**The Effort Scale**

**of Highpointing the Fifty US States**

**By**

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**Definition and Brief History of Highpointing**

Highpointing is the pursuit of reaching the highest elevation within a specified area. The formalization of highpointing each of the 50 US states is credited to the late Jack Longacre when back in 1986 he took notice of people mentioning their highpoint achievement in log books at the top of various summits. As a result, he went on to form the Highpointers Club. Jack became the seventh person to achieve standing on the summits of all 50 US states, and as of year-end 2018 only about 300 more people had followed suit.

The US state highpoints range from landmarks as low as 345 feet to mountains as tall as 20,320 feet. Some highpoints can be driven to, requiring little or no walking effort, whereas others take skilled mountain climbers’ days or even weeks to scale on foot.

**Not a One to One Comparison**

Too often people incorrectly equate the effort of reaching one highpoint to that of reaching another; unconsciously assuming that since all are highpoints all amount to equal effort. However, with the highpoints having such a wide range of geographical makeup there are many factors which influence their individual difficulty.

Traits such as prominence, isolation, type of terrain, vertical gain, weather, distance from a road, time required, gear required, natural dangers, and team size/dynamics all influence the struggle (or lack of struggle) of reaching a highpoint. As such difficulty/effort rankings tend to be (and rightly so) mostly a matter of opinion, and personal experience.

One highpointer might avoid walking when a driving option is available, use guides to lead him up the most challenging summits, and/or only venture out in fair weather. Whereas another might tackle highpoints solo or only during winter months, and avoid driving in favor of hiking.

Adding to the confusion, the Highpointers Club offers no hard and fast rules for obtaining a highpoint indorsing “any route to the top” be it by horse, automobile, foot, helicopter, or what have you – leaving the means of ascent to personal choice.

Furthermore, one might also incorrectly assume that a list of the 50 US state highpoints ordered by elevation would suffice as a list of difficulty. Unfortunately, that too falls short. For example, Mt Marcy of New York stands shorter than Nebraska’s Panorama Point with the latter being nothing more than a spot on a prairie requiring no uphill walking and the former being a mountain rising over 3000 feet from the trailhead.

**What is Difficulty?**

The dictionary defines *difficulty* as a thing that is hard to accomplish, and *effort* as strenuous physical exertion. For purposes of this article, and the Effort Scale, difficulty and effort should be considered alternative words.

For some the difficulty of highpointing might be finding the time to pursue the undertaking, or coming up with the money needed. For others it might be very challenging to plan the logistics of highpointing trips. Others might have no interest in visiting landmarks, and their challenge is to find the motivation to do so.

It is impossible to know and to measure all the factors that make a challenge difficult. Thus, for the 50 US state highpoint challenge the Effort Scale considers only measurable and probable variables which when combined result in level of effort.

**Effort Scale Explained**

The goal of the Effort Scale is to compare how much human-only effort is needed to reach one highpoint, as opposed to another, under one’s own foot-power exclusively. In other words, it is a measure of the walking, hiking, and/or climbing effort from the point where one steps out of the automobile (or plane), and makes his way, under solely his own power, to the highpoint and back down.

The scale does not try to account for all the various routes or means that lead to a highpoint; nor all the things that might happen en route. Rather it derives its measurements based on the least technical standard route, completed within a typical timeframe, under probable average weather.

The Effort Scale assigns effort points to each highpoint, with these points being a combination of total hiking mileage, vertical gain, terrain difficulty, nights required, and expected cold weather days. All other factors are exogenous to its model, and for the sake of simplicity must be ignored. Points are totaled for each highpoint, and then convert to a 0 through 1000 scale.

With a magnitude of effort number assigned to each highpoint the Effort Scale is also able to record the percent of physical effort each peak contributes to the whole task of reaching each of the 50 US state highpoints.

**Effort Scale Methodology**

As the baseline, the Effort Scale assigns one point to each round-trip hiking mile. Hiking distances less than 500 feet are considered insignificant and have been rounded to 0 miles.

The Effort Scale equates vertical gain to round-trip distance by multiplying vertical gain, in miles, by a difficulty factor and adding that to the baseline. The vertical gain used is an estimate of all elevation gain, including gain related to rising and falling terrain.

The scale considers it to be 15 times more difficult to climb 1 mile then to walk 1 mile, and arrives at this number by comparing the distance a reasonably fit person can walk in an hour to the distance the same person can climb in an hour. It is estimated that 3 miles can be walked in 1 hour, and likewise 1000 vertical feet (0.189394 miles) can be climbed in one hour. Truncating the ratio of 3/0.189394, the Effort Scale arrives at the multiplier of 15. As such the Effort Scale awards 1 point for each 352 feet of gain. Decimal places are carried through to the one and only final rounding.

To the round-trip distance and vertical gain points the scale next accounts for terrain difficulty by adding 6 points if a highpoint involves climbing with the use of both hands and feet, but not the protection of a rope, and 12 points if a highpoint involves roped rock climbing or roped glacier travel. Denali, Gannett Peak, Mount Hood, and Mount Rainier each earn 12 terrain points as they warrant roped glacier travel. Likewise, Granite Peak also earns 12 terrain points as it necessitates roped rock climbing. While Borah Peak earns 6 terrain points as it involves unroped scrambling using both hands and feet.

Next 1 point for each night required is added in. Mount Rainier, Granite Peak, and Kings Peak each earn 2 night points as a typical trip to their respective summits involve staying over for two nights. Mount Whitney earns 1 night point, Gannett Peak 3, and Denali 17.

As a means of accounting for weather, double points are awarded for each day where afternoon temperature can be expected to remain near or below the freezing point. For example, the average summer month temperatures on the summit of Rainier are close to the 32 F freezing point. As such a 3-day trip up Rainier earns 2 weather points for the summit day when the temperature likely will be at or below freezing. On Denali, everyday can remain below freezing so an 18-day trip earns 36 weather points. None of the other highpoints qualify for weather points.

Once the points, and any fractions thereof, are summed the results are rounded and then normalized to a 1 - 1000 scale, to allow easy comparisons.

The equation is as follows: Effort Score = 1000[mileage + 15(vertical distance in miles) + difficulty + nights + 2(temperature)] / [Maximum Points^].

^Maximum points are the total raw points of the highpoint with the most points before conversion to the 0-1000 scale. The table below does not list the raw points. Raw points can be calculated as explained above, or one can contact the author if interested in obtaining the raw points.

**Table 1: The Effort Scale of US state Highpoint Difficulty**

The table below is ordered by the most physically demanding (highest effort/difficulty) down to the least demanding as determined by the Effort Scale. If one highpoint has the same Effort Scale number as another, the highpoints are ordered alphabetically by US state name – in which case the reader may want to compare vertical gain and round-trip miles as a means of breaking a tie.

|  |  |  |  |
| --- | --- | --- | --- |
| **Effort Scale** | **Highpoint** | **Vertical Gain (ft)** | **Round-Trip (miles)** |
| 1000  (22.01%) | Alaska - Denali (M) | 19000\* | 39\*\* |
| 506  (11.14%) | Wyoming - Gannett Peak (M) | 8650 | 40.4 |
| 368  (8.10%) | Montana - Granite Peak (M) | 7700 | 22.2 |
| 366  (8.06%) | Washington - Mount Rainier (M) | 9100 | 16 |
| 291  (6.41%) | Utah - Kings Peak (M) | 5350 | 28.8 |
| 263  (5.79%) | California - Mount Whitney (M) | 6750 | 21.4 |
| 222  (4.89%) | Oregon - Mount Hood (M) | 5300 | 8 |
| 181  (3.98%) | Idaho - Borah Peak (M) | 5550 | 6.8 |
| 151  (3.32%) | New York - Mount Marcy (M) | 3200 | 14.8 |
| 147  (3.24%) | Colorado - Mount Elbert (M) | 5000 | 9 |
| 141  (3.10%) | Maine - Katahdin (M) | 4200 | 10.4 |
| 126  (2.77%) | Nevada - Boundary Peak (M) | 4400 | 7.4 |
| 120  (2.64%) | Arizona - Humphreys Peak (M) | 3500 | 9 |
| 106  (2.33%) | Texas - Guadalupe Peak (M) | 2950 | 8.4 |
| 98  (2.16%) | New Mexico - Wheeler Peak (M) | 3250 | 6.2 |
| 81 (1.78%) | Virginia - Mount Rogers (M) | 1500 | 8.6 |
| 68  (1.50%) | Oklahoma - Black Mesa (H) | 775 | 8.6 |
| 64  (1.41%) | South Dakota - Black Elk Peak (M) | 1500 | 5.8 |
| 55  (1.21%) | Minnesota - Eagle Mountain (M) | 600 | 7 |
| 31  (0.68%) | Connecticut - Mount Frissell-South Slope (M) | 450 | 3.6 |
| 28  (0.62%) | Vermont - Mount Mansfield (M) | 550 | 2.8 |
| 27  (0.59%) | Maryland - Backbone Mountain (M) | 750 | 2.2 |
| 21  (0.46%) | Illinois - Charles Mound (H) | 275 | 2.5 |
| 20  (0.44%) | North Dakota - White Butte (H) | 400 | 2 |
| 14  (0.31%) | Louisiana - Driskill Mountain (H) | 150 | 1.8 |
| 12  (0.26%) | Tennessee - Clingmans Dome (M) | 330 | 1 |
| 10  (0.22%) | Arkansas - Magazine Mountain (M) | 225 | 1 |
| 7  (0.15%) | Hawaii - Mauna Kea (M) | 230 | 0.4 |
| 5  (0.11%) | Wisconsin - Timms Hill (H) | 120 | 0.4 |
| 3  (0.07%) | Missouri - Taum Sauk Mountain (M) | 30 | 0.4 |
| 3  (0.07%) | North Carolina - Mount Mitchell (M) | 100 | 0.2 |
| 2  (0.04%) | New Jersey - High Point (H) | 40 | 0.2 |
| 2  (0.04%) | West Virginia - Spruce Knob (M) | 20 | 0.3 |
| 1  (0.02%) | Kentucky - Black Mountain (M) | 0 | 0.1 |
| 1  (0.02%) | Massachusetts - Mount Greylock (M) | 20 | 0.1 |
| 1  (0.02%) | Rhode Island - Jerimoth Hill (L) | 0 | 0.2 |
| 1  (0.02%) | South Carolina - Sassafras Mountain (M) | 0 | 0.1 |
| 0 | Alabama - Cheaha Mountain (M) | 0 | 0 |
| 0 | Delaware - Ebright Azimuth (L) | 0 | 0 |
| 0 | Florida - Britton Hill (L) | 0 | 0 |
| 0 | Georgia - Brasstown Bald (M) | 0 | 0 |
| 0 | Indiana - Hoosier Hill (L) | 0 | 0 |
| 0 | Iowa - Hawkeye Point (L) | 0 | 0 |
| 0 | Kansas - Mount Sunflower (L) | 0 | 0 |
| 0 | Michigan - Mount Arvon (H) | 10 | 0 |
| 0 | Mississippi - Woodall Mountain (H) | 0 | 0 |
| 0 | Nebraska - Panorama Point (L) | 0 | 0 |
| 0 | New Hampshire - Mount Washington (M) | 20 | 0 |
| 0 | Ohio - Campbell Hill (H) | 0 | 0 |
| 0 | Pennsylvania - Mount Davis (H) | 0 | 0 |

(x.yz%) = Percent of Total Difficulty, M = Mountain, H = Hill, L = Landmark

\* In the case of Denali, the ascent distance doesn’t equal the descent distance because climbers typically repeat sections of the climb for acclimation purposes and in the process of moving up supplies. The West Buttress route from base camp to the summit of Denali is 16.75 miles, but with repeated sections it becomes closer to 22.25 miles on the ascent resulting in a round-trip distance of 39 miles.

\*\* The elevation difference between Denali’s base camp (of the West Buttress Route) and the summit is 13,120 feet. However, with sections being repeated, as explained above, the elevation gain of Denali is listed as 19,000 ft.

**Conclusions**

The Effort Scale reflects the Pareto Principle which states that for most tasks roughly 80% of the results come from 20% of the effort. According to the Effort Scale reaching 39 of the 50 highpoints (aka 78%) requires only 19.96% of the effort. The remaining 11 highpoints (aka remaining 22%) requires 80.04% of the effort.

The Effort Scale classifies highpoints as mountains, hills, and landmarks. 33 of the 50 are labeled as mountains and they require 97.12% of the effort. Another 10 are deemed hills requiring 2.86% of the effort. The remaining 7 are branded as landmarks requiring only 0.02% of the physical effort.

Denali has a score basically twice as large as any of the other mountains, plainly showing it requires twice as much effort to climb than its next counterpart. In fact, it requires the next two highest ranking mountains plus one other to come close to its score – meaning one would need to climb Gannett, Granite, and at least one more highpoint to compare to the effort of climbing Denali.

The average score is less than 91 (72 without Denali), whereas the highest 10 average 350 points (251 without Denali).

There really is no comparison between reaching a drive-up landmark and that of climbing a mountain, and the Effort Scale reflects this. If one divides the score of any mountain, for instance Mount Elbert of Colorado by the score of any of the zero ranked landmarks, such as Ebright Azimuth of Delaware, the result is mathematically undefined telling us there is no comparison. Whereas if one divides the score of Mount Elbert by the score of West Virginia’s Spruce Knob (for example) he learns that Mount Elbert requires 73.5 times more effort to summit.

For any combination of highpoints, summing the percentage number listed below their Effort Scores of Table 1, reveals the proportion of effort those highpoints jointly contribute to the total effort of ascending all. For example, 3.10% for Katahdin plus 2.33% for Guadalupe Peak plus 0.11% for Timms Hill informs us that those three combined contribute 5.54% to the total effort of reaching the highest spot in every US state.

**About the Author**

The author’s highpointing calling reaches back to May 2001 when he and two friends, having never heard of highpointing, drove to the top North Carolina’s Mount Mitchell. By the fall of that same year he tagged a second highpoint without yet having a goal to reach all fifty. Over the next eight years he completed another six, followed by another seven between 2010 and his 2014 climb of Denali. Following Denali he tagged another four, and then went into highpointing hibernation for over four years. August 2019 his highpointing desire returned and over the next couple of months he increased his highpoint count to twenty-nine.

Recognizing his remaining twenty-one highpoints seem less physically severe, the author began to wonder what percent of the total physical effort he had remaining. As such he developed the Effort Scale. Although his remaining highpoints account for less than 4.0% of the overall physical effort he knows they will not come without other types of struggles. He is not holding himself to it, but he hopes to complete all fifty within a twenty-year timeframe before June 2021.