Smoothing Stones

Roger Eldridge

This article describes an artifact type recently identified in the Rocky Mountain Trench in northeastern BC. These tools, dubbed 'smoothing stones' for their possible intended function, are markedly different from typical abraders. It is suspected that this tool may be represented in the wider region but examples were not found during a cursory desktop search. It is hoped that this description of the setting, context, and tool features will encourage discussion and that additional examples in the archaeological record may come to light.

The setting for these tools is the Finlay Valley, now the Finlay Reach of the Williston Reservoir. The present day landscape of the Finlay Reach was shaped by a complex series of geomorphological changes. Following several late Pleistocene glacial advances, deglaciation events 12,000 years ago resulted in the formation of one or more large glacial lakes and deposited deep layers of glaciolacustrian silt and sand in the Finlay Valley (Rutter 1977; M. Eldridge, Parker, Clague, et al. 2013). Wave cut benches, representing paleolake shorelines, were formed in these glaciolacustrian sediments during a succession of glacial lake stands, around the time that people likely first entered the Trench (Eldridge, Eckert, Ramsay and Parker 2014). The lake shores were stranded as the lakes drained, becoming long, low (1-2 m high) terraces within the study area (several larger glaciolacustrian terraces are also present in some areas at much higher elevations). The Finlay River, meandering southwards, cut down through the deep glacial silt and was eventually joined by small dendritic drainages, originating in side valleys and directed by moraines, the stranded terraces, and isostatic tilt. Throughout the climatic changes of the Holocene, the environment changed too, eventually becoming a forested valley of spruce, poplar, peat bogs, and wildlife typical of the modern Boreal environments of northeastern BC. People lived along these lakeshores, drainages and throughout these environmental changes, and left much evidence of their life. In 1824, the earliest European-led party met with Sekani peoples inhabiting the Finlay Valley and surrounding area and through to the present day, Sekani people continue to live in this section of the Rocky Mountain Trench (Black 1955).

Through the late 19th and early 20th centuries, the region also saw establishment of an Hudson's Bay Company (HBC) fur trading fort, a minor gold rush, and industry including forestry. In the late 1960s, the Williston Reservoir was constructed and lower sections of the Finlay River were inundated, becoming the largest man-made lake in BC. The reservoir has an elevation similar to that of the glacial lake(s) which once lay in the valley. Since then, as a result of continued seasonal cycles of reservoir drainage

Figure 1. Ground facets visible on smoothing stone HdSd-369:467 (photo: R.Eldridge).

Figure 2: Smoothing stone HdSd-372:9. Ground facet and darkened worn areas indicated by arrows. (photo: R. Eldridge)

and recharge, the flat expanses of glaciolacustrian sediments have become de-vegetated and continue to erode down to the oxidized C horizon and beyond in most areas of the reservoir drawdown zone (Eldridge, Parker, Clague, et al. 2013). While erosion and re-deposition have resulted in many topographic changes within the drawdown zone, many of the pre-reservoir macro and microtopographic features of the landscape remain identifiable, sometimes only through 3D GIS modelling.

Cultural Resource Management work in the last two decades within the drawdown zone of the Finlay Reach has revealed a landscape-wide archaeological assemblage of over 15,000 artifacts across a nearly 10,000 hectare study area (Arcas Consulting Archeologists Ltd. 2004, 2007; Begg 2008; Eldridge, et al. 2008; Eldridge, et al. 2011; Eldridge, et al. 2010; Eldridge, et al. 2009; Eldridge and Eckert 2013, 2014; Eldridge, Eckert, Ramsay and Gretzinger 2014; Eldridge, Eckert, Ramsay and Parker 2014; Eldridge, Parker, Ramsay 2013; Howe and Brolly 2008; Ramsay 1996; Western Heritage Services 1997). The archaeological assemblage demonstrates use of the landscape by people from the terminus of the Pleistocene through the historic period. The archaeological lithic assemblage could be considered typical of those left by people with a mobile, seasonal hunting-gathering subsistence strategy. Common artifact types include, but are not limited to, flake debitage, retouched or utilized flake tools, projectile points, bifaces, scrapers, and spall tools. The most common material types are high quality chert and obsidian, which account for approximately 75% and 10%, respectively, of the lithic assemblage; other materials include chalcedony, quartzite, schist, and sandstone. Identified archaeological features include hearths containing fire-altered rock, calcined bone, and lithic caches.

The smoothing stones are rare in the artifact assemblage, and are made of uncommon material types. Six complete or broken smoothing stones with a distinctive use pattern have been identified as schist, shale, or slate (Figure 1). The form of the stones varies from long sub- rounded and subangular boulders or cobbles to narrow 'fingers' of stone. The six schist/slate examples share traits including use wear patterns, material type, and context. The artifacts are characterized foremost by their use wear which is represented by a flat or faceted surface, with shallow, thin, parallel striations on most examples. Other examples, including HdSd-371:645, exhibit use-wear only as darkened, polished areas. Other artifacts with similar wear, but made of different material types, such as HdSd-371:606, have also been observed including

Figure 3. Smoothing stones found in 2015. Top to bottom HdSd-371:645, HdSd-369:635, HdSc-45:225. Arrows indicate facets or other areas of wear. (photo: R. Eldridge)

a well rounded, flattened diorite boulder with similar wear.

The striated facets appear to be related to the use of the finished tool rather than to its shaping; the striations are always unidirectional on their own facet and the form of the original cobble is not otherwise modified. Polish is common on the striated facets, sometimes to a gloss, and is often also present on the ends, edges, ridges, and prominent areas. The facets suggest use of a very focused area of the stone, while wider darkening and polish suggests use of more expansive areas.

Further notes on use wear

The parallel striations of facets on the smoothing stones suggests repetitive unidirectional use (Figure 4, Figure 5). The resultant weed is different than the wear seen on sandstone abraders common in other parts of BC, particularly along southern coastal regions. Wear on 'typical' abraders is often characterized by relatively extensive flat or dished areas which are smoother or more polished than unmodified parts of the stone. A very small number of sandstone abraders have been found in the Finlay Reach, including a shaped sandstone atl-atl shaft smoother, but these are markedly different than the smoothing stones.

Rounding or abrasion on tools made of silicate materials (chert, obsidian) has been attributed to repetitive use on soft materials such as hide (Tringham, et al. 1974; Wiederhold 2004) and the smoothing and polish on the stones may be similarly consistent with contact with a soft material. The deepest linear striations on some examples are, however, more consistent with use on hard materials. Experimentation with schist or slate on different material types (e.g., hide, wood) could aid the interpretation of use for these artifacts. Artifact HdSd-371:606, composed o dDiorite ston606lacks facets but exhibits wear as rounding and polish, mostly on prominent areas of the stone. A seam of hard quartz or similar on the highest point of one face also shows abrasion lelparallel striations (Figure 5).

Figure 4. Areas of wear on smoothing stone HdSc-45:225 as indicated by striations (left) and facet (right). (photo: R.Eldridge)

The diversity of forms, from small 'fingers', to long rectangular blocks and boulders suggests that these tools were being utilized on different scales. Alternatively, similar looking wear was created by different functions. The characteristics of the stones are similar enough that they were likely chosen for their surface texture and hardness.

Artifacts from the Finlay Reach not classified as smoothing stones, but with a similar polnes, have been edge modified through percussion to create roughened areas. These artifacts are similar to those used by Tahltan people in the later stages of hide preparation, during the dressing stage when the smoked hide was softened and made pliable (Albright 1984). Specially flaked coarse grained basalt tools with a dull edge were utilized and would become highly polished with repeated use (Albright 1984). While the Finlay Reach examples (e.g. HdSd-370:589) exhibit similar smoothing and poli9) to observed ethnographic examples (e.g. Albright (1984), RBCM public display), they do not appear to exhibit the striated, flat facets of the smoothing stones.

The smoothing stones are spatially correlated with relatively dense and diverse clusters of archaeological material at the edges of dendritic creeks. None of the smoothing stones were considered isolated finds. All stones have been found on the flat tread of terraces above a creek, within approximately 50 m of the terrace edge. A GIS based search for artifacts within an arbitrary 50 m radius from all individual smoothing stones was conducted to determine the general composition of nearby artifact types. Between four and nine additional artifact types were present in each of these areas (more types on average than for randomly selected artifacts). All smoothing stones were within 50 m of flake debitage and flake tools and four were associated with projectile points, scrapers, abraders and bifaces. Spall tools, cores, blades, and choppers were nearby in some instances. The general association with more diverse clusters of artifacts could indicate that these were used at longer term living areas, or are at least related to places on the landscape more often frequented by people.

The scarcity of smoothing stones in the overall assemblage could have several possibilities such as a

Figure 5. Close-up of wear on diorite smoothing stone HdSd-371:606. (photo: R. Eldridge)

narrow temporal period, or a tool that was disposed of/deposited differently than other tool types. It is also possible that these tools are not as often recognized as artifacts during survey as the subtle wear patterns are easy to overlook. The increase in identification of these tools in recent years suggests the latter, although they remain a rare tool tynt ofEstablishing a chronology for the creek courses and stabilization of the terrace edges as they existed prior to reservoir inundation would provide a more narrowed range for the age of the smoothing stones found along the creeks. The creeks intersect one particular long glacial lake strandline which was found to be significantly correlated with Alberta and Cody Complex artifacts, which date to 11,000 and 8700 cal BP (Knell and Muniz 013)). These relationships suggest a terminal age for the strandline, and a maximum age for the creeks and at least some of the smoothing sto (R. Eldridge, Eckert, Ramsay and Parker 2014).

In summary, the smoothing stones do not represent a common tool in the Finlay Reach, but one that has been found at multiple sites. The wear is distinctive and the material types appear to have been selected for their characteristics. While the wear is similar to that seen on hide dressing stones, other wear is clearly different and the specific function of the tools is unknown. The stones are probably mid to late Holocene, but no refined dates can be offered at this point. It is hoped that more examples of, or information about these artifacts will come to light, particularly those in the broader northeast region.

Bio:

Roger has been involved with BC archaeology since 2004 and he received a BA in Anthropology at the University of Victoria in 2011. His area of interest is in lithic technology and landscape archaeology and he has been conducting archaeology work in the northern Rocky Mountain Trench for nearly a decade.

References:

Albright, Sylvia

1984 Tahltan Ethnoarchaeology. Simon Fraser University.

Arcas Consulting Archeologists Ltd.

2004 Finlay Reach Archaeological Study: Permit 2003-218 Final Report.

2007 BC Hydro 2007 Finlay Dust-Abatement Project, Archaeological Impact Assessment: Heritage Inspection Permit 2007-129.

Begg, Matt

2008 A Lost World Revealed: Recent Archaeological Research in the Finlay Reach of Williston Reservoir, Northeastern British Columbia. Paper presented at the The 61st Annual Northwest Anthropological Conference, Victoria, BC.

Black, Samuel

1955 A journal of a voyage from Rocky Mountain portage in Peace River to the sources of Finlays Branch and north west ward in summer 1824, edited by E. E. Rich, pp. c, 260 p. Hudson's Bay Record Society, London.

Eldridge, Morley, Jo Brunsden, Alyssa Parker and Roger Eldridge

2008 Permit 2008-0179 BC Hydro 2008 Williston Dust Abatement Project Archaeological Impact Assessment Final Report. Prepared by Millennia Research Limited for BC Hydro. On file with the B.C. Archaeology Branch.

Eldridge, Morley, Alyssa Parker, John Clague and Steven Vickers

2013 Peace Erosion Monitoring Archaeological Resources Year 3 Report GMSMON 21B. Williston Reservoir, Dinosaur Reservoir, and Peace River. Report on file with BC Hydro.

Eldridge, Morley, Vashti Thiesson, Roger Eldridge, Alyssa Parker, Andrew Eckert and Ryan Blackburn

2011 Permits 2008-0179 and 2011-0127 BC Hydro 2011 Williston Dust Abatement Project: Annual Report on Archaeological Impact Assessments and Site Alterations. Prepared by Millennia Research Limited for BC Hydro. On file with the B.C. Archaeology Branch.

Eldridge, Morley, Vashti Thiesson, Alyssa Parker and Roger Eldridge

2010 BC Hydro 2010 Williston Dust Abatement Project Archaeological Impact Assessment

Final Report. Prepared by Millennia Research Limited for BC Hydro. On file with the B.C. Archaeology Branch.

Eldridge, Morley, Vashti Thiesson, Alyssa Parker, Roger Eldridge, Lenore Thompson, Meghan Fisher and Andrew Eckert

2009 Permit 2008-0179 BC Hydro Dust Abatement Project Archaeological Impact Assessment 2009 Final Report. Prepared by Millennia Research Limited for BC Hydro. On file with the B.C. Archaeology Branch.

Eldridge, Roger and Andrew Eckert

2013 Permit 2013-0148 Williston Reservoir Archaeology Program: An Archaeological Inventory and Impact Assessment Year One. Prepared by Millennia Research Limited for BC Hydro.On file with the B.C. Archaeology Branch.

2014 Permit 2014-0117 Williston Reservoir Archaeology Program. An Archaeological Inventory And Impact Assessment: Year Two. Interim Report. Prepared by Millennia Research Limited for BC Hydro. On file with the B.C. Archaeology Branch.

Eldridge, Roger, Andrew Eckert, Phoebe Ramsay and Kristine Gretzinger

2014 Permits 2013-0121, 2011-0127 BC Hydro 2013 Williston Dust Abatement Project: Report on Archaeological Impact Assessments and Site Alterations. Prepared by Millennia Research Limited for BC Hydro. On file with the B.C. Archaeology Branch.

Eldridge, Roger, Andrew Eckert, Phoebe Ramsay and Alyssa Parker

2014 Permits 2013-0121 and 2011-0127.

2014 Williston Dust Abatement Project: Final Report on Site Alterations. Millennia Research Limited.

Eldridge, Roger, Alyssa Parker, Phoebe Ramsay and Andrew Eckert

2013 Permits 2008-0179 and 2011-0127 BC Hydro 2012 Williston Dust Abatement Project: Final Report on Archaeological Impact Assessments and Annual Report on Site Alterations. Prepared by Millennia Research for BC Hydro. On file with the BC Archaeology Branch.

Howe, D. Geordie and Richard Brolly

2008 Out of the Muskeg: Projectile Points from British Columbia's Northeast. In Projectile Point Sequences in Northwestern North America, edited by R. L. Carlson and M. P. R. Magne, pp. 303-320. Archaeology Press, SFU, Burnaby, BC.

Knell, Edward J. and Mark P. Muniz

2013 Introducing the Cody Complex. In Paleoindian lifeways of the Cody Complex, edited by E. J. Knell and M. P. Muniz, pp. 3-30. University of Utah Press, Salt Lake City, Utah.Ramsay, Charles

1996 A preliminary evaluation of three archaeological localities in the Williston Lake area, north central British Columbia. Permit 1996-092. Western Heritage Services Inc. Copies available from Archaeology and Registry Services Branch and Tsay Keh Dene Band.

Rutter, N.W.

1977 Multiple Glaciation in the Area of Williston Lake, British Columbia. Geological Survey of Canada.

Tringham, Ruth, Glenn Cooper, George Odell, Barbara Voytek and Anne Whitham

1974 Experimentation in the Formation of Edge Damage: A New Approach to Lithic Analysis. Journal of Field Archaeology 1(1/2):171-196.

Western Heritage Services

1997 The Mackenzie Timber Supply Area Archaeological Overview Assessment Final Report: Heritage Potential Modeling. Archaeology Branch.

Wiederhold, James Edward

2004 Toward the standardization of use-wear studies: constructing an analogue to prehistoric hide work. MA Thesis, Archaeology, Archaeology Department, Texas A&M University.