Procedure for Making Highly Erodible Land Determinations

Soil map units and an erodibility index (EI) are used as the basis for identifying Highly Erodible Land (HEL) for Food Security Act compliance. Erodibility calculations are based on the "frozen" soil map units, soil loss tolerance (T), and factors for water and wind erosion as they existed in the Field Office Technical Guide on January 1, 1990. The EI of a soil map unit is determined by dividing the potential erodibility for each soil map unit by the T value established for the soil. HEL determinations are completed using offsite methods by regulation and policy. See Title 7 Code of Federal Regulations (CFR) Part 12, Subpart B, and National Food Security Act Manual (NFSAM) Parts 511.0 and 511.1.

A soil map unit with an EI of 8 or more is designated as HEL. A soil map unit with an EI less than 8 is not HEL (NHEL). A soil map unit is potentially HEL (PHEL) if the Universal Soil Loss Equation (USLE) EI value using the minimum length of slope (LS) factor for the soil map unit is less than 8 and the EI value using the maximum LS factor for the soil map unit is equal to or greater than 8. Lists of frozen HEL soil map units by county are maintained in Section II of the electronic Field Office Technical Guide (eFOTG). In completing preliminary HEL determinations, do not make a field visit to complete field slope gradient and/or slope length measurements for HEL or NHEL map units. Only PHEL map units will be examined in the field to measure the percent slope and slope length to determine if they are HEL or NHEL. Otherwise, the HEL determination and any reconsideration or appeal is completed offsite.

Procedure

1. From the county hard copy soil survey, determine the soil series for the field needing the determination.
2. Using this soil survey and the county HEL report found in Section II of the eFOTG/Soils Information, determine if either $33^1/_3$% or 50 acres of the field has HEL or PHEL soils. **If not, the field is NHEL.**
3. If either $33^1/_3$% or 50 acres of the field has HEL soils, **the field is HEL**.
4. If part of the field being determined was previously determined HEL, that area remains HEL.
5. For all of the field not previously determined HEL, if PHEL + HEL soils make up $33^1/_3$% or 50 acres of the undetermined portion, **go to the field** to estimate slope gradient and slope length of PHEL soils. If the PHEL soils are determined HEL, **the field is HEL**.
   a. Select three representative areas of the PHEL soils in the field. Contact a soil scientist for assistance if you need help identifying the PHEL soils in the field.
   b. Measure slope gradient and slope length at these three locations in the field. Record the location of these field measurements on an aerial map.
6. From the county HEL report, determine the Rainfall Erosion Index (R).
7. From the county Conservation Reserve Program (CRP)—Frozen HEL Data Report located in eFOTG/Section II/your county/soil and site information reports (pdf) determine the T and soil erodibility (K) factors for the PHEL soil.
8. Use the slope gradient and slope length measurements collected from the field to determine LS for each of the three representative areas of PHEL soil using Table 3 from Agricultural Handbook 537 (inserted below). Average these 3 LS values.

TABLE 3.—*Values of the topographic factor,* **LS**, *for specific combinations of slope length and steepness*[1]

Percent slope	Slope length (feet)											
	25	50	75	100	150	200	300	400	500	600	800	1,000
0.2	0.060	0.069	0.075	0.080	0.086	0.092	0.099	0.105	0.110	0.114	0.121	0.126
0.5	.073	.083	.090	.096	.104	.110	.119	.126	.132	.137	.145	.152
0.8	.086	.098	.107	.113	.123	.130	.141	.149	.156	.162	.171	.179
2	.133	.163	.185	.201	.227	.248	.280	.305	.326	.344	.376	.402
3	.190	.233	.264	.287	.325	.354	.400	.437	.466	.492	.536	.573
4	.230	.303	.357	.400	.471	.528	.621	.697	.762	.820	.920	1.01
5	.268	.379	.464	.536	.656	.758	.928	1.07	1.20	1.31	1.52	1.69
6	.336	.476	.583	.673	.824	.952	1.17	1.35	1.50	1.65	1.90	2.13
8	.496	.701	.859	.992	1.21	1.41	1.72	1.98	2.22	2.43	2.81	3.14
10	.685	.968	1.19	1.37	1.68	1.94	2.37	2.74	3.06	3.36	3.87	4.33
12	.903	1.28	1.56	1.80	2.21	2.55	3.13	3.61	4.04	4.42	5.11	5.71
14	1.15	1.62	1.99	2.30	2.81	3.25	3.98	4.59	5.13	5.62	6.49	7.26
16	1.42	2.01	2.46	2.84	3.48	4.01	4.92	5.68	6.35	6.95	8.03	8.98
18	1.72	2.43	2.97	3.43	4.21	3.86	5.95	6.87	7.68	8.41	9.71	10.9
20	2.04	2.88	3.53	4.08	5.00	5.77	7.07	8.16	9.12	10.0	11.5	12.9

[1] $LS = (\lambda/72.6)^m\ (65.41\ \sin^2\theta + 4.56\ \sin\theta + 0.065)$ where λ = slope length in feet; $m = 0.2$ for gradients $<$ 1 percent, 0.3 for 1 to 3 percent slopes, 0.4 for 3.5 to 4.5 percent slopes, 0.5 for 5 percent slopes and steeper; and θ = angle of slope. (For other combinations of length and gradient, interpolate between adjacent values or see fig. 4.)

9. Use the formula: EI=RKLS/T to determine if the PHEL soil is HEL or NHEL. If EI is equal to or greater than 8 the soil is HEL. If the PHEL soil is determined HEL, **the field is HEL**. If the PHEL soil is determined NHEL, **the field is NHEL**.
10. Use Form KS-CPA-21, Potentially Highly Erodible Land (PHEL) Determination, to assist in calculating the EI value.