**Appendix 4**

**FEATURE DIGITIZING CRITERIA**

Feature mapping is done by digitizing the boundary of the feature as can be identified in the imagery. If more than one feature of the same type is identified in close proximity to one another, the features may be represented by one polygon and classified as “multiple” (see Table 1). Table 1 lists the user-defined fields and attributes. The digitizing criteria applicable to feature type, subtype, and if applicable, subtype description for mass movement, periglacial, and hydrological feature classes are outlined below in Tables Table 2, Table 3, and Table 4, respectively.

Table . **USER-DEFINED ATTRIBUTES**

|  |  |  |
| --- | --- | --- |
| **Field** | **Attribute** | **Notes** |
| CLASS | Mass movementPeriglacialHydrological | See Table 2See Table 3See Table 4 |
| TYPE | Feature typeUnclassified\* | See Tables 2-4 for applicable attributes |
| SUBTYPE | Feature subtype, if applicableNot applicable†Unclassified\* | See Tables 2-4 for applicable attributes |
| SUBTYPE\_DESC | Feature subtype description, if applicableUnclassified\* | See Tables 2 for applicable attributes |
| IND / MUL | IndividualMultipleNot applicable†Unclassified\* | Feature polygon represents single featureFeature polygon represents multiple features |
| ACTIVITY‡ | ActiveInactiveUnclassified\* | Fresh scarp; unvegetated surfaceRevegetated |
| MATERIAL‡ | BedrockUnconsolidated sedimentsUnclassified\* | Material in which failure occurred |
| ORIENTED§ | YesNoNot applicable† | See Table 4 |

\* “Unclassified” denotes field attribute could not be identified.

† “Not applicable” denotes field is not relevant to the feature.

‡ Field applicable to mass movement feature class only (Table 2).

§ Field applicable to hydrological feature class only (Table 4).

Table . **MASS MOVEMENT FEATURES**

| **Feature type** | **Subtype** | **Subtype description** | **Criteria** |
| --- | --- | --- | --- |
| Flow |  |  | * Exhibits a fluid character
 |
|  | Active-layer detachment |  | * Exposed soil
* Shallow failure plane
* Lack of crescent-shaped headwall
* Indicators of rapid movement: Smooth scar floor; elongated features deformed sediments at toe; extended runout onto lower gradient slope
 |
|  | Debris flow / fan deposit |  | * Fan-like deposit at bottom of slope or gully
* A discrete apex to fan
* Unvegetated scar may be visible upslope at source area and along path
 |
|  | Retrogressive thaw slump |  | * Steep headwall (although can be gentle if stable)
* Crescent-shaped headscarp, may have multiple crescent-shaped headscarps
* Deep failure (deeper than an active-layer detachment)
* Lower scar area: signs of flow; zone of accumulation if not next to lake (large area of accumulation implies ongoing sediment supply)
* Enlargement through time.
 |
|  | Solifluction |  | * Lobate toe
 |
|  |  | Lobe | * Sloped surface
* Isolated tongue-shaped feature(s)
* Largest dimension perpendicular to contour
 |
|  |  | Sheet | * Smooth, sloped surface
* Striping perpendicular to contour
 |
|  |  | Terrace | * Sloped surface
* Step with straight or lobate front
* Largest dimension parallel to contour
 |
|  | Rock glacier |  | * Lobate body with steep frontal slope
* Longitudinal or transversal flow features (ridges and furrows)
* Surface texture differs from surrounding slopes
* Mountainous terrain, typically below a steep rockwall
* Gravel/boulder covered
 |
| Slide |  |  | * Evidence of rigid movement
* Debris in more or less intact blocks
 |
|  | Rotational slide |  | * Rigid, back-tilted block of sediment displaced downslope
* May be one or a series of stepped blocks
* Curved failure plane
* Common along riverbanks
 |
|  | Translational slide |  | * Planar failure, usually bedrock plane
* Mountainous areas or riverbanks
 |
|  | Shoreline slump |  | * Over-steepened shoreline
* Headscarp parallel to shore
* Vegetation different from surrounding terrain
 |
| Fall |  |  | * Primarily in rocky, mountainous terrain and areas of steep rock slopes
* Blocky deposit at slope base
* Near vertical headwall
 |
| Topple |  |  | * Evidence of forward rotation of mass due to gravity
 |
|  | Block failure |  | * Toppled blocks of cemented sediment found along river banks and coastlines
 |
| Complex |  |  | * Evidence of more than on type of failure mechanism
 |

Table . **PERIGLACIAL FEATURES**

|  |  |  |
| --- | --- | --- |
| **Feature Type** | **Subtype** | **Criteria** |
| Ice-wedge polygon |  | * Polygonal surface pattern
 |
| High-centre | * Light-coloured centre
* Lacks ridges along troughs
 |
|  | Low-centre | * Dark-coloured or ponded water at centre
* Ridges bounding troughs
 |
|  | Undifferentiated | * Can not identify if high- or low-centre

\*Label according to majority of subtype within polygon |
| String / net fen |  | * Narrow ridges of peat with fen vegetation or small pools in depressions
* String: ridges roughly parallel and perpendicular to flow
* Net: net-like pattern, anastomosing of ridges
 |
| Palsa |  | * Discontinuous permafrost
* Circular or oval; less than 100 m in diameter
* Notable elevation difference with respect to surrounding terrain
* Typically adjacent to wetland or stream
 |
| Peat plateau complex |  | * Similar to palsa but irregular in shape and more extensive (up to several square kilometres)
* Elevated (~1.2m), flat surface
* Commonly surrounded by fen
 |
| Pingo |  | * Conical mound
* Circular or oval base
* Closed system (within lake basin)
* Open system (near base of slope)
* Collapsed features – circular; ramparts surrounding a lower centre
 |
| Thermokarst mound |  | * Network of distinct and regularly shaped, conical mounds separated by troughs
* Network similar to ice-wedge polygon network
* Occur in groups
 |
| Lithalsa |  | * Discontinuous permafrost
* Near open waterbody
* May be circular or crescent-shaped
* Frost-susceptible soils (silt and clay)
 |

Table . **HYDROLOGICAL FEATURES**

|  |  |  |
| --- | --- | --- |
| **Feature Type** | **Subtype** | **Criteria** |
| Beaded stream |  | * Series of small water bodies connected by a watercourse
* Drainage pattern may be angular
 |
| Drained-lake basin |  | * >90% of former shoreline can be delineated with confidence
* Drainage channel
* Change in vegetation
 |
|  | Fully drained | * > 75% drained
 |
|  | Partially drained | * 25-75% drained
 |
| Icing |  | * Areas of ice present when rest of map area is snow-free
* Contiguous areas of dead riparian vegetation
* Common in river valleys and at breaks in slope
 |
| Lake / pond affected by thermokarst |  | * Lake/pond with degradation apparent along shoreline
* Enlargement through time (if multiple images are available)
* Evidence of retrogressive thaw slumps, shoreline slumps, block failures, or degrading ice-wedge polygons along shoreline
 |
|  | Oriented | * Long axis of lake has similar orientation as surrounding lakes
 |
| Thermokarst gully |  | * Steep-sided trench or channel
* May be found within ice-wedge polygon network, extending from a drained lake basin or linear structure (i.e. road culvert)
 |