Table 5-2. Surficial Map Criteria for the Central Appalachians (after Kite, 1994).

A. Type I Criteria: Age, Origin, Landform, Material.

1. Age of Surficial Material

H = Holocene (< 10,000 years old)
W = Wisconsin (ca. 89 to 10 ka)
I = Illinoian
P = Pleistocene Undifferentiated
EP = Early Pleistocene
MPl= Middle Pleistocene
LP = Late Pleistocene
Q = Quaternary Undifferentiated
CZ = Cenozoic Undifferentiated

2. Origin / Surficial Process

A. Hillslope
r = residuum (in situ regolith)
c = colluvium (mass wasting)
ds = debris slide
rf = rock fall or topple
B. Valley Bottom
a = stream alluvium (normal flow)
hcf = hyperconcentrated flow
df = debris flow
sw = slackwater deposition
C. Lacustrine
l = lacustrine deposit, undiff.
lb = lake-bottom deposit
ld = lacustrine deltaic
D. Other
g = glaciofluvial, undifferentiated
go = glacial outwash
e = eolian
co = collapse (solution)
cr = cryoturbation
x = anthropogenic disturbance
f = artificial fill
rk = bedrock (process n/a)

3. Landform Units

A. Hillslope
n = nose
sl = side slope
h = hollow
veneer = < 2m of regolith
blanket = > 2 m of regolith
bf = boulder field
bs = boulder stream
pg = patterned ground
tls = talus deposits

3. Landform Units (Cont.)

B. Valley Bottom
ch = channel
fp = floodplain (RI </= 2-3 yr)
t = terrace (t1, t2 …tn; height AMRL)
f = fan
f-t = fan terrace (f1, f2 …fn; height AMRL)
a = apron (footslope deposit)
lo = lobe
lv = levee
ox = oxbow, abandoned channel
C. Other
ft = flow track (debris flows)
hm = hummocky topography
rb = rock-block slide deposits
x = excavated, fill, disturbed ground
d = delta
du = dune

4. Material (Composition and Texture)

b = boulders (>256 mm; clast supported)
c = cobbles (64-256 mm; clast supported)
p = pebbles (4-64 mm; clast supported)
g = gravel (>2 mm; clast supported)
sg = mixed sand and gravel
s = sand (0.05-2.0 mm)
st = silt (0.002-0.05 mm)
cy = clay (<0.002 mm)
l = loam (mix of sand, silt, clay)
d = diamicton undifferentiated
bbd = very bouldery diamicton
bd = bouldery diamicton
cd = cobbly diamicton
pd = pebbly diamicton
ds = sandy matrix diamicton
dt = silty matrix diamicton
dy = clayey-matrix diamicton
rk = bedrock (modify with lithology)
rs = rotten stone, saprolite
tr = travertine
tu = tufa
ma = marl
og = organic-rich sediment
w = water
u = unkown

B. Type II Criteria: 2-D Surface Features

1. Karst
bv = blind valley
ca = cave (human entry)
Active cave passage
Abandoned cave passage
dv = dry valley
kw = karst window
sk = sinkhole (doline)
skst = sinking stream
ks = karst spring
2. Hillslope
hs = headscar
ds = debris-slide scar
ls = landslide scar undifferentiated
rs = rotational slide (slump) scar
ts = translational slide scar
rb = rock-block slide scar
tc = terracettes
3. Other
wf = water fall
w = water, lake, reservoir
Spring
wt = wetland, undifferentiated
wh = wetland, heath
wm = wetland, marsh
ws = swamp
quarry (with highwall)
gravel pit
deep mine opening
strip mine (with highwall)
mine subsidence zone
rc = rock city
Scarp
Meander scroll on floodplain
Lacustrine strandline

C. Type III Criteria: - Data Reference Points

Sandwhich symbols showing stratigraphy
Depth to bedrock (drilling or seismic data)
Minimum depth to bedrock (log data)
Test hole / boring
Well
RE = refusal (in test boring)
Hand-auger hole, shovel hole,
Fossil locality
Paleocurrent direction
Observation Point

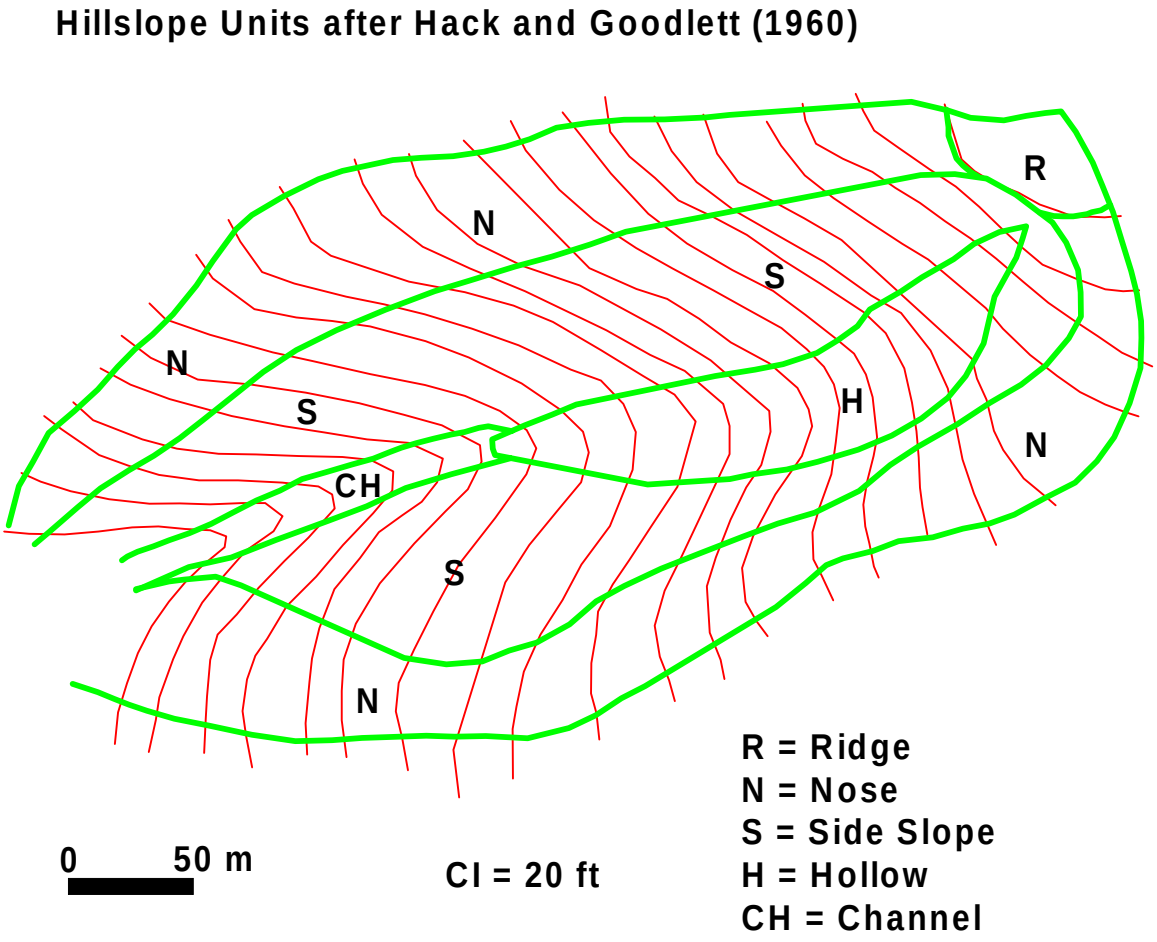

Figure 5-1. Hillslope landform elements after Hack and Goodlett (1960). Net transport flow paths are divergent on nose, covergent in hollows, and parallel on side slopes (Reneau and others, 1989). Noses represent drainage divides between zero- to first-order tributaries. Ridge crests serve as drainage divides between higher-order watersheds.

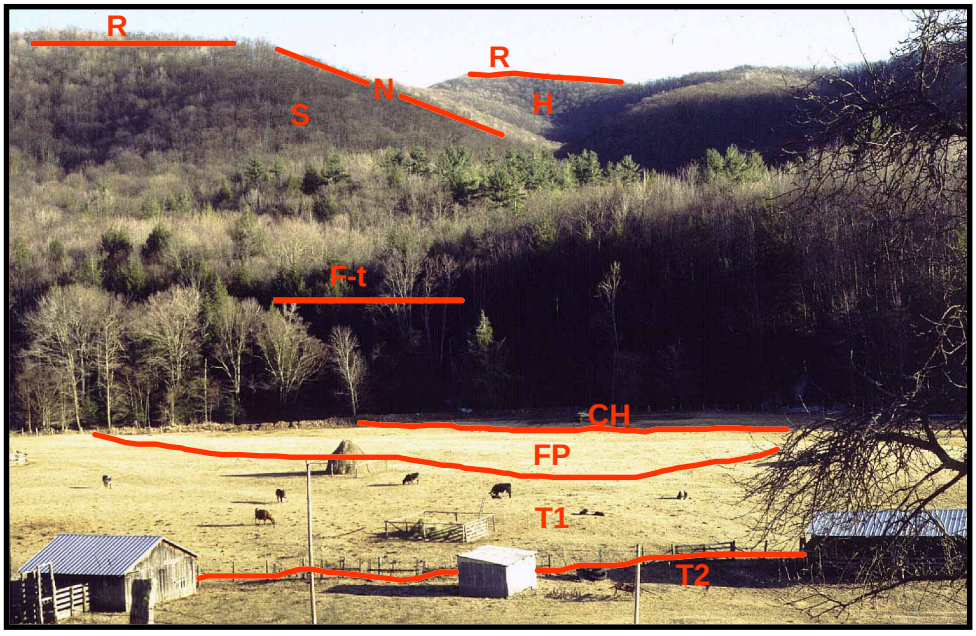

Figure 5-2. Principal landform elements recognized in the unglaciated, humid-mountainous landscape of the central Appalachians. Label identification is as follows: R = ridge, N = nose, S = side slope, H = hollow, CH = channel, FP = floodplain, T1 = low terrace, T2 = intermediate terrace, F-t = Fan terrace. Photograph is from the North Fork basin, Pocahontas County, West Virginia. See text for discussion.

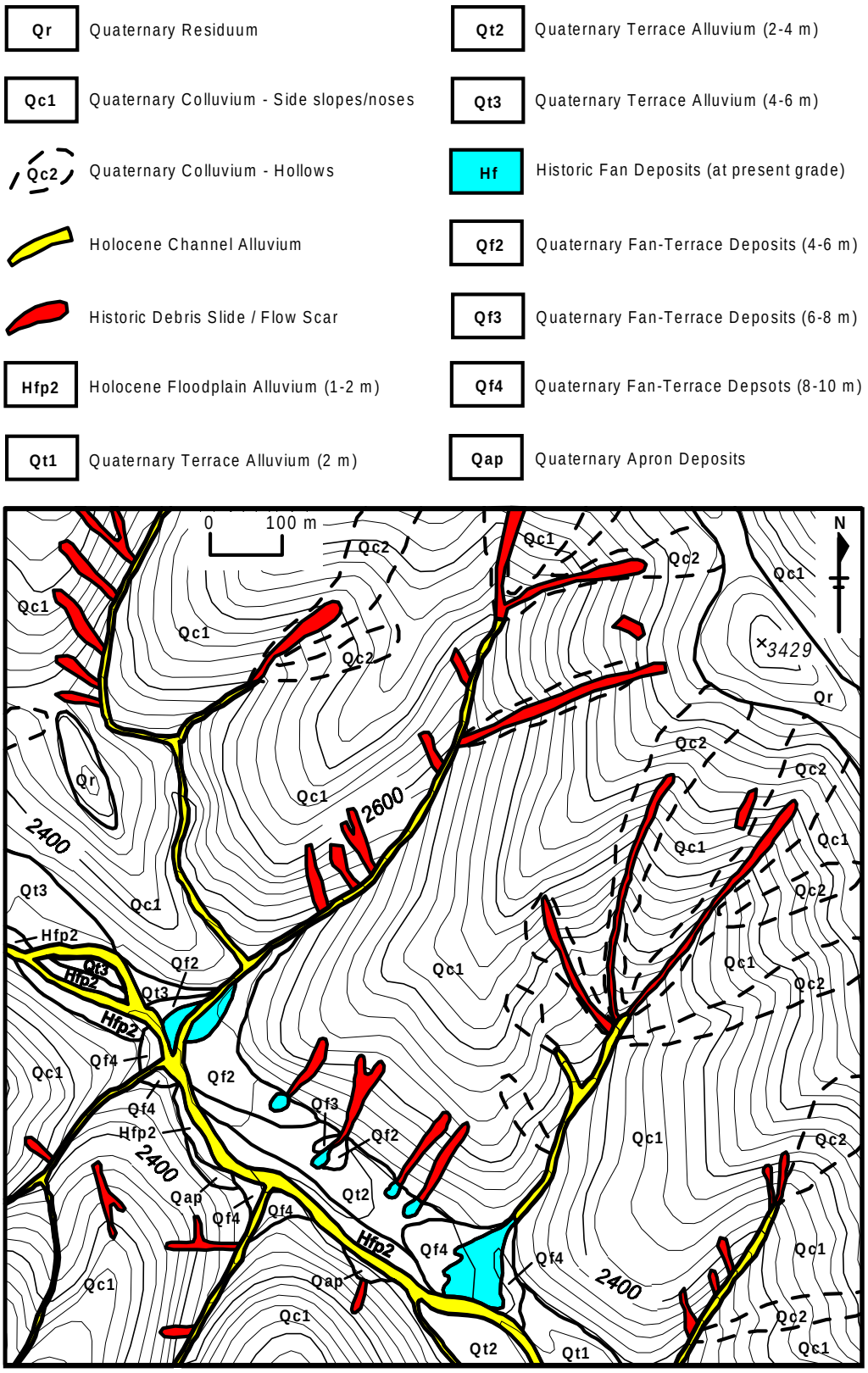

Figure 5-7. Portion of the surficial geology map for the Little River area, Augusta County, Virginia. Features were originally mapped at a scale of 1:9,600 (Taylor and Kite, 1998). Refer to Table 5-3 for an expanded explanation of map units. Contour interval = 40 ft.

Table 5-3. Example Application of Surficial Map Criteria at the Little River Basin, Augusta County, VA.

Map Unit Label	Map Unit Description	Age	Origin (Process)	Landform	Material (Texture)	Four-Fold Identifier	Comments
Qr	Quaternary Residuum	Quaternary (Undiff.)	Residuum	Ridge-Veneer	Cobble- to Boulder-Diamicton with Silty Loam Matrix	(Q,r,r-v,c-bdt-l)	Predominantly associated with ridge crests supported by the Pocono Formation.
Qc1	Quaternary Colluvium (Side Slopes)	Quaternary (Undiff.)	Colluvium	Nose-Side Slope Veneer	Cobble- to Boulder-Diamicton with Silty Loam Matrix	(Q,c1,n/s-v,c-bdtl)	Predominantly associated with side slopes underlain by the Hampshire Formation. Includes the Hazleton and Hazleton-Lehew soils series (Hockman and others, 1979).
Qc2	Quaternary Colluvium (Hollows)	Quaternary (Undiff.)	Colluvium	Hollow Veneer	Cobble- to Boulder-Diamicton with Silty Loam Matrix	(Q,c2,h-v,c-bdt-l)	Predominantly associated with zero- to first-order hollows underlain by the Hampshire Formation.
Qbf	Quaternary Boulder Field	Quaternary (Undiff.)	Colluvium (periglacial?)	Boulder Field	Cobbles and Boulders	(Q,c,bf,c-b)	Equant to irregularly shaped side slopes covered by greater than 80% cobbles and boulders. Commonly interpreted as the product of Pleistocene periglacial slope processes.
Qbs	Quaternary Boulder Stream	Quaternary (Undiff.)	Colluvium (periglacial?)	Boulder Stream	Cobbles and Boulders	(Q,c,bs,c-b)	Elongate valley-bottom areas covered by greater than 80% cobbles and boulders. Commonly interpreted as the product of Pleistocene periglacial slope processes.
Hch	Holocene Channel Alluvium	Holocene	Alluvium	Channel and Narrow Floodplain	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(H,a,ch,c-b-pl)	Fluvial channel deposits associated with first- to sixth-order streams. Unit includes channel alluvium and portions of adjacent floodplain too small to map at the given scale.
Hfp1	Holocene Floodplain Alluvium (0.5 to 1.0 m surface)	Holocene	Alluvium	Floodplain	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(H,a,fp1,c-b-pl)	Floodplain alluvium associated with second- to sixth-order streams. Unit includes low-lying surfaces 0.5 to 1.0 m above present channel grade with a flood recurrence interval of approximately 3 to 5 years.
Hfp2	Holocene Floodplain Alluvium (1.0 to 2.0 m surface)	Holocene	Alluvium	Floodplain	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(H,a,fp2,c-b-pl)	Floodplain alluvium associated with second- to sixth-order streams. Unit includes low-lying surfaces 1.0 to 2.0 m above present channel grade with a flood recurrence interval of approximately 3 to 5 years.
Hfp2A	Holocene Floodplain Alluvium (1.0 to 2.0 m surface)	Holocene	Alluvium	Floodplain	Sandy Loam	(H,a,fp2A,s-l)	Sandy slack-water deposits upstream from Hearthstone Lake. Unit includes low-lying surfaces 1.0-2.0 m above present channel grade with a flood recurrence interval of approximately 3 to 5 years. Buried root flares common.

Table 5-3 (Cont.).

Map Unit Label	Map Unit Description	Age	Origin (Process)	Landform	Material (Texture)	Four-Fold Identifier	Comments
Hfp2B	Holocene Floodplain Alluvium (1.0 to 2.0 m surface)	Holocene	Alluvium	Floodplain	Clayey Loam	(H,a,fp2B,cy-l)	Clayey slack-water deposits immediately upstream from Hearthstone Lake. Unit includes low-lying surfaces 1.0-2.0 m above present channel grade with a flood recurrence interval of approximately 3 to 5 years. Mud cracks and buried root flares common.
Hd	Holocene (Historic) Delta Deposits	Holocene (Historic)	Lacustrine Delta	Delta	Sandy Loam	(H,ld,d,s-l)	Historic lacustrine delta deposits associated with the flood-control reservoir at Hearthstone Lake.
Qt1	Quaternary Low-Terrace Alluvium (2.0 m surface)	Quaternary (Undiff.)	Alluvium	Terrace (Floodplain?)	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(Q,a,t1,c-b-pl)	Low-terrace deposits associated with second- to sixth-order streams. Unit includes low terrace surfaces 1.0 to 2.0 m above present channel grade with a flood recurrence interval greater than 5 years.
Qt2	Quaternary Terrace Alluvium (2.0 to 4.0 m surface)	Quaternary (Undiff.)	Alluvium	Terrace	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(Q,a,t2,c-b-pl)	Terrace deposits associated with third- to sixth-order streams. Unit includes terrace surfaces 2.0 to 4.0 m above present channel grade.
Qt3	Quaternary Terrace Alluvium (4.0 to 6.0 m surface)	Quaternary (Undiff.)	Alluvium	Terrace	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(Q,a,t3,c-b-pl)	Terrace deposits associated with third- to sixth-order streams. Unit includes terrace surfaces 4.0 to 6.0 m above present channel grade.
Qt4	Quaternary Terrace Alluvium (6.0 to 8.0 m surface)	Quaternary (Undiff.)	Alluvium	Terrace	Cobbles-Boulders and Pebbly Loam (rounded to subrounded)	(Q,a,t4,c-b-pl)	Terrace deposits associated with third- to sixth-order streams. Unit includes terrace surfaces 4.0 to 6.0 m above present channel grade.
Hf	Holocene (Historic) Fan Deposits (undissected)	Holocene	Alluvium - Debris Flow(?)	Fan	Cobbles and Boulders, Gravel Diamicton	(H,a-df?,f,c-bdt-l)	Historic fan deposits commonly associated with first- to second-order hollows at stream-tributary junctions. Identified by fresh deposits, disturbed and buried vegetation. Primarily the result of June 1949 flood event.
Qf	Quaternary Fan Deposits (undissected)	Quaternary (Undiff.)	Alluvium - Debris Flow(?)	Fan	Cobble- to Boulder-Diamicton with Silty Loam Matrix (subangular to rounded)	(Q,a-df?,f,c-bdt-l)	Fan deposits commonly associated with first-order hollows at stream-tributary junctions. Identified by older tree stands and lack of fresh appearance.
Qf1	Quaternary Fan-Terrace Deposits (2.0 to 4.0 m surface)	Quaternary (Undiff.)	Alluvium - Debris Flow(?)	Fan	Cobble- to Boulder-Diamicton with Silty Loam Matrix (subangular to rounded)	(Q,a-df?,f1,c-bdt-l)	Entrenched fan surfaces commonly located at stream tributary junctions. Diamicton may be crudely stratified with imbricated gravely-loam facies.

Table 5-3 (Cont.).

Map Unit Label	Map Unit Description	Age	Origin (Process)	Landform	Material (Texture)	Four-Fold Identifier	Comments
Qf2	Quaternary Fan-Terrace Deposits (4.0 to 6.0 m surface)	Quaternary (Undiff.)	Alluvium - Debris Flow(?)	Fan	Cobble- to Boulder-Diamicton with Silty Loam Matrix (subangular to rounded)	(Q,a-df?,f2,c-bdt-l)	Entrenched fan surfaces commonly located at stream tributary junctions. Diamicton may be crudely stratified with imbricated gravely-loam facies.
Qf3	Quaternary Fan-Terrace Deposits (6.0 to 8.0 m surface)	Quaternary (Undiff.)	Alluvium - Debris Flow(?)	Fan	Cobble- to Boulder-Diamicton with Silty Loam Matrix (subangular to rounded)	(Q,a-df?,f3,c-bdt-l)	Entrenched fan surfaces commonly located at stream tributary junctions. Diamicton may be crudely stratified with imbricated gravely-loam facies.
Qf4	Quaternary Fan-Terrace Deposits (8.0 to 10.0 m surface)	Quaternary (Undiff.)	Alluvium - Debris Flow(?)	Fan	Cobble- to Boulder-Diamicton with Silty Loam Matrix (subangular to rounded)	(Q,a-df?,f4,c-bdt-l)	Entrenched fan surfaces commonly located at stream tributary junctions. Diamicton may be crudely stratified with imbricated gravely-loam facies.
Qf5	Quaternary Fan-Terrace Deposits (>10.0 m surface)	Quaternary (Undiff.)	Alluvium - Debris Flow(?)	Fan	Cobble- to Boulder-Diamicton with Silty Loam Matrix (subangular to rounded)	(Q,a-df?,f5,c-bdt-l)	Entrenched fan surfaces commonly located at stream tributary junctions. Diamicton may be crudely stratified with imbricated gravely-loam facies.
Qap	Quaternary Apron Deposits	Quaternary (Undiff.)	Colluvium	Apron	Cobble- to Boulder-Diamicton with Silty Loam Matrix	(Q,c,ap,c-bdt-l)	Footslope deposits > 2.0 m in thickness. Commonly located at break in gradient between steeper side slopes and valley-bottoms.
Hds	Holocene (Historic) Debris Slide / Flow Scar	Holocene (Historic)	Debris Slide / Debris Flow	Scar	Commonly Scoured to Bedrock	(H,ds/df,sc,rk)	Slide scars associated with the June 1949 flood event. Debris slides transformed into debris flows with attendant erosion of surficial materials to bedrock. Identified by youthful and disturbed vegetation. Bedrock surfaces may be scratched and striated.