PART I

PREDICTING WATER EROSION LOSSES

SECTION A

THE FOLLOWING SECTION CONTAINS INFORMATION NEEDED TO DETERMINE HIGHLY ERODIBLE LAND BY USE OF THE UNIVERSAL SOIL LOSS EQUATION.

I. THE UNIVERSAL SOIL LOSS EQUATION

The USLE will **only** be used to determine highly erodible land (HEL), where the soil map unit is considered to be HEL if the RKLS/T value for the map unit equals or exceeds eight (8). The equation is expressed as follows:

$$RKLS/T \geq 8$$

where:

R = the rainfall factor. It is the number of erosion-index units in the total rainfall in a normal year. The erosion-index is a measure of the erosive force of specific rainfall.

K = the soil erodibility factor. It is the erosion rate per unit of erosion index for a specific soil in cultivated continuous fallow on a 9 percent slope, 72.6 feet long.

L = the slope length factor. It is the ratio of soil loss from the field slope length to that from a 72.6 foot length on the same soil type and gradient. 1/

S = the slope-gradient factor. It is the ratio of soil loss from the field gradient to that from a nine percent slope. 1/

T = the soil loss tolerance. It is the average annual erosion rate that can occur with little or no long-term degradation of the soil resource on the field. When the computed soil erosion rate is less than the "T" value, control of sheet and rill erosion is assumed to be adequate.

1/ In field application of the equation, values for slope length (L) and slope gradient (S) are combined as a single topographic factor (LS).

II. DETERMINING FACTOR VALUES FOR THE USLE

R - Obtained from Section I of the FOTG, Maps, or from Figure 1, **USLE Rainfall Factor Map**, Page A-3, Erosion Prediction, Part I, Section A.

K - Obtained from Soil Interpretative Groups, Section II of the Wyoming FOTG.

LS - Values for slope length and slope gradient are combined into the single topographic factor "LS". When slope length and gradient have been determined, the "LS" value is determined from Table 1, **USLE Slope Effect Factors**, Page A-2, Erosion Prediction, Part I, Section A.

T - Obtained from Soil Interpretative Groups, Section II of the Wyoming FOTG.

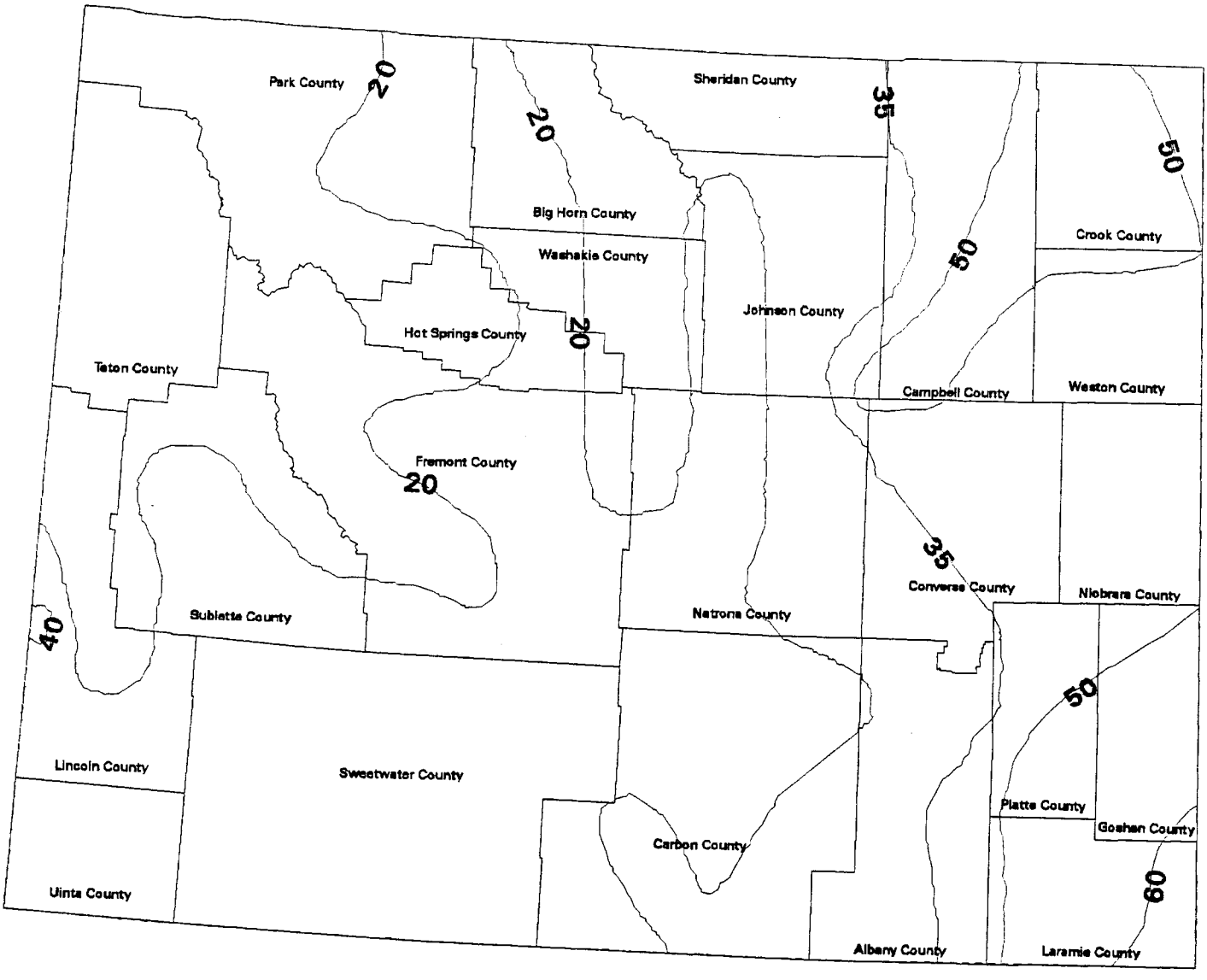
TABLE 1

USLE SLOPE-EFFECT FACTORS "LS"

Slope Length (L)	Slope Gradient (%) 0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
20	.05	.05	.06	.06	.08	.12	.18	.21	.24	.30	.44	.61	.81	1.0	1.2	1.6	1.8	2.6
40	.06	.07	.07	.08	.10	.15	.22	.28	.34	.43	.63	.87	1.2	1.4	1.8	2.2	2.6	3.5
60	.07	.08	.08	.08	.11	.17	.25	.33	.41	.52	.77	1.0	1.4	1.8	2.2	2.6	3.0	4.5
80	.08	.08	.09	.09	.12	.19	.27	.37	.48	.60	.89	1.2	1.6	2.0	2.6	3.0	3.5	5.5
100	.08	.09	.09	.10	.13	.20	.29	.40	.54	.67	.99	1.4	1.8	2.2	2.8	3.5	4.0	6.0
110	.08	.09	.10	.10	.13	.21	.30	.42	.56	.71	1.0	1.4	1.8	2.4	3.0	3.5	4.5	6.0
120	.09	.09	.10	.10	.14	.21	.30	.43	.59	.74	1.0	1.6	2.0	2.6	3.0	4.0	4.5	6.0
130	.09	.09	.10	.11	.14	.22	.31	.44	.61	.77	1.2	1.6	2.0	2.6	3.0	4.0	4.5	7.0
140	.09	.10	.10	.11	.14	.22	.32	.46	.63	.80	1.2	1.6	2.2	2.8	3.5	4.0	5.0	7.0
150	.09	.10	.11	.11	.15	.23	.32	.47	.66	.82	1.2	1.6	2.2	2.8	3.5	4.0	5.0	7.0
160	.09	.10	.11	.11	.15	.23	.33	.48	.68	.85	1.2	1.8	2.2	3.0	3.5	4.5	5.0	7.0
180	.10	.10	.11	.12	.15	.24	.34	.51	.72	.90	1.4	1.8	2.4	3.0	4.0	4.5	5.5	8.0
200	.10	.11	.11	.12	.16	.25	.35	.53	.76	.95	1.4	2.0	2.6	3.0	4.0	5.0	6.0	8.0
300	.11	.12	.13	.14	.18	.28	.40	.62	.93	1.2	1.8	2.4	3.0	4.0	5.0	6.0	7.0	10.0
400	.12	.13	.14	.15	.20	.31	.44	.70	1.0	1.4	2.0	2.8	3.5	4.5	5.5	7.0	8.0	12.0
500	.13	.14	.15	.16	.21	.33	.47	.76	1.2	1.6	2.2	3.0	4.0	5.0	6.0	8.0	9.0	13.0
600	.14	.15	.16	.17	.22	.34	.49	.82	1.4	1.6	2.4	3.5	4.5	5.5	7.0	8.0	10.0	14.0
700	.15	.16	.17	.18	.23	.36	.52	.87	1.4	1.8	2.6	3.5	5.0	6.0	8.0	9.0	11.0	16.0
800	.15	.16	.17	.18	.24	.38	.54	.92	1.6	2.0	2.8	4.0	5.0	6.0	8.0	10.0	12.0	17.0
900	.16	.17	.18	.19	.25	.39	.56	.96	1.6	2.0	3.0	4.0	5.5	7.0	9.0	10.0	12.0	18.0

WHEN THE LENGTH OF THE SLOPE EXCEEDS 400 FEET AND/OR PERCENT OF SLOPE EXCEEDS 24 PERCENT, SOIL LOSS ESTIMATES ARE SPECULATIVE AS THESE VALUES ARE BEYOND THE RANGE OF RESEARCH DATA.

FIGURE 1
USLE RAINFALL FACTOR (R) MAP



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