

Checklist and Check Weight

By Don Williams

When Colin Fletcher authored *The Complete Walker*, published in 1968, it was probably the most authoritative guide to backpacking at the time. He described the gear and its use in excellent detail. His warm weather base weight in 1960 is estimated to have weighed 36 pounds. Base weight is everything you carry in your backpack, but doesn't include food, water, and fuel. It doesn't include the clothes and shoes you wear, nor traditionally, your trekking poles if you use them. Colin's base weight isn't bad considering the state of the art in backpacking equipment at that time. That gear didn't include a tent or sleeping pad. He simply cowboy camped. His winter gear would add about 10 pounds to his base weight. He typically carried an additional 10 pounds of food and 1.5 gallons of water, which weighs 12.5 pounds. So he would be carrying 58.5 pounds in total in the summer, and 68.5 pounds in the winter.

Compare this to Sam "Shade" Carter, who in 2023 attempted to hike the Calendar Year Triple Crown (AT, PCT and CDT in one year). He completed about 6,000 miles of it before ending his hike. Why is this failed attempt so special? He carried less than 3 pounds base weight of gear. He also cowboy camped, sometimes in very cold weather without a sleeping bag. Instead he used only a space blanket for cover. That's quite extreme and I don't recommend any of us try that, but it does show what is possible.

What should you carry when you go backpacking? Let's look at three weight level options, but first let me explain a few terms, guidelines for pack weight, and let's consider some issues and rationales for packing at each weight level. There are roughly three weight levels of backpacking, although the weights assigned to each is not strictly agreed upon. Roughly, a base weight under 10 lb is considered ultralight. A base weight under 20 lb is considered lightweight. A base weight over 20 lb is considered standard or regular. The various gear that makes up the gear list of each weight level is a tradeoff between needs and wants, and comfort in camp versus comfort while walking with a lighter pack. To determine what you minimally need to enjoy your hike becomes the pursuit, almost obsession, of ultralight hikers, and to some degree, even lightweight hikers. There are benefits to carrying less weight on your back. The most obvious being that you will not be as tired, aching, and fatigued after hiking all day with a lighter pack. You may also avoid injury.

Physiologists have researched the effects of hiking while carrying various weights of backpacks. Much of this research was originally focused on soldiers who routinely carried weights of 60-80 lb. Research also now includes traditional hikers. The cumulative findings of this research include the following:

1. Hikers carrying more weight tend to hinge forward at the hips.
2. With loads approaching 40% of body weight, hikers have exaggerated left/right rotation of their torso as they walk.
3. With loads approaching 40% of body weight, hikers bend their knees to dampen the forces on their feet and ankles.
4. With loads approaching 40% of body weight, hikers shorten their stride to reduce single leg loading.
5. With loads less than 20% of body weight, hiker gait and stride is basically the same as when unloaded.
6. Weight carried is directly related to energy expenditure and fatigue when hiking.
7. Appalachian Trail (AT), Pacific Crest Trail (PCT) and Continental Divide Trail (CDT) thru hikers with lower base weights were more likely to complete the thru hike, enjoy the hike more and not be injured, which ends many thru hike attempts.

It is probably impossible to tease out all the details of why 75% of those who attempt an AT thru hike quit, but statements that include fatigue, stress, “not what I expected” and injury may all have some element of carrying too much weight on their backs. It is common for thru hikers to throw out or send home unnecessary gear and/or purchase lighter gear within the first 100 miles of their attempt.

The research noted above supports the general recommendation in the backpacking community to keep your total backpack weight (not just base weight) to less than 20% of your body weight. Just take your body weight and multiply by 0.2. Thus a 150 lb person shouldn't carry more than 30 lb. A 200 lb person shouldn't carry more than 40 lb. While this may seem like a heavier person has a higher carrying capacity, remember, overall health, endurance and strength are related. So a person who is at their recommended weight based on age, height and sex is likely to have the best endurance and be the strongest. An overweight person is unlikely to be able to carry a heavier pack and unlikely to have their ideal endurance level due to their excess weight.

Military researchers have used the Pandolf equation since it was developed in the 1970s. With this equation, we can estimate how much energy it takes to carry a backpack under various conditions such as hiker weight, pack weight, walking speed, trail slope, and terrain. It is known that the equation underestimates the actual energy consumption, but it is good for comparison. As you would expect, for a given set of conditions, if the hiker carries a heavier pack, they will consume more energy. Using this equation, we can estimate that a 180 pound male, walking on a 10% grade, gravel, at 2 mph, carrying a 40 lb pack versus a 20 lb pack, consumes an additional 47 calories per hour. Over 8 hours of hiking, this equates to an added 376 calories per day. Assuming you don't want to lose

weight while hiking, these calories come from the food you eat, and for our purposes, the calories you carry as weight on your back. Here we get the situation where the hiker carrying the heavier pack experiences adverse effects directly from the heavier pack.

Let's consider the food, water and fuel you'll carry in addition to the base weight items. If you need to carry food for a five day hike, let's start by assuming 2 lb of food per day, plus a liter of water at 2.2 lb. Plus something for the fuel you'll carry. So that adds about 12.5 lb to your base weight.

Let's look at the food issue another way also. Consider if it was sixty miles between resupply stops, how much food would you need to carry? Well, that depends on how far you walk each day. The less weight you are carrying, the easier it is for you to hike farther each day. Conversely, the heavier your pack is the more fatigued you get, and the fewer miles you can hike each day. If you walk 20 miles per day, you only need to carry 3 days worth of food. If you walk 15 miles per day, you have to carry 4 days worth of food. And if you only walk 12 miles per day, then you have to carry 5 days worth of food. This is an example of a feedback loop with detrimental effects from carrying a heavy pack that causes you to be fatigued and reduces your daily mileage.

The attention that ultralight and lightweight hikers pay to their base weight may also extend to their food choices. If we consider food as fuel to the body rather than cuisine for enjoyment (just for consideration of its effect on total weight carried), we could estimate how much weight we'll actually carry. When hiking all day we need more calories than our typical sedentary 2500 calories per day. If we hold constant that the hiker needs 4000 calories per day to maintain their weight, we could see how much that food would weigh in three scenarios. At 100 calories/ounce, 4000 calories weighs 40 ounces (oz), or 2.5 lb. So that's 12.5 lb for a 5 day hike. At 125 calories/ounce, 4000 calories weighs 32 oz, or 2 lb. Therefore 10 lb for a 5 day hike. At 150 calories/ounce, 4000 calories weighs 26.7 oz, or 1.7 lb per day. Therefore 8.3 lb for a 5 day hike. Add this to the fact that an ultralight hiker can travel farther in 5 days, and you see the compound effects of the weight you carry on your back.

So let's look at the gear list in the base weight of the ultralight, lightweight and standard backpacker. Note: The specific equipment named doesn't represent my endorsement or recommendation for you to buy that gear. It only shows a typical item at each weight level.

Link to Gear List:

<https://tidewateratc.com/wp-content/uploads/2026/01/Backpacking-Checklist-Article.xlsx>

You see that the three hikers carry most of the same items, but the attention given to the weight of the items makes a significant difference. The ultralight hiker even forgoes some items, deeming them not essential. They make careful choices considering all the facts when choosing each item. For example, the lighter overall weight of the pack of the ultralight or lightweight backpacker isn't considered an invitation to carry more weight for the food storage device (waterproof bag vs. Ursack vs. bear cannister). As long as they can reasonably protect their food from a bear, the ultralight or lightweight backpacker doesn't carry additional weight.

The ultralight and lightweight gear is often more expensive than general department store outdoor gear, so do your research well before investing in the gear that is right for your hiking needs.

There are many other things that ultralight backpackers do to make their pack even lighter than I've shown here. Instead of a tent, they might use a tarp. They may use 3/4 length inflatable sleeping pads or 3/4 length foam pads, and foam pads that might only be 1/8" thick. They may use an alcohol stove, also called a "cat can" stove, which between the stove itself and the fuel, becomes lighter than a typical stove and isobutane/propane canister. They might even skip the stove altogether and just cold soak their food in a plastic peanut butter or ice cream jar. These and other "sacrifices" that seem to give up on comfort while at camp, make up for it in comfort while walking with a much lighter pack. This minimalist attitude may serve us well in other aspects of life also.

I hope this article has given you some ideas about pack weight. If you want to start trying to lighten your load, buy a small accurate kitchen scale. Weigh your items. Research other options for the items you take. You can compile a list such as those above using the tools at www.lighterpack.com or www.packwizard.com . You can also find comprehensive checklists of things to take with you when backpacking at websites such as those published by REI, thetrek.co (note the spelling is ".co", not .com), www.backpacker.com , and many more. Just remember, reduce what you carry to the essentials, carry the lightest gear you can afford, and don't carry more of anything than you need. Happy trails!