





COMMISSION GÉOLOGIQUE DU CANADA

GEOLOGICAL SURVEY OF CANADA

B





Maps A–D are reconstructions of drainage systems, glacial ice limits, and geomorphic features drawn on a shaded relief digital elevation model at a scale of 1:750 000.

Map A Speculative preglacial drainage

Prior to glaciation (Map A), Yukon River flowed to the south at a level of at least 120 m above its contemporary bed. It may have alternated between channels A and B (the contemporary valleys of Yukon and Nordenskiold rivers, respectively) in the area of Carmacks. In the southwest, the drainage now tributary to Klaza River followed the valley of Lonely Creek southeastward. A low stream divide (C) was breached presumably during the subsequent pre-Reid glaciations. In the northwest, the deep, narrow canyon of the contemporary Yukon River was occupied by a stream divide separating the preglacial Yukon River basin from the preglacial Stewart River basin (D). This was also breached during the subsequent pre-Reid glaciations. Along the northern boundary of Carmacks map area, terrain now drained by Grand Valley and Lava creeks (Map B) into the Stewart River basin, flowed south. Drainage divide E prevented northwestward flow. Drainage in the northeast was dominated by preglacial Willow Creek. The segment of Pelly River between Fort Selkirk and Willow Creek was occupied by drainage divide F. East of preglacial Willow Creek, Pelly River and Needlerock Creek may have been local, minor streams. Divide G formed part of the headwaters of preglacial Pelly River. The main flow from what is now Pelly River basin may have followed a

Map B Pre-Reid glaciations

The last of at least two pre-Reid glaciations ended more than three-quarters of a million years ago. Erosion and colluviation have eroded or buried most of the deposits of these glaciations beyond the limit of ice cover during the subsequent Reid and McConnell glaciations (which removed all evidence of older glaciations). Eroded cirque-like features in Dawson Range and till deposits of entirely local provenance in this area indicate that cirque glaciers or ice caps existed there during the pre-Reid events. Elsewhere, glacier ice from the east and southeast generally flowed west-northwest across the area. Probably only scattered peaks in Dawson Range escaped glaciation. The reversal of Yukon River drainage and its diversion west into Stewart River basin were glacially induced. Breaching of stream divides in the Klaza and Lava-Grand Valley creek basins also occurred. The cutting of the valley of Pelly River between Fort Selkirk and Willow Creek and the breaching of drainage divide G (Map A) created a Pelly River course similar to the contemporary one. In the area of P, the course initially ran from P to R. Granite Canyon (G-G'), the contemporary course, was cut by glacial diversion of Pelly River either during the Reid or McConnell glaciations. It is not possible to determine when other crossupland glaciofluvial drainage system such as U (northeast of Carmacks) were initally cut. The last pre-Reid glaciation was accompanied by extensive fissure eruptions of basalt in the Fort Selkirk area and the subglacial eruption of Ne Ch'e

Map C Reid Glaciation

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Figure 3. Preglacial drainage and ice limits.

FIGURE 3 GSC Bulletin 539