

Geological Bridges of Eastern Canada NATMAP Project: bedrock mapping in Restigouche County, New Brunswick

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Geological Bridges of Eastern Canada is a multi-agency NATMAP program focussing on the Laurentian Margin and Appalachian Foreland. The “bridges” consist of several geotraverses, two of which transect the Restigouche area of northern New Brunswick, which is underlain by Late Ordovician to Middle Devonian rocks of the Gaspé Belt. In 1997 and 1999, regional multi-parameter airborne geophysical surveys were followed by stream and till geochemical surveys in order to stimulate exploration for potential porphyry and skarn mineralization in this area. Geological mapping began in 1999 in the Popelogan-Charlo River and Kedgwick areas.

The oldest rocks in the area are arc-related mafic volcanic rocks of the Mid to Late Ordovician Goulette Brook Formation, and overlying Caradocian black slates and cherts of the Popelogan Formation. Together, these constitute the Balmoral Group, an inlier of Dunnage Zone rocks exposed in the core of the Popelogan Anticline. In the Popelogan area, the

Balmoral Group is disconformably overlain by Upper Ordovician to Early Silurian rocks of the Matapedia Group, which consists of interbedded calcilutite, calcareous shale and minor calcarenite deposited as turbidites on a submarine slope.

The Matapedia Group is conformably overlain by the Silurian Chaleurs Group, which comprises, from oldest to youngest, the Upsalquitch, LaVieille (locally), Bryant Point and Benjamin formations. West of the Popelogan Anticline, the Upsalquitch Formation consists dominantly of thin-bedded, fine-grained calcarenite, calcilutite and calcareous siltstone, whereas east of the anticline, it consists mainly of thin-bedded, micaceous, weakly calcareous siltstone and fine-grained sandstone. The Upsalquitch Formation is commonly bioturbated and fossiliferous, and is interpreted to have been deposited in an outer shelf environment. The LaVieille Formation consists of nodular to massive fossiliferous limestone and minor calcareous fossiliferous siltstone. The

Bryant Point Formation is mainly composed of porphyritic, amygdaloidal mafic volcanic rocks, and the Benjamin Formation comprises maroon to red, commonly flow banded rhyolite.

The Kedgwick area is divisible into eastern and western domains separated by the northeasterly striking McKenzie Gulch Fault. West of the fault, the area is underlain by the Late Ordovician Grog Brook Group, which can be divided into a sandstone-dominated facies to the west, and a mudstone-dominated facies to the east. Grog Brook sandstones are fine to medium grained, light to medium-grey, generally weakly calcareous, and display bedforms typical of turbidite deposits. The mudstone-dominated facies is composed of thinly bedded siltstone and local shale, including a distinctive thin unit of carbonaceous, pyritiferous shale near

the top of the sequence.

East of the McKenzie Gulch Fault, the area is underlain by the Balmoral Group, Matapedia Group and Upsalquitch Formation, in ascending order. The Balmoral Group is represented by the Popelogan Formation (chert and slate), and overlying siltstones and fine grained sandstones ("Pat Brook beds") that are stratigraphically equivalent to, but lithologically unlike the Grog Brook Group. The gradationally overlying Matapedia Group consists of interbedded calcilutite, calcareous shale and local calcarenite. The Upsalquitch Formation is composed of thin- to medium-bedded, micaceous, calcareous sandstone, siltstone and weakly calcareous shale, overlain by thin-bedded, bioturbated, fossiliferous, calcareous siltstone and sandstone.