

- Dr. Bob's Philmont Hints, D -

The Philmont Challenge Index (PCI; Developed 2001 - 2002 by Dr. Bob Klein)

The Philmont Challenge Index (PCI) is a formula that enables individual Philmont trekkers to determine *a priori* how challenging a specific trek will be for themselves. The actual challenge of a Philmont trek, or any similar backpacking trek, involves many factors, some of which are objective and can be formally measured, while others of which are completely subjective. Subjectivity leads to endless arguments, and this topic was no exception. The PCI is an effort to meld the objective and subjective criteria into something measurable and useful. In essence, it is a TOOL that can help you see what factors you can control, which factors you cannot control, and how to help yourself improve your personal Philmont experience, at least from a *physical* point of view. Viewed dispassionately, the results will give you at least a qualitative sense for the relative merits of changes in the controllable parameters, such as pack weight and physical training. Or will give you a stark, final warning....

The Philmont Challenge Index Formula

The formula requires the following data input: Starting pack weight at Basecamp (PW), food weight adjustment (FWA), water weight adjustment (WWA), trekker weight (TW), Philmont recommended trekker weight (RW), trek length (TL), trek difficulty factor (TDF), an age factor (AF), a smoking factor (SF), a high altitude/mountainous training/residence factor (HAMTRF), a physical preparation factor (PPF), and a prior Philmont-like trek experience factor (PPLTEF). These parameters and several needed assumptions are explained below. The formula is as follows:

$$X = [(PW+FWA+WWA)/(PW+FWA+WWA+TW)] \times [(TW/RW) \text{ *or* } (RW/TW), \text{ whichever is higher}] \times TL \times TDF \times AF \times SF \times HAMTRF \times PPF \times PPLTEF$$

This looks mightily complex, but really it is rather simple - don't get spooked by all the terms! Note that there is an Excel calculator that runs this program, and generates the results automatically (see details at the bottom of this writeup).

Details and Assumptions:

X = Philmont Challenge Index Value - [See the interpretation scale below.]

PW - Pack Weight - This is the trekker's complete pack weight when leaving Basecamp on Day II, as measured by an accurate scale, including all requisite equipment, food, fuel, and water.

[Note: In order to "guestimate" your complete pack weight (PW) before you leave home, assemble your entire personal kit (i.e., from List II only - no Crew or common gear), remove one set of clothes, your boots, and your hiking poles (i.e., the stuff you'll be wearing/using when you leave Basecamp), empty your canteens, and get an accurate weight. Then, if you're using all Philmont supplied Crew gear, add 30 pounds; if you're using standard Troop gear, add 25 pounds; and if you're using specially selected lightweight Troop backpacking gear, add 20 pounds. Then add 1½ additional pounds for every man short of 12 (e.g., if you have a 9-man Crew, add 5 more pounds). The above addition values include food and water weight. The resulting weights won't be perfect, but they'll be close enough for the PCI calculations.]

FWA and WWA - Food Weight Adjustment and Water Weight Adjustment. These factors standardize all pack weights to the default values of 3 days worth of food (that is, 3 days til the first commissary pickup of food, fuel, and other consumables), and 3 liters of water. You can determine the number of days of food you'll have at Basecamp from the "Food Pickup" column on your Trek's itinerary summary sheet. On food, if you are carrying:

- 1 day's worth - your FWA is 4 pounds
- 2 day's worth - your FWA is 2 pounds
- 3 day's worth - your FWA is 0 pounds
- 4 day's worth - your FWA is -2 pounds (that is, *subtract* 2 pounds)

Similarly, on water, if you are carrying:

- 1 liter - your WWA is 4 pounds (but don't be dumb - put another liter in your pack!)
- 2 liters - your WWA is 2 pounds
- 3 liters - your WWA is 0 pounds
- 4 liters - your WWA is -2 pounds (that is, *subtract* 2 pounds)

TW - Trekker's Weight - The trekker's weight upon arrival at Basecamp (you can measure yourself during your Basecamp medical checks, or guesstimate based on your weight when you left home, adding 1 pound for each day since you left. If this latter addition seems excessive, consider that "planes, trains, and automobiles" (or buses), little or no exercise, and lots of fast food, are not exactly conducive to weight maintenance on the way to Philmont).

RW - Recommended Trekker Weight - The Philmont recommended weight for a trekker's height (listed below; note that the listed values are the averages of the ranges provided by Philmont). The term [(TW/RW) *or* (RW/TW)] is a weight factor, adjusting for those who are above (TW/RW) or below (RW/TW) their recommended weight (i.e., always use whichever of the two values is HIGHER (greater than 1.00)). Those rare individuals who are dead on their recommended weights default to 1.00.

Philmont Recommended Weights for Heights

Use ONLY these values for RW's:

5-0	118	5-10	160
5-1	122	5-11	165
5-2	126	6-0	170
5-3	130	6-1	175
5-4	134	6-2	179
5-5	138	6-3	184
5-6	143	6-4	189
5-7	147	6-5	194
5-8	152	6-6	199
5-9	157	6-7	205

It is appreciated that these average values do not take body physiology into account. However, body physiology IS taken somewhat into account in the pack weight percentage sub-equation, since the Trekker Weight is in the *denominator* (that is, $[(PW+FWA+WWA)/(PW+FWA+WWA+TW)]$).

TL - Trek Length - Scheduled Trek Length In Miles, as provided in the TREKS book. Note that if a Crew is planning on adding additional miles to their trek, they need to guesstimate those miles and add them to the TL.

TDF - Trek Difficulty Factor - A multiplier based on Philmont's categorization of treks as challenging, rugged, strenuous, or superstrenuous. [Note that a "strenuous" 60 mile trek is more difficult than a "rugged" 60 mile trek, even though both cover an identical distance. Note also that "challenging" used to be called "typical," and is still so listed in the Excel programs.] The TDF multipliers are as follows:

Challenging (Typical)	0.90
Rugged	0.95
Strenuous	1.00
Super-Strenuous	1.05

AF - Age Factor - a means for guesstimating AVERAGE overall experience, general physical condition, and mental and emotional ability to handle a trek. The multipliers are as follows:

14 or 15 years old	1.25
16 - 21 years old	1.00
22 - 30 years old	1.15
31 - 40 years old	1.25
41 - 55 years old	1.35
Over 55 years old	1.50

SF - Smoking Factor - a neutral to highly negative factor, as follows:

Never Smoked	1.00
Smoked at one time, but quit	1.05
Light smoker (< 2 packs/week)	1.15
Moderate smoker (ca. 1 pack/day)	1.25
Heavy smoker (> 2 packs/day)	1.50

HAMTRF - High Altitude/Mountainous Training/Residence Factor - Do you live at or above 3,500 feet elevation, *OR* will you be spending more than 3 days at or above 5,000 feet (for example, in Colorado Springs) just before hitting the Ranch, *OR* do you live and train in a mountainous area (regardless of altitude)?

No	1.00
Yes	0.95

PPF - Physical Preparation Factor - a means for estimating how much effort a trekker has put into physically preparing for Philmont. The multipliers (and explanations) are as follows:

Extensive	1.00
Moderate	1.15
Minimal	1.35
None	1.50

Extensive prep is defined as everyday or nearly everyday backpacking, carrying a heavy pack, for a minimum of 1 hour per day for at least 2 months prior to the trek start date, plus a minimum of 2 “realistic” backpacking shakedown events (10 miles minimum, including at least 2,000 feet of total elevation change, or 15 miles minimum with a lesser amount of elevation change), during the 2 months prior to the trek. “Extensive Prep” is rigorously defined as *weight-bearing practice* that toughens up your weight-bearing points (shoulders, hips, and feet), as differentiated from simple aerobic (cardiovascular) exercising.

Moderate prep is everyday or nearly everyday aerobic exercising (hiking, running, cycling, high-activity sports, treadmill, etc.), with occasional backpacking practice (1 - 2 per week), for a minimum of 1 hour per day for at least 2 months prior to the trek, plus 1 realistic backpacking shakedown event (as defined above), during the 2 months prior to the trek.

Minimal prep is occasional (3 - 5 per week) aerobic exercising, for a minimum of 1 hour per day for at least 1 month prior to the trek. [Note that this is where about a third of all advisors and most H.S.-athlete-Scouts fall.]

None is anything less than the Minimal category. [Note that this is where more than half of all Advisors, and most non-H.S.-athlete-Scouts, fall.]

PPLTEF - Prior Philmont-Like Trek Experience Factor - Previous Philmont treks *or Philmont-like treks* WITHIN THE PAST 5 SUMMERS reduce the challenge level. A “Philmont-like trek” means a backpacking trek covering at least 50 miles and at least 7 days. *This Implies Credible Understanding and Correct Practice of Basic Philmont Style Backpacking Protocols*, such as the caterpillar technique, dawn-to-dusk scheduling, early morning hiking, proper outfitting, etc. “Knowledge is Power.”

The multipliers are as follows:

0	1.00
1	0.95
2	0.90
3 or more	0.85

X Factor Evaluation Chart

Based on my personal experiences and observations, and the comments derived from the collective feedback from many previous Philmont trekkers (including Advisors, Rangers, and Scouts), the values derived from the PCI may be evaluated as follows:

< 15	Great Job! - Lightly Challenging - Easy Trekking!
15 – 20	Good Job - Somewhat Challenging
20 - 27.5	Moderately Challenging
27.5 - 35	Highly Challenging - Should Try to Improve
35 - 40	Extremely Challenging - Must Try to Improve
40 - 45	Hellish - Needs *Radical* Improvement!
Over 45	Potential Darwin Award Winner - Probably Shouldn't Go

Let's take a look at my 2000 Trek. That year, my pack weight started out at 40 pounds. We were on Trek 30, so we were carrying 3 days of food. However, I carried only 2 liters of water out of Basecamp, since we were walking from Six Mile Gate to Indian Writings to start (a flat, 4 mile hike starting at 8:30 am, so no need for 3 liters). I weighed about 160 pounds at my medical check (this is a guess; I didn't actually weigh myself, but I left home weighing 154 and chowed down pretty good in Colorado). I'm 5-6, so my recommended weight was 143. We took an enhanced version of Trek 30, equalling about 85 miles total; the trek was (originally) rated strenuous, and the additions did not, in my opinion, jump it to superstrenuous. I was 44 years old. I have never smoked. We spent 3 full days in Colorado before heading to the Ranch. My physical preparation level was "Extensive." I had completed 3 or more Philmont or Philmont-like backpacking treks during the 5 previous summers 1995 - 1999. Thus:

$$X = [(PW+FWA+WWA)/(PW+FWA+WWA+TW)] \times [(TW/RW) \text{ *or* } (RW/TW), \text{ whichever is higher}] \times TL \times TDF \times AF \times SF \times HAMTRF \times PPF \times PPLTEF$$
$$X = [42/202] \times (160/143) \times 85 \times 1.00 \times 1.35 \times 1.00 \times 0.95 \times 1.00 \times 0.85 = 21.6 \text{ (Low end of Moderately Challenging - which is about the way I felt.)}$$

Comments: Please note that this formula is designed to gauge the AVERAGE trekker, and exceptions to the rule are just that! Obviously, this cannot properly gauge trekkers with significant physical, mental, or emotional problems, ridiculously poor equipment, bad training, or crappy attitudes; nor can it handle Joe Stud Ranger, his female equivalent, or their real-world compatriots - in all such cases, a little common sense has to be employed. However, also note that I received feedback from approximately 150 Advisors, Rangers, and Scouts, nearly all of whom felt the PCI results were "highly accurate."

I hope everyone finds this exercise to be useful. I also hope no-one feels the need to give a mighty Tarzan yell, beat his naked chest with his fists, and crow about what a macho guy he was for enduring a PCI Value of 47.2 (or whatever) on his last trek. The intent of the PCI is to help you AVOID such a fate, not revel after enduring it. No Pain = No Pain; this is a GOOD thing!

[Excel Program Available! Tom Wills and Al Thomson have put together an Excel program that will automatically do the PCI calculations. [A copy of this program should be on the CD you received.] Otherwise, Earl Owens has posted a variant of this spreadsheet on his Philmont website; see:

http://www.geocities.com/troop764x/philmont_chal_index_calc.xls

A quick tutorial: It's possible your computer will load the program automatically. If not, first, download the calculator into any appropriate subdirectory on your computer. Then, open Microsoft Excel (on most computer setups, accessed through your Start, then Programs, buttons). The (blank) Excel program will come up. Then you go to File --> Open --> [Go to the subdirectory where you downloaded the program, and Double Click on the calculator .xls program]; the calculator will load, and you're ready to rock and roll. The program is especially useful in that you can change individual entries (e.g., Pack Weight), click on the PCI value box, and immediately see the recalculated results.

Acknowledgments: Thanks especially to Tom Wills, Al Thomson, Earl Owens, Chris Summers, and Justin Dolske (all members of the 2002 Philmont List-Serve) and Rick Wolff (Troop 111, Arlington) and Clay Henderson (then Troop 151, currently Troop 2535, Arlington) for their efforts on the original (now defunct) Philmont Pain Index (PPI) and subsequently on the Challenge Index (PCI).