

105° 30'
44° 15'

R 72 W | R 71 W



EXPLANATION
SOIL QUALITY

- Poor
- vvvvvvvvvv Fair
- Good

Soil quality.—Soil quality classes show, in a general way, the relative suitability of the soils for crop and natural forage production. Good soils are essential to agriculture and balanced ecosystems, specifically for raising livestock and grain, controlling erosion, and maintaining surface-water quality and wildlife habitat.

Thirty-three soil types, previously mapped in the reconnaissance soil survey of Campbell County (U.S. Soil Conservation Service, 1955), were regrouped into three qualitative classes because separate evaluation of all types was not practical. The three categories were based on descriptions in the soil survey of forage- and crop-producing capacities of the soil types or physical properties that affect these capacities (table 1). These properties included texture, thickness, infiltration rates (which affect soil moisture available for plant use), salinity, alkalinity, and states of erosion. The three category classification was reviewed by U.S. Soil Conservation Service soil scientists and the district conservationist who are currently preparing a new detailed soil survey of the county.

Generally high quality soils occur east of the highway on sandy bedrock of the Wasatch Formation. These productive soils are mature, deep, fine sandy loams and loams developed in sandy residuum and in a complex unit of windblown sand and silt, sheetwash alluvium, and residuum (Fullerton and Kirkham, 1977). The soils are developing on stable, nondissected landscapes on gently to moderately sloping hills, ridges and valley sideslopes and to a lesser extent on moderately to steeply sloping hillslopes and nearly level to gently sloping upland flats. These soils are classified as Ustollic Haplargids and Ustollic Paleargids (Soil Survey Staff, 1975). In terms of the old classification, they are semiarid grassland Brown soils and clay pan soils of the Brown soil zone. High quality alluvial soils (Ustic Torrifluvents) occur on the nearly level to gently sloping stream terraces and narrow floodplain of Antelope Butte Creek.

Fair to poor quality soils are found in the more steeply sloping, dissected, youthful landscapes mostly west of the highway and in the northeast corner of the quadrangle. These soils are shallow, fine-textured clays to clay loams. They are developing in shales and fine-grained mudstones of the Wasatch Formation on drainage divides and moderate to steeply sloping headwater areas of the Tisdale, Duck Nest, and Antelope Butte Creek watersheds. Fair soils are also developing on the toe slopes, old alluvial fans, and sheetwash alluvium in these valleys. These soils have one or more of the following properties that could limit plant growth: a heavy clay subsoil that absorbs moisture slowly; a thin, droughty surface horizon; shallow bedrock; excessive sodium salts; or high erosiveness. The fair quality soils are mostly Ustic Torrifluvents (Lithosols and Regosols).

The poorest quality soils in the quadrangle have little to no horizonation (shallow Entisols). They are found on summits, shoulders and sideslopes of steeply sloping hills in areas of active erosion and on clinker or bedrock outcrops. Such conditions are common on the upper drainage divides between the Tisdale, Duck Nest, and Antelope Butte Creek watersheds near the west edge of the map. Poor clayey soils are developed in the extreme northwest corner of the map on dissected and steeply sloping terrain underlain by shale and mudstone. Other poor soils include massive clay in nearly level to depositional sites sometimes flooded by ephemeral ponds, for example the plays immediately east of the State Highway in sec. 18 near the center of the south edge of the quadrangle.

A small percentage of poor soils have toxic sodium salt accumulations. These are Haplustollic Natrargids or fine-textured sodicized solonchets of the Brown soil zone in the old classification (Singleton and Cline, 1976, p. IV-C-3). Sites with these soils have sparse vegetation and a micro relief characterized by slight depressions scattered amongst low hummocks. Local residents refer to these areas as scabland or buffalo wallows, which usually occur in alluvium of valley floors. These sites resemble the salt precipitate areas in a plains region of Alberta shown by Toth (1966, p. 59) to be ground water discharge areas. Similar areas in The Gap quadrangle may be discharge sites for local ground-water flow systems. Examples occur in nearly level margins of low terraces surrounding the middle-to-lower reaches of Tisdale Creek two miles east of the highway in sec. 8, T. 48 N., R. 71 W.

Table 1.—Comparison of productivity of three qualitative soil types (modified from U.S. Soil Conservation Service, 1955)

[Estimated average acre yields of wheat and alfalfa taken from Table 6 of U.S. Soil Conservation Service, (1955). Leaders (---) indicate soil not suited to crop.]

SOIL TYPE	SOIL USE		
	Range ¹ Acres	Winter Wheat ² Bushel	Alfalfa Tons
GOOD			
Banks fine sandy loam	18	10	0.6
Fort Collins loam	16	18	1.0
Gosham fine sandy loam	14	19	1.1
Renovill loam	30	14	0.5
Searing gravelly loam	30	12	0.6
Terry loamy sand	20	12	0.6
Uln clay loam	25	15	0.7
Uln loam	20	16	0.8
Uln loam, reddish subsoil phase	20	16	0.8
Average yields	21.4	14.7	0.7
FAIR			
Arvada clay loam	35	12	0.6
Arvada loam	30	14	0.5
Renovill clay loam	35	12	0.6
Renovill clay loam, rolling phase	40	---	---
Terry loamy sand, rolling phase	25	---	---
Uln clay loam, shallow phase	32	13	0.6
Uln loam, rolling phase	32	---	---
Average yields	32.7	12.7	0.5
POOR			
Arvada clay	40	---	---
McKenzie clay	35	---	---
Renovill clay	40	---	---
Rough broken ground	35	---	---
Rough broken ground (steering soil material)	40	---	---
Waban-Searing complex	---	---	---
Average yields	37.5	---	---

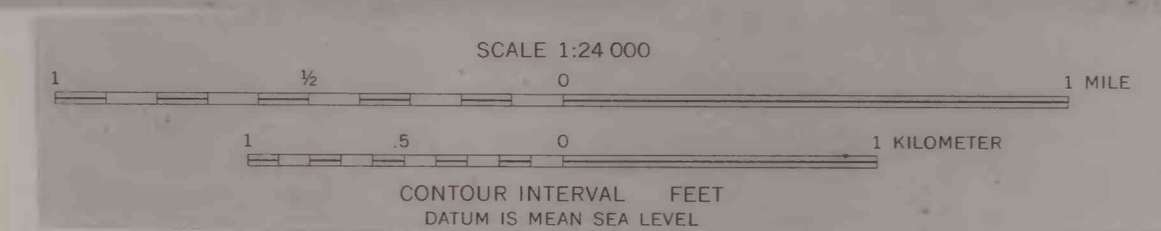
1. Approximate number of acres of rangeland required to support one animal unit (equivalent to a 1,000 lb. cow) during the grazing season without injury to the range, based on a 12-month grazing season in Campbell County.
2. Green on summer-fallowed land.

T 49 N
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MAPS SHOWING NATURAL RESOURCES AND EXISTING LAND USE
OF THE GAP QUADRANGLE, CAMPBELL COUNTY, WYOMING

By
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