount of weight occupies a larger volume of space. Fill power is a measure of loft and represents how many cubic inches of volume is occupied by one ounce of down. Higher fill power garments are warmer, lighter, and more expensive.

Fill power generally ranges from 450-900. Duck down has less loft, a lower fill power (topping out at 750-800), and is less expensive than goose down.

Down functions well in dry conditions. But, it doesn't repel water and loses loft and its insulating ability when wet. It is also slow to dry once wet. There are specially treated downs that are water-resistant, but they will still lose loft when exposed to heavy rain. Encasing down beneath waterproof fabric can preserve down's insulating properties by keeping it dry.

Synthetic insulation is made of polyester fibers that try to mimic the loft provided by down. It is less durable, less expensive than down, insulates when wet, and it is hypoallergenic. Synthetic insulation is heavier, bulkier, less compressible, and has a lower fill power than down. Hybrid insulation combines water-resistant down and synthetic insulation; its characteristics fall in between those two components.

If the higher cost is not an impediment, then getting a down garment is best for dry areas. Getting a down garment with overlying waterproof fabric is the best for wet areas. Down is the best, but it costs more. Synthetic insulation is heavier, bulkier, and less efficient at insulating than down. Its main advantage is that it's cheaper.

Fleece^[367] is a synthetic generally made of polyester fibers to mimic wool. Its qualities include moisture wicking, low water adsorption permitting water to pass through its fibers, dries fast when wet, it's lighter than wool, and it's inexpensive. As compared to down, fleece is a bit more water-resistant and dries more quickly. Both are durable, but fleece is easier to care for; it's machine washable. Down insulates better and it is warmer and more expensive than fleece. Fleece can be used as an outer layer in moderate cold and as a mid-layer in more extreme cold. Down is versatile and can be appropriate for a wide range of temperatures depending upon its fill power. Down combined with a waterproof outer fabric can be used for extreme cold.

Here are some considerations for choosing your survival shorts and pants:^[368],
^[369] ^[370]

- Select a weight based upon your climate
- Durable fabric that will not easily tear:
 - Cotton: Comfortable, durable, heavier, absorbs water. Silicone treatments can provide water resistance.

- Cotton blends: Better wicking, lighter
- Canvas: Durable, heavy, stiffer.
- Synthetics (e.g., Lycra® or spandex): Light, flexible, wick moisture well.
- Soil and stain resistant
- Comfortable, flexible
- Drab color to blend in with other people and your environment
- Numerous pockets, some with zipper or hook and loop closure
- Teflon® coated fabric for water resistance in wet areas
- Quick-drying
- Easy to pack
- For pants:
 - Get relaxed-fit so you can wear long underwear beneath them
 - Tapered pant leg opening to fit more easily inside socks or boots (an alternative is to have a drawstring around the bottom hem) to keep out insects and debris.

Socks are a critical part of your survival gear. Feet sweat a lot and socks need to be able to wick away the sweat keeping your feet dry and prevent blisters that form due to friction. Wool socks pull moisture away from your feet and facilitate evaporation making your feet feel cool. Wool is also a good insulator in cold weather. Cotton socks absorb water and perspiration keeping your feet wet and cotton is slow to dry once wet. Merino wool alone or blended with synthetic material is great for socks. Merino wool is not itchy like ragg wool. It dries slower and is more expensive than synthetics. Blended fabrics may include nylon or spandex (Lycra®) for elasticity and shape retention. Polyester (COOLMAX®), acrylic (Wickspun®), and polypropylene (Isolfil®) are used to wick moisture away from your skin. Synthetics are durable, but provide less insulation when wet. Socks come in different weights or thicknesses with heavier ones providing more cushion and insulation. Liner socks are meant to be worn beneath your primary socks. They are often fabricated from polyester (COOLMAX®) to transfer moisture from your feet to your overlying primary sock for evaporation. Some liner socks are made of silk which is less desirable because they wear out much faster. To save space in your BOB, you can pack numerous pairs of the smaller liner socks and just a few pairs of the bulkier primary socks. Liner socks dry faster than primary socks, so you can more easily wash them daily

keeping a clean pair on your feet. You can wash your primary socks less frequently this way.^[371]

Here, we'll provide illustrative examples of various clothing items beginning with your Sub Layer and progressing to your Outer Shell. Examples are given for women's and men's clothing. Some items of clothing are unisex. Here are the examples:

Item name: Brooks UpRise Crossback Sports Bra

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3hnxaaa>

Price: \$25.73

Weight: Not specified

Size: XS, S, M, L, XL, XXL

Material: 85% polyester/15% spandex. Lining fabric: polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: Lightweight, perforated cups provide excellent ventilation to keep you cool. Mesh straps deliver maximum ventilation. DriLayer® Adapt bottom band molds to the body for a personalized fit with every wear.

Available colors include black, heather asphalt, and quartz marble/berry.

Item name: Smartwool Seamless Bikini Underwear - Women's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/34JpSs8>

Price: \$23.79

Weight: Not specified

Size: XS, S, M, L, XL

Material: 77% merino wool/23% nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: The ventilation zones, soft merino wool interior, and covered elastic waistband of the women's Smartwool Seamless Bikini underwear help keep you comfortable and deliver an all-day fit. The outer layer is designed for support. Available colors include black, deep navy, and light wave blue.

Item name: Under Armour Men's Original Series 6-inch Boxerjock Boxer Briefs- 2 Pack

Vendor: Mike's Online Solutions on Amazon.com

Webpage URL: <https://amzn.to/2KZONAR>

Price: \$21.58

Weight: 7.2 ounces

Size: Small through 5-XL

Material: 95% Polyester/5% Spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Lightweight, smooth HeatGear® fabric. 4-way stretch construction moves better. Wicks sweat and dries really fast. Anti-odor technology. Working fly. 2 boxer briefs per pack. Inseam: 6".

Item name: Darn Tough Merino Wool Boot Sock Full Cushion

Vendor: Darn Tough Store on Amazon.com

Webpage URL: <https://amzn.to/3hiMXXO>

Price: \$25.95

Weight: 8 ounces

Size: Small through 2-XL

Material: 66% Merino Wool 32% Nylon 2% Lycra Spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Merino-wool. MIDWEIGHT WITH FULL CUSHION - A midweight sock with high density cushioning throughout the entire sock for full-on comfort and performance. True Seamless technology allows for an undetectable seam fusion for an ultra-smooth, invisible feel. BOOT SOCK HEIGHT - Sits mid-calf for added protection and warmth. COMPOSITION - The fast action wicking pulls moisture away from skin, so no more sweaty, stinky socks. The soft, breathable merino wool has fast-drying, all-weather performance that keeps you cool in the summer and warm in the winter. GUARANTEED FOR LIFE - Darn Tough's famous guarantee - if these socks wear, tear, or develop holes, Darn Tough will replace them no questions asked.

Item name: REI Co-op COOLMAX® EcoMade Liner Crew Socks

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3mS1E5o>

Price: \$8.95

Weight: Not specified

Size: Small through XL

Material: 50% COOLMAX® EcoMade polyester/49% nylon/1% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: The polyester yarn in REI Co-op COOLMAX® EcoMade liner socks is made from recycled water bottles. Nylon adds durability, while

spandex offers stretch and shape retention so the fit will remain snug, wash after wash. Smooth, flat toe seams ensure no bunching or irritation for your toes. Machine wash inside out in cold or warm water; no bleach or fabric softener; tumble dry low.

Item name: Odlo Blackcomb Light Crew Base Layer Top - Women's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3pw5brt>

Price: \$38.73

Weight: Not specified

Size: XS, S, M, L, XL

Material: 69% polyamide/31% polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: Short sleeve, T-shirt style base layer top. Moisture-wicking. Providing excellent comfort on any activity and in any weather conditions, the women's Odlo Blackcomb Light crew-neck base layer top can be worn year-round. Enjoy unrestricted freedom of movement with seamless body-mapping technology that's built to perform with your body, not against it. Highly elastic and fast-drying fabric increases comfort during your favorite activities. Effect by Odlo means you'll feel fresher for longer thanks to permanent anti-odor treatment. Reflective details. Earphone loop helps wrangle your cord.

Item name: Mato & Hash Workout Shirts for Men | Moisture Wicking Shirts, Breathable Build

Vendor: Mato & Hash Store on Amazon.com

Webpage URL: <https://amzn.to/3hpyLQy>

Price: \$11.99

Weight: 3.8 ounces

Size: Sizes small through 4-XL

Material: 100% Polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: Breathable, moisture-wicking, and lightweight. Not too snug, not too baggy. You'll be able to move freely. Many different colors. Can use it for your sublayer or base layer.

Item name: Bodtek Women's Thermal Underwear Set Premium Long John Base Layer Fleece Lined Top and Bottom

Vendor: Bodtek Store on Amazon.com

Webpage URL: <https://amzn.to/2JtJBEY>

Price: \$29.99

Weight: 10.41 ounces

Size: XS, S, M, L, XL

Material: 92% ultra-soft polyester and 8% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Made with a poly-spandex blend that offers you 4-way stretchability. Their fleece lining and stitching prevent ripping and tearing for your thermal's longevity. Moisture-wicking technology on our long johns women wicks away moisture while eliminating chafing and skin irritation. Elastic waistband. Snug fit.

Item name: Bodtek Men's Thermal Underwear Set Premium Long John Base Layer Fleece Lined Top and Bottom

Vendor: Bodtek Store on Amazon.com

Webpage URL: <https://amzn.to/3aKDIDP>

Price: \$29.99

Weight: 12 ounces

Size: Small through 2-XL

Material: 92% polyester, 8% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: 4-way stretchability. Their fleece lining and stitching prevent ripping and tearing for your thermals longevity. Moisture-wicking technology to stay dry and comfortable.

Item name: Craft Core Trim Thermal Mid Layer - Women's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3mUvohI>

Price: \$89.95

Weight: Not specified

Size: XS, S, M, L, XL

Material: 93% polyester/7% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Long sleeve. Hip length. Partial zip. Moisture-wicking. Quick-drying. Thumbholes in sleeves. Color: Trace/Melange.

Item name: REI Co-op Active Pursuits Half-Zip Shirt - Men's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3rsrAbj>

Price: \$49.95

Weight: Not specified

Size: Small through 2-XL

Material: 89% polyester/11% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Partial-zip. Deep neck opening offers extra venting on hot days. Sun protective fabric with UPF Rating 50. Moisture-wicking. Quick-drying. Long sleeve. Fabric blend traps air to keep you warm and comfortable on cool days. Thumbholes keep sleeves in place when you're moving fast. Soft ribbing at the collar. Use it as your core layer.

Item name: Carhartt Women's Rugged Flex Original Fit Canvas Work Cargo 8 Inch Short

Vendor: Moosejaw

Webpage URL: <http://bit.ly/3nV81G7>

Price: \$29.99

Weight: Not specified

Size: 2, 4, 6, 8, 10, 14, 18

Material: 98% Cotton, 2% Spandex canvas. Fabric weight: 8 ounces per square yard.

Appropriate for which BOBs: Short, Medium, Long

Comments: A durable cargo short for summer comfort. The stretchy cotton canvas is lightweight, breathable, soft on the skin, and comfy on the move. Mid-rise; sits slightly below the waist. Easy fit through the hip and thigh. Contoured waistband prevents gapping in the back. Triple stitched main seams. The hammer loop, cargo pockets, and slip pockets hang onto the daily necessities, including a snack for the trail. Available colors: Tarmac and Yukon.

Item name: Men's DuluthFlex Fire Hose® 11" Cargo Shorts

Vendor: Duluth Trading

Webpage URL: <https://bit.ly/34KvYIY>

Price: \$64.50

Weight: Not specified

Size: Waist 32 through 48 inches

Material: 97% cotton/3% spandex Duluth Flex Fire Hose fabric

Appropriate for which BOBs: Short, Medium, Long
Comments: Available in 5 colors. Crouch Gusset® for more room where it counts and triple-stitched seams that won't rip out. Pre-washed 8-oz. Fire Hose cotton canvas is 30% lighter than the originals, just as abrasion-resistant. Stain- and water-repelling FendOff Finish® fabric treatment. 11 pockets, including cargo pockets with in-or-out tuckable pocket flaps. Relaxed Fit. 11" inseam hits just below the knee on your average 5'10" all-American Joe (also available in 9" inseam).

Item name: Women's Taclite Pro Pant

Vendor: 5.11 Tactical

Webpage URL: <http://bit.ly/2KvQaYc>

Price: \$49.99

Weight: Not specified

Size: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. Regular 31 inch inseam. Long 35 inch inseam.

Material: 6.2 oz. polyester/ cotton TACLITE® ripstop fabric

Appropriate for which BOBs: Short, Medium, Long

Comments: Lightweight, durable. Double reinforced seat and knees. Hip mounted D-ring. YKK zippers. Gusseted construction. Bartacking at major seams and stress points. Seven pockets including strap and slash pockets. Teflon finish. Prym snaps. Designed to provide outstanding performance in hot and humid climates. Also available in shorts.

Item name: CQR Men's Tactical Pants, Water Repellent Ripstop Cargo Pants, Lightweight EDC Hiking Work Pants

Vendor: CQR Store on Amazon.com

Webpage URL: <https://amzn.to/37QB8EV>

Price: \$39.98

Weight: Not specified

Size: Waist 28 through 46 inches. Length 30 through 36 inches.

Material: Mix of Polyester and Cotton Rip-stop fabric materials. Duratex Fabric repels liquids, dirt, and other contaminants.

Appropriate for which BOBs: Short, Medium, Long

Comments: Multi-purpose cargo pockets for various tools and equipment. Fade, shrink, and wrinkle resistant. High-strength High-density metal alloy button and zipper along with a durable mounted stopper.

Item name: REI Co-op Sahara Convertible Pants (to shorts) - Women's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/38D8Kph>

Price: \$48.89

Weight: Not specified

Size: 0, 2, 4, 6, 8, 10, 12, 14, 16. Inseam: 32 inches pants, 7 inches shorts.

Material: 94% nylon/6% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Mid-rise. Lightweight nylon blend fabric dries fast and has a durable water-repellent finish; low-bulk fabric with flat seams prevents chafing, also allowing pants to pack down small. UPF 50+ rating provides excellent protection against harmful UV rays. Multiple pockets provide storage for essentials; many pockets have secure zip closures and all pockets have mesh or eyelets to allow drainage. Reinforced cuff backs stand up to abrasion from boots. Stretch fabric with a center gusset provides comfort, allows you to move freely with a full range of motion. These lightweight pants zip off into trail-ready shorts in a flash. Color-coded thigh zippers help you easily tell the right leg from the left leg when converting back to pants. The fabric packs down small and dries quickly, so globetrotting hikers can easily wash them on the go. Available colors include Dark Army Cot, Quiet Shade, and Beachwood

Item name: Columbia Men's Silver Ridge™ Convertible Pants To Shorts

Vendor: Columbia

Webpage URL: <http://bit.ly/2WNIIPR>

Price: \$45.00

Weight: Not specified

Size: Waist 28 through 44 inches. Length 28 through 36 inches

Material: OMNI-SHADE MAIN BODY: 100% nylon Silver Ridge ripstop.

OMNI-WICK MESH PANELS: 57% recycled polyester/43% polyester mesh

Appropriate for which BOBs: Short, Medium, Long

Comments: With one zip, go from pants to shorts in no time. Made of nylon ripstop with an advanced wicking fabric and UPF 50, these pants keep you cool and dry. Partial elastic at waist. Gusset detail. Pockets with hook and loop closure. Zip-closed security pocket. Mesh pocket bags.

Item name: Women's Mountain Pile Fleece Vest

Vendor: L. L. Bean

Webpage URL: <http://bit.ly/38DXHMr>

Price: \$89.00

Weight: lb

Size: XXS, XS, S, M, L, XL

Material: 100% polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: Thick and cozy 300-weight sherpa fleece provides serious warmth during outdoor excursions. Falls at the hip. Machine wash, line dry. Elastic at armholes and hem for flexible comfort and to block out wind. Two lower zippered hand pockets. Available colors: Black, natural, nautical navy, vintage lavender. Available in Plus sizes (1X, 2X, 3X) for \$99.00

Item name: Men's Basin Trail™ Fleece Vest

Vendor: Columbia

Webpage URL: <http://bit.ly/37Q4WBB>

Price: \$32.90

Weight: Not specified

Size: Small through XXL

Material: 100% Polyester 225gm Anti Pill Solid Microfleece

Appropriate for which BOBs: Short, Medium, Long

Comments: Black color. Drawcord-adjustable waist, this versatile vest can be worn alone or as a heat-trapping layer. Hand pockets. Binding at collar.

Item name: The North Face Osito Fleece Jacket - Women's

Vendor: Back Country

Webpage URL: <http://bit.ly/3aJmTDN>

Price: \$74.21

Weight: 1.3 lb

Size: XXS, XS, S, M, L, XL, XXL

Material: 100% polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: Soft, high pile zip-up fleece jacket. Mid-weight. Regular fit. Tall collar. Stretch cuffs. 2 zippered hand pockets. Hip length. 27.25 inches long center back. Lifetime manufacturer warranty. Available in 5 different colors: Marllard blue, blue frost, black, white, grey.

Item name: Men's Wind Protector™ Fleece Jacket

Vendor: Columbia

Webpage URL: <http://bit.ly/2KTotIt>

Price: \$49.99 (Regularly \$99.99)

Weight: Not specified

Size: Small through XXL

Material: Shell: 100% polyester Windproof Fleece Lite. Lining: 100% polyester Omni-Heat Reflective™. Chamois Touch Tricot

Appropriate for which BOBs: Short, Medium, Long

Comments: Olive Green and Black colors. Crafted from laminated fleece for windproof protection, this toasty zip-up jacket is the best combination of comfort, protection, and style. The thermal-reflective lining retains your body heat while remaining breathable. Features: Omni-Heat™ thermal reflective, Omni-Wind™ Block windproof, Abrasion resistant chin guard, Zippered chest pocket, Zippered hand pockets, Modern Classic Fit, Drawcord adjustable hem.

Item name: Women's Roffe Ridge™ Windblock Full-Zip Jacket
(Windbreaker lightweight jacket)

Vendor: Coumbia

Webpage URL: <http://bit.ly/2WPZvwg>

Price: \$100.00

Weight: Not specified

Size: XS, S, M, L, XL, XXL

Material: Outer shell:100% Polyester Windblock Peached Back. Shell: 180g Thermo Stretch Fleece 91% polyester / 9% elastane

Appropriate for which BOBs: Short, Medium, Long

Comments: Full zip wind-blocking jacket. Omni-Wind™ Block windproof, breathable. The fleece lining provides a layer of warmth and additional protection from the wind. Integrated stretch fabric allows this jacket to move with you. Zippered hand pockets. Colors: Dark Nocturnal, Lapis Blue, White.

Item name: Patagonia Houdini Jacket - Men's (Windbreaker lightweight jacket)

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3nV1ISW>

Price: \$99.00

Weight: 3.7 ounces

Size: Small through XXL

Material: 1.2 oz. recycled ripstop nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: 11 different colors. Durable water repellent (DWR) coating provides the first layer of defense against moisture. Weather-resistant and featherweight ripstop nylon blocks wind, withstands abrasion, and packs down into chest pocket. Zippered chest pocket converts to a stuffsack with a reinforced carabiner clip-in loop. Hood adjusts in one pull, and won't block peripheral vision. Durable half-elastic cuffs and drawcord hem seal out the elements. Reflective detail enhances visibility in low-light conditions. Slim fit with a slight drop tail for better fit during movement; accommodates a base layer or a light mid-layer.

Item name: FROGG TOGGS® Women's Classic All-Purpose Waterproof Breathable Rain Suit

Vendor: FROGG TOGGS Store on Amazon.com

Webpage URL: <https://amzn.to/2L1MHjD>

Price: \$45.99

Weight: 1 lb

Size: S, M, L, XL

Material: 100% Polypropylene

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes jacket and pants. The Jacket features an adjustable, tuck-away hood with E-Z push cord locks to protect the user's head and hair. The jacket comes in a full-length parka cut, front zip with snap-down storm flap, elastic cuffs, shock cord/barrel lock adjustable waist. The pant features an adjustable, elastic waist, and leg openings with a straight-leg design.

Available colors: Black, Cherry/Black, Realtree® Edge, and Safety Green jacket and Black pants.

Item name: FROGG TOGGS® Men's Classic All-Sport Waterproof Breathable Rain Suit

Vendor: FROGG TOGGS Store on Amazon.com

Webpage URL: <https://amzn.to/3nSTtqP>

Price: \$36.20

Weight: 10.4 ounces

Size: Small through 3XL

Material: 100% Polyester

Appropriate for which BOBs: Short, Medium, Long

Comments: All-Sport Rain Suit includes a jacket and pants. Made with Frogg

Toggs® breathable, non-woven fabric that is waterproof, wind-resistant, and lightweight. Jacket features an adjustable, removable hood and a full-length parka-cut, open-waist design. Jacket zipper is covered by a snap-down storm flap and elastic cuffs are provided to keep you dry. Pant features an adjustable, elastic waist and adjustable leg openings.

Item name: REI Co-op Stormhenge 850 Down Jacket - Women's (Waterproof)

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3aL6ChD>

Price: \$249.00

Weight: 1 lb 6 ounces

Size: XS, S, M, L, XL

Material: Shell: 98% nylon/2% polyester. Lining: polyester. Insulation: 850-fill power goose down

Appropriate for which BOBs: Short, Medium, Long

Comments: 2-layer waterproof, breathable nylon shell with fully sealed seams provides burly weather protection. 850-fill-power goose down is highly compressible and provides abundant warmth for its lightweight. Down has also been treated with a durable water repellent (DWR) to help it resist water. Insulation is mapped to the body, providing warmth where it's needed and reduced bulk where it's not. Bonded baffles welded to the shell eliminate cold spots. Insulated 3-way hood adds protection and warmth. Pit zips and 2-way front zipper act as vents to dump core heat as needed. Seam-free shoulders won't chafe under pack straps. Adjustable cuffs seal out the elements. Zippered hand pockets securely stow essentials. Hip length. Back length 26.25 inches.

Item name: REI Co-op Stormhenge 850 Down Jacket - Men's (Waterproof)

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3mQXNp1>

Price: \$249.00

Weight: 1 lb 11 ounces

Size: Small through XXL

Material: Shell: 98% nylon/2% polyester. Lining: polyester. Insulation: 850-fill power goose down

Appropriate for which BOBs: Short, Medium, Long

Comments: 2-layer waterproof, breathable nylon shell with fully sealed

seams provides burly weather protection. 850-fill-power goose down is highly compressible and provides abundant warmth for its lightweight. Down has also been treated with a durable water repellent (DWR) to help it resist water. Insulation is mapped to the body, providing warmth where it's needed and reduced bulk where it's not. Bonded baffles welded to the shell eliminate cold spots. Insulated 3-way hood adds protection and warmth. Pit zips and 2-way front zipper act as vents to dump core heat as needed. Seam-free shoulders won't chafe under pack straps. Adjustable cuffs seal out the elements. Zippered hand pockets securely stow essentials. Hip length. Back length 28.75 inches.

Item name: REI Co-op Power Wool Beanie

Vendor: REI Co-op

Webpage URL: <http://bit.ly/2M80GoJ>

Price: \$26.95

Weight: Not specified

Size: One size

Material: Polartec® power wool (merino wool interior, synthetic fiber exterior)

Appropriate for which BOBs: Short, Medium, Long

Comments: Merino wool interior is breathable, warm, and soft; synthetic fiber exterior is stretchy and durable. Water beads up and rolls off the durable water repellent (DWR) finish. Wicks moisture, dries quickly, and is naturally odor-resistant. Minimal seaming ensures comfort.

Item name: Outdoor Research Cloud Forest Rain Hat (Wide brim, UV protection, waterproof)

Vendor: REI Co-op

Webpage URL: <http://bit.ly/34NkPXT>

Price: \$45.00

Weight: Not specified

Size: S/M and L/XL

Material: Nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Walnut color. In cooler climates, a Ventia™ waterproof nylon shell and under-brim polyurethane coating shed foul weather. On hot days, dark fabric under the brim deflects sunlight while the breathable TransAction™ headband prevents sweat from interfering with your vision.

UPF 50+ fabric shields you from harmful UV rays. Single-handed drawcord adjustment and removable chin cord secure your fit. Packable design is easy to stash in your bag. Reflective OR logo adds visibility in low light. Quick-drying, waterproof, and moisture-wicking to keep you dry.

Item name: Buff Original Multifunctional Headwear (Neck gaiter and many other uses - see below in comments)

Vendor: REI Co-op

Webpage URL: <http://bit.ly/34Jrke4>

Price: \$20.00

Weight: Not specified

Size: One size

Material: REPVEVE® polyester microfiber

Appropriate for which BOBs: Short, Medium, Long

Comments: 5 colors. Wear it climber style or as a neck gaiter, bandana, hairband, helmet liner, headband, beanie, balaclava, half mask, hood, or scarf. REPVEVE® performance polyester microfiber is made from recycled materials—including single-use plastic bottles. 4-way stretch fabric moves easily with you and holds its shape over and over. UPF 50 fabric shields against harmful UV rays. Recycled polyester fabric helps manage moisture and dries quickly. Seamless construction is comfortable against the skin.

Item name: Outdoor Research Helmetclava Balaclava

Vendor: REI Co-op

Webpage URL: <http://bit.ly/2M3HWqo>

Price: \$42.00

Weight: Not specified

Size: S, M, L

Material: 68% nylon/26% polypropylene/6% spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Gore WindStopper® soft-shell fabric to keep you warm in stormy weather. Soft, insulating Motion Fleece™ at the back of the neck enhances warmth. Thermodynamic™ fabric at the crown and ear panels fits smoothly under a helmet without bunching up; fabric does not inhibit sound from traveling to your ears. Breathable fabric and a laser die-cut breathing port allow moisture to escape.

Item name: Rothco Solid Color Shemagh Tactical Desert Keffiyeh Scarf

Vendor: Rothco Store on Amazon.com
Webpage URL: <https://amzn.to/3psiVUI>

Price: \$11.99

Weight: 7.2 ounces

Size: One size. 42x42 inches.

Material: Woven cotton

Appropriate for which BOBs: Short, Medium, Long

Comments: 8 solid colors. Rothco's Solid Color Shemagh Keffiyeh Scarves are adaptable to any environment. Great as a face mask, neck gaiter, headwrap, and much more! Breathable Woven Cotton Construction Provides the Perfect Combination of Comfort and Resiliency While Protecting Your Head and Neck From Harmful Sunrays, Snow, Sand, and Other Debris. Can Be Manipulated and Used as a Makeshift Sling, Tourniquet, Pouch, and Much More.

Item name: WOLF TACTICAL Everyday Riggers Belt - Tactical 1.75"
Nylon Web Belt for CQB, Military Training, Holsters, Concealed Carry, Law Enforcement, First Responders

Vendor: Wolf Tactical Store on Amazon.com

Webpage URL: <https://amzn.to/3mSneGP>

Price: \$18.99

Weight: No specified

Size: S (28-34"), M (35-41"), L 42-51")

Material: 1.75" nylon webbing. DURABLE STEEL BUCKLE AND D-RING.

Appropriate for which BOBs: Short, Medium, Long

Comments: Featuring breathable soft nylon webbing, our riggers belt is comfortable enough for daily wear, but sturdy enough for tactical use. If you're looking for a versatile lightweight belt that can be worn casually and can also safely carry smaller concealed firearms, holsters, and tactical gear, look no further. Solid metal hardware allows our belt to convert into a tie-down, carry strap, or tactical harness in emergencies. Velcro hook and loop secures the running end to make sure your belt stays cinched and will never slip. Perfect for military, law enforcement, first responders, EMTs, hunting, and outdoor survival. Crafted with rugged, rip-resistant 1.75" nylon webbing. Single-layer nylon webbing allows our belt to stay super comfortable throughout the day. No holes in the belt mean you can fully adjust for a

custom fit whether or not you're carrying. Full refund if your expectations aren't met for any reason.

Item name: Relentless Tactical The Ultimate Concealed Carry CCW Gun Belt | Made in USA | 14 oz Leather

Vendor: Relentless Tactical on Amazon.com

Webpage URL: <https://amzn.to/3nUC80D>

Price: \$59.99

Weight: 11.2 ounces

Size: 32-52 inches

Material: 1.5 inch wide, 14 ounce, one-piece Premium Full Grain US Leather
Appropriate for which BOBs: Short, Medium, Long

Comments: PROUDLY HANDMADE IN THE USA! LIFETIME

WARRANTY! If you are ever unhappy with this belt for any reason just let us know and we will replace it at absolutely no cost to you. KEEP YOUR FIREARM WHERE YOU WANT IT WHEN YOU NEED IT! Won't stretch, bend or sag! A Strong and Secure platform for your IWB or OWB holster, mag pouches, flashlights, and any other gear you need! SAY NO TO NYLON BELTS! This 1.5 Inch 14 ounce Premium Full Grain US Leather Belt is strong enough to carry all your gear and stylish enough for discreet everyday use. No plastic inserts or multiple piece lamination to worry about falling apart. THE BEST REVIEWED GUN BELT ON AMAZON! Great for Open Carry as well.

Survival Shoes And Boots

Buying shoes is a very personal choice and the best type for your escape will depend upon your locale and where you anticipate ending up. Consider factors such as the terrain (e.g., city landscape, flat countryside, bayous, mountains, etc), water exposure (e.g., streams, rivers, rainy climate), temperature range, and how much walking you'll be doing.

Proper fit and comfort are prime considerations when choosing your footwear. Measure your feet or try on footwear in the afternoon to account for enlargement of your feet due to swelling that occurs as the day progresses. Also, try on footwear while wearing the socks you will be wearing when you escape from disaster. Your survival socks may be thicker than your everyday socks, so you'll need to account for that when you size your shoes.

You'll have some decisions to make:[\[372\]](#), [\[373\]](#)

- Low cut (lighter) versus high top (heavier, more support, more protection against scrapes and bumps) footwear
- Waterproofing (e.g., Gore-Tex lining)
 - Heavier. Slow to dry when wet. Not very breathable
 - Even waterproof footwear eventually gets wet.
 - Non-waterproof footwear: Lighter, breath more freely, dry faster when wet.
- Material used for the upper:[\[374\]](#)
 - Synthetic: Lighter. Less expensive
 - Full-grain leather: Leather that is not brushed or roughened on its inside or outside surface. Stiffer than nubuck or suede. Best water resistance. Durable. More expensive
 - Nubuck: Made by leather's outside (i.e., top-grain) surface. Textured to have a napped finish. More breaking-in needed. Less water-resistant than full-grain leather. Stronger and more water and abrasion-resistant than suede.
 - Split grain leather: The bottom or inner layer of leather (includes suede). Better water resistance. Cheaper
 - Suede: Soft. Created by brushing the leather's inside surface to create a napped finish. Soft and pliable.
- Strong lacing system (e.g., D-rings, eyelets, hooks) that resists breakage.
- Sole material and configuration
 - Toe and heel brakes for steep terrain
 - Self-cleaning tread that sheds mud and small stones as the sole flexes while walking.
 - Shock-absorbing material
 - Prevent pain, bruising of the soles of your feet from branches, stones, etc.
 - Flexible
 - A tread pattern that provides good traction
 - Vulcanized rubber: Chemically altered natural rubber. Resists deformation and elasticity loss with temperature changes. Longer lasting and more durable.

Saving weight on your shoes is important because the weight on your feet results in approximately 4-6 times the energy expenditure as the same amount

of weight carried on your back.^[375] ^[376] One of the biggest advantages of low cut shoes is their weight savings as compared to high top boots.

One question is whether high-top boots offer protection against ankle injuries such as sprains. The results of numerous studies were either inconclusive or showed that high top boots or high top shoes provided no ankle protection compared to low cut shoes. Studies show that ankle braces and exercises to strengthen muscles about the ankle can protect against ankle sprains.^[377] ^[378] ^[379] ^[380] Many people like the support they feel high top boots give them. So, feel free to choose high top boots if you prefer them. They do protect your ankles from scrapes and bruising when walking around vegetation and rocks.

You have a variety of shoe styles to choose from:

- Trail running shoes
- Hiking shoes
- Hiking boots
- Tactical boots

Trail Running Shoes

Trail running shoes^[381] ^[382] are lighter than hiking boots. They are similar to but stouter than regular road running shoes. Most are low cut. Waterproofing is available, but the non-waterproof version offers better breathability. Their soles provide greater resistance to twisting than standard running shoes. But, their softer soles do not protect the bottom of your feet as well as hiking boots from stepping on rocks and other hard objects. They are less durable than hiking shoes and will last approximately 500 trail miles.

Item name: Salomon® Speedcross 5 Trail-Running Shoes - Women's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3aKXeL3>

Price: \$130.00

Weight: 1 lb 3.8 ounces

Size: 6 through 12 in regular and wide widths

Material: Upper: Nylon mesh/welded synthetic overlays. Midsole: Injected EVA. Outsole: Contagrip® rubber

Appropriate for which BOBs: Short, Medium, Long

Comments: Moderate cushion. 10mm heel to toe drop. Heel units create cradles for heels, ensuring clean foot strike and stability through the stride.

Completely welded uppers with dissociated SensiFit™ arms move naturally

with feet; SensiFit™ cradles feet from midsoles to laces, providing a secure and snug fit. Contagrip® rubber outsoles use deep, sharp lugs made from a compound that balances durability and adhesion for maximum grip on loose, soft, or rugged and uneven surfaces. EnergyCell™+ high-rebound midsoles provide exceptional energy return along with substantial cushioning and durability. Removable OrthoLite® footbeds add shock absorption; antimicrobial treatment deters odors. Quicklace™ system ensures a secure and customized fit: just pull, lock the toggle and go; pockets on tongues store laces out of the way. Protective toecaps guard against bumps and abrasion.

Item name: Salomon® Wildcross Trail-Running Shoes - Men's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3aMzxCG>

Price: \$130.00

Weight: 1 lb 4.4 ounces

Size: 8 through 14

Material: Upper: Nylon mesh/welded synthetic overlays. Midsole:

EnergyCell™. Outsole: Contagrip® TA rubber

Appropriate for which BOBs: Short, Medium, Long

Comments: Ankle height. Moderate cushion. 8mm heel-to-toe drop. More space in the forefoot, SensiFit™ DreamTex wings and water-repellent TPU mesh keep your feet secure and comfortable. EnergyCell™+ high-rebound midsoles provide exceptional energy return along with substantial cushioning and durability. Quicklace™ system ensures a secure and customized fit—just pull, lock the toggle, and go. Protective toecaps guard against bumps and abrasion. Full rubber Contagrip® outsoles with multidirectional lugs give you more traction in the mud.

Hiking Shoes

Hiking shoes are more durable but heavier than trail running shoes. They generally last about 750 trail miles. They are low cut below the ankle and are available with or without waterproofing. They occupy the product space between trail runners and hiking boots.^[383], ^[384], ^[385]

Item name: Salomon® Women's X Ultra 3 GTX Hiking Shoes

Vendor: Backcountry on Amazon.com

Webpage URL: <https://amzn.to/2MdgXZF>

Price: \$150.00

Weight: 27 ounces

Size: 5 through 12

Material: Water-resistant mesh and waterproof PU-coated leather upper. GORE-TEX® breathable, waterproof protection. Injected EVA midsole. Contagrip® outsole.

Appropriate for which BOBs: Short, Medium, Long

Comments: Thanks to Descent Control technology, it efficiently tackles technical hikes and really shines during tough descents. Wear this pair and head downhill with a spring in your step, even in wet conditions. Protective mudguard around the base of the foot protects the lateral and medial sides from muddy trails. Anti-debris Mesh upper prevents debris from being trapped between your foot and the footbed. EnergyCell™ midsole, a high-performance EVA foam, provides shock attenuation. Gore-Tex® waterproof.

Item name: Salomon® X Ultra 3 GTX Hiking Shoe, Men's

Vendor: Salomon

Webpage URL: <http://bit.ly/354qhFZ>

Price: \$112.50

Weight: 28 ounces per pair of size 9.5 shoes

Size: 7 through 12.5. D and EE width

Material: Water-resistant mesh and waterproof PU-coated leather upper. GORE-TEX® breathable, waterproof protection. Injected EVA midsole. Contagrip® outsole.

Appropriate for which BOBs: Short, Medium, Long

Comments: Ideal for fast hiking over moderate to technical terrain in wet-weather conditions. Waterproof bootie construction. SENSIFIT™ system envelopes the foot for a precise, secure fit. Stitch-free upper construction provides a smooth, glove-like, fit, and feel. Gusseted tongue helps keep the debris out. Protective rubber toecap. Mud guard. External heel counter locks the foot into place. Heel pull. Plush tongue and collar. Breathable fabric lining for a great in-shoe feel. Removable EVA footbed with OrthoLite® sock liner that combines a specific cushioned foam and an EVA heel cup. OrthoLite® foam creates a cooler, drier, better-cushioned environment under the foot. EVA heel cups allow for better heel support and added cushioning. Advanced Chassis™ system maximizes motion control, energy management, and propulsion for a stable, efficient, and responsive ride. Molded shank provides enhanced stability. Non-marking Contagrip®

outsole delivers exceptional grip and durability. Chevron lug design with deep penetration and multi-directional grip, improving traction on soft surfaces like mud or loose dirt. A patterned area on the heel grabs terrain more aggressively, giving you more control especially on descents.

Hiking Boots

Hiking boots^[386], ^[387], ^[388], ^[389] have collars that extend above the ankle. They are heavier and more durable than other types of hiking footwear. They will last about 300-500 to 1000 trail miles depending upon factors like terrain, weather, gait, and carry weight. The sole may vary from flexible to stiff and it is made of a harder, more durable rubber than on trail running shoes. Shoes with stiffer soles provide better support when carrying heavier loads and when walking on uneven terrain. They come with and without waterproofing, varying degrees of breathability, and for differing temperature ranges.

Item name: Salomon® Quest 4D 3 GTX Hiking Boots - Women's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3rEK8VV>

Price: \$230.00

Weight: 2 lb 5 ounces per pair

Size: 6 through 12

Material: Upper: Nubuck leather/textile. Lining: Gore-Tex. Midsole: Dual-density EVA. Outsole: Contagrip rubber

Appropriate for which BOBs: Short, Medium, Long

Comments: Over-the-ankle. Lace-up closure. Seam-sealed Gore-Tex® membranes offer excellent protection from water and allow vapor to escape to help keep feet dry and cool. New lug design for better grip on all surfaces. New 4D Advanced Chassis design enables more forefoot flexion for a smoother ride that flows from step to step. Long-lasting split suede leather and nylon mesh uppers offer flexibility, breathability, and lightweight comfort. Padded, gusseted tongues have a contoured instep fit; tongue folds lie flat and smooth to relieve lace pressure while keeping trail debris and moisture out. Laces feature sheath materials that provide soft flex and secure grip, keeping knots secure while on the move. Wicking polyester linings absorb and disperse excess moisture for comfort. Removable OrthoLite® footbeds absorb shock; antimicrobial treatment deters odors inside the boots. Dual-density EVA midsoles supply lasting comfort and support.

Item name: Salomon® Quest 4D 3 GTX Hiking Boots, Men's

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3rypwys>

Price: \$172.49

Weight: 2 lb 13.2 ounces per pair

Size: 8 through 14

Material: Upper: Nubuck leather/textile. Lining: Gore-Tex. Midsole: Dual-density EVA. Outsole: Contagrip® rubber

Appropriate for which BOBs: Short, Medium, Long

Comments: Over-the-ankle. Lace-up closure. Seam-sealed Gore-Tex® membranes offer excellent protection from water and allow vapor to escape to help keep feet dry and cool. New lug design for better grip on all surfaces. New 4D Advanced Chassis design enables more forefoot flexion for a smoother ride that flows from step to step. Long-lasting split suede leather and nylon mesh uppers offer flexibility, breathability, and lightweight comfort. Padded, gusseted tongues have a contoured instep fit; tongue folds lie flat and smooth to relieve lace pressure while keeping trail debris and moisture out. Laces feature sheath materials that provide soft flex and secure grip, keeping knots secure while on the move. Wicking polyester linings absorb and disperse excess moisture for comfort. Removable Orthoclipse footbeds absorb shock; antimicrobial treatment deters odors inside the boots. Dual-density EVA midsoles supply lasting comfort and support.

Tactical boots

First, how do tactical boots differ from hiking boots and combat boots?^[390],^[391],^[392] Here are some key features of each type of boots:

- Tactical Boots:
 - Thinner, lighter, more flexible
 - Most often synthetic or combo synthetic and leather upper
 - Sole softer and less durable than combat boot sole
 - May or may not be waterproof
 - Readily available for civilians from many retail outlets
- Hiking Boots:
 - More flexible than combat boots
 - Provide stability on uneven ground
 - Lighter weight than combat boots
 - Heel breaks to aid with descents

- Combat Boots:
 - Long-lasting
 - Generally, heavy leather upper
 - More durable
 - Replaceable outsole
 - Waterproof
 - Heavier

Tactical boot uppers come in synthetic, leather, or a combination of the two materials. Uppers made of synthetics and leather are popular because they have good breathability and resistance to abrasion, but they are less durable than all-leather boots. They dry faster when wet. You can get tactical boots with insulated and moisture-wicking lining materials. They are also available with Gore-Tex lining for waterproofing. Gore-Tex® can become more permeable allowing water to penetrate boots that have been worn extensively particularly when exposed to moisture, heat, and UV radiation. Leather boots can receive repeated wax surface treatments to keep them waterproof, but they have poor breathability, they are heavy and more expensive. [\[393\]](#), [\[394\]](#), [\[395\]](#)

Here are some things to know about and look for in the construction of your boots: [\[396\]](#)

- The boot's sole is comprised of the midsole and outsole
- Midsole
 - Provides cushioning
 - Often made of EVA foam or polyurethane foam
 - EVA foam: Lighter, softer. Loses its ability to rebound and becomes compressed faster thereby losing its cushioning function
 - Polyurethane foam: Denser. Initially stiffer. Retains its shape longer providing more durable cushioning
- Outsole
 - Usually made of natural or synthetic rubber
 - Most are oil-resistant, non-marking
 - Lug pattern provides traction
- Toe protection: This is optional. Composite is better than steel since it does not remain bent and pressed against your toes upon heavy impact. It is also not cold like steel in lower temperatures.
- Boot height (collar length) can vary between four and eight inches, although some are even longer. Shorter collars are better for carrying

light loads, scrambling, and running. Taller collars are better for carrying heavy loads and for protection against bumps or scrapes from objects you may encounter.

- Arch support: More important the heavier load you're carrying. Substitute the factory insole with an aftermarket insole if needed.
- Zipper closure: Faster than using laces. Allows less frequent lace adjustment. Some boots come with a built-in side zipper closure. Aftermarket zipper closure add-ons are also available.

Some reputable manufacturers of tactical boots include:^[397]

- Salomon®
- Asolo
- Rocky
- LOWA
- Meindl
- Hanwag

Item name: Rocky Alpha Force Women's Waterproof Public Service (tactical boot)

Vendor: Rocky

Webpage URL: <http://bit.ly/3rw3YIZ>

Price: \$113.00

Weight: 1.30 lb

Size: 5 through 10. Medium and wide widths.

Material: Full-grain water-resistant leather upper. Airport Footbed Provides Support and Cushioning. Oil- and slip-resistant, non-marking RigiTrac™ molded EVA/rubber outsole. Rubber Outsole is Non-Marking

Appropriate for which BOBs: Short, Medium, Long

Comments: Rubber Outsole is Non-Marking. Guaranteed Rocky®

Waterproof construction. Non-metallic stabilizer. Contoured removable polyurethane cushion insole providing direct underfoot cushion comfort. The polyurethane material used in its insole is known for its cushioning while not bottoming out features. Some open-celled foams feel very comfortable to the initial touch but will tend to break down faster than a product made with polyurethane. Plus, it is extra thick in the heel contact area. This provides additional underfoot comfort to the wearer. 2-inch heel height

Item name: 5.11 Women's A.T.A.C. 2.0 8" Storm Tactical Boots

Vendor: 5.11

Webpage URL: <http://bit.ly/3mS3BPg>

Price: \$139.99

Weight: Not specified

Size: 5 through 10. Regular and wide widths.

Material: Roughed out suede toe. 840D nylon upper. Full-length dual durometer Ortholite® footbed

Appropriate for which BOBs: Short, Medium, Long

Comments: 8 inches high. Airflow breathable tongue construction. Achilles heel flex zone for enhanced comfort and flexibility. Shock Mitigation System®. Strobel construction. Hidden knife pocket. Lighter weight upper construction. Ortholite® Achilles cuff for comfort. YKK® side zipper. Slip-and oil-resistant outsole. SlipStream™ waterproof BBP membrane. Black color.

Item name: Rocky S2V Predator Military Boot, Mens

Vendor: Rocky Store on Amazon.com

Webpage URL: <https://amzn.to/37SBvza>

Price: \$146.75

Weight: 4 lb

Size: 4 through 15 in half sizes, regular and wide width

Material: Water-resistant leather and 1,000-denier CORDURA nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Coyote Brown and Black colors. GSA/TAA compliant boot. PTFE-coated for flame resistance. Drainage vents with advanced S2V Sieve technology circulate air in and push water out, allowing you to quickly "walk-them-dry." The durable, triple-stitched military boot stays together through wear and tear and reduces ankle injuries with Roll-Stop Ankle Stability™. The stretch LYCRA® tongue hugs your foot for a secure fit. This tactical boot has a Vibram® sole with proprietary high walls and a polyurethane midsole. Dri-Lex® lining wicks away moisture. The Rocky Air-Port™ footbed cushions your foot and has perforations for airflow. An Aegis® Microbe Shield™ on the footbed helps fight odor and bacteria. The fiberglass shank supports the arch of your foot.

Item name: 5.11 Tactical ATAC Men's 8" Leather Jungle Combat Military Coyote Boots, Style 12110

Vendor: 5.11 Store on Amazon.com

Webpage URL: <https://amzn.to/2WQK9b4>

Price: \$84.99

Weight: 3.6 lb

Size: 4 through 15 in both regular and wide widths

Material: Full-grain leather and durable, extra-strong nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Coyote Brown and Black colors. Synthetic sole. Shaft measures approximately 8" from arch. 5.11 Tactical A.T.A.C. 8" Side Zip. Open-cell foam cushion and Cushioned Ortholite® insole. Hypertext lasting board with Injection-molded Phylon midsole. Non-metallic shank with Oil and slip-resistant outsole. Semi-rigid heel and toe reinforcement and Moisture-wicking lining. Suede with Covert tactical pocket. 5.11 Shock Mitigation System and YKK® zippers.

TOOLS

Tools for your BOBs covered in this chapter include:

- Cutting tools
 - Saw
 - Hatchet
 - Axe
 - EMT scissors
- Electricity related tools
 - Headlamp
 - Rechargeable batteries
 - Battery charger
 - Lithium-ion power bank
 - Solar Panel
- Maintenance tools
 - Sharpening tools
 - Caring for your hatchet and axe
 - Sewing kit
 - Shoe Goo® or Barge Cement™
- Other tools
 - Multi-tool
 - Shovel
 - Crowbar

As a means of providing you with cross-reference, the following tools are covered in other chapters in this book:

- Knives: Survival Knives chapter
- Flashlights: Communications chapter
- Water valve wrench: Water chapter
- Gun cleaning: Please see the “Spare Parts And Cleaning Supplies For Your Firearms” section in the “Personal Protection Items” chapter

One thing to keep in mind when selecting tools for your BOBs is to try to

choose tools that have multiple functions so you can save space and weight. Examples include:

- Multi-tools that include a knife, saw, pliers, file, screwdrivers, etc
- Shovels that have a saw on one side edge and a sharpened edge for chopping
- Hatchet that can be used as a hand axe and hammer

Saw, Hatchet, Axe: Which should I pack in my BOB?

There could be circumstances where you might find a use for them in your Short-Term BOB. But, these are items to primarily consider for your Medium- and Long-Term BOBs. All three of these tools can help you in numerous ways including:

- Processing wood for fires and shelters
- Making tools and weapons
- Processing game
- Clearing debris

Let's examine some of the pros and cons of each. [\[398\]](#), [\[399\]](#), [\[400\]](#), [\[401\]](#), [\[402\]](#), [\[403\]](#)

Saw:

- Pros:
 - Lightweight
 - Compact
 - Safer, requires less skill to use than hatchet or axe
 - Faster at cutting wood against the grain than hatchet or axe
 - Good for processing wood and game
 - Easier to make straight, precision cuts than with hatchet or axe
- Cons
 - Difficult to sharpen a blade when it dulls
 - Blade can break

Hatchet (a small axe with a short handle that can be used with one hand):

- Pros
 - One-handed use for detailed work
 - Most handles are long enough to permit 2 hand grip when more power is needed
 - Shorter handle enables it to be used in tighter spaces than an axe
 - Lighter, more compact than an axe
 - Can sharpen it with makeshift materials or objects (concrete

sidewalk, rocks, etc) when in a pinch

- Can be used as a hammer
- Handy for limbing trees, chopping small trees, splitting wood, carving, processing game.
- Harder to break and lasts longer than a saw
- Can be used as a weapon
- Cons
 - Bulkier and heavier than a saw
 - Greater risk of injury than with a saw
 - Shorter handle makes a miss or over swing more likely to cause injury than a long-handled axe
 - Requires more energy to use than a saw

Axe (handles longer than 14 inches):

- Pros
 - Good at quickly splitting wood in line with its grain
 - Longer handle provides more powerful strikes
 - Can process larger pieces of wood, game
 - Can sharpen it with makeshift materials or objects (concrete sidewalk, rocks, etc) when in a pinch
 - Can be used as a hammer, carve wood
 - Hard to break, lasts longer than a saw
 - Can be used as a weapon
- Cons
 - Large, heavy
 - The bit (cutting part of the axe) can skive off of or be deflected by wood upon impact potentially causing injury
 - Requires space to swing it
 - Be aware of what's behind you when swinging overhead
 - Overtravel of the bit can cause it to strike the user especially when standing too close to the object being chopped or split
 - Not as good for chopping against the wood's grain

What you decide to carry will depend upon your circumstances and preferences. Your Short-Term BOB will be the lightest of your bags and contain the fewest items. You will probably not include a saw, hatchet, or axe in your Short-Term BOB since other items will take priority

Modern survival saws are compact and light making them easy to carry and worthwhile addition to your Medium- and Long-Term BOBs. A hatchet is a multi-use tool and can do some things better than a saw. It's more durable than a saw and it can be sharpened, which are advantages in longer-term survival situations. It's worthy of including in your Medium- and Long-Term BOBs. You might pack both a saw and a hatchet if you can accommodate their size and weight considering the other items you'll be carrying.

An axe is too large and heavy to carry on one's person since there are plenty of other items that will be more critical to include in your BOBs. An axe is something to consider packing if you're escaping in your vehicle. You'll have limited space even in a vehicle, so what you bring will need to be vetted based upon your assessment of what you will likely need the most.

Saw

You may have seen wire saws that come packaged as part of survival tins. These are braided wires with handles on each end, often comprised of metal rings into which a finger can be placed. Their main advantages are that they are inexpensive, very light, and compact. You can use them for light cutting chores on a variety of materials including wood, plastic, bones, and thin, soft metals. Most cut when pulled in both directions. Their main disadvantages are that they lack durability and they tend to bind when cutting through materials.

Pocket chainsaws are similar to wire saws, but use chains as their cutting mechanism. Chainsaws are larger and heavier than wire saws. The chains are similar to those found on power chain saws. They have a handle on both ends of the chain. The chain cuts in both directions. The better chainsaws have sharp teeth made of carbon steel with heavy-duty hand straps. Saw lengths of 24 and 36 inches require fewer back and forth cutting strokes making sawing easier than with shorter chainsaws. The advantages of chainsaws are that they are light and compact. They can cut fast since they are cutting three sides of an object at the same time. The disadvantage is that they require two hands, they are more difficult to clean, and expend more energy to operate than a folding saw. [\[404\]](#), [\[405\]](#)

A pocket chainsaw is more effective than a wire saw in terms of durability and its cutting ability. Because of their small size, you could consider including one of them in your EDC and perhaps as a backup saw in one of

your three BOBs. However, a folding saw is a better choice as your primary saw for BOBs. Here is an example of a pocket chainsaw:

Item name: Sportsman Pocket Chainsaw 36 Inch Long Chainsaw

Vendor: Sportsman Industries on Amazon.com

Webpage URL: <https://amzn.to/3rw4hx9>

Price: \$23.95

Weight: 4.9 ounces

Size: 36 inches not including handles

Material: 65 MN high carbon heat-treated steel.

Appropriate for which BOBs: Short, Medium, Long

Comments: Bidirectional, self-cleaning chainsaw style cutting teeth. Heavy-duty rugged cross-stitched handles with metal brackets. Can easily be re-sharpened with a regular 5/32 round chainsaw file, unlike other sharp pointed pocket saws. Heavy-duty nylon storage pouch comes with front a snap clip and a belt loop. Free fire starter. Lifetime Money Back Guarantee.

A folding saw is a handy item for your Medium and Long Term BOBs. Some features to look for:[\[406\]](#), [\[407\]](#), [\[408\]](#)

- Folding saw for space savings
- There are limitations to a bucksaw (also known as a frame saw). Most have C or H metal shaped frames. The frame size limits the size of wood that can be cut. Buck saws tend to be bulkier and heavier than folding saws.
- A saw blade that cuts in both push and pull directions. These cut quickly and aggressively, but leave a rough cut.
- A saw blade that cuts on the pull stroke provides more control and a smoother cut, but tend to jam if a lot of pressure is applied to them.
- A blade with a high number of teeth per inch (TPI) will cut more smoothly, but less aggressively, taking more time to cut
- A blade with a lower TPI cuts fast but leaves a rougher cut edge.
- Hardened stainless steel blades are more durable and remain sharper longer.
- Coated blades prevent rust and friction
- Locking mechanism that securely holds the blade opened and closed
- The ability to replace saw blades if you anticipate a long term survival situation where you'll process lots of wood

Item name: Corona RazorTooth Folding Pruning Saw, 10 Inch Curved Blade, RS 7265D

Vendor: Corona Store on Amazon.com

Webpage URL: <https://amzn.to/34PDLVE>

Price: \$21.98

Weight: 12.8 ounces

Size: 1x2.68x12 inches

Material: Impulse hardened steel blade

Appropriate for which BOBs: Medium, Long

Comments: 3 sided razor teeth for efficient cutting. 10" blade is ideal for cutting 5" - 6" diameter, small to medium, branches. The handle provides a comfortable grip. The folding blade is curved, taper-ground, and replaceable. Blade latch prevents injury when not in use. Impulse hardened teeth for long service life. Up to 6 teeth per inch and curved blade design for faster cutting. Cuts are smoother and quicker than a traditional saw. Chrome-plated blade reduces friction and improves efficiency. Also available with 7 and 8 inch long saw blades.

Item name: Silky Ultra Accel Professional 240mm Curved Folding Saw Large Teeth

Vendor: Silky Store on Amazon.com

Webpage URL: <https://amzn.to/2WOqfxb>

Price: \$60.43

Weight: 10.4 ounces

Size: 1.5x3x12 inches

Material: Lightweight aluminum chassis

Appropriate for which BOBs: Medium, Long

Comments: 9.5 inches (240-mm) blade length - Large teeth, 6.4 teeth per inch. Curved blade for maximum speed and efficiency. Easy-grip rubberized handle. Replaceable blades.

Hatchet

Here are some things to consider when choosing a hatchet:^[409], ^[410], ^[411]

- Handle: Wood handles are classic. Often hickory. Be sure that the wood's grain runs parallel to the long axis of the handle for strength. Other handle materials include fiberglass, metal, and plastic. Some handles are straight. Curved handles are more comfortable to hold. Some come covered with rubber, leather, or paracord.

- Head: Forged, carbon steel
- Weight: Lighter is easier to carry and swing quickly. Heavier provides more power.
- Balance: Balance between the head and the handle provides comfort and control.
- Length: Shorter is easier to pack and to use for precise functions like carving, light chopping. Longer gives greater power.
- Sharpness: Stainless steel is more durable, but not as easy to sharpen and not as sharp as high carbon steel.
- Sheath: To protect the bit from damage and for safety.
- Price: Paying more does not mean you'll get a better hatchet. If you're unfamiliar with hatchets, read numerous reviews to get a sense of which ones are best.

Item name: Fiskars® 378501-1002 X7 Hatchet

Vendor: Fiskars® Store on Amazon.com

Webpage URL: <https://amzn.to/3hkwYZc>

Price: \$28.98

Weight: 1.38 lb

Size: 1x5.5x16.5 inches

Material: Handle is made of composite fiberglass material. Forged steel head.

Appropriate for which BOBs: Medium, Long

Comments: Proprietary blade-grinding technique provides a sharper edge for better contact and cleaner cuts. Low-friction blade coating powers through wood and prevents the head from getting stuck. Stronger-than-steel

FiberComp® handles and inseparable insert-molded heads. Handle has a non-slip grip and a vibration-absorbing chamber. Virtually impossible to break.

Sheath included. Lifetime warranty.

Item name: Estwing Sportsman's Axe - 14" Camping Hatchet with Forged Steel Construction and Genuine Leather Grip - E24A

Vendor: Estwing Store on Amazon.com

Webpage URL: <https://amzn.to/3rtGcHg>

Price: \$34.98

Weight: 1.7 lb

Size: 2x7x13 inches

Material: Forged 1055 carbon steel

Appropriate for which BOBs: Medium, Long

Comments: Forged in 1 piece. Leather grip, hand sanded, and lacquered for a durable, yet comfortable finish. Made in the USA. Ballistic nylon sheath. Available with 2.75 or 3.25 blade.

Axe

Different types of axes are optimized for different tasks:[\[412\]](#)

- Felling axes: Long handle. Heavy. Narrower bit to concentrate impact to a smaller area. For felling trees and chopping logs. Designed to cut against a wood's grain.
- Forest axes: Heavy-duty. Extra-long handle. Flared blade with a slightly curved tip. Used for felling trees.
- Splitting axes: Long handle. Wide-wedged head. Splits wood.
- Splitting maul: Similar to a felling axe, but much heavier, thicker, wedge shaped head. Long handle. Designed to cut with the grain to split wood.
- Broad axes: Blade is flat on one side and has a broad bevel on the other side for chopping. Used for hewing (making round timber into flat-edged timber)
- Carpenter's axes: Small, but larger than a hatchet. Straight, sharp blade for accurate cuts. May have a nail removal notch in the blade. Not ideal for felling or chopping. Used for woodworking
- Hunter's axes: Grooved handle to improve grip when bloody. Rounded flay poll is useful for game skinning without damaging the hide like the straight poll with sharp corners found on an ordinary axe blade.
- Double bit axes: Two blades, one on each side of the head. One blade is sharp for felling and chopping. The other blade is blunt for splitting wood. Heavy and bulky.
- General duty axes: Rounded bits to handle a broad spectrum of tasks

Factors to consider in selecting a survival axe:[\[413\]](#), [\[414\]](#), [\[415\]](#), [\[416\]](#)

- Length: 15-20 inches is a good compromise between power, weight, and portability.
- Weight: Two pounds or less for the axe head is a good compromise between power and weight.
- Balance: Proper weight balance enables the axe to swing properly
- Handle: Hickory is the most popular. It is strong, flexible, and comfortable to grip
- Forged carbon steel. Swedish steel has a reputation for strength
- Durable, protective sheath to protect the bit

Item name: Fiskars® 378571-1002 X15 Chopping Axe 23.5"

Vendor: Fiskars® Store on Amazon.com

Webpage URL: <https://amzn.to/3hllk0d>

Price: \$44.33

Weight: 3.6 lb

Size: 1.75x7.5x26.75 inches

Material: Handle is made of composite fiberglass material. Drop forged medium carbon steel blade

Appropriate for which BOBs: Medium, Long

Comments: Ideal for felling trees. Perfected balance and power-to-weight ratio increases swing speed to multiply power. Friction-reducing non-stick coating to the head. Shock-absorbing FiberComp® handle is lightweight yet stronger than steel to prevent overstrike damage. An insert-molded design locks the blade in place so it won't ever unhitch itself from the durable, weatherproof handle. Sturdy sheath included. Lifetime warranty

Item name: Gransfors Bruks Small Forest Axe 19 Inch

Vendor: Boundary Waters

Webpage URL: <http://bit.ly/3hllowZ>

Price: \$173.00

Weight: 2.25 lb (1.5 lb head)

Size: Head 3.75x7 inches. Overall 19.5 inches.

Material: Forged steel head. Hickory handle

Appropriate for which BOBs: Medium, Long

Comments: Excellent for felling trees, limbing, splitting small sticks.

Vegetable-tanned leather sheath. Handmade in Sweden. 20-year guarantee.

EMT Scissors

EMT scissors (also known as trauma shears) should be part of your first aid kit, EDC, and each of your three BOBs. They are small, lightweight, and can function in many different scenarios. They are much more effective at cutting than regular scissors. They can cut clothes, webbing, light sheet metal, medical dressings, leather, rubber, wire, rope, small branches, etc. Some common features of these scissors include:

- Large, plastic handles that accommodate multiple fingers so you can squeeze the blades together with more force than with regular scissors
- Serrated blades. Milled serrations are carved into the blades making them more durable than stamped serrations that are pressed into the blade.

- Blades generally made of stainless steel
- Blunt, extended lower blade to protect a person's body when scissors are used to remove a covering from them (e.g., clothes, shoes, splints, dressings, etc)
- The blades angle upwards approximately 30 degrees midway between the handles and the blade tips
- Each blade has a central concave depression running along its length to provide greater bending resistance
- Tough and durable
- Can cut through almost any material

Item name: Ever Ready Titanium Bonded Bandage Shears 7 1/4" Bent (EMT Scissors)

Vendor: Ever Ready First Aid Store on Amazon.com

Webpage URL: <https://amzn.to/2KDCuKB>

Price: \$6.95

Weight: 2.4 ounces

Size: 0.5x3.9x7 inches

Material: Blades are made of bonded titanium, which is a lot stronger than steel

Appropriate for which BOBs: Short, Medium, Long

Comments: Blunt tip. Bent handle.

Item name: Leatherman Raptor Shears, Black with MOLLE Compatible Holster, Multi-Tool, Stainless Steel Folding Shears with Strap Cutter, Ring Cutter, Ruler, Glass Breaker (EMT Scissors)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3nXdDQu>

Price: \$64.99

Weight: 9.59 ounces

Size: 0.7x2.7x6.2 inches

Material: 420HC stainless steel blades. Glass-filled nylon handles

Appropriate for which BOBs: Short, Medium, Long

Comments: The shears come apart for cleaning and maintenance. The blades fold in between the handles to make them more compact. Serrated blades.

Strap cutter. Ring cutter. Ruler. Carbide glass breaker. Oxygen tank wrench.

Lanyard hole. Replaceable pocket clip. Hard holster included. 25-year warranty.

Headlamp

The primary advantage of a headlamp over a flashlight is its hands-free operation. This is a huge advantage in a survival situation where you need to use of both hands:

- Processing wood
- Building shelter
- Cooking
- Navigating
- Map reading
- Finding items in your BOB
- Cleaning your gun or sharpening your knife

Headlamps are a good addition to your EDC and BOBs, but you should also carry a flashlight. You can always carry a flashlight on your person, access and deploy it quickly, use it as a defensive tool including in conjunction with your handgun.

Some features to look for in a headlamp include:[\[417\]](#), [\[418\]](#), [\[419\]](#), [\[420\]](#), [\[421\]](#)

- Variable brightness levels: High-output of at least 200 lumens.
- Floodlight mode: Wide beam, shorter throw. More illumination off to the sides
- Spotlight mode: Focused, narrower beam, longer throw.
- LED: Better power consumption, smaller size than conventional bulbs.
Almost all current headlamps use LEDs.
- LED housing that tilts. Some also swivel.
- Control buttons that are easily accessible and manipulated
- Battery life: Most use 3-4 AA or AAA batteries.
- Size
- Light weight: The greater the number of LEDs, the heavier the headlamp.
- Comfort and fit
- Water-resistant, waterproof
- Durable
- Optional features: Red light to preserve night vision and make you less conspicuous. Strobe mode. Rechargeable via USB cable. Lock-out feature (handy to prevent inadvertent activation inside BOB). Remaining power level indicator. Detachable LED housing to permit handheld use.

Item name: Energizer Vision HD + LED Headlamp

Vendor: Walmart

Webpage URL: <http://bit.ly/2KWGZQc>

Price: \$16.97

Weight: 2.96 ounces

Size: Not specified

Material: Plastic housing

Appropriate for which BOBs: Short, Medium, Long

Comments: LED. Pivotal head. 4 light modes (spotlight, floodlight, spot and floodlight joined, and red light for night vision). Uses 3 AAA batteries (included). Powerful beam comes to up to 80 meters and puts out up to 350 lumens. Launderable band. Tolerates drops up to 1 meter high. Water-resistant (IPX-4). Runs as long as 4 hours in high mode.

Item name: Black Diamond Storm Headlamp

Vendor: Black Diamond store on Amazon.com

Webpage URL: <https://amzn.to/34OhFD8>

Price: \$37.95

Weight: 3.9 ounces

Size: Not specified

Material: Plastic housing

Appropriate for which BOBs: Short, Medium, Long

Comments: One Quad Power LED and one Double Power white LED emit 350 lumens. LED housing tilts. Red, green, and blue Single Power LEDs for night vision have dimming and strobe settings and activate without cycling through white mode. Power Tap Technology allows instant transitioning between full and dimmed power. Settings include full strength in proximity and distance modes, dimming, strobe, red, green, and blue night-vision, and lock mode. Waterproof (30 minutes submerged in 1 meter of water) and dustproof. Sealed housing withstands immersion up to 1 meter for 30 minutes.

Rechargeable Batteries

Items in your BOBs like your headlamp and flashlight require batteries. Some of these devices are capable of being recharged, usually using a USB cable. But, most devices rely upon removable batteries. Carrying extra batteries takes more weight and space. And, your batteries will be depleted eventually. It's better to use rechargeable batteries and bring a solar charger.

Here are some advantages of rechargeable batteries over single-use batteries:

- Overall cheaper despite higher initial cost because they can be used over and over many times
- Convenience of not having to have a supply of single-use batteries on hand
- Better for the environment

Alkaline batteries employ electrodes of zinc and manganese dioxide in an alkaline electrolyte of potassium hydroxide (KOH). They account for the majority of batteries sold worldwide. Most cannot be recharged and can rupture if attempts are made to recharge them. There are a few rechargeable alkaline batteries. Alkaline batteries can leak KOH causing respiratory, eye, and skin irritation.^[422]

There are different types of rechargeable batteries.^[423], ^[424], ^[425]

- Nickel-cadmium (NiCd)
 - They were the first rechargeables
 - Contains cadmium, a toxic metal
 - Lowest capacity of the rechargeables
 - Discharges when left unused over a month
 - Rarely used today
- Nickel-metal hydride (NiMH)
 - Works well in high drain items needing a lot of power quickly (e.g., digital cameras)
 - Larger capacity than other rechargeables, three times the capacity of NiCds
 - Must be charged before use (the exception is that LSD versions come pre-charged)
 - Maintain their voltage until near the end of their charge versus the steady voltage decline that occurs with alkaline batteries
 - Can be recharged 150 to >500 times
 - Overcharging and repeatedly discharging the batteries completely can reduce the number of times it can be recharged
 - Readily available in retail outlets
 - Low voltage of 1.2V. Cheap, unregulated flashlights run dimmer. Devices using >4 batteries may discharge batteries fast or not operate at all.
 - Highest discharge rate of any battery type. Many brands self

discharge completely when unused for several months. Low Self Discharge (LSD) versions have a lower capacity.

- Select batteries with capacity of at least 1900mAh (milliamps per hour, a measure of capacity and how long the battery will run)
- Nickel-zinc (NiZn)
 - Works well in high drain items
 - Lasts longer in some high-drain devices than NiMH's
 - Higher voltage (1.65V+) makes lights burn brighter (except some LED flashlights which regulate the voltage)
 - Can damage some electronics with no voltage regulator because of its higher voltage
 - High self-discharge rate, losing approximately 13% of their initial charge per month of not being used
 - Capacity decreases with more cycles of discharge and recharging
 - Variable performance with some batteries ceasing function quickly or self-discharging faster than usual
 - Requires special charger
 - Available only in AA and AAA sizes
- Lithium-ion (Li-ion)
 - Works well in high drain items
 - AAA, AA, C, and D-size Li-ion put out 3.7V instead of 1.5V. Accidentally putting a 3.7V Li-ion in a 1.5V device could easily destroy it.
 - Some flashlights/headlamps are designed for either standard 1.5V or 3.7V Li-ion's and they're typically brighter with Li-ion's.
 - Requires a special charger

Bottom line: Pack at least two sets of NiMH rechargeable batteries for each of your battery-operated devices. You can keep one set of batteries in your devices while the second set of batteries are recharging. You may be able to recharge batteries using your vehicle, but you'll most likely be recharging them using a solar panel in a survival situation. It can take many hours to recharge batteries using a solar panel on a sunny day. You don't want to be without the use of your device while waiting for its batteries to recharge.

Item name: Panasonic BK-3HCCA4BA Eneloop pro AA High Capacity Ni-MH Pre-Charged Rechargeable Batteries, 4 Pack, Black

Vendor: Eneloop Store on Amazon.com

Webpage URL: <https://amzn.to/3nTwf3K>

Price: \$18.72

Weight: 0.48 ounces

Size: 1.2x3.38x4.25 inches

Material: Ni-MH High Capacity

Appropriate for which BOBs: Short, Medium, Long

Comments: These are premium, highly rated batteries that cost more than other batteries. 2550mAh type, 2450mAh min, Ni-MH High Capacity. 1.2V. Pre-charged. Recharge up to 500 times. Low Self Discharge: Maintain 85% of their charge up to 1 year (when not in use). No memory effect - batteries can be recharged when fully, or partially discharged. Work in extreme temperatures down to -4°F. Also available in AAA (950mAh, recharge up to 500 times)

Battery Charger

You'll need a battery charger if you're going to use rechargeable batteries. After an extensive search, I found the following:

- Battery chargers that work on wall outlet AC power that also have cigarette lighter adapters so they can be used in a vehicle
- Battery chargers that derive power through USB cables

However, I could not find a battery charger that derives power through a USB cable and has a car adapter. That means having to get two separate battery chargers if you anticipate escaping by vehicle:

- One battery charger to keep in your vehicle that has a cigarette lighter adapter. These chargers usually also include an AC adapter, so you can plug them into a wall socket if you have access to one.
- A second battery charger that is powered through an USB cable so you can connect it to a solar panel if you're escaping on foot or if you anticipate transitioning from vehicle to foot travel. One possible workaround is to use to connect the battery charger's USB cable into a USB-vehicle cigarette lighter adapter similar to those commonly used to charge cell phones. But, I can find no literature that discusses this manner of use to determine if it works or if it is safe.

Here is an example of an AAA, AA battery charger that works of AC and has a car adapter:

Item name: Nitecore® D4 Digital Smart Battery Charger for Li-ion Ni-MH Ni-CD with 12V DC Car Adapter, NBM40 18650 Battery Magazine and EdisonBright Battery Carry Case

Vendor: EdisonBright Store on Amazon.com

Webpage URL: <https://amzn.to/3hnYO6X>

Price: \$38.95

Weight: 15 ounces

Size: 2x8x8 inches

Material: Plastic case

Appropriate for which BOBs: Medium, Long

Comments: Capable of charging 4 types of batteries simultaneously.

Compatible with Li-ion (26650, 22650, 18650, 17670, 18490, 17500, 18350, 16340(RCR123), 14500, 10440), Ni-MH and Ni-Cd (AA, AAA, AAAA, C) rechargeable batteries. Intelligent circuitry detects the battery type and status before entering automatic charge mode. Intelligent automatic power-off function terminates current when charging is complete. Features over-charge prevention to protect batteries. Features temperature monitoring to prevent overheating. Features reverse polarity protection. Integrated LCD panel clearly displays charging parameters and progress. 12V DC Cable, Nitecore® NBM40 battery magazine, and BBX3 EdisonBright battery carry case included.

Here is an example of an AAA, AA battery charger that works of a USB cable, so it can be connected to a solar panel:

Item name: EBL 40Min iQuick Smart Battery Charger (Model EBL-U421) with USB Port and AA 2300mAh. Rechargeable Batteries 4 Counts

Vendor: EBL Store on Amazon.com

Webpage URL: <https://amzn.to/3mWMkEq>

Price: \$18.99

Weight: 11.22 ounces

Size: 2.01x3.9x4.41 inches

Material: Plastic case

Appropriate for which BOBs: Medium, Long

Comments: Unique USB design freely compatible with all 5V USB enable devices like power bank, adapter, solar charger, etc. For 1/2/3/4 AA AAA Ni-MH rechargeable batteries. Four EBL 2300mAh AA Rechargeable Batteries included.

Solar Panel

A solar panel can keep your battery-powered devices running in a grid-down situation or if you have to escape somewhere without access to electrical power. It can also be useful if you escape by vehicle in case you're unable to refuel. Your car battery will eventually run down and you'll be left without power.

Having a power bank (an external battery) may suffice for your EDC or Short Term BOB. Some power banks come with a solar panel attached to one of their surfaces. The small solar panels on these power banks are not practical for recharging a depleted power bank or external devices. It can take days for the solar panel to even recharge the power bank. You'll need a dedicated solar panel if you want to generate useful power from sunlight. Fortunately, there are numerous portable solar panels designed for those traveling on foot. Some of these solar panels can be attached to the back of a rucksack so it can recharge your devices while you're walking.

Depending upon your circumstances and priorities, you may decide to pack numerous devices that can benefit from having a solar panel as part of your BOB:

- Cell phone
- Flashlight
- Headlamp
- Emergency radio's internal battery
- GPS
- Tablet
- Laptop
- Ham radio
- Satellite phone
- USB battery charger

A solar panel's charging ability is dependent upon the sun. If you connect devices directly to your solar panel, the charge they receive will fluctuate depending upon the intensity of sunlight at a given moment. Very little charging may occur if clouds move in to block the sun thereby prolonging your recharging time. A better way to charge your devices that have internal batteries is to first connect a power bank (external battery) to the solar panel so it will be fully charged by the time you need to recharge one of your

devices. Connect your devices needing recharge to the power bank rather than directly to the solar panel. That way, you will always have a steady and maximal charge from the power bank available when you need it. Simply recharge your power bank as needed so it is always ready to use. Some solar panels come with an integrated battery pack negating the need for an external power bank.^[426]

It's best to obtain a Li-Ion power bank rather than rechargeable AA battery packs as the intermediary to deliver charge from the solar panel to your devices. Li-Ion power banks provide 50% more charge for 50% less weight than the AA battery packs used for the same purpose.^[427]

You can use a battery charger to recharge batteries for your devices that have removable batteries rather than built-in rechargeable batteries. The battery charger can be connected directly to your solar panel when there is sunlight or to your power bank if sunlight is inadequate or at nighttime.

Item name: Portable Charger Power Bank 25800mAh Huge Capacity External Battery Pack

Vendor: LanLukDirect on Amazon.com

Webpage URL: <https://amzn.to/34OibRA>

Price: \$25.95

Weight: 11.3 ounces

Size: 0.59x2.95x5.91 inches

Material: Lithium polymer battery

Appropriate for which BOBs: Short, Medium, Long

Comments: 25800mAh power bank could charge your phone at least 5-8 times. 2 USP ports: one 5V/1A output port and one 5V/2.1A output ports allow charging 2 devices simultaneously with high speed. 4 led lights indicate the remaining power. The power bank can be fully charged in 14 hours via the charger and the supplied micro USB cable. (If you use 2.1A Charger and USB cable to charge, it will faster. Built-in security devices protect your devices from excessive power, overheating, and overcharging.

Some points to consider regarding solar panels:^[428]

- Assess your charging needs (i.e., what devices do you need to recharge) and then select a solar panel that will provide adequate power to suit your needs
- Larger solar panels will provide greater charge. Balance panel size and

- capacity with how much you can carry
- Position the solar panels perpendicular to the sun to capture the most of the sun's energy
 - Panels will decrease their charging ability the more the sun is blocked, but they will return to full charging capacity once unobstructed sunlight is restored
 - Keep solar panels off of hot surfaces because heat reduces their charging performance
 - Heat degrades batteries, so avoid connecting your devices directly to the solar panel while it's being exposed to the sun

Item name: Ryno-Tuff Portable Solar Charger for Camping - 21W Foldable Solar Panel Charger 2 USB Ports - Waterproof and Durable

Vendor: Ryno Tuff USA on Amazon.com

Webpage URL: <https://amzn.to/37RAqY2>

Price: \$50.95

Weight: 16.6 ounces

Size: 0.79x5.9x11.8 inches folded. 0.12x11.8x18.1 inches unfolded.

Material: Rugged 600D waterproof PVC canvas material on the outside of the solar panels. PET laminated X-Series SUNPOWER solar cells.

Appropriate for which BOBs: Medium, Long

Comments: The 21w Solar Charger can charge your cell phone or tablet in as little as 2 hours. Charge 2 devices at once. Will automatically stop charging when fully charged or the device is overheated. Delivers 2.4amp per port with a max of 3amps when both ports are in use. You can also store the devices in the protective pocket while charging. Rugged 600D waterproof PVC canvas material protects your solar panel. 2 carabiners are included for hanging the unit. Lifetime Warranty, free replacement if it breaks under normal usage.

Sharpening Tools

You'll most likely have a folding knife as part of your EDC. And, you'll generally have one or two fixed blade knives as part of your three BOBs. You may even have a machete, hatchet, or an axe. Having a way to keep those cutting tools sharp is important to include in your Long Term and possibly your Medium Term BOBs.

The sharpeners that you select for your BOB need to be compact, light, and

durable. You may sacrifice the ability to hone your blades to a razor-sharp edge with these survival sharpeners, but they will convert blades dulled from use to ones with serviceable edges. Some sharpeners commonly used at home would not be ideal in your BOB in a disaster situation:

- Traditional whetstones: Too large and heavy
- Traditional diamond plates: Too large and heavy
- Traditional ceramic rod sharpening systems: Easier to break
- Multi-stone and guide systems: Too large and heavy

Here are some compact knife sharpeners for you to consider for your BOBs:

Item name: Hoffman Richter HR-1 Pocket Knife Sharpener

Vendor: Hoffman Richter

Webpage URL: <http://bit.ly/3h1WHQS>

Price: \$9.95

Weight: 0.35 ounces

Size: 0.3x2.5x3.2 inches

Material: Tungsten carbide rods. Ceramic finishing rods. ABS plastic housing

Appropriate for which BOBs: Short, Medium, Long

Comments: Hone your knife to an exact 22.5 degrees, to give your blade a constantly perfect edge each time, in seconds flat, from your old pocket knife to a full-sized machete. Just a few strokes over the tungsten carbide rods will almost instantly restore even the dulllest blade. Super-tough ceramic rods will then polish almost any sharpened blade to a finished edge in just a few strokes. Ironclad Lifetime Warranty.

Item name: Victorinox VN43323 Fixed Blade, Knife, Hunting, Camping, Outdoor Knife Sharpener

Vendor: Victorinox Store on Amazon.com

Webpage URL: <https://amzn.to/3aNmDE2>

Price: \$13.84

Weight: 1.41 ounces

Size: 5.625 inches long

Material: Ceramic rod

Appropriate for which BOBs: Medium, Long

Comments: Compact ceramic sharpener features a ceramic v-groove and oval rod. Red pocket clip

Item name: Lansky® QuadSharp™ Carbide/Ceramic Multi-Angle Knife

Sharpener

Vendor: Lansky

Webpage URL: <http://bit.ly/2WQOECd>

Price: \$21.99

Weight: 3.2 ounces

Size: 0.5x2.25x4.25 inches

Material: Metal casing. Carbide and ceramic sharpeners

Appropriate for which BOBs: Medium, Long

Comments: Four separate carbide slots with sharpening angles of 17°, 20°, 25°, and 30°. Sharpen in 3-4 strokes. Ceramic (800 grit) benchstone for fine polishing. Ceramic Benchstone is harder than steel, will never wear out, and can be used often as the primary sharpening element of your QuadSharp™. The Ceramic Benchstone is also tapered for sharpening serrated knives. Can be used to sharpen regular, serrated, and filet blades.

Hatchets and axes can be sharpened in the field using a file or compact whetstone, things that can be packed into your Long Term BOB:

Item name: Bahco 1-143-08-1-2 Mill Cut 1-File with Handle, 8-Inch

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2WOhgMv>

Price: \$11.06

Weight: 3.2 ounces

Size: 1.5x3x10 inches

Material: Metal (the type of metal is not specified). Plastic handle

Appropriate for which BOBs: Short, Medium, Long

Comments: 8-Inch file. Width of 25/32-Inch. 44 teeth per-Inch. Type of cut: bastard. Widely used for sharpening tools and implements such as spades, shovels, hoes and scrapers.

Item name: Fallkniven Diamond-Ceramic Whetstone Sharpener

Vendor: primesalles on Amazon.com

Webpage URL: <https://amzn.to/3mWb8we>

Price: \$19.89

Weight: 2.3 ounces

Size: 0.25x1.25x4.0 inches

Material: Ceramic on one side, diamond on the other side

Appropriate for which BOBs: Short, Medium, Long

Comments: Highly effective axe sharpener. One side is made from fine ceramic and the other from a coarser diamond. The ceramic side of the sharpener has a 2000 grit rating, while the diamond has about 800. Thanks to this, this sharpener can be used both for “rough” sharpening and fine honing to make it shaving-sharp. Fallkniven recommends using it dry without water or oil.

Author’s note: Here are some other sharpening tips:

- You can use your leather belt as a strop to add the finishing touch to sharpening your knife, hatchet, and axe blades
- In case you did not pack sharpeners for your knives, hatchet, or axe in your BOBs, you can use the file on your multi-tool as a sharpener in a pinch. You can also use a stone with a flat side to it as a sharpening surface.

Caring For Your Hatchet and Axe

Most hatchet and axe handles are made of hickory because it is a strong, durable wood that has sufficient flexibility to absorb vibration from impacts. The wood can be damaged by moisture causing it to swell or warp. Wood can also shrink if it dries out. This can be a particular problem where the handle fits inside the metal head.

You can protect your wooden handle by wetting it to raise the wood grain, letting it dry, then lightly sanding it, followed by applying oil to it, especially on the two ends where the wood will absorb the most. The most popular oils to use are linseed oil (made from flax seeds) and boiled linseed oil. Boiled linseed oil is not actually boiled. It has mineral spirits added to it to make it dry faster than pure linseed oil. Linseed oil can encourage the growth of molds and does not provide UV protection, important factors if you leave your axe outdoors. [\[429\]](#)

Pure tung oil (from the nut of the Tung tree) is even better because it is more water-resistant, dries faster, and does not attract mildew like linseed oil. It is non-toxic and penetrates wood sealing it. It hardens when dry providing a protective surface; it’s used as a surface finish for wooden decks and floors that are meant to be walked on. It is elastic, so it will not crack when wood swells and shrinks with weather changes. It does not protect against UV radiation. [\[430\]](#), [\[431\]](#), [\[432\]](#)

Apply three to five coats of these oils on your handle initially and then about once yearly thereafter. Pure linseed and tung oils can take 30-45 weeks to cure. But, they will dry enough in two to seven days that you can apply the next coat of oil. Do a light sanding between coats using 400-600 grit sandpaper or #0000-grade steel wool. Do not sand the final coat. The initial process of applying multiple layers is time consuming. That's why some people use boiled linseed oil since it dries in one to three days.^[433], ^[434]

Item name: Hopes 16to12 1 Pint 100% Tung Oil

Vendor: max_warehouse on eBay.com

Webpage URL: <http://ebay.to/2JlYjO2>

Price: \$19.33

Weight: 1 lb

Size: Not specified

Material: 100% Tung Oil

Appropriate for which BOBs: Short, Medium, Long

Comments: None

Item name: LinSheen Raw Linseed Oil – Food-Grade Wood Treatment. 4 oz bottle

Vendor: LinSheen on Amazon.com

Webpage URL: <https://amzn.to/3nSVP99>

Price: \$8.50

Weight: 4.8 ounces

Size: 1.55x1.55x5.2 inches

Material: 100% raw linseed oil

Appropriate for which BOBs: Short, Medium, Long

Comments: None

Hatchet and axe heads are most often made of high carbon steel rather than stainless steel, so they are prone to rust. Dirt and moisture speed corrosion. You can remove rust using white vinegar and steel wool. You can prevent rust by removing dirt and sap, cleaning, drying, and applying oil to the steel head. For those of you carrying a firearm maintenance kit, you can use gun oil such as Rem® Oil for this purpose. You can also use 3-IN-ONE® oil.^[435], ^[436], ^[437]

Item name: Rem®-Oil, 1 oz bottle

Vendor: Outdoor Gear To Go on Amazon.com

Webpage URL: <https://amzn.to/37TEN4Q>

Price: \$6.49

Weight: Approximately 3 ounces

Size: 1x3x5 inches

Material: Oil

Appropriate for which BOBs: Short, Medium, Long

Comments: Exclusive Teflon® formula provides thin long-lasting film.

Cleans dirt and grime from exposed metal surfaces. Penetrates the smallest metal pores. Displaces non-visible moisture from metal pores for rust protection. Cleans, lubricates, protects.

Most hatchet and axe sheaths are made of leather. It will require some care to prevent it from drying out and cracking. Also, you'll want to protect it from moisture. Do not use any product that will cause the leather to soften or stretch to compromise its fit on the head. You can use wax products designed for leather.^[438]

Item name: Nikwax® Waterproofing Wax for Leather

Vendor: Nikwax® Store on Amazon.com

Webpage URL: <https://amzn.to/3ryrmiQ>

Price: \$9.00

Weight: Approximately 4.5 ounces

Size: Not specified

Material: Wax-based product

Appropriate for which BOBs: Short, Medium, Long

Comments: 3.4 fluid ounces. Non-flammable, safe product that you can apply to wet or dry leather, providing instant Durable Water Repellency (DWR).

Works immediately after treating and will not soften leather. Water-based, biodegradable, and contains no PFCs, VOCs, optical brighteners, or added scent.

Sewing Kit

A sewing kit is light, compact, and a useful item, especially for your Medium- and Long-Term BOBs. Examples of how it may come in handy include:

- Repairs: Clothes, sleeping bag, backpack, etc
- First aid: Suture lacerations, ligate a bleeding blood vessel
- Assembly: Use fabric from torn pants to make a satchel or pouch, etc

These are some items to include in a sewing kit:^[439] ^[440]

- **Needles:** Pack a variety of needles of different sizes, shapes, and points.
 - Standard straight needles
 - Sailmaker's needles. Developed to use on heavy canvas sails. Much stronger than standard needles, easier to grip.
 - Sack needles. Large curved needles with extra-large eyes. Strong.
 - Leather needles. For leather and heavy nylon. Blunt tips.
- **Thread:** Pack threads of different sizes and types.
 - Braided is stronger than non-braided thread
 - Kevlar thread is very strong
 - Waxed thread helps seal seams, glides more easily through fabric, is slightly stronger versus un-waxed thread.
 - In a pinch, you can use fishing line or the internal strands that make up the paracord you packed in your BOB as thread
- **Scissors:** You can use the small scissors of your multi-tool to cut thread and your EMT scissors to cut fabric
- **Awl:** Useful for making holes in canvas and leather. Although not as pointed and fine as a regular awl, most multi-tools include an awl.
- **Pins or safety pins:** To hold fabric together as you sew.
- **Pieces of linen** to serve as patch material
- **Sharpening stone** for your needles. You can use the same sharpening tools you packed for your knives, hatchet, axe.
- **A small metal or plastic container** (e.g., Altoid® tin) or zippered nylon pouch to store your sewing kit.
- **Optional items:** Thimble, buttons

It takes a bit more work to assemble your own sewing kit, but it allows you to customize it to suit your preferences and needs. The product below is an economical choice for needles:

Item name: SINGER Heavy Duty Household Hand Needles 7 Count, 3-Pack

Vendor: Singer Store on Amazon.com

Webpage URL: <https://amzn.to/2KuYqaR>

Price: \$5.00

Weight: 0.81 ounces

Size: 0.01x0.01x0.01 inches

Material: Metal needles

Appropriate for which BOBs: Short, Medium, Long

Comments: Singer heavy duty assorted hand needles come in a variety of sizes and shapes. Use these hand needles on things like carpets, canvas, upholstery, coats, tents, mattresses, furs, and leather. You get 3 packs each containing 7 needles. Each pack has 3 thinner, straight needles of different lengths, 2 curved needles of different lengths, and 2 long, thick, straight needles (one has an upward angle near its tip).

Here is a product for those of you who want a pre-packaged sewing kit to avoid assembling a kit from scratch on your own:

Item name: Best Glide ASE Survival Sewing and Repair Kit

Vendor: Best Glide ASE on Amazon.com

Webpage URL: <https://amzn.to/3aJqbqD>

Price: \$14.99

Weight: 0.8 ounces (This printed weight is probably incorrect and too low)

Size: 0.2x4x4.8 inches

Material: Not specified

Appropriate for which BOBs: Short, Medium, Long

Comments: Includes the following items: (1) MILSPEC 5 x 4 Aloksak® Bag, (1) 2 3/4" x 1/2" Needle Holder, (2) #7 Needle, (2) #18 Darner Needle, (1) #16 Darner Needle

(4) Heavy Duty Straight Pins, (6) Assorted Buttons, (6) Assorted Safety Pins, (1) Thread - #69 Heavy-Duty, (1) Needle Threader, (1) Metal Thimble, (1) Fresnel Lens Magnifier, Bonded Kevlar Thread, 50 lbs test, Brass Repair Wire, Type 1A MILSPEC Utility Cord

Duct Tape (Made in the USA), (1) 3" x 4" Durable Waterproof Patch, (2) Commercial Grade Cable Ties, (1) Military Approved Derma Safe Knife.

Shoe Goo® or Barge Cement™

Most people will probably not have an extra pair of shoes or boots in their BOB. This could be an issue for long-term survival since you'll be putting your footwear through heavy use including carrying a heavy pack over rugged terrain. Serviceable footwear is critical for keeping your feet protected and uninjured. Shoe Goo® and Barge Cement™ are both all-purpose adhesives that can be used for shoe repair and much more. They can bond materials together, patch small holes, and serve as a waterproof surface sealant. They can be used on rubber, vinyl, PVC, polyurethane, cotton,

canvas, woven fabrics, synthetic fabrics, and leather.

Item name: Repair Adhesive for Fixing Worn Shoes or Boots (Shoe Goo®)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3nTwVWQ>

Price: \$4.96

Weight: 3.7 ounces

Size: 3.7-ounce tube. Available in other sizes also

Material: Adhesive

Appropriate for which BOBs: Short, Medium, Long

Comments: Synthetic. Clear. Shoe Repair and Protective Coating for Leather, Vinyl, Rubber, or Canvas. Shoe Goo® is ideal for fixing worn soles or damaged heels, coating shoes to prevent premature wear, sealing galoshes, waders, or rubber boots. The unique formula is designed for strong abrasion resistance and better adhesion to flexible materials. Bonds, protects, and rebuilds for a permanent repair. Excellent sealant – Perfect for patching small holes. Waterproof – bond remains secure even when exposed to Water. Creates extra traction – can even be used on skateboards. Stronger than glue.

Item name: Barge Original All Purpose Cement 2oz Tube Adhesive Glue (2-Pack)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3hktxSp>

Price: \$11.00

Weight: 5.1 ounces

Size: 2-ounce tube, 2.5x4x8 inches. 2 tubes included

Material: Adhesive

Appropriate for which BOBs: Short, Medium, Long

Comments: All-purpose cement. Neoprene Base. Waterproof. Superior Flexible Bond Perfect for outdoor gear repair. Toluene-free tube. All-Purpose Cement is a professional strength glue/adhesive that can be used on Leather, Rubber, Vinyl, PVC, Polyurethane, Cotton, Synthetic fabrics, Woven fabrics. It is much stronger than anything you can find in a retail store.

Multi-Tool

A multi-tool best exemplifies the principle of having each item in your BOB serve multiple functions. These compact tools should be in your EDC and each of your three BOBs. Some pocket knives like those made by Victorinox

can be considered to be multi-tools, but here we will limit our discussion to the larger, folding tools first popularized by Leatherman. Most of these tools will include:

- A knife with a plain edge and sometimes a second, serrated blade knife
- Needle nose pliers with integrated wire cutter
- 1-3 flathead screwdrivers of various sizes
- Phillips head screwdriver
- Saw
- File often with different grits to its two sides
- Can and bottle top opener
- Awl
- Crimping tool
- Ruler markings on the handles

Factors to consider when choosing your survival multi-tool:

- Size and weight
- Select a tool with functions that fit your individual needs. Avoid tools with functions that you won't use
- Quality of materials and construction. Lots of imports from China are junk from my personal experience. Stay with a major brand (e.g., Leatherman, Gerber, SOG, Victorinox)
- Comfort when gripping the handles hard (e.g., squeezing the pliers, etc)
- Ease of accessing the tools
- Locking mechanism to keep the tool being used from accidentally closing back onto your hand.
- This is one of the survival items that you will use the most. So, get the best that you can afford.

Item name: Gerber Suspension NXT Multi-Tool

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3rrfpeN>

Price: \$32.95

Weight: 6.7 ounces

Size: 4.25 inches closed. 6.25 inches open

Material: Stainless steel blade and handle

Appropriate for which BOBs: Short, Medium, Long

Comments: Tools include: Single 2.25 inch long knife blade with straight and serrated edge, Phillips and standard screwdriver, bottle opener, can opener,

wire stripper, fingernail file, lanyard ring, pliers, awl, ruler.

Item name: Leatherman Wave Plus Multi-Tool

Vendor: REI Co-op

Webpage URL: <http://bit.ly/3rEMt39>

Price: \$99.95

Weight: 8.5 ounces

Size: 4 inches closed.

Material: 420HC stainless steel knife blade. Handle made of stainless steel

Appropriate for which BOBs: Short, Medium, Long

Comments: 18 tools include needle-nose and regular pliers, premium replaceable wire/hard-wire cutters, electrical crimper, wire stripper, 420HC knife, serrated knife and saw, spring-action scissors, 8 in. (19 cm) ruler, can opener, bottle opener, wood/metal file, diamond-coated file, small and large bit driver and medium screwdriver. Many features are outside-accessible, allowing you to access them when the multi-tool is folded and closed. All features are locking and can be operated with a single hand. Made in the USA.

Shovel

Lots of survival shovels now come bundled with multiple tools on their blades and inside their handles. You can use those tools as a backup for your primary tools or perhaps even use them as a substitute for other tools to save weight and space. A shovel's most basic function is digging and it does that better than you can with your bare hands, knife, or makeshift tools like a plank or stick. Some common short and long-term survival uses for a shovel include:

- Digging your vehicle out of mud or snow
- Leveling ground for your tent
- Digging a trench around your tent to divert water away from it
- Creating a fire pit
- Digging a latrine
- Digging for water in a dry riverbed
- Digging a hole to make a solar still for water collection
- As a chopping tool especially if you sharpen its edge
- Plant a garden using your survival seeds
- As a weapon

Factors to consider when selecting a survival shovel:^[441], ^[442], ^[443], ^[444], ^[445]

- Do you plan to carry it with you or leave it in your vehicle? (It's best to take it with you if you have to leave your vehicle.)
- Avoid plastic shovel blades or handles. They are lightweight, but break easily
- The type of metal used in its construction:
 - Aluminum: Lighter. Not as strong
 - Stainless steel. Won't rust. Fairly heavy
 - High carbon steel. Stronger than regular stainless steel. Rusts. Usually covered with oxide paint to prevent rust, but paint can come off.
- Handle length. Longer handle easier to use but increases weight and bulk
- Handle type:
 - Fixed: Strong. Takes more space
 - Folding: Easier to carry, smaller size when folded. Can be used as a pickaxe or hoe with the blade locked perpendicular to the handle. Folding pivot is a weak point for breakage.
 - Telescoping: Flexible length. Each junction between the segments is a weak point subject to breakage
- Blade size: Larger blades move more dirt, require more energy, and can be difficult to work around rocks
- Blade edge: Some have a sharpened plain edge, others have a sharpened serrated edge
- Blade thickness: Thin blade can bend and eventually break
- Blade shape: Narrow versus wide, pointed versus flat.
- What tools are included with a multi-function shovel? (And, what is the quality of their materials and construction?)

Your choice of survival shovels comes down to 3 broad types. Which type you pick is a matter of your personal preference. Here are the three types and an example of each:

- A simple, super-strong non-folding shovel: Cold Steel 92SFS Special Forces Shovel
- A simple, folding shovel to save space: Gerber E-Tool Folding Spade, Serrated Edge
- A multi-function shovel: EST Gear Survival Shovel

Item name: Cold Steel 92SFS Special Forces Shovel

Vendor: Blade Shop on Amazon.com

Webpage URL: <https://amzn.to/2L1PuJD>

Price: \$27.97

Weight: 1.6 lb

Size: 20.50 inches

Material: Medium carbon steel blade, 2mm thick. Hardwood handle

Appropriate for which BOBs: Short, Medium, Long

Comments: Sheath not included, but available separately. Broad flat steel blade and 3 sharp edges. Modeled after an original Soviet 'Spetsnaz' military entrenching tool. A popular tool with military and special operations units worldwide.

Item name: Gerber E-Tool Folding Spade, Serrated Edge

Vendor: Ozark Outdoorz, LLC.

Webpage URL: <https://amzn.to/3nUEJHV>

Price: \$48.10

Weight: 2.25 lb

Size: 2.13x6x9.5 inches when closed

Material: Powder-coated boron carbon steel spade head and a 7075 aluminum shaft

Appropriate for which BOBs: Short, Medium, Long

Comments: The Folding Spade has a serrated blade edge for chopping and sawing roots. Built with a glass-filled nylon handle, a powder-coated steel spade head and an anodized 7075 aluminum shaft. Lightweight and tough. Ridged knob around the shaft operates a locking mechanism that keeps the tool open when in use. No sheath included. Sheath part number is Gerber 22-00026

Item name: EST Gear Survival Shovel (Multi-function shovel)

Vendor: EST Gear on Amazon.com

Webpage URL: <https://amzn.to/3ppUdnw>

Price: \$119.99

Weight: 3.81 lb

Size: 36 inches assembled length. Spade size 6 inches

Material: Heat-Treated, High Quality, SOLID Carbon Steel blade.

Aerospace-Grade Aluminum handle.

Appropriate for which BOBs: Short, Medium, Long

Comments: 18 tools: shovel, saw, axe, knife, spear, bottle opener, hoe, fire

starter, wire-cutter, trowel, hexagon wrenches, nail puller, ice pick, ruler, hook, waterproof storage, screwdriver, whistle compass, and rope cutter. Includes packable ripstop nylon pouch. Free LIFETIME REPLACEMENT guarantee.

Crowbar

A crowbar can be used for numerous tasks during a survival situation including:

- Prying open doors
- Breaking windows
- Break locks
- Pry wooden pallets apart to use as fuel for fire
- As a lever to raise a heavy object
- Breaking into a vending machine for food and drinks
- As an impact weapon

Crowbars are more useful if you are facing a disaster situation in an urban environment. They come in numerous lengths and shapes. Most are made of carbon steel. Titanium crowbars are available but are more costly. Their primary advantages are greater strength and less weight than steel. You can consider bringing a larger crowbar (e.g., 36 inches long) with you if you are escaping by vehicle. Longer crowbars provide you with greater leverage. You will need to opt for a smaller crow bar (e.g., 7-15 inches) if you plan to carry one while escaping on foot. I once bought a crowbar from a discount tool store and it bent the first time I used it. So, be sure that your crowbar is made of high-quality metal. The following product example represents a compromise. It is not the smallest crowbar. But, it is long enough to provide significant leverage.

Item name: VAUGHAN Superbar 15-in Carbon Steel Crowbar

Vendor: Lowes

Webpage URL: <https://low.es/3poyxIv>

Price: \$13.98

Weight: 1.5 lb

Size: 15 inches

Material: Spring-tempered carbon steel

Appropriate for which BOBs: Short, Medium, Long

Comments: 15-In length provides excellent leverage. Rocker head design

offers maximum prying power. 3 Beveled nail slots provide easier twist prying. Polished, sharp blades offer easy insertion.

SURVIVAL KNIVES

Knives are a critical part of your EDC and BOBs. Most would argue that knives are one of the very most important items in your kit. Because of their importance, we'll spend time to delve into some technical aspects of knives to provide you with information to help you make an informed decision as you select your knives. Examples of survival knives at various price points will be listed at the end of this chapter.

A folding knife is most convenient for your EDC and since it is carried with you all the time, you do not need to add another folding knife to your BOBs. It is important to add at least one fixed blade knife to your BOBs because they are more durable than folding knives. The weak link to folding knives is their folding mechanism. A single fixed blade knife is adequate for your Short Term BOB, but it is worthwhile to consider adding redundancy and versatility to your Medium and Long Term BOBs by having two fixed blade knives. This is particularly true for your Long Term Bag because your knives will be subject to hard use over potentially a long time. One of these knives can be smaller and useful for finer work like feathering wood for tinder or carving. The larger knife can be used to baton wood and for chopping (to serve a similar function as a machete).

Covered in this chapter are some features to evaluate when choosing knives for your BOB:

- Length
- Handle material
- Full tang
- Blade material, type of steel
- Hardness of the steel (Rockwell C rating)
- Blade shape
- Blade cutting edge profile (grind)
- Straight or serrated cutting edge
- Blade thickness

- Sheath

Now, we'll look at each one of these features in some detail.

Knife Length

Different tasks are more easily accomplished with different length knife blades. This is why you might consider packing two knives of different sizes. Here are some general guidelines^[446]:

- Blade length 3.5-5 inches: Delicate, detailed work. Examples include feathering, carving wood. Meat and fish preparation
- Blade length 6-7.5 inches: Can perform functions of smaller and larger knives, although not as well
- Blade length 8-10 inches: Baton wood, chopping

Handle Material

A comfortable handle grip is important and this is a highly individualized factor. You have to hold the knife in your hand to determine if it feels good to you. The handle's length, circumference, and cross-section profile contribute to its fit in your hand.

The handle should be made of a material that is strong and durable. The material should afford a secure grip and does not become slippery when it is wet. Leather is not ideal for the long term because it is not as durable as some other materials and it may rot. Wood scales are more prone to break and are less durable than some other materials. Micarta® (fabric in a thermosetting plastic) is a hard, solid material commonly used for handles. Other hard handle materials include G10 (high-pressure fiberglass laminate) and carbon fiber laminates. Some handles are made of synthetic rubber-type materials that are resistant to UV-radiation, temperature extremes, and chemicals. A couple of these are Krayton ®(Krayton Polymers) and Hypalon® (Dupont®).

Full Tang

Full tang means that the portion of the metal knife blade that resides inside the handle extends the full length and width of the handle. This provides the greatest strength. Less expensive knives may have a full length, but very narrow tang within the handle. This narrow tang results in a weak point at the junction where the blade enters the handle raising the risk of blade breakage. Other knives have partial tangs that extend only part of the length of the handle. Full tang knives are the preferred choice because of their strength.

The metal of some knives extends slightly beyond the end of the handle to create a pommel that can be used for striking or hammering.

Blade Material

Blades of survival knives are made of steel. Other blade materials such as ceramic are not used because they are easier to chip, crack, and break than steel. The three common steels used for knife blades are carbon, stainless, and tool. There are many types of steel within these three main categories. To save space here, please refer to the following reference describing some of the more common types of steel: Bell, Terence. "Compare 20 Grades of Knife Steel." ThoughtCo, Jan. 31, 2020, [thoughtco.com/knife-steel-grades-2340185](https://www.thoughtco.com/knife-steel-grades-2340185).

Here are some pros and cons of the different types of steels:

- Carbon steel: Good edge retention. Easier to sharpen, sharper but not as tough as stainless steel. Rusts easily. Examples: 1050, 1060, 1070, 1084, 1095, Carbon V, 5160
- Stainless steel (carbon steel alloyed with chromium): Good edge retention, corrosion resistance (can still rust if not given proper care), tough, and resistant to wear. More durable, but not as easy to sharpen and not as sharp as high carbon steel. Examples: ATS-34, AUS-6, AUS-8, AUS-10, BG-42, 420, 420HC, 420J, 440A, 440C, 154CM, VG-10, S30, S60V, 12C27
- Tool steel (carbon steel with alloying to increase mechanical properties): Good edge retention. Good wear resistance. Corrosion resistance better than carbon steel, but not as good as stainless steel. Examples: A2, D2, W2

Here is a variety of steel categorized by quality^[447]

- Premium Steels: M390, CTS-204P, CPM-20CV, CPM-M4, CPM-S90V, CPM-S110V, Elmax
- High-End Steels: CPM-154, CPM-3V, CPM-4V, CPM-S30V, CPM-S35VN, CTS-XHP, LC200N
- Mid-Range Steels: 1095, 154CM, A2, D2, H1, O1, N690, VG-10
- Budget Steels: 420, 420HC, 440C, AUS-8, CTS-BD1, Sandvik Series, 14C28N, 12C27MoV, 7CR17MoV, 8Cr13MoV

Hardness Of The Steel

The hardness of a steel is denoted by its Rockwell C rating (HRC). The

hardness test is done by using a drill-press type machine to apply light pressure and then heavy pressure through a pointed metal tip to the surface of a flat piece of steel. The applied pressure produces a slight depression in the metal's surface. For any given amount of pressure, the depression made will be deeper in softer steels. The HRC rating number is lower for softer metals and higher for harder metals. A steel's hardness can differ from one point to another on its surface and depending upon the depth from the surface. Therefore, a steel's hardness rating is generally stated as a range rather than a single number.

Why is steel hardness important? Excessively hard steel is more brittle and will chip or break more easily. Harder steels will have better edge retention but are more difficult to sharpen. On the other hand, softer metals with lower Rockwell C ratings are easier to sharpen but will become dull more quickly. Harder steels are less durable and less resistant to breaking when subjected to impact stresses than softer steels. A good compromise for a survival knife is a steel with a hardness rating of HRC 55-58, which balances edge retention with the ability to withstand repeated impacts (e.g., batoning, chopping).^[448] It's not always possible to learn the HRC rating of a knife's steel when shopping for your knives. Most product descriptions will list the type of steel used to make the knife's blade, but most times an HRC rating is not included.

Blade Shape

Knives come with many different types of blade shapes and tip configurations. Choosing the optimal one will depend upon its intended use. Some common blade types include drop point, clip point, tanto, hawkbill, spey point, spear point, sheepsfoot, and trailing point. The most popular blade shapes for survival knives are drop point and clip point.

A drop point blade's spine (i.e., the top of the blade on the opposite side of the cutting edge) begins straight as it leaves the handle and then "drops" towards the tip of the blade creating a convex profile (when viewed from the side) in the area of the drop. A clip point blade's spine also begins straight as it leaves the handle, but it takes on a concave profile (when viewed from the side) as it curves towards the tip.

Here are some benefits of a drop point blade:

- The belly (i.e., the curved portion of the blade behind its tip end) is fairly large. Good for slicing and slashing.

- There is a relatively long straight cutting edge. Good for slicing.
- The tip is lower and close to the center, longitudinal axis of the knife enhancing ability to control the knife
- The tip is sharp and strong (stronger than a clip point). Good for piercing thrust cuts. The tip is not as prominent as a clip point making it better suited for skinning and field dressing game with less chance of puncturing their gut.
- Can be used for self-protection

Here are some benefits of a clip point blade:

- The tip is lower and close to the center, longitudinal axis of the knife enhancing ability to control the knife
- The tip is more pointed and sharp (the downside is that this makes the tip weaker)
- There is a lot of belly. Good for slicing and slashing
- There is a relatively long straight cutting edge. Good for slicing.

Blade Cutting Edge Profile (Grind)

A blade's grind refers to the shape of its cutting edge. There are numerous different grinds. The best for survival knives are the flat grind and sabre grind. But, first let's touch upon another popular grind, the hollow grind.

In a hollow grind, the two sides of the knife blade are concave (i.e., curved inwards) as they merge towards the cutting edge. This creates a very sharp cutting edge and hence is popular for hunting knives. It does well cutting through soft tissues, but the thin edge is relatively weak and can chip if it strikes bone. Hollow grind blades can do shallow slicing and are good for downward press cutting. This grind tends to dull easily.

There are three varieties of flat grind depending upon where the single bevel begins: Full, High, and Scandinavian. The bevel begins at the spine on both sides of the blade with a full flat grind. A high flat grind leaves a short amount of blade the same thickness as the spine before the bevel begins and the two sides of the blade taper towards the cutting edge. The Scandinavian flat grind is also called a Scandi or V Grind. The blade bevels in a Scandi grind begins much farther below the spine than with a high flat grind.

The single bevel of a flat grind can be sharpened to a fine edge. It can be sharpened fairly easily in the field because of its single bevel. One of the

reasons for the popularity of Scandi grinds is their ease of sharpening. In general terms, the flat grind is not as sharp as a hollow grind, but it's sharper than a sabre grind. It retains its edge better than a hollow grind, but not as well as a sabre grind. Its flat edge is stronger than a hollow grind (which has less metal because it is concave), but it can chip easier than a sabre grind. Flat grinds are good for slicing and chopping. Flat grinds provide a good balance between strength, sharpness, and edge retention.

A sabre grind has a dual bevel. It begins like a flat grind (the primary bevel), but there is a short, secondary bevel just before the cutting edge. This short secondary bevel is backed by more metal than a hollow or flat grind, so it is stronger than either of those grinds making it ideal for chopping and splitting wood. It is not as good for slicing because of its thicker edge. It is more difficult to sharpen a sabre grind because of its dual bevel. Only the short secondary bevel is sharpened. Once sharpened, it tends to retain its edge well.

Straight Or Serrated Cutting Edge

Serrated cutting edges on knives have a chisel grind, which means that they are beveled only on one side. They are useful for slicing and sawing where the blade is moved forward and backward. They are well suited for cutting through nylon webbing, hard surfaces, animal tissue, fibrous materials, and thick rope. They are not as good at push cuts where the blade is pushed straight downward; this is something flat grind blades do better. One downside is that serrated blades are more difficult to sharpen than straight-edge blades.

Blade Thickness

A thick blade is stronger than a thinner one if both are made of the same type of steel. But the thin blade will usually have a thinner cutting edge, so it will cut more easily than the thicker blade. The thinner blade will be better for intricate, more detailed, and precise work, but they will not hold up as well to extensive heavy work. Thicker blades will be more durable and are better for batoning wood and chopping activities.

Survival knives need to be up to the task of hard use over potentially a long period. If you are to have only one knife with you, then it will have to withstand being used for splitting and chopping wood. Such a heavy use knife should have a width of 1/8 to 1/4 inch. It will be more difficult to use this thicker and larger knife for fine tasks, so you might consider also

carrying a smaller, lighter survival knife in your BOB.

Sheath

Knife sheaths come in different designs and quality. They should have some retention device. Some sheaths capture the knife with friction or mechanical fit where prominent material inside the sheath captures part of the knife. Other sheaths have a strap and snap to retain the knife somewhere around its handle.

Sheaths may have a fixed loop or a loop with a snap or hook and loop closure. These loops are designed to go around a belt. Other sheaths are MOLLE® compatible.

Leather is a common sheath material. It requires some care such as oil application or the use of a wax-based product (e.g., Sno-Seal®) to protect the leather from water.

Nylon is also commonly used for sheaths. It is essentially maintenance-free and durable. Some of these sheaths will have compartments to hold a honing stone and/or a ferro rod.

Kydex® is a thermoplastic acrylic-polyvinyl chloride material that is extremely durable, scratch-resistant, waterproof, and it will not shrink or stretch. It is an excellent material for knife sheaths.

Examples of Survival Knives

Here, some examples of survival knives in varying price ranges will be listed along with their specifications.

Item name: KA-BAR® BK7 Becker Combat Utility

Vendor: Amazon

Webpage URL: <https://amzn.to/3hku0E9>

Price: \$98.97

Weight: 0.85 lb

Blade/Overall Length: 7.0/12.75 inches

Blade thickness: 0.188 inches

Blade shape: Clip point

Steel type: Carbon (1095 Cro-Van steel)

Blade grind: Flat

Tang: Full

Handle material: Ultramid®, Grivory®
Sheath: Nylon
Appropriate for which BOBs: Medium, Long
Comments: Made in the USA

Item name: KA-BAR® Becker Companion BK2

Vendor: Amazon

Webpage URL: <https://amzn.to/3hyfM2J>

Price: \$93.84

Weight: 1.0 lb

Blade/Overall Length: 5.25/10.5 inches

Blade thickness: 0.25 inches

Blade shape: Drop point

Steel type: Carbon (1095 Cro-Van steel)

Blade grind: Flat

Tang: Full

Handle material: Ultramid®

Sheath: Hard plastic

Appropriate for which BOBs: Medium, Long

Comments: Made in the USA

Item name: Schrade SCHF9

Vendor: Amazon

Webpage URL: <https://amzn.to/37PHjZY>

Price: \$39.38

Weight: 1.0 lb

Blade/Overall Length: 6.4/12.1 inches

Blade thickness: 0.25

Blade shape: Kukri

Steel type: Carbon (1095). A stainless steel version is also available (model SCHF9N)

Blade grind: Hollow

Tang: Full

Handle material: Textured thermoplastic elastomer (TPE), Krayton®

Sheath: Ballistic nylon

Appropriate for which BOBs: Medium, Long

Comments: 90-degree flat spine. Made in Taiwan.

Item name: Gerber LMF II Survival Knife

Vendor: Amazon

Webpage URL: <https://amzn.to/2L3IWKU>

Price: \$72.37

Weight: 0.73 lb

Blade/Overall Length: 4.84/10.59 inches

Blade thickness: 0.189 inches

Blade shape: Clip/Drop point

Steel type: 420HC stainless

Blade grind: Sabre

Tang: Full

Handle material: Glass-filled nylon with TPV overmold

Sheath: Kydex® with ballistic nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Partially serrated blade. Made in the USA.

Item name: Cold Steel 80PGTK GI Tanto 7" Carbon

Vendor: Amazon

Webpage URL: <https://amzn.to/2L1PZU1>

Price: \$26.63

Weight: 1.0 lb

Blade/Overall Length: 7.0/12.0 inches

Blade thickness: 0.157 inches (4mm)

Blade shape: Tanto

Steel type: 1055 carbon

Blade grind: Flat

Tang: Full

Handle material: Polypropylene

Sheath: Zytel® Secure-Ex sheath

Appropriate for which BOBs: Medium, Long

Comments: Popular, strong, durable knife for its low price. Thick blade.

Many people customize this knife. Handle is slippery. Made in China.

I would be remiss if I did not mention Morakniv knives because they are popular amongst preppers and survivalists. They are low-cost knives with a reputation for sharpness and edge retention. The company traces its roots back to 1891 in the village of Ostnor in Mora, Sweden. These knives are lighter in construction than standard all-in-one survival knives and are not

meant for heavy use like batoning or chopping. For those who pack a light knife for smaller, finer tasks and a larger knife to handle heavy tasks, then Mora knives can be considered for the light knife spot in their BOB. They can be used for wood carving, feathering wood for tinder, game and fish prep, and the like. Here are some examples of their knives:

Item name: Morakniv Bushcraft Survival

Vendor: Amazon

Webpage URL: <https://amzn.to/354tdT1>

Price: \$59.61

Weight: 0.5 lb

Blade/Overall Length: 4.3/9.1 inches

Blade thickness: 0.125 inches

Blade shape: Straight (with a slight drop)

Steel type: 12C27 (carbon)

Blade grind: Scandi

Tang: Partial (extends 3/4 the length of the handle)

Handle material: TPE rubber

Sheath: Polymer (Note: Knife sharpener and fire starter rod integrated with the sheath)

Appropriate for which BOBs: Short, Medium, Long

Comments: 90-degree spine for ferro rod striking. Made in Sweden.

Item name: Morakniv Garberg

Vendor: Amazon

Webpage URL: <https://amzn.to/3aKJMH2>

Price: \$89.99

Weight: 0.6 lb

Blade/Overall Length: 4.3/9.0 inches

Blade thickness: 0.125 inches

Blade shape: Straight (with a slight drop)

Steel type: Carbon (there is a version available with 14C28N stainless steel)

Blade grind: Scandi

Tang: Full (Note: this is the only full tang knife Morakniv currently makes)

Handle material: Polyamide

Sheath: Polymer

Appropriate for which BOBs: Short, Medium, Long

Comments: 90-degree spine for ferro rod (not included) striking. Made in

Sweden.

Item name: Morakniv Companion HD (Heavy Duty)

Vendor: Knife Country USA

Webpage URL: <http://bit.ly/2WQ9l1m>

Price: \$20.29

Weight: 0.4 lb

Blade/Overall Length: 4.1/8.8 inches

Blade thickness: 0.125 inches

Blade shape: Straight (with a very slight drop)

Steel type: Carbon

Blade grind: Scandi

Tang: Partial

Handle material: TPE rubber

Sheath: Molded polymer

Appropriate for which BOBs: Short, Medium, Long

Comments: Blade is thicker than Morakniv's lower-priced knives. Made in Sweden.

CORDAGE

Cordage is the subject of this chapter. Here are topics that will be covered:

- Paracord
- Bank line
- Fishing line
- Tying knots
- Duct tape or Gorilla® Tape

Cordage has innumerable uses and it is essential to include some in your BOB. You may be able to scavenge some cordage if your escape from disaster places you in an urban area. You can fashion cordage from naturally occurring things if you end up in the woods (e.g., stalks of stinging nettle or milkweed plants, bark from sagebrush trees, vines, the roots of some plants, animal tendons and fascia, etc). It takes valuable time and energy to find or make cordage especially when you need it right now. It's much better to be sure to carry cordage with you.

Paracord

Paracord is one of the most popular and commonly used forms of cordage, especially for survival. There are entire articles written about the many uses for paracord. First, what is paracord? There are six types of paracord according to the US Military standard. Type III is also known as 550 paracord because it has a tensile strength of 550 pounds and it is the one that is most commonly used, including by survivalists. Type IV paracord is stronger with a tensile strength of 750 pounds, but it is rarely used because it is much more expensive, thicker, and heavier than Type III paracord. Paracord 550 has the best balance of cost, weight, and strength.

Beware that not all paracord is the same even if it's called 550. There are cheaper, foreign-made paracords that are inferior either due to poorer materials, poorer construction, or both. Generally, paracord made in the USA will be of the highest quality.

Paracord is strong because of its kernmantle construction, which means that it has an inner kern or core for strength and a braided outer sheath for protection against abrasion. The military standard, or Mil Spec, specifies that paracord III/550 must have its kern comprised of seven to nine yarns each made of three nylon fibers. This means that when paracord 550 is taken apart in a survival situation, it will yield at least seven lengths of yarn or 21 lengths of individual nylon fibers. Mil Spec paracord tends to be of larger diameter (4mm) as compared to many commercial paracord 550 (3mm) that use two nylon fibers per yarn. ^[449]

Some additional points: If you're looking for genuine Mil Spec paracord, its formal name is Genuine 550 Parachute Cord (MIL-C-5040 Type III). Mil Spec paracord III/550 is made entirely of nylon (kern and outer sheath); the outer sheath is made of braided nylon 32 or 36-strand. Lower quality paracords may use polyester instead of nylon for the kern, sheath, or both. You can burn the cut end of paracord to prevent it from separating. Paracord is not meant to be used for climbing. Its strength rating (e.g., 550 pounds) is based upon testing using a static weight, so it can fail if it is subjected to a lighter weight that is falling. Protect your paracord from abrasion to avoid damaging its sheath. Paracord can degrade when exposed to UV radiation, so keep it out of sunlight. ^[450]

Many articles discuss the plethora of uses for paracord. Here is one example of such an article that lists 80 uses for paracord: <https://survivalife.com/80-uses-for-paracord/>

Here are some examples of paracord that you can buy:

Item name: Genuine 550 Parachute Cord (MIL-C-5040 Type III) - 100 ft

Vendor: Adventure Survival Equipment

Webpage URL: <http://bit.ly/2KuZBXP>

Price: \$11.95

Weight: 7.2 ounces

Size: 100 feet length

Material: Nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: 50 ft (3.6 ounces) for \$6.50 from this same vendor. These are examples of true Mil Spec paracord III/550

Item name: JET BLACK 550 PARACORD MADE IN USA

Vendor: Paracord Galaxy

Webpage URL: <http://bit.ly/38IptHP>

Price: \$5.89

Weight: Approx 7.2 ounces

Size: 100 feet length

Material: Nylon/nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: This is an example of a good grade commercial version of Mil Spec 550 Parachute Cord. It has seven two-ply cabled inner nylon strands. (Note: The 2-ply inner nylon strands do not meet the Mil-Spec requirement of having 3 inner nylon strands.) Its outer sheath is 32-strand woven nylon and its diameter is 4mm. It has a minimum tensile strength of 550 pounds.

Bank Line

Bank line is another useful form of cordage to have in your pack. Although it's not as well known as paracord, it has some advantages. First of all, what is bank line? It is an inexpensive, strong, waterproof, UV resistant nylon twine that is tarred giving it a black color. The tarred surface helps bank line hold knots well. Its braided version has higher tensile strength, but its twisted version can be separated into smaller strands for finer uses. It has innumerable survival uses including as snares, fishing line, lashing, knots for ridgelines, and sewing.

Bank line is available in many sizes. #36 is a good size for survival purposes. It is much lighter and compact than paracord 550. #36 bank line is about 2mm in diameter, has a tensile strength of 320 pounds, and 100 feet weighs approximately 2.9 ounces.^[451]

Item name: Bank Line Size 36 Tarred Braided 5col Survival Supply Half Pound Roll 240 ft

Vendor: 5col on eBay

Webpage URL: <http://ebay.to/3nXaBvp>

Price: \$17.99

Weight: 0.5 lb

Size: 240 feet length

Material: Braided tarred #36 bank line

Appropriate for which BOBs: Short, Medium, Long

Comments: Braided

Item name: Catahoula No 36 Tarred Twisted Bank Line 4 oz Spool 117 ft Nylon AA Seine Twine

Vendor: 5col on eBay

Webpage URL: <https://ebay.to/3nOrd8y>

Price: \$8.99

Weight: 0.25 lb

Size: 117 feet length

Material: Twisted tarred #36 bank line

Appropriate for which BOBs: Short, Medium, Long

Comments: Twisted

Fishing Line

Fishing line is handy to have for other uses besides fishing. Some of its uses include:

- Suspend a tarp to use as a shelter
- Suspend food off the ground keeping it away from animals
- Repairs: Clothes, tent, backpack, tarp
- Suturing wounds
- Make snares to trap game

There are so many different types of fishing lines available that it's confusing choosing which line is best to use in a survival situation. The purpose of this section is to provide you with information to make the best choice for you. In case you are "bottom line-oriented" and do not want to read the complete discussion about fishing lines, just skip to the end of this section for the "conclusions."

Some of the issues to consider when selecting your BOB fishing line include:

- What type of line do I get? The main types are monofilament nylon, braided, super-braided, and fluorocarbon
- Color of the line
- Pounds test
- Durability: Becomes most important for your Long Term BOB since what you pack with you is probably all you'll ever have to use. Longevity can be affected by UV radiation exposure, abrasion against rocks and vegetation.
- Spool memory: How much does the line take on a coiled shape after being

wrapped around a reel for a prolonged time? Lines with low spool memory experience less coil effect.

- Use a leader?
- Cost
- Length of line to pack

There are four main categories of fishing line:[\[452\]](#), [\[453\]](#), [\[454\]](#), [\[455\]](#), [\[456\]](#), [\[457\]](#), [\[458\]](#), [\[459\]](#), [\[460\]](#), [\[461\]](#)

- Braided
 - Oldest line. Includes nylon and Dacron. Now, the least used line since the advent of superbraided lines. Its primary use is deep water bottom fishing.
 - Pros: Minimal stretch. Cheaper than superbraid and fluorocarbon lines
 - Cons: Larger diameter for the same degree of strength as compared with other lines (comparable to monofilament). More expensive than monofilament.
- Monofilament nylon
 - Created as a cheaper line compared with braided line. It stretches more than any of the other lines, which can be an advantage or disadvantage depending upon the application. Increased stretch helps absorb the shock of a big fish striking a fast-moving lure. Increased stretch also prevents your hook from tearing a hole in the fish's mouth. The disadvantage of increased stretch is that it makes it harder for you to feel when a fish strikes (i.e., less sensitive).
 - Pros: Inexpensive. Supple, flexible making knot tying easier. Holds knots well. Good for casting live bait or lures. Slips through guides of a rod with much less interference than with fluorocarbon line. It floats which is an advantage for top fishing.
 - Cons: Large diameter making it harder to cast long distances and also means you can spool less onto your reel. The large diameter also creates more drag, which makes it more difficult to keep light lures or jigs on target near the bottom in moving water or windy conditions. Loses strength with UV exposure. Absorbs water making it less durable. More visible underwater than fluorocarbon line. Soft making it wear faster. Tends to fray. High

spool memory (develops coils when stored on a reel for a long time).

- Super-braided

- Superbraid lines are made from woven fabric. The materials used to make braided lines consist of fibers such as Dacron® (Polyester; it's cheaper, but not as strong and stretches more than Spectra of the same diameter), Spectra® or Dyneema® (both are UHMWPE fibers).
- Pros: Smaller diameter for a comparable strength compared with other lines. The smaller diameter results in less drag allowing the use of smaller jigs and lures. There is less deflection in wind and currents. Can spool more line on a reel than larger diameter monofilament or fluorocarbon line. Small diameter allows it to be cast over longer distances. Similar strength at 50% or less of the diameter of monofilament, fluorocarbon, and regular braid. Some manufactures have tested their line to be up to 15 times stronger than other types of fishing line. Abrasion-resistant, durable, outlasts the others threefold. Good for larger fish, higher test applications, trolling, rocky terrain, heavy cover, or rough bottoms. Fish like pike or walleye with sharp teeth will also have a tough time biting through braided line. Low stretch makes it easier to feel fish strikes (i.e., more sensitive) and drive your hook into a fish's mouth better when you set the hook on a strike than with higher stretch monofilament or fluorocarbon lines. Low spool memory (i.e., resists coiling).
- Cons: Expensive. Highly visible in water compared with other lines. Tangles easily and is harder to untangle. Harder to tie knots in braided lines than it is in other types of lines. Color tends to fade over time.

- Fluorocarbon

- Most are 100% fluorocarbon and extruded as single strands, but some lines are blended with other fibers.
- Pros: Nearly invisible in water (the least visible of all the lines). Good for targeting line-shy species that spook at the presence of more visible lines like braid or even clear monofilament line. Almost no stretch making them very sensitive allowing you to better feel fish strikes. Small diameter. Water absorption, UV

light, and abrasion-resistant contributing to better durability. Fast-sinking line moves through the water quickly and get to the bottom of the water. A good choice for fishing light baits near the bottom, especially in places where moving currents will not create a drag on your line.

- Cons: Expensive. A tendency to not cinch knots down securely leading to poorer knot strength. Use knots suggested by the manufacturer or at least those with multiple wraps to spread the load. It is also critical to wet the line before snugging down the knot. They are thicker than braided lines of the same breaking strength. Because fluorocarbon sinks it is not always the best choice to use with floating lures like topwater plugs or for suspending lures. Fluorocarbon line is stiffer and has more memory than monofilament, which can lead to more tangles, especially if you try to spool too much onto your reel.

For those who prefer a line that is least visible to fish, fluorocarbon line is the best because its refractive index is the same as water allowing light to pass through with less distortion. That makes fluorocarbon the least visible lines to fish underwater. That is an advantage since fish may be spooked by a fishing line that they can see. Clear monofilament is difficult to see underwater. Clear blue monofilament line is also difficult to see underwater, but it is visible to the fisherman above water. Yo-Zuri H.D. Carbon Fluorocarbon Leader has a pink tint. Pink disappears easily in water.^[462] Areas of your line that gets kinked or scraped are readily noticeable with a regular fluorocarbon line but are invisible with the Yo-Zuri® line.^[463]

Some anglers choose fishing lines, which are visible clearly underwater. The reason behind choosing such type of fishing lines is that anglers can clearly see the line move and also distinguish between multiple lines in the water. Yellow and red-colored lines are useful for this purpose.^[464] Some anglers, however, do not prefer such type of fishing lines because they are also visible to fish. This makes fish alert and may spook them. So, some people select lines of various colors to make them less visible to fish. This is an area without a definitive answer and there are many different line colors available with adherents to each. Some anglers choose the color of fishing lines according to the place where they are fishing. For example, they may use fishing lines of green color to blend in where vegetation is dense and make

fish think that the line is natural. The green-colored line would be easily visible in clear water lacking vegetation.^[465], ^[466] Some people argue that line color is not so important and that the focus should be on line material and how it affects lure action, reel speed, spool size, and tangling.^[467]

The tensile strength of a fishing line is described as its test and measured in pounds. It refers to how large a fish you can catch with a particular line. In a survival situation, you may not have a rod and reel. You may be handline fishing, which involves just using your hands to handle the line. You might fish by tying fishing line to the end of a tree limb or branch. Or, you may be using a manual hand reel such as a hobo fishing rod^[468] or Cuban Yo-Yo reel.^[469] You will not have the benefit of the drag setting provided by a mechanical reel or the flex of a fishing rod to dampen the fish's pull, so there is a greater risk of breaking your line. It's a good idea to build in a safety margin by using a higher test line when you are handline fishing as compared with fishing with a rod and reel.

A leader is a short length of clear, low visibility monofilament or fluorocarbon fishing line that is attached to the end of the main line, which is often braided. Leaders are usually 24-30 inches long. They can be 30-42 inches long if you're using live bait. The purposes of a leader include:^[470]

- It's harder for fish to see a clear leader than it is for them to see braided main line. Using a leader gives you the advantage of your hook being tied to a low visibility line while having the strength of a braided main line.
- Leader material has more stretch than braid, which helps absorb the shock caused by a striking fish. This helps avoid the hook tearing out of the fish's mouth and also protects your main line.
- Avoid a thrashing fish from twisting your main line through the use of placing a swivel between your leader and main lines.

Fluorocarbon or monofilament line is most often used to make leaders. Monofilament leaders float, making them better for fishing floating lures like topwater plugs. They offer abrasion resistance because of their large diameter. Fluorocarbon leaders sink, making them better for subsurface presentations. Fluorocarbon leaders are also better at resisting abrasion. Most experienced anglers attach a leader to the end of their line before tying on a hook or a lure.

The number of pounds test line to select depends upon what type of fish you anticipate catching. This will depend upon your locale. Some examples of different fish and the appropriate test for them include:^[471]

- Freshwater fishing:
 - 2-4 lb test for panfish, trout
 - 6-12 lb test for bass, walleye, salmon
 - 14-20+ lb test for catfish, stripers, pike
- Saltwater fishing:
 - 8-14 lb test for flounder, sea bass
 - 16-25 lb test for redfish, stripers, blues
 - >30 lb for tuna, marlin, shark

Some people choose to pack very heavy test line ranging from 65-100 pounds for their BOB.^[472] ^[473] The rationale for including a heavy test line is so it can be used for other purposes like serving as a ridgeline and lashing wood together. However, it is better to pack bank line and paracord for these purposes. Plus, these heavy test lines are impractical to use for survival fishing except for use as the main line for trotline fishing (see the chapter “Food Items” for more information about trotline fishing).

How much line should you pack in your BOB fishing kit? Most ready-made survival fishing kits include 50 feet of 10-14 pound test monofilament line. Some include up to 250 feet of line. If you are assembling a kit and have the space, you might pack a 150-250 yard spool of fishing line since it is lightweight.

Here is the bottom line as far as what type of fishing line to pack in your BOB (Feel free to use your favorite line. These are my choices along with the reasoning behind them.):

- Type of line:
 - Use braided line if you have to choose only one line to pack in your BOB. Strong. Smaller diameter for comparable strength versus other lines. Lower drag. High sensitivity giving better awareness of fish bites. Low spool memory. Tangles less.
 - Monofilament is cheaper and popular, but it has a larger diameter, so you’ll be able to carry less of it if space is a concern. Monofilament also loses strength with UV radiation exposure, absorbs water, and has high spool memory causing it to coil.

Pack some monofilament line to use as leaders to attach to your braided main line.

- Fluorocarbon lines are nearly invisible and resistant to water absorption, UV radiation, and abrasion. But, fluorocarbon is expensive, has poor knot strength, is thicker than braided, and sinks fast making it poor for top fishing (monofilament floats making it best for top fishing, braided is a compromise because it doesn't float as well as monofilament, but sinks much more slowly than fluorocarbon).
- Test weight: 12-20 lbs. This range of test weights provides good versatility for survival fishing. Choose 20 lb test if you have room to carry only one spool of line. It is better to not go with a really high test line for the idea of using the fishing line for other functions like ridgelines. It is more difficult to catch fish with a thick, higher test weight line because it is more visible to fish. Also, since you are preparing ahead of an emergency, you have the ability to pack other cordage (e.g., 550 paracord) to better address things like making ridgelines.
- Line color:
 - There is no single color that will be “least visible” underwater for all circumstances. Green is a popular low visibility color for braided line. It blends in with a wide range of environments, but it will be visible in clear water lacking vegetation. Using a clear leader is helpful in those conditions.
 - Red or yellow if you want to be able to see your line
- Leader: Optional. Can pack 100-200 feet or more of clear monofilament or fluorocarbon line to use as low visibility leaders.
- Length of main line to pack: At least 150-250 yards

Warning: Handline fishing without a pole and reel can hurt your hands. Wet fishing line is also slippery as you pull it in from the water by hand. Be sure to wear protective leather gloves when handline fishing so you can protect your hands. Bringing a lightweight hobo reel or Cuban Yo-Yo reel (read more about these two items in the “Food Items” chapter) will also help to protect your hands since you can wind your line back on to these reels. You can also tie your fishing line to the end of a tree limb or branch to serve as a fishing pole. Without a reel, you can simply walk inland from the water's edge while holding your makeshift fishing pole to bring your fish on to land.

Item name: KastKing® Extremus Braided Fishing Line

Vendor: High-end Sports on Amazon.com

Webpage URL: <https://amzn.to/3rzZ1sf>

Price: \$17.99

Weight: Not specified

Size: 300 yards of 20 lb test weight line

Material: Braid line with 4 strands of MultiTuf fibers. Green color

Appropriate for which BOBs: Medium, Long

Comments: Unlike other braid line brands using water-based dyes that wear off easily and allow water to penetrate the fibers, Extremus braided line utilizes a “petroleum derivative” based coating that is the best at preventing water absorption and color fading. Advanced Braid Technology - Combining proprietary KastKing® processes of “Diamond Weave” technology, Extremus braided fishing line is extremely abrasion-resistant and made for fishing around hard structure. Thin Diameter and Extreme Sensitivity – KastKing® Extremus braided line is available in consistent line strengths from 6-80 lbs, but with the monofilament diameter equivalent of lines from 1-20 lbs. Extremus braided fishing lines are also zero memory, zero stretch, and extremely sensitive. You can cast farther, feel the slightest bites even with heavier lines, and have the confidence to land any large fish in rugged conditions. Greater knot strength is an added bonus.

Item name: Berkley® Trilene® Big Game Monofilament Fishing Line

Vendor: litvakpro on Amazon.com

Webpage URL: <https://amzn.to/3mSjbdu>

Price: \$19.37

Weight: Not specified

Size: 650 yards. 0.018 inches diameter, 20 lb test weight line.

Material: Monofilament nylon. Clear color.

Appropriate for which BOBs: Medium, Long

Comments: Incredible strength, reliability, and value. Its shock-resistant design allows controlled stretch for awesome fighting power. The line also boasts exceptional abrasion resistance, making it super-tough against rough or sharp objects, as well as outstanding knot strength for durable holding power. Also available in brown, green, blue colors.

Item name: Trilene® 100% Fluorocarbon Professional Grade/Leader

Material Fishing Line

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3aLZH88>

Price: \$23.56

Weight: Not specified

Size: 200 yards or 20 lb test weight line. Spooled size 1x5x5 inches.

Material: Fluorocarbon line. Clear color.

Appropriate for which BOBs: Medium, Long

Comments: Ultimate invisibility - similar refract index to water so fish can't see it. Ultimate impact strength - proprietary 100% pad formula specially processed for the ultimate in impact strength. Excellent MANAGEABILITY - lower memory for superior casting. Used by pros. Low stretch. Extremely sensitive. Available in clear - reduces sparkle and flash.

Knot Tying

You don't have to be an expert at tying knots. But, you must know how to tie some basic knots. Learn how to tie them and then practice using a length of your paracord. Opinions may vary, but here are some useful knots to know before disaster strikes:

- Bowline: This creates a non-slip loop
- Square knot: Joins 2 ends of the same rope or 2 different ropes together
- Taut-line: This creates a slip knot loop that is handy for adjusting the length of a rope.
- Trucker's hitch (also known as power cinch knot): This is a compound knot useful for securing tension in a line where length does not need adjusting.
- Sheet bend or double sheet bend: Quickly joins 2 pieces of cordage together. Especially handy when the cords are of different sizes.
- Clove hitch: Fast way to secure a load around something like a post. It becomes tighter as the load increases and will come apart when the load is released.
- Shear lashing: Used to joint the ends of two poles together when making an A-frame.
- Square lashing: Used to join sticks or poles together at right angles to one another.

A book on knot tying by Patty Hahne is on the reference list at the end of this book. Here are some on-line resources about tying essential knots for survival:

- <https://urbansurvivalsite.com/survival-knots/>
- <https://prepper.com/survival-knots/>
- <https://www.skilledsurvival.com/survival-knots/>
- <https://www.primalsurvivor.net/survival-knots/>

It is handy to pack into your BOB a compact knot tying reference for those of you who are less experienced at tying knots. There are references made of plastic and about the size of a credit card. Some have multiple plastic cards connected by a rivet. They are inexpensive, waterproof, take up little space, and their weight is negligible. An example is listed below:

Item name: Pro-Knot Outdoor Knots by John E. Sherry (9th edition. August 15, 2019) [Knot Tying Guide](#)

Vendor: Survival Metric, LLC on Amazon.com

Webpage URL: <https://amzn.to/2KZTUB3>

Price: \$6.95

Weight: Not described. Probably 1-2 ounces

Size: 0.125 x 2.25 x 3.5 inches

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: 20 knots are described on these cards

Duct Tape

Having some duct tape in your BOB can help you in many ways including repair (e.g., tent, poncho, BOB), holding dressings in place, hold the edges of wounds together, treating blisters on your foot, wrap a sprained ankle, as a fire starter, or lash your survival knife to a pole to create a spear. Duct tape, also known as duck tape since it repels water like a duck's back, is an adhesive tape backed by cloth and coated with waterproof polyethylene.

Several brands including Gorilla® Tape consist of an enhanced duct tape utilizing three layers. According to its manufacturer, it is three times stronger compared to a leading value brand duct tape and it's made with double-thick adhesive and a strong reinforced backing with a tight weave. Its weather-resistant coating withstands moisture, UV radiation, and temperature changes. It is thicker and heavier than standard duct tape.

There are numerous ways to bring duct tape with you while minimizing space and weight. First, remove how much duct you need from its heavy cardboard

spool and then carry it in one of the following ways:

- Fold it over-and-over on itself to make a flat “roll” of whatever length best suits your storage situation
- Roll it around a credit card
- Roll it around itself without any center spool

Item name: T.R.U. Utility Grade Cloth Duct Tape. 2" Wide X 60 Yd. Length (Black)

Vendor: tapessupply on eBay

Webpage URL: <http://ebay.to/2KWJbXW>

Price: \$11.99

Weight: 1.1 lb for 1 roll

Size: 2” wide x 60 yards

Material: Economy grade polyethylene-coated cloth with a natural rubber adhesive

Appropriate for which BOBs: Short, Medium, Long

Comments: Physical Properties: Total Thickness: 7.2 Mils Adhesion to Steel: 44 oz/in Tensile Strength: 31lbs/ in Elongation: 19% Temperature Range: -4 F to 140 F

Item name: Black Gorilla® Duct Tape Heavy Duty Double Thick 1.88 Inches X 35 Yard 1 Roll

Vendor: dealsteam on eBay

Webpage URL: <http://ebay.to/38FfO4t>

Price: \$11.99

Weight: 1.7 lb for 1 roll

Size: 1.88” wide x 35 yards

Material: Double-thick adhesive, strong reinforced backing, and a tough all-weather shell

Appropriate for which BOBs: Short, Medium, Long

Comments: 2-3x as thick as traditional duct tape

NAVIGATION ITEMS

This chapter will cover the following navigation tools for your consideration:

- Compass
- Maps
- Ranger beads
- GPS device (optional)
- Binocular versus monocular

Compass

Having a compass is essential. And, it is inexpensive, takes very little space, and weighs little. It is worthwhile to include a compass in each of your BOBs. There are numerous types of compasses. But, these are the main types to consider for your BOB:

- Baseplate compass: This is the least expensive type of compass. It has a clear plastic base plate so you can view a map placed beneath it. Its straight edges can be used to draw bearing lines on the map. Some include a flip-up cover that has a sighting hole at its base and a mirror on its under-surface. The flip-up cover adds little cost and is helpful for sighting distant objects when taking a bearing. The mirror allows you to see your compass reading while sighting, so you don't have to lower the compass and shift your position while viewing the needle housing. The mirror can also be used for emergency signaling. Some also include a clinometer (a needle that pivots as the compass is angled upwards) to gauge the angle of a slope.
- Lensatic compass: This is a heavier compass that is designed for rugged use. The protective flip-up cover includes a clear window with a sighting wire. There is a flip-up rear sight that you look through to line up the sighting wire with a distant object to take a reading. The flip-up rear sight may include a magnifying glass to help you view the needle housing. Some have a rear portal in the compass body that permits you to see the directional reading more easily without having to lower the compass so you can look through the top of the needle housing. Some

include a clinometer.

Author's note: I have a lensatic compass and put it in my Short-Term BOB because it contains the fewest number of items and I have the extra space for the bulkier lensatic compass. I have baseplate compasses in my Medium- and Long-Term BOBs. I keep a second baseplate compass to serve as a backup in my Long-Term BOB because it takes so little space and it is such an essential item. My preference is a baseplate compass with a flip-up cover because the sighting hole and mirror make it easier to take a reading as compared to a baseplate compass without a cover.

The compass you select must have the ability to compensate for declination, which is the difference between magnetic north (which is the direction a compass needle points) and true north. The amount of declination varies depending upon your location and also over time, so it is important to have the current declination values for your area and the area you plan to escape to. You can still account for declination using a compass that does not compensate for it, but it is harder because you'll need to add or subtract the declination value in degrees from your compass reading.

Author's note: Two books are listed in the References section of this book and they provide detailed information about compass features and how to navigate using a compass:

- Burns, Bob and Burns, Mike: "Wilderness Navigation. Mountaineers Outdoor Basics," Third Edition. Mountaineers Books. Seattle, Washington. 2015.
- Department of the Army: "Map Reading And Land Navigation - FM 3-25.26 US Army Field Manual FM 21-26. 2001." Doublebit Press. Eugene, Oregon. 2019 (with new content, introduction, and annotations).

I will mention a few words about electronic compasses. These can be incorporated into your cell phone, wristwatch, or can be separate devices. They are accurate and can store bearings, but like all things electronic, they require batteries and they can be subject to damage. It is important to carry a standard magnetic compass even if you use an electronic compass.

The two companies that sell the most baseplate compasses are Brunton and Suunto. Silva is another reputable company. Their compasses are of good

quality and reasonably priced. Be sure to buy a compass that compensates for declination. Brunton compasses have a revolving part in the base plate that you rotate to dial in your declination reading. Suunto compasses require the use of a small key to set the declination value.

Item name: TruArc 3 - Base Plate Compass

Vendor: Brunton on Amazon.com

Webpage URL: <https://amzn.to/2KF6967>

Price: \$15.29

Weight: 1.3 ounces

Size: 0.6x2.4x4.1 inches

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: Tool-free declination adjustment. No flip-up cover

Item name: SUUNTO MCB Amphibian Compass

Vendor: Forestry Suppliers

Webpage URL: <http://bit.ly/3nS7hSo>

Price: \$24.75

Weight: 1.3 ounces

Size: 1.2x2.3x2.7 inches

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: Flip-up top with sighting hole and mirror. Floats. Detachable snap-lock nylon lanyard with a whistle. Fixed declination scale.

Item name: SUUNTO Compass with magnifying glass

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2M6kuJ3>

Price: \$19.75

Weight: 1.1 ounces

Size: 0.6x2.4x4.1 inches

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: SS012095013 SUUNTO A-30 NH Metric Compass. A compact, accurate compass for hiking and orienteering. Balanced for the northern hemisphere. Metric scales

Fixed declination correction scale. Luminescent markings for working in low

light. Baseplate with magnifying lens. Control marking holes. Detachable snap-lock lanyard. Easy to detach for working with the map.

Maps

A compass will tell you your direction of travel, but it will not tell you your location without a map. You should pack maps of your area, surrounding area, and any area you think you may escape to. Simple road maps are handy if you are escaping in your vehicle and will be traveling by road. You can get road maps for free from the Automobile Association Of America (AAA) if you're a member. You can also find road maps in most mini-marts attached to gasoline filling stations. But, road maps do not provide declination values nor topographic information.

You can go to the National Oceanic and Atmospheric Administration's (NOAA) website and use their magnetic declination calculator to determine the declination for any location. The calculator can be found at this URL: <https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml>

To use the calculator, just type in the longitude and latitude coordinates for your location and you can get the current declination value (or the value from any prior date). There is a place for you to type in an address to find its longitude and latitude so you can enter those values into the calculator. It is handy to look up the declination values for your area and wherever you think you may escape to. Write those declination values down for reference in case you have to navigate by map.

If your escape plan includes going to areas that are remote and away from roads, then a road map will be less helpful. It is much more useful to get topographical maps like backpackers use. These maps use contour lines to show elevation and will list the area's declination value at the bottom; check the map's date so you know you have the current declination value.

You can view and download .pdf maps for free on the US Geological Service (USGS) website (<https://www.usgs.gov/products/maps/topo-maps>). Another free resource for these maps is on the TopoQuest web site (<https://www.topoquest.com/>).

You can purchase topographical maps from numerous sources including on the USGS web site. Other places you can purchase topographical maps

include:

- REI Co-op: They stock many maps, but not all of them include contour lines to denote elevation. Maps are available in paper and waterproof versions. Prices per map range from approximately \$12.95 to \$19.95.
- Amazon.com: These are mostly \$8.95 and include contour lines. These are not waterproof.

You can also choose to make custom maps to cover a particular area of interest to you.^[474] First, you would search online for a map that includes your area of interest. Second, you could crop the portion of the map that you want to print and save that as a .pdf file. It is useful to save one file as an overview map that covers a larger area to give you more perspective. Then, save two more files that are “zoomed in” on the specific area that interests you. You now have .pdf files of 3 maps of that area that you can pack and carry with you. The third step is to print those .pdf files and here are just a few ways that you can accomplish that:

- Bring your .pdf files to a local FedEx or UPS Store and let them print them for you. If desired, you can even buy waterproof paper ahead of time and bring it with you to have the maps printed on.
- You can print the files at home on your laser printer. You can use waterproof paper if you want.

A useful custom mapping tool is offered by Caltopo (<https://www.caltopo.com/>) which has free and subscription services. You can select your area to map and then add overlays of additional data including contours, slope angle shading, public lands, and more. You can either print your map, save it to Google® to share, or save it in a format that can be uploaded to a GPS device.

Ranger Beads

Ranger beads have been used for centuries to help keep track of distance traveled. Their name is associated with the Army Rangers. They are also known as pace counting beads or SAS (British Army Special Air Service) beads. You might consider adding them to your BOBs because they are inexpensive, simple to use, compact, lightweight, and durable. The usual configuration is a cord with knots at both ends and another knot located 2/3 the length of the cord from one of the ends. Beads are strung on the cord with nine on the longer segment and four on the shorter segment side of the cord.

The beads are all pushed towards one side of the cord to start. Start walking. After every tenth step, move one of the nine beads upwards on the cord. Repeat this by moving another bead upwards after every tenth step. Walk another ten steps after all nine beads have been moved and then move one of the groups of four beads up along the cord. Now, push all nine beads back to the bottom of its section of cord and start all over. Each time all nine beads are pushed to the other side of their section of cord, push another of the group of four beads upwards along the cord. Once all four beads have been moved to the other side of their section of cord, you will have walked 500 steps and you can start all over. Using Ranger beads in this fashion provides you with a step count.^[475], ^[476]

Do a test walk and count how many steps it takes you to walk 100 yards or 100 meters. Use this information to convert your Ranger bead pace count into the number of yards or meters you walked. From there, you can calculate how many miles or kilometers you traveled:

- 1 mile = 1760 yards
- 1 kilometer = 1000 meters

The number of steps you record using your Ranger beads for a given distance will differ from what you measured during your test walk depending upon terrain. For example, your stride length will be shorter if you are scaling steep inclines on a slippery surface, causing your Ranger beads to overestimate the distance you traveled.

Another way to use your Ranger beads is to move a bead each time you take the number of steps that it took you to walk either 100 yards or 100 meters during your test walk. For example, if it took you 100 steps to cover 100 yards during your test walk, then move a bead on your Ranger pace counter after you take 100 steps. This way, your Ranger beads will keep track of your distance walked rather than the number of steps that you took as in the first method described above.^[477]

Item name: Ranger Paracord Pacecounter Beads - Set of Three (3)

Vendor: briarwoodsupply on ebay.com

Webpage URL: <http://ebay.to/3rxNXfu>

Price: \$8.99

Weight: Less than 1 ounce

Size: Approximately 12 inches in length

Material: Paracord and plastic beads

Appropriate for which BOBs: Short, Medium, Long

Comments: Three Ranger Bead pace counters are included. It has a looped end to help attach it to your pack, vest, belt, etc. without any additional hardware.

GPS Device (optional)

Your compass and maps are your “go-to” navigation items. They are the “must-have” items for your BOB. Having a GPS device is handy, but optional. It will be another thing to pack taking up space and adding weight. And, it will work only so long as it has battery power. You can maintain its usefulness if you have a solar charger to replenish its batteries, but that is another item to carry. Having one is a matter of personal choice and depends on how much else you’ll be carrying.

GPS devices work off satellites, so anything that interferes with signal reception will impair their function. They may not work indoors, in caves, on cloudy days, or under a canopy of trees.

Most smartphones made after 2007 have a built-in GPS receiver chip to enable 911 emergency call centers to locate you.^[478] These chips receive information from GPS satellites and do not rely on cellular towers or cell service. Newer phones employ assisted GPS or A-GPS where cell tower information is incorporated with satellite information for faster location information.^[479] GPS apps in phones require a cellular signal to download maps, so be sure to load desired maps ahead of time since cellular reception may be degraded or non-existent in remote areas or the event of a disaster. Also, using a cell phone’s GPS app depletes the phone’s battery. You may want to conserve your phone’s battery for emergency calls in case of a disaster.

There are different types of GPS devices including those for automotive, marine, and outdoors/hiking uses. An automotive GPS is ideal if you plan to escape in your vehicle. Some vehicles have built-in GPS capability. If you think your escape will include getting off-road into remote areas, then an outdoor GPS is better because:

- It is lighter and more rugged
- You can upload into it the latest topographical maps from the USGS.
Some units come preloaded with topographical maps.

- It provides altitude and distance information
- You can save location data to create a “bread crumb” trail by setting waypoints to help you retrace your steps
- It can include an electronic compass. This is a feature you want to be sure it includes so the device can calculate a bearing while you’re standing still. A 3-axis compass can calculate a bearing with the GPS held in any position while a 2-axis compass requires that you hold the GPS device level.

US satellites use the GPS system while Russia has its satellite system called GLONASS. Most current GPS devices use both satellite systems for accuracy, so be sure your unit has that capability.

Item name: Garmin® GPSMAP 64st, TOPO U.S. 100K with High-Sensitivity GPS and GLONASS Receiver

Vendor: SpddyS on Amazon.com

Webpage URL: <https://amzn.to/38IqZK1>

Price: \$499.99

Weight: 8.1 ounces with batteries

Size: 1.43x2.15x2.6 inches

Material: Not specified

Appropriate for which BOBs: Short, Medium, Long

Comments: 2.6-inch color display. 16-hour battery life. 3-axis compass.

Altimeter. GPS and GLONASS receiver. 8 GB of internal memory and a microSD card slot. Preloaded TOPO U.S. 100K maps plus a 1-year BirdsEye Satellite Imagery subscription.

Item name: Garmin® eTrex 30x GPS

Vendor: GPS City on Amazon.com

Webpage URL: <https://amzn.to/38E3qSr>

Price: \$184.99

Weight: 0.31 lb

Size: 1.3x2.1x4.0 inches

Material: Plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: 2.2 inch color display. Battery life up to 25 hours. 3-axis compass. Altimeter. GPS and GLONASS receiver. 3.7 GB of internal memory and microSD card slot. Preloaded base map. You can load your

topographical maps.

Binocular versus monocular

Having a magnifying optic in your BOB is useful for many things including:

- Watching for problems lurking ahead of you on your escape path such as physical barriers, unfriendly people, or animals
- Scouting for animals or signs of animals when hunting for food
- Identifying possible water sources in the distance
- Looking for shelter
- It can be used to help start a fire similar to a magnifying glass

A monocular is a single tube magnifying optic and a binocular is two monoculars connected together. Two numbers presented as 8x22 are used to reference both types of optics. The first number, 8, indicates the amount of magnification and the second number, 22, indicates the diameter of the objective lens (i.e., the lens on the end of the optic farthest away from your eye or closest to the object you're looking at). The field of view is the size of the area that you see when looking through the optic. The field of view shrinks as magnification increases. Larger objectives collect more light and help in low light situations, but they are bigger and heavier. The quality of your image will be better with higher quality BK-4 glass as compared to less expensive BK-7 glass. Coatings placed over the lenses will also improve image quality. Waterproofing and a rubber-coated body are pluses for use in the field.^[480], ^[481]

Here are some points regarding monoculars:

- Generally less expensive than binoculars
- Lighter
- Smaller
- More strain on the eye when viewing through it for long periods especially at moving objects

Here are some points regarding binoculars:

- Generally more costly
- Heavier
- Larger
- Easier on the eyes when looking through them for a long time
- Wider field of view

You can use a rifle scope if you have one, but it will not be as ideal as having a monocular or binocular. It will be harder to hold for an extended period and have a narrower field of view. Moving a rifle and scope makes you more visible than viewing through compact binoculars. You must also be careful about pointing your rifle in the direction of people if you use your scope in this manner. One option is to remove the scope from your rifle before using it as a monocular.

Here is an example of an economical monocular that is lightweight, compact, and 7x18:

Item name: Brunton® Echo Pocket Scope (monocular)

Vendor: Escape Distribution on Amazon.com

Webpage URL: <https://amzn.to/3hiS7mE>

Price: \$27.81

Weight: 1.8 ounces

Size: 1.3x3.3 inches

Material: Polymer frame

Appropriate for which BOBs: Short, Medium, Long

Comments: 7x18 monocular comes with a lanyard, carry case, and lint cleaning cloth.

Binoculars come in a wide range of magnification and cost. 6-8 x 21-32 is a good range of magnification and objective diameter for a BOB binocular. Buy the best quality that you can afford. Realistically, there are usually budget constraints, so I would opt for an inexpensive one and put the money saved into other items for my BOB. Some reputable brands include Tasco®, Bushnell, and Nikon (more expensive). Zeiss® and Steiner have a reputation for making high-end optics and they may be something to consider if your budget allows it. Here are examples of an economical pair and a higher end pair of binoculars that could be part of a BOB:

Item name: Bushnell PowerView Roof Prism 8x 21mm Binoculars

Vendor: TacticalGear.com

Webpage URL: <http://bit.ly/38D2Fch>

Price: \$13.49

Weight: 7 ounces

Size: 1.75x2.75x4.5 inches

Material: Synthetic

Appropriate for which BOBs: Short, Medium, Long
Comments: Fully coated lenses. BK-7 glass lenses. Fold-down eyecups.
Rubber armor.

Item name: Zeiss® 8x25 Terra ED Compact Pocket Grey-Black Binocular

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3psWvm0>

Price: \$289.99

Weight: 10.9 ounces

Size: 4x6.7x9.5 inches

Material: Aluminum

Appropriate for which BOBs: Short, Medium, Long

Comments: Waterproof. SCHOTT ED glass featuring a hydrophobic multi-coating. Lens Coating -Hydrophobic ZEISS MC. Easy-grip surfaces and focus wheel. Smooth focus and ergonomically correct eyecups. 2-year guarantee.

COMMUNICATION ITEMS

In this chapter, we'll cover the following communication items:

- Cell phone
- Signal mirror
- Flashlight
- Whistle
- Hand crank emergency radio
- Portable two-way radio
- Satellite phone

Cell Phone

Almost everyone will have their cell phone with him or her when they escape in an emergency. You will want to use it as little as possible to conserve its battery unless you have a way to recharge it (e.g., with your vehicle's battery or solar charger; see "Tools" chapter for information about solar chargers). Save it for emergency calls or texts. You will have other items in your BOB that can perform these functions, but in a pinch your cell phone can do these things:

- Its glass face can serve as a signal mirror
- Its flashlight can be used to signal or just as an illumination source
- It can serve as a GPS device (you'll need an app and downloaded maps)
- It can serve as a compass (generally requires that you download a compass app)
- Its battery can be used to ignite tinder to start a fire
- Its internal metal chassis and circuit board can be sharpened against a stone and used as a cutting tool

Signal Mirror

Mirrors are the simplest and most reliable signaling devices. They do not rely on a power source such as chemical or electrical lights. They are available in a variety of sizes and styles. The simplest mirrors are solid pieces of reflective metal, plastic, polycarbonate, or glass. Typical unobstructed

distances that a mirror can be seen are 6-10 miles on the ground and 20 miles from the ground to sky.^[482]

My preferred mirror has a central hole that is used for targeting or aiming the reflected light from your mirror at an object (e.g., ship, plane, or helicopter) or person to get their attention. You can also use it to send Morse code. Military mirrors and high-quality commercial mirrors use a retroreflective mesh in this central hole to cast an image of a “glowing ball” or “fireball” over your intended target when the mirror is properly oriented.^[483]

There are mirrors on the market with fake, non-functioning, imitation aiming mesh in their aiming hole.^[484] Real retroreflective mesh is made by gluing reflective glass beads to the mesh. Mirrors with fake aiming holes use various materials that have a mesh appearance but lack the retroreflective property, so they are useless. You can easily recognize a fake signal mirror because you will not see the “fireball” when looking at the mesh in the central aiming hole. How can you avoid getting a fake mirror before buying one? Most fake mirrors are made in Taiwan and are priced way lower than mirrors with real retroreflective mesh. Genuine signal mirrors have the following markings on the back of the mirror:

- “Mil-M-18371E” for those made by S. I. Howard
- “Made in Japan:” for those made by Vector 1. Its most common distributor is Coghlan’s

Author’s note: I bought a fake signal mirror as my first mirror thinking that I had scored a bargain. I was puzzled why I could not see a “fireball” when looking through the aiming hole. I realized that I actually “scored” a fake after doing some reading. I subsequently bought two genuine Mil Spec mirrors. The items below are genuine signal mirrors:

Item name: Star Flash Signal Mirror - Ultimate Survival

Vendor: Adventure Survival Equipment

Webpage URL: <http://bit.ly/3mQ23oJ>

Price: \$8.95

Weight: 0.7 ounces

Size: 2x3 and 3x5 inches

Material: Lexan™, polycarbonate

Appropriate for which BOBs: Short, Medium, Long

Comments: The Star Flash Signal Mirror has been an included item in Air

Force Survival Kits. Targeting Star: Retroreflective encapsulated bead fabric. Lighter than glass mirrors. Floats in water. Durable, rugged.

Item name: MIL-M-18371E Emergency Signaling Mirror, Mark 3, Military Issue

Vendor: Scol Survival Supply on Amazon.com

Webpage URL: <https://amzn.to/34NMUhB>

Price: \$29.99

Weight: 2.72 ounces

Size: 2x3 inches

Material: Glass

Appropriate for which BOBs: Short, Medium, Long

Comments: Manufactured from glass for maximum reflectivity, this mil-spec signal mirror is substantially brighter than its plastic counterparts. Conforms to US military specification MIL-M-18731E Type I 2 in. x 3 in. Lanyard included.

A genuine signal mirror is light and compact. It is worthwhile including in your BOBs. Other uses for your mirror include:

- To see yourself while shaving
- To look for foreign bodies on the surface of your eye
- To look around corners without exposing your head

Flashlight

A flashlight has so many uses and is a must-have item for your EDC and all of your BOBs. Some features to look for in a BOB flashlight include:

- Compact
- Rugged, durable
- Uses readily available size batteries
- Either rechargeable (USB) or uses rechargeable batteries that can be recharged by your vehicle's battery or a solar charger
- High and low output modes to permit high visibility and battery conservation
- Water-resistant or waterproof
- A pocket clip or a case for belt or MOLLE® attachment
- A lanyard to help prevent you from dropping and losing your flashlight
- Minimum 200 lumens, preferably 400 lumens or greater for its high output mode

Optional features:

- A removable red lens filter to use at night. It helps preserve your night vision and makes you less conspicuous to others
- A strobe mode. This is found on many flashlights to stun potential threats. Its usefulness is limited and I find it is just one more mode to cycle through when pressing the flashlight's function button. It can be used as a signaling device. But, you can simply turn your flashlight on and off if you don't have a strobe mode.
- Ability to float

Author's note: Headlamps are an important part of your BOB because they free up both of your hands. They are covered in the Tools chapter.

There are many flashlight manufacturers and models to choose from that fit the criteria for use in your BOB. Your choice will largely depend upon your personal preference and price point. Here are two of my personal flashlights that I like:

Item name: LED Lenser F1 (flashlight)

Vendor: trekk inn Outdoor shop by tradeinn

Webpage URL: <http://bit.ly/3mMpEGY>

Price: \$58.99

Weight: 3.53 ounces

Size: 1.06x3.46 inches

Material: Anodized aluminum

Appropriate for which BOBs: Short, Medium, Long

Comments: HA III anodizing (housing: matte black) with military standard, is waterproof (IPX8), and features electronic control with a temperature sensor, a tail stand, integrated roll protection, an interchangeable glass-breaking ring. 400 lumens max output. Modes: High, low, strobe. Pocket clip. Hand strap. 5-year warranty. Note: The F1R model is the rechargeable version of this flashlight, priced \$89.95 on Amazon.com

Item name: Olight M2R Pro Warrior Flashlight (this is the new version of the discontinued Warrior model which is the one I have)

Vendor: Olight Direct on Amazon.com

Webpage URL: <https://amzn.to/3ppG75C>

Price: \$109.95

Weight: 6.31 ounces

Size: 1.16x5.37 inches

Material: Aircraft-grade aluminum body with anti-scratch type III hard anodizing

Appropriate for which BOBs: Short, Medium, Long

Comments: Third Generation Magnetic Charging Cable. Rechargeable lithium battery with maximum runtime of 50 days. Pocket clip, lanyard, holster. Max output 1800 lumens. Output modes: 1, 15, 60, 250, 750, 1800 lumens. Side and tailcap button switches. Waterproof (IPX8).

Whistle

A whistle is so inexpensive, lightweight, and compact that there is no reason not to include one in your BOBs as a signaling device. You can scream for help to draw someone's attention, but your voice will soon become tired, sore, and hoarse. It requires much less energy to blow a whistle and you can do it for longer.

There are two universally recognized distress signals that you can use with your whistle^[485]:

- International distress call: Three whistle blasts each lasting three seconds. This is easier to perform and to remember than the SOS signal in Morse code.
- Morse code: "SOS" in Morse code means, "help" and is represented by three dots, three dashes, and three dots. Three short whistle blasts represent the three dots. Three longer whistle blasts represent the dashes.

Besides signaling for help, a whistle can be used to^[486]:

- Scare off animals
- Scare off threatening humans
- Make your location known if you buried under rubble after an earthquake

Some features to look for when selecting a whistle for your BOB includes:

- High quality plastic material. Functions well at high and low temperatures. Corrosion-resistant. Strong. Floats.
- Loudness level of 100-120 decibels. These can be heard over background noises up to distances of 0.5-1 mile or more
- Pea-less design. So you don't have to be concerned about the pea becoming jammed or frozen in place.
- High visibility bright color

- Attachment site for a lanyard

Item name: Fox 40 Sonik Blast CMG (cushioned mouth grip) Whistle

Vendor: greatcallathletics on eBay.com

Webpage URL: <http://ebay.to/3nTKCoG>

Price: \$9.49

Weight: 0.64 ounces

Size: 1x1x2 inches

Material: High-impact ABS plastic

Appropriate for which BOBs: Short, Medium, Long

Comments: Pea-less design. 2 chambers which self-clear after being submerged in water. Break-away lanyard. Can be heard over 1 mile away. More than 120 decibels. High pitched sound. Available in approx 18 colors and color combinations.

Hand Crank Emergency Radio

Emergency radios keep you connected to the world even when there may be no cellular, landline, or Internet service during a disaster. All 50 states in the USA can receive emergency weather broadcasts through the National Weather Radio (NWR) network, which is controlled by the National Oceanic and Atmospheric Administration (NOAA). The NWR also transmits alerts regarding natural, public, and environmental safety as well as national security and AMBER alerts,^[487]

Most of these emergency radios also have:

- Capability to receive all 7 NOAA channels
- AM and FM reception
- SW (short wave) band reception
- Flashlights
- Emergency siren
- The ability to charge other devices via a variety of ports including USB

An emergency radio must have the capability to be manually powered by a hand crank when the power grid is down. These radios generally also have other means of power including one or more of the following:

- Rechargeable batteries
- Cigarette lighter adapter for charging in a vehicle
- USB port
- Solar panel

- AC adapter

Here is an example of a popular hand-crank emergency radio:

Item name: Kaito KA500 Voyager ([hand-crank emergency radio](#))

Vendor: Electronixx on Amazon.com

Webpage URL: <https://amzn.to/3mOF5hX>

Price: \$49.98

Weight: 1.4 lb

Size: 2.25x5x8.25 inches

Material: Premium impact-resistant and water-resistant ABS material

Appropriate for which BOBs: Medium, Long

Comments: NOAA Certified Emergency Radio (provides coverage of AM, FM, SW1, and SW2, plus all 7 pre-programmed national weather channels). 6-way powered portable emergency radio with hand crank generator, solar panel. Works as an emergency mobile battery charger for other devices. 5-LED reading lamp, LED flashlight and a red LED S.O.S. beacon light.

Portable Two-Way Radio

Portable radios that offer two-way communication provides a way to stay in contact when cellular, landline, and Internet service is down. You will need to have a way to keep them powered (e.g., solar charger or vehicle battery) during a disaster. There are different types of portable two-way radios (PTWR) based upon the part of the radio frequency spectrum they utilize.

Here is a comparison of the most common types of PTWRs^[488], ^[489], ^[490], ^[491]

- Amateur (ham) radio
 - Frequency spectrum: 1.8-1,300 mHz
 - License required: Yes
 - Test required: Yes
 - Power: 5-8 watts typical for handheld ham radios. FCC (Federal Communications Commission) maximum allowable is 200 watts with a Technician license and 1,500 watts for a General license
 - Able to utilize repeaters: Yes
 - Access to emergency channels: Yes
- Citizen's band (CB) radio. Most often associated with use by truck drivers.
 - Frequency spectrum: 26-27 mHz, 40 channels
 - License required: No

- Test required: No
- Power: Maximum allowable 4 watts
- Able to utilize repeaters: No
- Access to emergency channels: No
- Family Radio Service (FRS). Inexpensive and found in big-box discount stores. Common “walkie talkie.”
 - Frequency spectrum: 462-467 MHz, 22 channels
 - License required: No
 - Test required: No
 - Power: Maximum allowable 2 watts
 - Able to utilize repeaters: No
 - Access to emergency channels: No
- General Mobile Radio Service (GMRS)
 - Frequency spectrum: 462-467 MHz, 22 FRS channels plus 8 repeater channels
 - License required: Yes
 - Test required: No
 - Power: Maximum allowable 5 watts
 - Able to utilize repeaters: Yes
 - Access to emergency channels: No

Published radio transmission distances are based upon theoretical ideal conditions. Real-life transmission distances will be much less and will depend upon factors such as weather, terrain, physical obstructions, power output and design of the radio, signal frequency and channel, quality of your antenna, and the vertical height above ground of your antenna. Here are some estimates for communication distances between two handheld radios of the same type taking into account various realistic situations^[492], ^[493]:

- Amateur (ham) radio: 1-2 miles
- CB radio: 1-2 miles
- FRS radio: 0.25-1 mile
- GMRS radio: 0.5-2 miles

One way that radios can extend their communication distance is to transmit their signal to a repeater, which is an antenna placed atop of a high location (e.g., mountain top, tall building). The repeater passes the signal to another repeater or another radio. The FCC allows only ham and GMRS radios to utilize repeaters.

Ham radio users are required by the FCC to be licensed and users have the choice of testing for three different levels of licenses: Technician, General, and Extra. While most people preparing for disasters opt for the basic Technician's license, ham radio users can gain access to longer wavelength high frequency (HF) bands to significantly increase their communication distance if they upgrade their license. [\[494\]](#), [\[495\]](#)

So, which portable two-way radio is best for your BOB? Your best bet overall is to go with a ham radio for a variety of reasons. Its higher power, the capability of using repeaters when available, and ability to use high frequency allow it to operate over longer distances under the right conditions. It operates over the broadest frequency range helping you to avoid the congestion posed by many people using the other types of radios that operate over narrow frequency bands. Ham radio is the only portable radio that allows the reception of local emergency services and NOAA broadcasts. So, you could consider ditching your hand crank emergency radio if you carry a portable ham radio that is capable of emergency broadcast reception so long as you have a way to keep it powered over the long term.

For those of you interested in getting a ham radio, you can find information about the three different classes of licenses and how to get them by going to this web page:

<https://www.bugoutbagbuilder.com/learning-tutorials/how-get-your-radio-license>

Here is the link to the page on the FCC's web site regarding ham radio licensing: <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/amateur-radio-service>

The following is a popular portable ham radio:

Item name: BaoFeng BF-F8HP 8 Watt Dual Band Handheld Ham Radio (3rd generation)

Vendor: BaoFeng on Amazon.com

Webpage URL: <https://amzn.to/2WQ4Ofa>

Price: \$69.89

Weight: 10.1 ounces

Size: 2x2x10.5 inches

Material: "New Hardened Durable Radio Shell." Details are unavailable. It

appears to be made of ABS plastic. Water-resistant, but not waterproof. Appropriate for which BOBs: Medium, Long
Comments: High / Med / Low Power Settings. Frequency Range: 65-108 MHz (Only commercial FM radio reception), VHF: 136-174 MHz(Rx/Tx), UHF: 400-520 MHz(Rx/Tx); Broad (Wide) / Narrowband (Narrow) Selectable. Battery life 20 hours (8 watts) and 24 hours (5 watts). Includes 2000 mAh battery, 7-inch high gain dual output V-85 antenna, power adapter, earpiece, belt clip, hand strap, battery charger. 1-year concierge service and warranty support.

The BaoFeng BF-F8HP radio has been very popular and has therefore spawned counterfeit versions. Here is a web page from the “BaoFeng Tech News and Blog” that describes how to be sure you’re buying a genuine version of this radio: <http://bit.ly/3mSJTTt>

Satellite Phones

Satellite phones or sat phones are another communication device alternative when cellular, landline and Internet services are down. Sat phones utilize satellites orbiting the earth. Globalstar®, Iridium®, and Inmarsat® are the major companies offering paid service for the commercial sat phone market. You can make voice calls, text messages, and email depending upon the type of service and phone that you have. Sat phones require an unobstructed view of the sky to acquire signals from satellites. You may experience varying degrees of latency or delay between signal transmission and reception depending upon your location and the satellite system you’re connecting to (i.e., less latency with low earth orbiting versus geosynchronous or geostationary satellites orbiting over the equator).^[496], ^[497], ^[498]

Iridium® owns and operates 66 low earth orbit satellites, the largest number of satellites of any satellite network. It provides coverage everywhere on the globe and with the shortest latency. Inmarsat® lacks coverage at the north and south poles as does Globalstar®. Globalstar® also lacks coverage in some mid-ocean areas. You have to stand still and have the antenna pointed towards the equator to use the Inmarsat® network. You can be on the move while using your phone on the Iridium and Globalstar® networks. All three of these major networks support voice, text, data, and GPS location. However, Globalstar® is capable of only incoming texts.^[499]

You can buy satellite phone service from the major service providers either

on a monthly plan or by prepaid airtime. As an example, an Iridium® monthly plan for \$52.95/month comes with 10 minutes of outgoing voice and 10 outgoing text messages. Incoming voice calls and texts are free. Excess outgoing voice calls are charged \$1.29/minute and excess texts are charged \$0.50/message.^[500] An example of a prepaid card is an Iridium® card that offers 4,500 units (1 unit/minute of voice, 6 units/outgoing text) that expire after 30 days for \$144.00. Incoming voice calls and text messages are free and cost you no units off your prepaid plan.^[501]

Even though prices have decreased over time, sat phones are still costly. You can rent sat phones by the day or by the month. But, for BOB purposes, you'll want to buy one so it is ready to go when you are. A popular and rugged option for a sat phone is the following:

Item name: Iridium® Extreme 9575 Satellite Phone

Vendor: SatPhoneStore on Amazon.com

Webpage URL: <https://amzn.to/3psKJb0>

Price: \$1,150.00

Weight: 8.6 ounces

Size: 1.08x2.4x5.6 inches (length includes the external antenna)

Material: Not specified

Appropriate for which BOBs: Long

Comments: Military-grade durability (MIL-STD 810F). Battery Standby time: Up to 30 hours. Talk time: Up to 4-hour. Two-way SMS and short email capability. Combines location awareness, a fully integrated SOS button with included emergency response service. **FACTORY INCLUDED**

ACCESSORIES: Iridium 9575 Extreme handset, battery, AC travel charger with international adapters, DC car charger, hands-free earpiece with microphone, leather case, USB data cable, quick start guide, CD-ROM with software, 2 accessory adapters, and a magnetic vehicle mount antenna.

SATPHONESTORE BONUS ACCESSORIES: Tempered glass screen protector designed for Iridium 9575, SatPhoneStore Tough Case, and a silicon protective case.

PERSONAL PROTECTION ITEMS

This chapter reviews items for personal protection. Your environment and where you anticipate escaping will largely influence what you choose to pack in your BOBs. The items discussed below will give you some things to consider packing:

- Sunscreen
- Sunglasses
- Safety goggles
- Ballistic eyewear
- Mask
- Earplugs
- Leather gloves
- Trekking poles
- Insect repellent
- Pepper spray
- Knife
- Handgun
- Rifle
- Shotgun
- Pellet air gun
- Spare parts and cleaning supplies for your firearms
- Bow, arrows

Some additional personal protection items will be discussed for you to consider bringing with you when you can carry more by escaping by vehicle rather than on foot:

- Ballistic vest
- Ballistic helmet
- Gas mask

- Alarms, camp security systems

Sunscreen

Pack some sunscreen to protect your skin from sunburn especially if you will be escaping on foot. Use a sunscreen that protects you from UV-A and UV-B radiation. Select a sunscreen with a rating of at least 30 SPF (Sun Protection Factor), but be aware that sunscreens with greater than SPF 50 provide only slightly more protection. Buy water-resistant sunscreen, which means that SPF is maintained up to 40 minutes in water. SPF that's maintained in water for 80 minutes is termed very water-resistant. The mode of application is a matter of personal preference; lotion is thinner and less greasy than cream and it's easier to apply over a large area. Don't forget to apply lip balm with at least SPF 30 to your lips and wear sunglasses, a wide brim hat, long sleeve shirts, and long pants to further protect your skin. If possible, try to avoid being in the sun from 10 am to 4 pm.^[502]

The composition of sunscreen is another factor to consider. Some include zinc oxide or titanium dioxide, which lie on the skin's surface, and they are called physical or mineral sunscreens. Others called chemical sunscreens contain substances like oxybenzone or avobenzone, which are absorbed into the skin. It's best to go with a physical sunscreen if you have sensitive skin or acne.^[503]

Item name: Neutrogena Ultra Sheer Dry-Touch SPF 70 Sunscreen Lotion, 3 fl. oz

Vendor: Walmart

Webpage URL: <http://bit.ly/3aLd5ZX>

Price: \$8.97

Weight: 3 ounces

Size: Not specified

Material: This is a chemical sunscreen. Active ingredients include Avobenzone (3%), Homosalate (15%), Octisalate (5%), Octocrylene (2.8%), Oxybenzone (6%)

Appropriate for which BOBs: Short, Medium, Long

Comments: Water-resistant. Non-greasy feel. Absorbs quickly.

Recommended by dermatologists.

Sunglasses

Be sure to protect your eyes. UV radiation can damage the surface and the

inside of your eyes. Sunburned eyes can result in photokeratitis, which is inflammation of the cornea or outside coating of your eye. One form of photokeratitis is snow blindness, but it can also occur from the reflection of light off water. Symptoms include eye pain, blurred vision, seeing halos, swelling, sensitivity to bright light, and temporary vision loss; these are all things you want to avoid when you're focused on your survival. Long term UV eye damage can include growths (e.g., pterygium), cancer, and cataracts. [\[504\]](#) [\[505\]](#)

What to look for when buying sunglasses for eye protection [\[506\]](#):

- Blocks 99-100% of UV-A and UV-B light. The statement "UV absorption up to 400" means 100% UV blocking
- Meets Food and Drug Administration (FDA) criteria for impact resistance
- Wrap-around design to block UV radiation from the sides and top
- Optional features that are unrelated to UV absorption: Polarized to reduce glare. Darker lenses for brighter situations. Mirror coated to reduce light transmission. Blue-blocking to make distant objects appear sharper especially in snow or a haze. Polycarbonate lenses are more impact, but less scratch-resistant, so be sure they have a scratch-resistant coating.

There are countless sunglass choices. People requiring prescription sunglasses will have a somewhat smaller selection to choose from. The price range is vast. Sunglasses weigh about 0.8-1.3 ounces. [\[507\]](#)

This is one item where I will not leave a product example since everyone is familiar with sunglasses and choosing one is such an individual choice.

Safety Goggles

Formal medical care will be difficult or impossible to obtain during a disaster. So, you will want to do everything you can to protect yourself from injury. Lightweight safety goggles are handy to have with you to protect your eyes from things like windblown sand, vegetation if you're trekking through dense brush, and wood chips when axing wood. Unlike eyeglasses, goggles provide a seal all-around your eyes for much greater protection. Anything is better than nothing, so those on a strict budget can get an inexpensive plastic pair as we used in chemistry class. Better quality goggles are available at a higher price. Make sure your goggles have vents to prevent fogging.

Item name: Safety Goggles, Protective Safety Glasses, 2 pairs

Vendor: Yun Tuo on Amazon.com

Webpage URL: <https://amzn.to/3nSZmEr>

Price: \$10.99 for 2 pairs

Weight: 2.7 ounces

Size: 3.15x3.54x6.3 inches

Material: Transparent PVC frame, uncoated polycarbonate lenses, adjustable elastic strap

Appropriate for which BOBs: Short, Medium, Long

Comments: Can wear over eyeglasses. 4 vents permit airflow while preventing entry by liquids, certain airborne particulates, and chemicals. 99% UV protection. Scratch-resistant. Anti-fog.

Item name: Safety Goggles - Spherical Medical Protective OTG Anti-splash Glasses

Vendor: Pagurio on Amazon.com

Webpage URL: <https://amzn.to/3ppXUJU>

Price: \$13.99

Weight: 4.8 ounces

Size: 3.2x5.1x7.5 inches

Material: Transparent PVC frame, uncoated polycarbonate lenses, adjustable elastic strap

Appropriate for which BOBs: Short, Medium, Long

Comments: Polycarbonate transparent lens with impact-resistant, effectively blocking ultraviolet rays. Anti-fogging coating. No vents. Made to fit the prescription glasses underneath them. There is a slot on each side of the frame to accommodate eyeglass temples. Certified Safety Goggles - Passed the test of FDA for solid indoor and outdoor protection under multiple circumstances including lab, welding, grinding, and etc. These goggles received a 4.3-star rating on Amazon. There were a few people who experienced fogging, but the vast majority described having no fogging problems.

Item name: Rothco OTG Ballistic Goggles

Vendor: Tungsten Blue on Amazon.com

Webpage URL: <https://amzn.to/2WLHFKU>

Price: \$35.98

Weight: 4.8 ounces

Size: 3.2x3.2x7.0 inches

Material: Rubber, Foam, Polycarbonate

Appropriate for which BOBs: Short, Medium, Long

Comments: Goggles Are Set to Military MIL-DTL-43511D (the standard for polycarbonate flyer's helmet visors, used to certify goggles) and ANSI-Z87-1 Standards For Ballistic Eyewear Protection. Fits over prescription glasses. There is a slot on each side of the frame to accommodate eyeglass temples. 2mm thick polycarbonate anti-fog and anti-scratch lenses and UV 400 protection treatment. Movable hinges, adjustable straps. 3/8" foam seal. Top and bottom vents.

Ballistic Eyeglasses

You'll need to have eye protection if you plan to use firearms for hunting game or hunkering down in a defensive situation. To save carrying ballistic eyeglasses, you could use your ballistic goggles for this purpose (see the Rothco OTG Ballistic Goggle example under the "Safety Goggles" section).

Be sure whatever eye protection you get is ballistic protection certified. At a minimum, your glasses should be ANSI Z87.1 certified by the American National Standards Institute which tests occupational and educational personal eye and face protection devices in the US. Testing includes protection against UV radiation, chemicals, and impacts. The marking Z87.1 means that the glasses or goggles have passed the basic impact test. The marking Z87.1+ means that the lenses passed the high mass test (500 gram pointed weight dropped from 5 feet onto the lens) and high-velocity impact test. That test consists of a 1/4" steel ball shot at the lens 102 mph from 150 feet for eyeglasses and at 170 mph from 250 feet and 205 mph from 300 feet for goggles. [\[508\]](#)

Military standards for ballistic eye protection are more stringent than ANSI Z87.1, so look for your glasses to be certified MIL-PRF-31013 (spectacles) and MIL-DTL-43511D (goggles). The MIL-PRF-31013 testing produces approximately 7 times more impact energy than the ANSI Z87.1 standard. [\[509\]](#) To be MIL-DTL-43511D certified, a lens must withstand impact from a .22 caliber, 17-grain projectile traveling 550-560 fps. [\[510\]](#)

US military personnel must wear eye protection that is APEL (Authorized Protective Eyewear List) approved. Civilian products need not bear the APEL marking even if they pass military ballistic standards; they will usually bear

the markings MIL-PRF-31013 or MIL-DTL-43511D.

Item name: Edge Tactical Eyewear Dragon Fire Safety Glasses Clear Anti-Fog Lens (Ballistic Eyeglasses)

Vendor: Safety Glasses USA

Webpage URL: <http://bit.ly/3hkmQQj>

Price: \$7.95

Weight: Not specified

Size: Not specified

Material: Frame consists of a flexible and durable TR90/Nylon compound material (material increases "grip" as it becomes moist or warm). Lens material is not specified.

Appropriate for which BOBs: Short, Medium, Long

Comments: Complies with ANSI Z87.1+2010 and Military Ballistic MCEPS GL-PD 10-12 standards. Clear lenses. All Edge lenses block 99.9% of UVA, UVB, and UVC radiation and are coated to reduce scratching. Anti-fog.

Item name: Bolle Assault Tactical Safety Glasses with Matte Black Frame and ESP Anti-Fog Lens (Ballistic Eyeglasses)

Vendor: Safety Glasses USA

Webpage URL: <http://bit.ly/3mQyF1x>

Price: \$28.99

Weight: Not specified

Size: Not specified

Material: Ultra-Flexible And Comfortable Nylon Frame. Ballistic Polycarbonate Lens.

Appropriate for which BOBs: Short, Medium, Long

Comments: Certified to Ballistic Resistance Standard GL-PD 10-12, MIL-PRF-31013 and ANSI Z87.1-2015. Non-slip bridge, flexible temples. Anti-Scratch, Anti-Fog Coatings. ESP (Extra Sensory Perception) an award-winning innovative coating that enhances the ability to see detail and improve contrast without distorting colors. Reduces glare, eyestrain, and the harmful effects of blue light. ESP filters 70% of blue light while delivering 63% visible light transmission and 100% UVA/UVB protection.

Mask

Masks come in all different varieties. [\[511\]](#), [\[512\]](#) The most basic ones will protect you from dust, pollen, particulates, and bacteria. Better masks will offer

protection from chemicals. Some people use shemaghs as a face covering and that will help protect against larger particulates like blowing sand, but it will not offer protection against inhaling smaller objects.

A study from Duke University comparing 14 masks in the context of the Covid-19 virus demonstrated the importance of a mask's "pore" size and fit on its effectiveness in blocking speech-related droplets from the person wearing the mask. It is reasonable to surmise that their results would apply for droplets and particles going the other direction as well. The researchers found that the more interwoven layers a mask has, the more effective it will be at blocking particles. This explains why the multi-layered cotton, surgical and N95 masks performed so well. All fabric and textiles have spaces between their fibers, so having multiple layers makes it more difficult for particles to pass through. The study also found that a tightly fitting mask forces particles to pass through the mask itself. However, particles can escape out the sides, top, and bottom of a loosely fitting mask. The combination of larger pores and a loose fit make neck fleece and bandanas ineffective as protective masks. [\[513\]](#)

Lighter weight masks come in disposable and reusable varieties. Disposable medical masks are among the lightest and least expensive masks. Disposable, multi-layered surgical masks were second most effective in the Duke University study, with N95 respirator masks coming in first place ahead of them. Examples are listed below of different masks starting with the least protective and progressing to the most protective. First, here is an example of a multi-layer surgical mask:

Item name: Disposable 3 ply Face Masks Pack of 50 pieces/Box, Albatross Health 3ply Deluxe Procedure Earloop Face Mask

Vendor: Albatross Health New England on Amazon.com

Webpage URL: <https://amzn.to/3nVeMaX>

Price: \$27.98 for 50 masks

Weight: Not specified

Size: Not specified

Material: Melt Blown Polypropylene (MBPP), Spunbond Polypropylene (SBPP), Plastic Covered Iron, Polyester and Spandex

Appropriate for which BOBs: Short, Medium, Long

Comments: Tested by Nelson Labs in the USA for quality and safety. Skin

Friendly - Meets ISO 10993 standards, latex-free. Triple-layered mask for maximum particle filtration. The non-woven melt-blown material prevents saliva droplets and dust to penetrate. Hydrophobic material creates a barrier against any size liquid particle such as saliva. 80mmHg fluid resistance meets the requirements of ASTM F2100. Adjust Nose Clip. Easy Breathability. Flat knitted earloop.

Here is an example of a disposable mask that is rated P100 (higher filter rating than N95 masks):

Item name: 3M 8293 P100 Particulate Respirator

Vendor: Safety Company

Webpage URL: <http://bit.ly/3px1nXf>

Price: \$10.09

Weight: 0.2 ounces

Size: 2.5x4x7.5 inches

Material: Electrostatically charged microfiber filter media. Foam face seal.

Appropriate for which BOBs: Short, Medium, Long

Comments: P100 Approved, NIOSH's highest rated filtration efficiency in a filtering facepiece respirator. 3M™ Cool Flow™ Valve. Adjustable buckle straps and nose clip. Provides a minimum filter efficiency of 99.97% against oil and non-oil-based particles. Protects against lead, MDA, arsenic, cadmium (excluding asbestos), dust, mold, silica.

The following is an example of a full face respirator mask rated N95. This type of mask is large and something you would probably include if you are escaping in your vehicle:

Item name: PD-100 Full Face Respirator Gas Mask with Organic Vapor P-A-1 N95 Equivalent Filter Set

Vendor: Parcil Distribution

Webpage URL: <http://bit.ly/37S1oiz>

Price: \$99.97

Weight: 1.6 lb

Size: 6x7.5x9.3 inches

Material: ABS plastic, silicone, activated charcoal

Appropriate for which BOBs: Short, Medium, Long

Comments: Filters 95% of non-oil-based particulates according to NIOSH standards. Blocks lead, cadmium, arsenic, methylenedianiline, dust, mold,

gasoline, ether, nitroalkane, nitrobenzene, carbon trichloride, gases and organic vapor, acetone, alcohols, anilines, carbon dioxide, chloroform, chloropicrin. Replaceable filters. Clear plastic full face shield. Cannot wear eyeglasses inside the face shield. Utilizes air circulation technology to keep your face cool and ensure the lens never fogs. Equipped with a speaking diaphragm. Comes with two filter cartridges. 1-year warranty.

There are other large, protective masks that you would probably only take with you if you are escaping in your vehicle. These masks include:

- CBA/RCA masks rated for chemical blowing and riot control agents like pepper spray, tear gas
- NBC masks rated for nuclear, biological, and chemical threats
- CBRN masks rated for chemical, biological, radiation fallout from a dirty bomb, and nuclear threats

An example of a CBRN mask is:

Item name: Mira Safety CM-6M Tactical Gas Mask. Full-face respirator for CBRN Defense

Vendor: Mira Safety

Webpage URL: <http://bit.ly/3ho2UMn>

Price: \$239.99

Weight: 1.23 lb without filter

Size: 6x7x10 inches

Material: Facepiece bromine-butyl rubber. Visor polycarbonate.

Appropriate for which BOBs: Short, Medium, Long

Comments: 20-year shelf life. Compatible with the 3M Safety 6878 Spectacle Kit (sold separately). Uses widely available NATO-standard, 40-mm filter cartridges. Can be used with 1 or 2 filters. Meets CBRN protection standards. Hypoallergenic inner mask prevents fogging, even under hard use. Tested resistance to mustard gas penetration for nearly 30 hours. Helmet-compatible. Comes with a pre-installed hydration system and 900 ml canteen. Compatible with CamelBak® water bladders with a Type M adapter (not included). Meets all requirements under EN 136:1998, Class III. Complies with all standards under EN 168 for impact protection, making this the perfect mask for riot control situations. 5-year manufacturer's warranty. Manufactured in the Czech Republic.

Earplugs

Some form of hearing protection is important especially if you will be discharging a firearm for hunting or personal protection. Earplugs are small, light, and inexpensive. They are perfect for packing into your BOB. Because of their small size, they are preferable to earmuffs.

It's possible to get high-end electronic earplugs that amplify speech and other low sounds while dampening loud sounds. These are rechargeable. These will not be included in the current discussion because of their recharging requirement. Standard earplugs work well and do not require any power source so they are better suited for your BOBs.

Hearing protective equipment is rated by how much they reduce overall noise. The NRR (Noise Reduction Rating) measures this noise reduction in decibels (db).^[514] For example, a person exposed to 100 db noise level while wearing hearing protection with a 25 db NRR will experience an actual noise level of 75 db. It is best to buy earplugs with the highest NRR rating. Here is an example of economical earplugs with a 33 db NRR:

Item name: Mack's Ultra Soft Foam Earplugs, 50 Pair - 33dB Highest NRR

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2KTuxRf>

Price: \$9.89 for 50 pairs

Weight: Not specified

Size: Not specified

Material: Super low-pressure, slow-release, Comfy Cush Comfort Foam (Polyurethane foam)

Appropriate for which BOBs: Short, Medium, Long

Comments:

Leather Gloves

Since medical help may be unavailable in a disaster situation, it's important to protect your hands from blisters, punctures, and lacerations that may become infected. A simple precaution is to pack good quality leather gloves in your BOBs. Avoid all fabric gloves or gloves with leather palms, but fabric tops since they offer less protection than all leather gloves. Here is an example of some reasonably priced gloves:

Item name: Mens Wells Lamont Leather Work Gloves All Purpose

Vendor: maxsalvage on eBay.com

Webpage URL: <http://ebay.to/3aILWXXK>

Price: \$13.49

Weight: 0.3 lb

Size: Not specified

Material: Premium cowhide leather

Appropriate for which BOBs: Short, Medium, Long

Comments: Pre-curved fingers. Reinforced palm.

Trekking Poles

Trekking poles are an optional item, but they offer some useful benefits especially when walking on uneven terrain weighed down by a backpack:^[515],
^[516], ^[517], ^[518], ^[519]

- They aid with you maintaining your balance improving your safety
- Reduce impact to your legs, knees, ankles, and feet especially when descending hills
- Use them to move obstructions away from your path of travel
- Increases your speed of walking
- Improves your traction especially on mud, snow, and loose rock
- Can be used to probe water puddles, snow, mud
- Use as a defensive tool to ward off animal or human predators
- Allows your arms to help pull you uphill
- Helps you maintain proper posture
- Helps remove some load from your back

Trekking poles may be used for other purposes besides as walking aids:

- They can replace your tent poles
- Serve as splints for injured limbs
- Serve as makeshift crutches for lower limb injuries

What are some downsides of using trekking poles?

- They represent an added cost
- More weight to carry
- More bulk to take up space in or on your pack
- If you need to frequently use your hands, then you'll have to pack and unpack your trekking poles

Factors to consider when selecting trekking poles:

- Get one pole or two? Two poles are better than one because they will

better accomplish the benefits listed in an earlier paragraph

- Type of pole shaft material:
 - Carbon fiber: Expensive. Light. Not as strong as aluminum. Suddenly snaps when it breaks.
 - Aluminum: Cheaper than carbon fiber. Heavier. Very strong. Bends rather than snaps when over-stressed.
- Type of grip material
 - Cork: Molds to your hand over time. Moisture and bacteria resistant. Durable. Wicks perspiration away from your hands to reduce blisters. Heavier than foam. More expensive, but the best choice.
 - Rubber: The most water-resistant. Very durable. Less expensive. Friction when wet can cause skin blisters.
 - Foam: Softest, comfortable. Absorbs water. Breaks down faster.
- Grip extensions: The grip material extends 4-5 inches down the shaft from the normal grip area. This allows your hands to be positioned higher or lower, so you don't have to lengthen and shorten your poles to adjust their height to match the terrain.
- Pole shaft design:
 - 2 Section Telescoping: Tallest, heaviest, most durable, good for heavy use
 - 3 Section Telescoping: Lighter, but less durable than 2 section poles.
 - Trifold: Multiple shaft segments attached by an elastic cord. Lightweight. Less durable than telescoping poles.
 - Fixed: One piece. Strongest, safest, most durable.
- Locking mechanism
 - The different sections of telescoping and folding shafts are secured by one of two locking mechanisms.
 - Twist lock: They permit adjustment without any tools. Tighten and loosen by twisting a threaded locking ring at the junction between the shaft segments.
 - Flick lock: A lever is flipped to lock and unlock the shaft segments. A screwdriver is usually needed to make large adjustments.
- Basket
 - These are the ring-like pieces at the end of the pole that keep the

- pole from sinking into soft surfaces
- They are screwed into place and interchangeable on most poles. They are fixed and not replaceable in some poles.
- Baskets of < 3 inches diameter are for more firm surfaces and present less material to potentially snag against vegetation.
- Baskets of > 3 inches diameter are for softer surfaces like mud and snow.
- Tip
 - Carbide: Most common tip. Good for soft surfaces. Can skid on hard surfaces. Noisier when contacting the ground.
 - Rubber: Good on hard surfaces. Quieter when contacting the ground. Not as effective as carbide tips on soft surfaces.
 - Rubber caps: Available to place over carbide tips to use on hard surfaces to protect the tips and provide better traction.
- Shock-absorbing poles
 - An internal spring absorbs shock.
 - Heavier, more expensive, less stable
 - Shock absorbers can be turned on and off on some poles
 - Helps on long downhill descents to absorb impact and protect hips, knees, ankles.
 - A disadvantage for ascending hills because compression of the spring results in loss of power.
 -
- Proper length for your trekking poles:
 - On level ground: Your elbows should be bent 90 degrees when you are gripping your pole with your arms at your side.
 - Going uphill: Your poles should be shortened so your elbows maintain a 90 degree bent position.
 - Going downhill: Your poles should be lengthened so your elbows maintain a 90 degree bent position.

Item name: Black Diamond Trail Ergo Cork Trekking Poles

Vendor: REI Co-op

Webpage URL: <http://bit.ly/2L1SPZb>

Price: \$129.95

Weight: 1 lb, 2 ounces

Size: 27 inches collapsed. 55 inches maximum length.

Material: Aluminum shaft. Cork grip material.

Appropriate for which BOBs: Short, Medium, Long

Comments: Three-section shaft. External Lever Lock offers quick and secure length changes. Ergonomic, natural cork grips wick sweat and provide comfort; updated soft rubber grip extensions and solution straps offer added security and better handling. 15° corrective angle delivers optimal grip position. Interchangeable carbide Tech Tips; 38mm trekking baskets. Ski-compatible ferrules will accept 100mm powder baskets (sold separately) for deep snow.

Insect Repellent

It is worthwhile packing insect repellent if your emergency escape takes you outdoors. Insect bites (e.g., mosquitoes, ticks, etc.) can create irritating wounds especially for those with sensitive skin. Insect bites can also transmit diseases.

The Environmental Protection Agency (EPA) has approved six insect repellents for use on the skin. They are DEET (the most popular and longest-lasting), picaridin, IR3535, oil of lemon eucalyptus (OLE), para-menthane-diol (PMD), and 2-undecanone. Avoid using OLE or PMD on children younger than 3 years and avoid DEET on children younger than 2 months. Insect repellents containing 10% or less of the active ingredient will last only a couple of hours. Buy repellents containing up to 30% of the active ingredient. Wear long-sleeve shirts and pants to protect your skin. Also, tuck your pant legs into tall socks for further protection.^[520]

Insect repellents come as sprays, lotions, and wipes. Here are some examples:

Item name: OFF! Deep Woods Insect and Mosquito Repellent VIII,

DryTouch Technology, Long-Lasting Protection 4 oz. (Pack of 2)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/38IjjqU>

Price: \$7.97 for 2 spray cans

Weight: 13.3 ounces

Size: 1.8x3.6x6.4 inches

Material: 25% DEET

Appropriate for which BOBs: Short, Medium, Long

Comments: Protection from biting insects such as mosquitoes, black flies, sand flies, chiggers, gnats, and ticks, including those that may carry Lyme

disease.

Item name: REPEL Plant-Based Lemon Eucalyptus Insect Repellent, Pump Spray, 4-Ounce

Vendor: Amazon.com

Webpage URL: <https://amzn.to/3psYLTu>

Price: \$4.97

Weight: 0.8 ounces

Size: 1x2x5.5 inches

Material: Oil of lemon eucalyptus

Appropriate for which BOBs: Short, Medium, Long

Comments: Oil of lemon eucalyptus is the only plant-based active ingredient recommended by the CDC. Derived from oil obtained from the leaves of the Eucalyptus citriodora tree, this active ingredient repels mosquitoes and deer ticks for up to six hours. DEET-free.

Pepper Spray

Pepper spray^[521] is a common form of non-lethal self-defense against animals and people. Pepper spray can cause respiratory arrest and sudden elevation of blood pressure. People, especially those with asthma, have died from pepper spray exposure even though it's thought of as non-lethal. More typically, people will experience 30-45 minutes of eye pain and blindness. They may also experience burning in the throat, wheezing, cough, and shortness of breath.

Oleoresin capsicum (OC) is the active ingredient in pepper spray. Scoville Heat Units (SHU) are used to grade a pepper's heat. A bell pepper rates 0 SHU while a jalapeno pepper rates 2,500-5,000 SHU. Commercial pepper sprays rate approximately 2 million SHU. Police grade pepper spray rates approximately 5 million SHU and have a capsaicin content of 10-30% compared with bear sprays that contain much lower concentrations of capsaicin of about 1-2%^[522]

Pepper spray is available in different forms^[523]:

- Fogger: Very fine droplets. Range 4-8 feet. Not good in windy situations where spray may blow back on to you.
- Stream: Sprays with higher force. Range 15-20 feet. Works even in wind. Less likely to blow back on to you. You may inhale it or get splashed if used indoors.

- Gel: Ideal for indoor and close quarters. Range 25 feet. Sticks to whomever you spray. Doesn't splatter.
- Foam: Ideal for indoor and close quarters. Range 6-8 feet.
- Animal: OC concentration is less than sprays designed for use on humans

Item name: Police Strength 23 Pepper Spray 1/2 oz Flip Top (2 PACK)

Vendor: Defense Shopper

Webpage URL: <http://bit.ly/2KFHBd5>

Price: \$28.99

Weight: Approximately 2 ounces

Size: Approximately 1.5x4.5 inches

Material: Case made of plastic. 1.47% Total Capsaicinoids

Appropriate for which BOBs: Short, Medium, Long

Comments: Each container contains 1/2 oz. Streetwise 23 Pepper Spray and comes in a hard case with key chain attachment. Incapacitates for up to 45 minutes. UV marking dye. The Certified Heat Rating (CHR) measures how hot the pepper spray will be once it comes in contact with your attacker. Streetwise 23 Pepper Spray has a CHR of over 230,000 SHU (1.47% Total Capsaicinoids) making it one of the hottest, most effective self-defense sprays on the market. For comparison, the independent laboratory tested competing brands. They found the average heat rating to be 123,000 SHU, making Streetwise 23 over 87% hotter than the competition. Warranty: 1 year for canister and nozzle, until expiration date for pepper spray.

Knife

Your EDC and BOB knives can also be used for personal protection. So, there is no need to get a separate knife for personal protection. You can refer to the chapter "Survival Knives" for information about knives.

Handgun

A handgun is the lightest and most compact firearm, so it's the first one to consider making a part of your EDC and BOBs. Just be cognizant of and obey the laws governing carrying and using a firearm in your area and areas where you travel.

There are numerous considerations in choosing your handgun. Many of you already have your favorite handguns and carry them on your person regularly. There can be much debate over what comprises the best handgun and ammunition caliber for emergencies. There is no single handgun that is

best for everyone. It comes down to an individual choice. Having any handgun is better than having none. Here are some general points to ponder as you make your selection:

- Semi-automatic pistol versus revolver
- Size: Sub-compact, compact, mid-size, or full-size pistol or revolver
- Caliber: Most commonly a choice between .38, .357, 9mm, 40 S&W, .45
- Ammunition: Generally an expanding, hollow-point bullet
- Extra ammunition: Carry spare magazines, speed loaders, speed strips, dump pouches
- Iron sights versus night sights versus optical sight (e.g., red dot, etc)
- Holster type: Inside waistband (IWB), outside waistband (OWB), appendix carry, over-the-chest open carry (if in the wilderness)

Here is an example of a medium frame revolver:

Item name: Ruger® GP-100, 6-inch barrel, stainless (manufacturer's part 1707)

Vendor: Brownells

Webpage URL: <http://bit.ly/3ruGFcd>

Price: \$697.99

Weight: 2.87 lb

Size: 6-inch barrel. 11.5 inches overall

Material: Stainless steel

Appropriate for which BOBs: Short, Medium, Long

Comments: Can shoot .38 or .357 ammunition. 6 round. Adjustable front and rear sights. Polymer grip. Full under lug.

Here is an example of a mid-size semi-automatic pistol:

Item name: Glock® 19, Gen 5

Vendor: Omaha Outdoors

Webpage URL: <http://bit.ly/3hopaG4>

Price: \$629.00

Weight: 23.63 ounces

Size: Barrel length 4.02 inches. Overall length 7.28 inches. Slide width 1 inch.

Material: Polymer frame. Slide finish nDLC.

Appropriate for which BOBs: Short, Medium, Long

Comments: Contrast white front dot and white bracket rear sight. Trigger pull

5.8 pounds. Caliber 9mm. Comes with 3 magazines, lock, cleaning rod, nylon brush, mag loader, modular backstraps

Here is an example of a full-size semi-automatic pistol:

Item name: Sig Sauer® P320 Full Size .40 S&W, night sights

Vendor: Osage County Guns

Webpage URL: <http://bit.ly/34L9WFM>

Price: \$579.99

Weight: 29.5 ounces

Size: Barrel length 4.7 inches. Overall length 8 inches. Overall height 5.5 inches. Overall width 1.3 inches.

Material: Stainless steel frame. Black Nitron stainless steel slide. Modular black polymer grip.

Appropriate for which BOBs: Short, Medium, Long

Comments: 40 S&W. Striker type trigger. Siglite night sights. M1913 accessory rail. Two 10 round steel magazines included. 14 round magazines are available.

Rifle

A rifle is worthwhile taking with you especially as part of your Long Term BOB and if you are escaping by vehicle. You can certainly bring a rifle with you if you escape on foot, but you'll have to judge if you can carry its extra bulk and weight along with all your other survival items. If you are out in the backwoods on your own after running out of the food you were able to carry with you, you will need to procure food. That will probably include hunting. Since you will be without refrigeration, your hunting will be geared towards small game, things that you can eat right away. Unless it is winter time and you're in a very cold location, you will not be able to keep larger game like deer from spoiling before you can eat it all. Also, small game is more plentiful than large game like deer, elk, moose, wild boar, or bear.

From a practical standpoint, you'll be hunting things like squirrels, rabbits, raccoons, and birds. That means you will not need a high power rifle. A high power rifle would create so much soft tissue destruction in small animals and birds as to make them inedible. A .22 LR caliber rifle is optimal for small game. .22 LR caliber rifles are relatively inexpensive, they are lightweight (especially with a polymer stock), and ammunition is cheaper, smaller, and lighter to carry than other calibers. A .22 LR caliber rifle can also be used for

personal protection, although larger caliber rifles would serve better for that purpose.

If you prioritize personal protection, then you might select a rifle that shoots .223 cal or 5.56x45 mm NATO rounds, something like an AR-15 style rifle. AR-15 rifles come with 14.5, 16, and 20 inch long barrels. You can choose one of the shorter barrels if you want a more compact platform. AR-15's also come in pistol versions that have 10.5-inch barrels and no stock. Only the buffer tube protrudes out the rear of the pistol. Rifles chambered for .223/5.56 are heavier than .22 LR rifles and their ammo is bulkier and heavier also.

Here are some examples of .22 LR caliber and .223/5.56 rifles:

Item name: Ruger® 10/22, polymer stock, stainless, .22 LR Semiautomatic Rifle

Vendor: Academy Sports and Outdoors

Webpage URL: <http://bit.ly/3pp90yM>

Price: \$279.99

Weight: 5 lb

Size: 37 inches overall. Barrel length 18.5 inches.

Material: Black synthetic stock. Stainless steel, hammer-forged barrel.

Appropriate for which BOBs: Medium, Long

Comments: Detachable rotary 10-round magazine with extended-release.

Combination scope base adapter. Push-button manual safety. Gold bead front sight. Adjustable rear sight. Semi-automatic. .22 LR rimfire. There is also a version called the Ruger® 10/22 Takedown Lite that weighs 4.5 lbs and comes apart into 2 pieces for more compact carry.

Item name: Henry U.S. Survival AR-7 .22 LR Semiautomatic Rifle

Vendor: Academy Sports and Outdoor

Webpage URL: <http://bit.ly/3aL53QV>

Price: \$249.99

Weight: 3.5 lb

Size: 16.5 inches when stowed (comes apart to save space). 35 inches assembled

Material: Steel barrel. ABS plastic stock (impact and water-resistant)

Appropriate for which BOBs: Medium, Long

Comments: Assembles and disassembles without tools. Pieces fit inside the

stock when the rifle is disassembled. Thumb safety. Semiautomatic. Two 8-round magazines included. 3/8" grooved, Teflon®-coated receiver for mounting a scope (not included). Blade front sight; adjustable rear peep sight. Steel barrel is covered in ABS plastic and coated with waterproof Teflon®. .22 LR rimfire. Rubber buttplate. Used by US Air Force pilots as a survival rifle since 1959.

Item name: Springfield Armory Saint 5.56mm Semi-Automatic Rifle

Vendor: Sportsmans Outdoor Superstore

Webpage URL: <http://bit.ly/2WMfdZt>

Price: \$949.99

Weight: 6 lb 9 ounces

Size: 35.5 inches with fully extended stock, 32.25 inches with stock collapsed

Material: Upper and lower receivers made of Type III Hard Coat Anodized Aircraft Grade 7075 T6 Aluminum

Appropriate for which BOBs: Medium, Long

Comments: Free Float Handguard. 5/56x45 NATO or .223 Rem. 16-inch chrome moly vanadium 1:8 RH twist Melonite® barrel. Direct impingement mid-length gas system with low profile gas block. Springfield Armory® proprietary nickel boron coated GI trigger. SA low-profile flip-up dual aperture rear sight with 1/2 MOA windage adjustment. Flip-up front sight with 1/2 MOA elevation adjustment. Bravo Company Mod 3 pistol grip. M-Lok® aluminum SA patent-pending free float handguard with SA locking tabs. Bravo Company 6 position buttstock. Carbine "H" heavy tungsten buffer. Mil-Spec carbine receiver extension 7075 T6 Type III hard-anodized aluminum. GI-style charging handle. M16 bolt carrier group with Carpenter 158 steel bolt, shot-peened and magnetic particle inspected. 2-30 round Magpul® PMAG® Gen M3 magazines. Cable lock. Soft rifle case.

You can use iron sights to save space and weight. But, a riflescope will enhance the accuracy of your shots and help you conserve ammunition by reducing the number of missed shots. The following is an example of a riflescope with 3-9x variable magnification:

Item name: Bushnell Optics, Drop Zone BDC Reticle Riflescope with Target Turrets and Side Parallax, Matte Black, 3-9x/40mm

Vendor: Angel Seller on Amazon.com

Webpage URL: <https://amzn.to/37SvmTj>

Price: \$119.99

Weight: 1.13 lb

Size: Tube 1-inch diameter. Length 12.2 inches.

Material: High-durability aluminum alloy, anodize-finished and sealed

Appropriate for which BOBs: Medium, Long

Comments: 3-9x variable magnification. Fully multi-coated Optics. Target turrets. Fast-focus eyepiece. Side focus parallax adjustment for adjustable long-range accuracy. Target turrets (1/4 MOA click value) for pinpoint precise adjustments. Medium height rings provide the clearance necessary to eliminate contact with the cap and the scope base or receiver on most firearms. Drop Zone-223 BDC Ballistic Reticle is calibrated for 55-62 grain, 223 REM/5.556 loads with aiming points out to 500 yards.

Shotgun

A shotgun is a great home defense tool. But, you would be better off with a rifle than a shotgun as your long gun choice for your BOB and emergency escape. Shotguns have a shorter effective range of fire than rifles. Shotguns have a smaller magazine capacity and generally hold five to eight shells even with an extended magazine tube. Some exceptions include shotguns with removable box magazines holding ten shells (e.g., Kalashnikov Komrade 12.5 at 8.5 pounds unloaded) or double barrel high capacity models (e.g., DP-12 with two 14 shell magazines at 9.5 pounds unloaded weight, Kel-Tec® KSG-25 with two 12 shell tubes at 9.25 pounds unloaded weight). These high capacity shotguns are heavier than most rifles.

Another disadvantage of shotguns is that shotshells are bulkier and heavier than rifle ammunition limiting the number of rounds you can carry. Twenty Federal® TruBall slugs weigh two pounds compared to twenty .223 Rem. cartridges that weigh 0.5 pounds.^[524]

The example of a shotgun below is the Remington Model 870, which has sold over 11 million, making it the best-selling shotgun of any type in history. It is available in dozens of configurations. For those who want to carry a shotgun, it would be one to consider:

Item name: Model 870 Express Synthetic Field and Home Combo (2 barrels)

Shotgun

Vendor: Remington

Webpage URL: <https://bit.ly/2M1drkT>

Price: \$578.00

Weight: 7 lb

Size: 46.5 inches overall

Material: Steel receiver

Appropriate for which BOBs: Medium, Long

Comments: 12 gauge. Shoots shotshells and slugs. Receiver milled from a solid billet of steel for strength and durability. Pump action. Twin action bars ensure smooth, reliable non-binding action. 2 barrels included with 26 and 18.5-inch lengths. Smooth bore barrels. 4+1 magazine capacity. Single bead sight. Vent rib. Matte blue. Non-glare finish. Black synthetic stock and fore-end. Rubber recoil butt pad.

Pellet Air Gun

Earlier, I mentioned that any gun is better than having no gun. That is particularly true when you're faced with feeding yourself to survive. You may not be in a location where you can fish. The use of snares and traps requires skill, patience, and has a relatively low yield. You usually need to put out numerous snares and traps as you play the numbers game hoping to catch game. You can fashion a spear by lashing your survival knife to a wooden pole. You can bushcraft a bow and arrows. None of these things is as practical or simple as having a gun to hunt game for food.

Those on a budget might not be able to afford a firearm. Consider getting a pellet air gun. There are high-end air rifles costing over \$1,000 that can fire a .45 caliber projectile at 1100+ fps that can kill large game up to coyote, javelina, boar, or small deer size. But, here, we'll limit our discussion to more economical air guns. These fire .177, .22, or .25 caliber pellets at about 1000 fps with sufficient power to take small game like squirrels. Avoid CO2 powered air guns because they will not work once you run out of CO2 cartridges.

You want an air gun that is self-powered for your emergency BOB. There are two main power systems: gas piston and spring piston powered air guns. They both have their advantages and disadvantages. Both types of rifles are lightweight, very accurate, and fully self-contained. On the whole, you should go with a spring-piston gun because they are simpler to use, require less maintenance, and it is possible for you to fix it if it breaks. [\[525\]](#)

Here are some advantages of using an air rifle:

- Relatively inexpensive compared to firearms
- Accurate
- Lightweight
- Pellets are lightweight and inexpensive compared to rimfire and centerfire ammunition
- Quieter when discharged compared with firearms

The effective hunting range of an air rifle is a subject for debate. An oft-stated distance is 40 meters where a pellet still has more than adequate kill power. Air rifles have more than enough accuracy at this range. The limiting factor is your own skill and accuracy. Headshots are the most reliable way to kill small game using pellets. Heart and lung shots are next best if you can get the right shot angle. Your target area is a little more than one-inch diameter with any of these kill shots when hunting game as small as squirrels. ^[526] Iron sights are fine if you can get close enough to your quarry. Having the option of an air rifle scope can aid your longer shots.

Here is an example of a spring-piston air rifle that you can use for hunting small game:

Item name: Ruger® Air Hawk Scope Combo (spring-piston air rifle)

Vendor: Airgun Depot

Webpage URL: <http://bit.ly/37Svq5v>

Price: \$149.95

Weight: 8.16 lb

Size: 44.80 inches

Material: Blued steel. Hardwood ambidextrous stock.

Appropriate for which BOBs: Medium, Large

Comments: Shoots .177 caliber pellets at 1,000 fps. Single shot. Spring piston mechanism. Single stroke break barrel mechanism. 18.70-inch long rifled barrel. Fiber optic front and rear sights, two-stage adjustable trigger, 11mm dovetail rail, a muzzle brake, a conveniently placed automatic safety, a rubber recoil pad, Monte Carlo cheek rest. 4X32 Scope with two-piece mounts. 1-year limited warranty.

Spare Parts And Cleaning Supplies For Your Firearms

I'll briefly mention spare parts for your firearms. Firearms are generally durable and will function over many cycles with normal use. You won't need to pack spare parts for a revolver or air gun since they have few parts that

may break. Having spare parts is a consideration for semi-automatic pistols and rifles, so you will be able to put them back into action if something fails. Parts may vary depending upon the manufacturer and model of your firearm. Spare parts are light, small, and relatively inexpensive, so you might consider packing some in your Long Term BOB. Some of the more common parts that may fail include:

- Extractor
- Firing pin
- Springs: Recoil, trigger, hammer, slide stop lever, magazine
- Magazine follower

It is important to have a cleaning kit including lubricant in your Long Term BOB for your firearms. You can either get a kit for the specific caliber of your firearm or you can get a universal kit.

Item name: Otis Technologies FG-750 Cleaning System, Tactical, Clam Package (Firearm Cleaning Kit)

Vendor: Amazon.com

Webpage URL: <https://amzn.to/2Mbplca>

Price: \$41.31

Weight: 0.8 lb

Size: 4x4x2.5 inches

Material: Aircraft-grade Memory-Flex cables. Bronze bore brushes.

Appropriate for which BOBs: Long

Comments: Cleans all rifles/pistols/shotguns. Three Memory-Flex cleaning cables with over 750-pound tensile strength. Three forged slotted brass tips. T-handle for added comfort. Small and large obstruction removers knock out mud, snow, stuck casings, and doubles as T-handle base for included T-handle. 0.5-ounce tube of Otis O85 Ultra Bore cleaner, lubricant, and preservative. All-caliber cotton cleaning patches for 0.270 caliber and larger. Small caliber patches for 0.17 to 0.223 caliber. Shotgun brush adapter and rubber Patch Savers to get 360-degree coverage in your shotgun barrels. Six high-quality bore brushes. Bore reflector/flag safety.

Bow And Arrows

Some of you may already have a bow and arrows. Those of you would still be better served to invest in a firearm for your BOB. For those of you who do not already have a bow and arrows, it is better that you place your focus on

firearms.

Some potential advantages offered by bow and arrows as compared to firearms include:

- Lightweight (this advantage is negated when using a compound bow or crossbow)
- Less expensive (although high-end bows can cost as much as some firearms)
- Quiet when fired

A bow and arrows' shortcoming outweigh their advantages:

- Requires a high skill level to use effectively for hunting
- Effective hunting range is short so you have to be close to your prey
- Followup shots are slower than with a firearm
- You can only carry a limited number of arrows because of their size. The fact that they are reusable partially mitigates this factor.
- Less effective as a personal defense tool than a firearm

Author's Comment

Here is my bottom line personal advice and preference for lethal personal protection items assuming you have the room to carry them. Realize that others may have their own opinion as to what is best.

- Handgun: Compact to medium frame (instead of full-size frame) semiautomatic with iron sights in 9mm or 40cal as a good balance between size, weight, and power. Pack a holster of your choosing.
- Rifle: .22cal if you prioritize hunting or .223cal/556mm if you prioritize personal protection. 3-9x/40mm variable power scope. Two-point sling. Also, have a way to attach it to the outside of your pack.
- Spare magazines and ammo: As much as you can carry
- Compact cleaning kit for your guns

Ballistic Vest

Ballistic vests are a type of body armor designed to protect you from bullets and shrapnel. As we'll soon see, without special additions, they do not protect you against edged blades or spikes. You might consider adding a ballistic vest to your BOB if you want to be prepared for civil unrest such as rioting, looting, or home invasion. Ballistic vests tend to be bulky and heavy. It is something that you will be more likely to carry with you if you escape by vehicle rather than on foot. If the situation is dangerous enough, you might

even consider the added weight a worthwhile trade-off to have the extra protection when escaping on foot even if it means having to leave something else behind.

The National Institute of Justice (NIJ) is part of the US Department of Justice. It developed the NIJ Body Armor Classification based upon the level of protection provided against different projectiles^[527]:

- Type I: 22 LR, 380 ACP
- Type IIA: 9mm, 40 S&W
- Type II: 9mm, 357 Magnum
- Type IIIA: High velocity 9mm, 44 Magnum
- Type III: Rifle ammo up to 7.62x51mm NATO FMJ (U.S. Military designation M80) at a velocity of ~2780 ft/s, which is very similar to the .308 Winchester round
- Type IV: Armor-piercing rifle

The body armor industry created a new protection level called III+, which is in between Level III and Level IV. It is not sanctioned by the NIJ, so its definition varies slightly from one manufacturer to another. Generally, Level III+ will protect against the same rounds as for Level III, but at higher velocities or will protect from additional threats such as 5.56x45 M855 and 5.56x45 M193 rounds.

Types of protection offered by body armor^[528], ^[529], ^[530]:

- Ballistic:
 - Threats: Bullets
 - For Level I-III A: Soft materials comprised of layers of woven fibers such as aramid fibers (e.g., Kevlar®, Twaron®, Goldflex®) or polyethylene fibers (e.g., Spectra®, Dyneema®)
 - For Level III and IV: Hard materials like steel, ceramics, polyethylene, hybrid (steel and polyethylene)^[531]
- Edged blade:
 - Threat: Knives, axes, broken bottles
 - Materials like chainmail to defeat edged blades
 - Usually ballistic material like Kevlar underneath
- Spike:
 - Threat: Ice picks, screwdrivers, needles
 - Layers of plastic laminate on the surface to defeat spikes

- Usually Kevlar and possibly chainmail underneath
- Multi-threat
 - Threat: A combination of two or more of the threats above
 - A combination of materials to defeat the multiple threats

The most comfortable body armor uses soft armor either sewn into a wrap-around vest that can be low profile and worn beneath clothing. The soft armor inserts can also be placed into plate carriers that are generally worn outside of clothing and can include MOLLE attachment points for holsters and other gear. Hard armor offers higher levels of protection but is much heavier. It comes in solid plates that are inserted into plate carriers. It is even more important to invest in a high-quality plate carrier when using solid ballistic plates especially the heavier steel ones. The plate carriers need to be sturdy, prevent the plates from shifting as you move, have well-padded shoulder straps, and strong pouches to hold the ballistic plates.

Wrap around ballistic vests come in an all-in-one unit with the soft armor built-in. If you go the plate carrier route, you can either buy a package that includes the body armor inserts or you can purchase the inserts separately. You can select the level of ballistic protection you desire and also whether you want to have protection against edged weapons and spikes. You can select the material used to make the ballistic inserts. This can make a big difference in weight if you decide to get solid plates. Although steel plates are the least costly solid plate option, they are the heaviest. At the most basic, you will purchase front and back ballistic inserts. You have the option of purchasing side ballistic inserts that fit into pouches in your plate carrier. The front, back, and side inserts come in different sizes. The most common plate sizes are 8x10, 10x12, and 10x14 inches. The front and back inserts come in a squared-off profile or you can choose to get cutouts on both sides of the top of the inserts to facilitate arm movement. The front and back plates also come either flat or curved for a more anatomical fit to your body. You can get an optional coating for the plates that reduce spall (e.g., fragmentation of the bullet after impact with the vest). It's a good idea to buy optional non-ballistic trauma pads to place between the soft or hard ballistic panels and your body to help dissipate bullet impact forces and reduce energy transfer to your body.

There are lots of options you can choose for the outside of your carrier vest.

You can add pistol and/or rifle magazine pouches, pistol holster, first aid pouch, tourniquet pouch, flashlight holder, radio pouch, or hydration pouch. Your rig will be heavier and more expensive as you add accessories.

Level IIIA soft armor is a good choice if you want a compromise between weight and comfort versus protection level. It is a reasonable choice if you anticipate that your most likely threats will be from handguns. And, it is concealable.

Level III plates are the most commonly employed solid plates and they protect against all handgun rounds as well as many rifle rounds. There is a company (Safe Life Defense) that offers a Multi-Threat Armor System whereby a rifle plate can be inserted into a Level IIIA vest to provide Level IV protection when desired.

Although Level III plates are commonly used, steel versions are heavy. AR 500 Armor makes a Level III+ steel plate that is thinner and lighter than a Level III steel plate, so you get more protection at less weight. Their Level III+ Lightweight 10x12 inch steel plate costs \$115 and weighs 6.5 pounds. For comparison, their Level III 10x12 inch steel plate costs \$65 and weighs eight pounds. A 6x8 inch side plate costs \$67 and weighs 2.5 pounds in Level III+ Lightweight while a similar side plate costs \$36 and weighs 3.5 pounds in Level III. The overall weight savings is five pounds between Level III and Level III+ Lightweight for a rig with front, back, and 2 side plates. So, if you can bear the additional cost, a Level III+ set up would be better.

Here are some examples of ballistic vests:

Item name: Concealable Multi-Threat Vest Level IIIA (ballistic vest)

Vendor: Safe Life Defense

Webpage URL: <http://bit.ly/3nT1cFd>

Price: \$449.00

Weight: Not specified

Size: From 4XS to 3XL, regular and short lengths

Material: Custom para-aramid

Appropriate for which BOBs: Short, Medium, Long

Comments: Safe Life Defense armor reliably defends against all common handgun rounds including .357 Magnum, 9mm, .45 ACP, all the way up to .44 Magnum. Level IIIA protection even protects the wearer from shotgun

rounds including 00 buckshot, 12 gauge slugs and even submachine gun rounds. In conjunction with our level IV rifle plate, our armor protects against rifle threats up to .30-06. Bullet, strike, and slash-resistant. Ultra-concealable. Engineered for comfort and maneuverability. Cooling mesh liner. 10 Point adjustable with 4 Comfort Straps. 2 Hidden pockets for level IV hard plates. Water-resistant 600D polyester carrier. Comes standard with wrap-around side protection. 5-Year manufacturer warranty on all ballistic panels and plates. 2-Year warranty on all carriers.

Item name: AR500 Armor® Testudo™ Fully Loaded Package - Carrier, Level III Curved Plates, Pads and Pouches (ballistic vest)

Vendor: Armored Republic, LLC

Webpage URL: <http://bit.ly/3hkxwhP>

Price: \$419.40

Weight: Not specified

Size: 1 standard size

Material: Steel plates

Appropriate for which BOBs: Short, Medium, Long

Comments: Two AR500 Armor® Level III 10" x 12" Curved Plates (steel) and two Trauma Pads. Testudo™ Gen 2 Plate Carrier with a fully adjustable cummerbund and shoulder straps. Rugged side retention buckles and straps. 500D Cordura® nylon. Strategic lower-offset rear shoulder mounts position the rear plate pocket higher, alleviating the traditional “low hanging” rear plate pocket as seen on carriers that lost sight of proper armor placement. Inner plate retention straps on both pockets further ensure ideal body armor ride height for optimal vital coverage. 3D Mesh Technology dramatically increases ventilation and airflow for a cooling and comfort effect. Heavy-duty drag handle. Dual admin pockets increase storage capacity. The Testudo™ front and rear plate pockets are compatible with our Trauma Plate Insert. Optional 6x8 inch side armor plates (\$45 for two).

Ballistic Helmet

There are helmets designed to protect your head from impacts, but offer no ballistic protection from firearm projectiles or shrapnel. These are termed bump helmets. Ballistic helmets offer protection against bullets and are much more expensive than bump helmets. Most are rated to provide Level IIIA ballistic protection (i.e., protects against handgun, but not rifle bullets).

Two common materials used to fabricate ballistic helmets are aramid fabrics and ultra-high molecular weight polyethylene (UHMWPE). UHMWPE is lighter than aramid. The most well known aramid is Kevlar® (Dupont®). Commercial brands of UHMWPE include Dyneema® (Dutch State Mines) and Spectra® (Honeywell).^[532], ^[533] Kevlar® was developed by Dupont® in 1965. It was used in the US military PASGT (Personal Armor System For Ground Troops) helmet from the early 1980s through the mid-2000s. Dupont® Kevlar® KM2 is an improved version capable of absorbing 20% more kinetic energy. Dupont then combined a high toughness resin with Kevlar® KM2 Plus fibers to create Kevlar® XP, which provides the same performance while weighing 20% less. Improved versions of Kevlar® have been used in helmets that replaced the PASGT.

US military helmets are listed below to help you distinguish between them if you decide to purchase a military surplus helmet^[534], ^[535], ^[536], ^[537]:

- MICH (Modular Integrated Communications Helmet). Introduced late 1990s. Improved Kevlar®, front brow eliminated, lighter, offered in 3 different cut levels, offer greater peripheral vision, four-point harness/chin strap, lower brim raised to allow greater compatibility with communications versus the PASGT.
- ACH (Advanced Combat Helmet). KM2 Kevlar®. Introduced in 2002, issued in large numbers by mid-2000s. Shape identical to MICH. In 2007, the Army introduced a ballistic "nape pad" that attaches to the ACH's rear suspension system to protect the lower head and neck.
- LW-ACH Gen II (Lightweight Advanced Combat Helmet Generation II): Introduced in 2003. 1 pound lighter than the ACH while offering the same ballistic protection. It is the USMC's successor helmet to the PASGT.
- CVC (Combat Vehicle Crew Helmet): Introduced in 1970s. Originally fiberglass. Kevlar® shell was added in the 1980s. Later upgraded to KM2 Kevlar® (Advanced CVC). Tall concave cutout from lower brim to accommodate earmuffs for sound suppression and communications.
- FAST (Future Assault Shell Technology): Introduced in 2009. Made by Ops-Core (acquired by Gentex® in 2011). UHMWPE. 25% lighter than ACH. There is no covering over the ears. Allows attachment of accessories like comms to its outer shell.
- ECH (Enhanced Combat Helmet): UHMWPE. Introduced in 2013. 35%

better protection against small arms fire and fragmentation than the ACH. Protects against some rifle bullets. A higher tactical cut offers less protection. Allows for the addition of devices such as communications and night-vision equipment.

- IHPS (Integrated Head Protection System). Introduced in 2019. Made by 3M. UHMWPE. Offers the same ballistic protection, but 100% greater blunt impact protection than the ECH helmet. Boltless (eliminates four holes to avoid weakening by the holes) chinstrap retention system, has an optional mandible with eyeshield for maxillofacial protection, and removable side rails for attaching equipment like flashlights. More inside space for communications headsets. Slightly larger, but 5% lighter than ECH.

You have many choices in the commercial ballistic helmet market. You can select a more protective, but heavier style similar to the ACH. Or, you can choose one of the popular lighter, less protective, above the ear (ATE) helmets similar to the FAST. (Beware that some of the ATE style helmets on the market lack ballistic protection and are made of plastic or carbon fiber.) Below are some examples of each:

Item name: Gentex® TBH-III A Helmet System (the low cut version is similar to the ACH helmet)

Vendor: Tentex

Webpage URL: <http://bit.ly/38F1YPE>

Price: \$596.00

Weight: Not specified

Size: S, M, L, XL

Material: Shell made of a Woven Aramid monolithic composite.

Appropriate for which BOBs: Short, Medium, Long

Comments: NIJ Level IIIA protection. Three combination suspension/retention options. Choice of 3 colors.

Item name: Ballistic Helmet ATE® HHV (similar in shape to FAST helmet)

Vendor: Hard Head Veterans

Webpage URL: <http://bit.ly/3aK9RpA>

Price: \$485.00

Weight: 3.0 lb

Size: S, M, L, XL

Material: Kevlar

Appropriate for which BOBs: Short, Medium, Long

Comments: NIJ Level IIIA protection. Above the ear or high cut designs. M-LOK rails, A3S shroud, and 3 part comfort pad system. Designed to be compatible and upgradable with other helmet manufacturers' systems and various components.

Alarms, Camp Security Systems

Security is an important issue whether you escape in your vehicle or on foot, especially if you are alone. You cannot be alert 24 hours per day. There are times when you're distracted, focusing on some task, or asleep. Even when awake, you'll be a more attractive target to predators than if you're a member of a group.

You can do some basic things to make yourself less of an attractive target. Blend in with your surroundings to make yourself less visible to others. Place your gear and valuables out of sight. Hang your food from a height out of reach of animals. Bury food waste or move it a distance away from your campsite so it doesn't attract animals. Set up as close to possible to a water source to minimize the time you leave your gear unattended.

You can try to choose the safest location possible for your vehicle or camp. Determine routes of ingress and egress into your location. Pre-determine a defensible position. Have pre-planned escape routes. Are there areas around you where someone can stage an attack on your position? Are there areas that are blind to you?

If you're escaping with your dog, then they can help serve as an early detection system. But, without a dog, you can still prep your camp to detect intruders by setting up warnings placed at least 50 yards away from your camp. This can be accomplished in a variety of ways including:

- Tripwire: cordage (e.g., fishing line) attached to empty cans
- Tripwire: cordage (e.g., fishing line) attached to a bottle to fall from a height and break
- Tripwire attached to a commercial pin-pull alarm
- Motion sensors
- A camera that transmits alerts to your smartphone
- Smoke grenade head assemblies that have been removed from the body of the grenade. (Available for \$55 for 10 head assemblies at Old Sarge's

Drop Zone, <http://bit.ly/37SvHFz>) Remove the “spoon” and the igniter casing. Enlarge the igniter casing hole large enough to fit a shotgun primer. Tie one end of a tripwire to the cotter pin that holds back the hammer/firing pin.^[538]

- Tripwire attached to a mousetrap (painted a dark color for concealment) that strikes 2 pistol ammo primers glued into holes drilled into the trap’s wooden base.^[539]
- Tripwire attached to a Sentry Alarm Mine loaded with a .22 cal blank. These can be mounted with screws or nails. They can also be pushed into the ground. Very durable and loud. They are metal, large and heavy. You can purchase one for \$24.99 and 6 for \$119.99 at <https://www.alarmmine.com>^[540]

Here is another camp security product:

Item name: 209 CCI Primer Trip Alarm

Vendor: Fith Ops

Webpage URL: <http://bit.ly/3aTxxI6>

Price: \$25.00

Weight: 1.3 ounces

Size: 1x1x4 inches

Material: Aluminum and steel

Appropriate for which BOBs: Long

Comments: Tripwire operated. Discharges a 209 CCI primer (for shotgun shell).

ITEMS FOR YOUR PET

Be sure to prepare items for your pet's survival and comfort. Do not leave your pets at home expecting to return for them sometime in the future. Pets may not survive when left alone. They may succumb to injury, starvation, or become prey for other animals. Make preparations to take your pets with you when you have to escape at a moment's notice. Your pets depend on you.^[541],^[542],^[543],^[544]

Some items to include for your pet include:

- Leash
- Collar or harness
- Up-to-date ID tags around their neck (and have them microchipped ahead of time)
- Shoes
- Jacket and/or raincoat
- Food. Dried, not canned food for weight savings. When food is depleted, they will be eating what you eat.
- Water
- Prescription medication
- 1-month supply of flea, tick, and heartworm preventative medications
- Collapsible food and water bowls
- Treats
- Pet waste bags
- Litter box, litter, litter scoop for cats
- Life vest for flotation
- Canine tourniquet
- Doggy backpack: You can consider getting a doggy backpack if you have a larger dog so they can help carry some of their own lighter weight items such as their collapsible food and water bowls, food, and/or treats.

Documentation about your pet to photocopy and take with you in a

waterproof container^[545]:

- Veterinary records: Rabies certificate, vaccination record, medical summary, heartworm test result (dogs), FeLV/FIV results (cats)
- Medication prescriptions with a schedule log
- Registration info: Proof of ownership or adoption records
- Pet description: Breed, sex, color, weight
- Recent photos of your pet
- Microchip information: Registration number. Name and contact information for the microchip company.
- Your contact information

Items to include if you're escaping by vehicle:

- Pet carrier
- Bed
- Toys
- Extra food
- Canine ballistic vest

Dog Shoes

Dog shoes can protect your dog's feet in a variety of conditions^[546], ^[547]:

- Winter boots: Insulate your dog's feet from cold, dampness, ice, snow, salt, deicers (many are toxic for dogs). Should be insulated, waterproof
- Summer boots: Protect feet from hot concrete and asphalt
- Hiking boots: Guard feet from rocks, thorns, burrs, cacti. Should have thicker rubber soles with extra grip. Tighter straps. More durable material.
- Boots for rain or other slippery conditions: Should be waterproof and not vented.

There are challenges associated with dog shoes:

- It is hard to order the right size shoes even when measuring your dog's feet and using sizing tables
- It's hard to get those shoes on to your dog's paws especially when your dog is not cooperating with you
- It's hard to keep the shoes from falling off.

Qualities to look for in shoes for your dog:

- They should fit snugly, but not too tight
- There should be room to accommodate the nails on your dog's feet

- The material should be flexible enough to conform to the shape of your dog's feet
- The material of the upper should be durable
- The material of the sole should be non-slip and durable
- The shoe should have sturdy adjustable ankle straps to prevent the shoe from slipping off

Be aware that one-way dogs cool themselves is by their paw pads perspiring. Summer shoes can hamper this cooling process causing your dog to overheat. You may need to periodically remove your dog's shoes on hot days to help them cool off.

Item name: Ruffwear Grip Trex™, All-Terrain Paw Wear for Dogs

Vendor: NetRush on Amazon.com

Webpage URL: <https://amzn.to/2JmyfSX>

Price: \$37.50

Weight: 3.2 ounces

Size: 1.5x2x3.9 inches

Material: Breathable mesh upper keeps dirt and debris out while keeping them cool and comfortable. Ruffwear-designed Vibram® outsole for flexibility and exceptional grip.

Appropriate for which BOBs: Short, Medium, Long

Comments: These shoes are rated highly in multiple surveys. The closure system combines hook-and-loop with hardware and cinches around the narrowest part of the dog's leg, providing a secure fit. Reflective trim. Wide opening that makes it easy to put boots on. Comes in 3 colors.

Collapsible Water And Food Bowls

Here are a couple of points to keep in mind about bowls for your pets:

- Make sure that they are BPA-free
- Bring along two bowls so they will have one for food and one for water

Item name: Outward Hound Port-A-Bowl

Vendor: Outward Hound on Amazon.com

Webpage URL: <https://amzn.to/2KZIMnK>

Price: \$4.99

Weight: 1.44 ounces

Size: 5.2x6.2x7 inches

Material: Nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Folds flat, dry fast. For food or water. Easy to clean. Hold 48 ounces of water. Green color.

Item name: Prima Pets Collapsible Silicone Food and Water Travel Bowl

Vendor: Little Lots USA on Amazon.com

Webpage URL: <https://amzn.to/3mUDQ0q>

Price: \$11.99

Weight: Not specified

Size: 3 (full expanded height) x 5 (base) x 7 (top opening) inches. 0.75 inch fully collapsed height.

Material: Food-grade silicone. BPA-free plastic rim.

Appropriate for which BOBs: Short, Medium, Long

Comments: Holds 5 cups (42 ounces) when fully expanded. Holds 2 cups (16 ounces) when partially expanded. Carabiner quick release clip included.

Available in 5 different colors. Sturdy base prevents bowl from tipping over.

Dog Life Vest

Why consider getting a life vest for your dog? Most dogs are good swimmers. But, even good swimmers will eventually tire and drown if left in water long enough. It's worthwhile bringing a life vest for your dog if you'll be near any area of water including a river, lake, ocean, or if you live in an area prone to flooding. Some pets are even at higher risk for drowning^[548]:

- Older dogs
- Dogs with medical problems
- Dogs with mobility limitations
- Dogs with short noses and flat faces (brachycephalic breeds) like pugs, shih tzu, chow chow.
- Dogs with low body fat like greyhounds

Here are some features in a dog life vest to look for^[549], ^[550]:

- Good buoyancy: Flotation cells beneath abdomen, chest, sides, and around the neck area to keep your dog's head above water.
- Sturdy handle used to carry and lift your dog
- Bright color along with reflective material for enhanced visibility
- Durable material
- Comfortable
- Proper fit so our dog can easily sit, lie down, and urinate, defecate

- Easy to put on and take off your dog

Item name: RUFFWEAR - Float Coat Dog Life Jacket

Vendor: FUFFWEAR Store on Amazon.com

Webpage URL: <https://amzn.to/3nTBQag>

Price: \$79.95

Weight: 6.4 ounces for size XXS

Size: 2.5x7.3x8.1 inches for size XXS

Material: 1680-denier ballistic nylon. Closed-cell foam panels. Water-compatible webbing.

Appropriate for which BOBs: Short, Medium, Long

Comments: Sizes XXS, XS, S, M, L, XL. Choice of three colors. Strong, low-profile handle on the back. Reflective trim. Leash attachment point. Adjustable neck closure. Easy-to-clip covered buckles. Loop located on top for attachment of optional light beacon. If a dog flips over, the Float Coat returns the dog to their natural swimming position.

Item name: Outward Hound Dog Life Jacket

Vendor: Outward Hound Store on Amazon.com

Webpage URL: <https://amzn.to/2KYHrxk>

Price: \$27.99

Weight: 9.6 ounces

Size: 9x11x16.5 inches for medium size vest

Material: Ripstop nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Sizes XS, S, M, L, XL. Front float support helps keep your dog's head above water. Adjustable side release buckles provide a secure fit and a neoprene belly band supports their chest and belly. Dual grab handles.

Canine Tourniquet

If your dog sustains an injury that involves major bleeding, the first step is to apply pressure over the wound similar to what one would do for humans.

Pressure can be applied with your hands or with a circumferential pressure dressing. There are also hemostatic agents for dogs that are placed within the wound to aid with blood clotting (e.g., Celox™ Veterinary gauze and Pet Clot).^[551]

Tourniquets are needed much less often for dogs than for humans^[552], but it is still worthwhile packing one since they are small and lightweight. A major

hemorrhage from an extremity blood vessel is less likely to occur in dogs than humans. The legs of a dog receive less blood as a percentage of their total blood volume than the arms and legs of a human. And, the axillary and femoral arteries are better protected by body tissue in dogs than humans. When a tourniquet is needed for a dog, it should be placed as high as possible where the legs join the body. Tourniquets will tend to slide downward because the upper part of a dog's leg is funnel-shaped.^[553]

Tourniquets for people are covered in the "First Aid" chapter of this book. Standard windlass tourniquets are too large for dogs. The TK-4, SWAT-T™, and RATS are elastic tourniquets and can be used for dogs.^[554], ^[555] The TacMed™ K-9 tourniquet is designed specifically for dogs:

Item name: TacMed™ K-9 Tourniquet

Vendor: TacMed™

Webpage URL: <http://bit.ly/37TAw1s>

Price: \$23.00

Weight: 3.8 ounces

Size: 1.5x2.5x5.5 inches folded size

Material: Not specified. The strap appears to be constructed of nylon webbing along with plastic hardware.

Appropriate for which BOBs: Short, Medium, Long

Comments: The K9 Tourniquet is engineered to work effectively on tapered anatomies, such as the leg of a K9, and is designed to be placed high on the limb. It has integrated traction technology that prevents the tourniquet from slipping down the animal's leg, which would result in a loss of compression. The slippage is amplified when the animal is moved and extricated. Slippage is a common occurrence when tourniquets or pressure dressings designed for humans are used on such tapered anatomy. The K9 Tourniquet addresses these issues and does so while offering rapid application.

Dog Backpack

A backpack lets a dog carry some of his or her items (e.g., food, water, leash, water bowls, shoes) freeing up space in your backpack. It gives them a sense that they're doing a job, especially those with a work-dog mentality. Having to focus more on balance while walking with the weight of the backpack on their back also serves to calm some dogs.

Start training your dog to wear a backpack only after it is fully grown, usually

at 12 months for small dogs and 18 months for larger dogs. Begin getting them used to the backpack by placing it empty on them. This should be easy if they are already used to wearing a harness. Start by placing the backpack on them for a few minutes and then gradually increase the time. Once your dog is accustomed to wearing the backpack, you can gradually begin adding items to it, reaching the desired capacity after a few days to weeks^[556].

Here are some guidelines as to how much your dog can carry^[557]:

- Maximum of 20% of your dog's weight. Carrying this much will make the distance walked feel twice as long to your dog.
- Most dogs can comfortably carry 10-15% of their body weight.
- Be aware that some dogs (especially small dogs) are not suited to carry any weight. Young dogs with immature skeletons should not carry weight.
- A dog's ability to carry weight will generally decrease as they become older and with certain medical problems.

Here are some features important in a backpack for your dog:

- Proper fit: Important not only for comfort, but to prevent the backpack from shifting around, rubbing, and injuring your dog.
- Adjustable straps to help ensure an optimum fit
- Bright color and reflective material for high visibility
- Strong carry handle to aid with carrying and lifting your dog
- Durable material
- Chest strap to prevent the backpack from sliding towards the rear of your dog
- Select a bag based not only on your dog's size but what you plan for your dog to carry.
- Padding on the backpacks harness and straps to reduce chafing
- Mesh lining to improve air circulation if you're in a hot climate

Item name: RUFFWEAR - Approach Dog Pack, Backpack

Vendor: REI Co-op

Webpage URL: <http://bit.ly/38CMdca>

Price: \$79.99

Weight: 1 lb and 5 ounces for L/XL size

Size: 1x15x25.4 inches for L/XL size

Material: 420-denier ripstop nylon

Appropriate for which BOBs: Short, Medium, Long

Comments: Sizes XS, S, M, L/XL. External gear loops. Reflective trim. Light loop for an optional beacon. Integrated harness with five points of adjustment for just the right fit. A padded handle and supportive straps. Two leash points: clip in with the strong aluminum V-ring and reinforced webbing loop leash attachment points. 4 exterior pockets. Colors: Meadow green or orange. Gear capacity: S: 762 cubic inches, M: 885 cubic inches, L/XL: 1,465 cubic inches.

Canine Ballistic Vest

You might consider bringing a ballistic vest for your dog if you are escaping during a period of civil unrest or some other violent incident. Canine vests protect your dog's back, sides, abdomen, and chest from bullets. Protection against stabbing trauma from knives is also available. Vests come with leash attachment rings and grab handles to use for lifting your dog. The lining is usually made of a material that helps manage heat and moisture. Vests are available in standard sizes or can be custom made to fit your dog. Look for a vest that comfortably fits your dog, is lightweight, and enables freedom of movement.

Item name: BulletSafe K-9 Bulletproof Vest for Dogs

Vendor: BulletSafe

Webpage URL: <http://bit.ly/37PLvZI>

Price: \$499.00

Weight: Not specified

Size: One size. Fits large breed dogs (e.g., German Shepherd, Malinois, Bloodhound, Doberman Pinscher, Akita, Labrador Retriever, Rottweiler)

Material: Nylon carrier. Ballistic material not specified. Soft armor

Appropriate for which BOBs: Short, Medium, Long

Comments: Uses the same ballistic materials as in their vests made for humans. Provides Level 3A protections stopping handgun rounds up to .44 Magnum. Also, provides S-1 level stab-proof chest protection. Top handle rated for 500 lbs of force. 6 adjustable buckles to facilitate a perfect fit.

Item name: Gemini Dual Purpose Armor for dogs

Vendor: Protect Paws Alive

Webpage URL: <https://bit.ly/37Qcvbt>

Price: \$1,400.00

Weight: Not specified

Size: Each vest is custom made to your dog's measurements

Material: Kevlar® bulletproof cloth (same as used for human vests)

Appropriate for which BOBs: Short, Medium, Long

Comments: Bullet and stab-resistant. NIJ level IIA ballistic protection and level III spike protection. These vests help protect the K9s from gunshots, stabbings, explosives, and blunt force trauma such as being kicked, punched, or beaten with a weapon or other dangerous objects such as a bat or tire iron. Hidden dynamic cummerbund, shoulder fit adjustments, and covered zipper closure. These vests are a streamlined package allowing the K9 to move freely with minimal snag points. Offer ease of movement, breathe-ability and cooling comfort in a rigorously field-tested vest. New three-dimensional spacer mesh lining provides outstanding heat and moisture management to keep the K9 cool. These vests allow the K9s full range of motion. Carry handle on the top (dog's back) of the vest. D-ring attachment points for short or long leads. GPS tracking pocket. six different fabric patterns/colors available.

Dog Travel Bed

A travel bed for your dog is probably an item you'll pack only if you're escaping by vehicle rather than on foot. It will give your dog a comfortable place to hang out, rest, and sleep. It can also make anxious dogs feel more relaxed and secure to have something familiar to them when on the road. Travel beds can be placed inside pet carriers or crates for padding and comfort.

Here are some characteristics of travel beds to consider^[558], ^[559]:

- High-quality materials: Better comfort and durability
- Beds thicker than 1 inch to provide greater loft, cushioning
- Ease of cleaning
- Suitable size for your dog
- Water-resistant
- Compact, lightweight
- Easy to pack up and carry. Most fold up or roll up and are secured by straps and buckles.

Item name: Loft Wander Waterproof Outdoor Dog Bed

Vendor: Kurgo Store on Amazon.com

Webpage URL: <https://amzn.to/3hpE5Qi>

Price: \$57.95

Weight: 3.7 lb (Large size)

Size: 1.5x36x48 inches open and 9.5x17 inches rolled up (Large size)

Material: Water-resistant top made of microtomic ripstop material.

Waterproof Rufftex bottom. Polytech fill.

Appropriate for which BOBs: Long

Comments: Outdoor dog bed. Also available in medium size (1.5x25x36 inches open and 8x12.5 inches rolled up, 2.2 pounds). Colors: Brown and chili red. Kurgo Lifetime Warranty. Plush, recycled Polygo fleece top for comfort and rolls up like a sleeping bag with a handle. Waterproof Rufftex non-slip bottom. Machine washable, hang dry.

EXTRA ITEMS IF YOU ARE ESCAPING BY VEHICLE

You will hopefully begin your escape from disaster in your vehicle. The big advantage of traveling in your vehicle is that you can carry more survival items than when on foot. You should always have your Short-Term BOB with you or in your vehicle during normal times. Be sure to grab your Long-Term BOB when escaping by vehicle during a disaster. Some extra items to consider taking with you include:

- More food
- More water
- Propane and compact stove
- Larger cooking utensils
- Fishing pole
- Extra fishing tackle
- More hygiene items
- Portable, hanging shower bag
- More clothes
- Extra shoes
- Pillow
- Tent
- More medical items
- Extra batteries
- Larger solar charger
- Electrical extension cords
- Extra cordage
- More ammunition
- Extra firearm
- Long handle axe
- Alarms, camp security systems (see the “Personal Protection” chapter)
- Ballistic vest (see the “Personal Protection” chapter)

- Ballistic helmet (see the “Personal Protection” chapter)
- Gas mask (see the “Personal Protection” chapter)

One fast way to gather items and have redundancy (having multiple items that serve the same vital function) is to grab all three of your BOBs (Short-, Medium-, and Long-Term BOBs) and put them into your vehicle. Essential items will be duplicated in all three bags (e.g., knives, water filters, ferro rods, compass, signal mirror, hand-cranked emergency radio, headlamp, etc), so you will not have to put extra copies of those particular items separately into your vehicle.

Don't forget to store items in your vehicle to help keep it running:

- Tire jack and lug nut wrench
- Spare tire
- Tire sealant for flat tires: TyrFil™
- Tire pressure gauge
- Air pump that runs off your car battery
- Jumper cables
- Fuses
- Wiper blades
- Spare bulbs
- Ice scraper
- Radiator fluid
- Transmission fluid
- Engine oil
- Windshield washer fluid
- Extra gasoline

Stay with your vehicle as long as possible. It provides shelter and security besides transportation. There may be a time when you have to abandon your vehicle. At that point, you'll have your Long-Term BOB to rely upon and to take with you.

CLOSING REMARKS

I hope that this book has prompted you to think about how three separate BOBs may fit into your survival preparation as you consider emergencies that span Short-, Medium-, and Long-Term time frames. I also hope that this book has provided you with ideas about how you can plan to address your emergency needs for the major survival categories such as water, fire, food, shelter, and first aid. Be sure to carry your BOBs once you assemble them, so you can ascertain if they are of a size and weight that you can realistically carry over extended distances and time. Size and weight constraints will force you to prioritize which items are most important for your survival and what you decide to include in your BOBs.

Once you put your BOBs together, make sure that you place them in locations where you can quickly grab them when an emergency arises. Also, regularly review the contents of your BOBs to remind yourself of what you packed. Importantly, practice using the items in your BOBs so you do not waste valuable time during an emergency event trying to figure out how they function. For example, practice using your ferro rod, water filter, compass, tourniquet, Israeli Bandage Battle Dressing, and chest seal. Practice setting up your tarp in different shelter configurations. If you are packing a tent, practice setting it up. Practice tying some basic knots, so they become part of your skillset. Try living off of the items in your BOBs as a way to familiarize yourself with them and also to better determine if some of the items can be eliminated and if there are some other items that you need to add.

Preparing for emergencies and disasters is an evolving process. It is indeed a major accomplishment to have assembled your BOBs. But, for me and many of you, our BOBs and their contents will be modified periodically because of reasons that may include the following:

- You discover a new need that must be covered, so you have to research and purchase an item to serve that need.
- New products are developed that can perform a function better than an

item you currently possess. Or, the new item may be stronger, lighter, or more compact than your current item.

- You've saved up money enabling you to purchase an item on your wish list.

Continue the learning process and continue preparing. The knowledge you gain and the items in your BOBs may one day save your life or the life of someone else. Choose to be a survivor.

I hope that you've enjoyed reading this book and that you gained some valuable information to help you be better prepared to survive a disaster. I would love to hear from you if you have comments about this book including any ideas about how to make it better. You can email me at jy@waggingtalebooks.com.

Send me (jy@waggingtalebooks.com) your email address so you can:

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AUTHOR BIO

Joseph Yao, M.D. practices orthopedic surgery. He began his medical practice in Orange County, California, and later moved to Arkansas where he remains today.

Dr. Yao's passion for creating things and bringing them from concept to reality lead to his inventing proprietary nerve protection pads. These pads divert external pressure and vibration away from the median and ulnar nerves of the hand to treat and prevent carpal tunnel syndrome and Guyon's canal syndrome. He designed and marketed a line of gloves incorporating these patented pads.

His long interest in research and writing include writing 19 book chapters and articles in peer-reviewed orthopedic surgery medical journals. He also wrote a regular medical column for trucking magazines and several newspaper articles on orthopedic topics.

Dr. Yao's diligence about preparation, spurred partly by his nature and reinforced by his surgical training, prompted his interest in emergency and disaster preparedness. He wrote the book, *Bug Out Bag Encyclopedia*, to provide others with valuable, comprehensive information to help improve their odds of surviving a disaster while shortening the learning curve. A section of the book is devoted to preparedness for furry, four legged family members.

Animals hold a special place in Dr. Yao's heart. He is a long-time supporter of the National Wildlife Federation, The Humane Society Of The United States, and the American Society for the Prevention of Cruelty to Animals (ASPCA). He particularly loves dogs and especially Shao Shoon, adopted from the Seal Beach Animal Shelter.

His affection for dogs is the impetus for a future a series of books about

"CoCo, The Flying Poodle." It will be about the life and adventures of CoCo, a toy poodle. Updates will be provided on the progress of those books.



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