Supplementary Data

**Post-Bonneville Flood Terrace Stratigraphy and Geochronology**

*Qt1 terrace (~13.2 ka)*

 The stratigraphy of Qt1 terrace deposits consists of three lithofacies units (Fig. 5). The basal unit (lithofacies 2) consists of ~20 m-thick gravel of the Bonneville Flood. The basal gravel is overlain by ~2.0 m-thick, massive, silty sand deposit of lithofacies 4a (Fig. 7). The bottom of lithofacies 4a is a planar depositional boundary defined by SB 1. The top of lithofacies 4a is marked by a wavy erosional boundary with alluvial fan deposits that defines SB 4. The overlying alluvial fan deposits consists of ~3.5 m-thick, moderately stratified, poorly sorted, silty sand with angular gravel and cobble of lithofacies 7a (Fig. 7).

 Luminescence analysis of a single sample from near the base of lithofacies 4a at a depth of 4.5 m returned an OSL age of 13.16 ± 0.99 ka (Table 2). The sample was taken from lithofacies 4a after exposing a clean vertical face, which involved excavating through a thin mantle of hillslope colluvium; however, the deposit sampled showed little to no evidence of disturbance from mass-wasting (e.g., landsliding). An additional age constraint at the site is from 14C analysis of a bivalve shell recovered from colluvium at ~2 m below the top of the exposure, coinciding with the middle section of lithofacies 7a (Fig. 7). The sample was poorly preserved and consisted of 50% whole shell. The bivalve shell was identified as a mussel belonging to either *Margaritifera* sp. or *Gonidea* sp. The mussel shell yielded an AMS 14C date of 10,112 ± 34 yr BP that was corrected for reservoir effect to 7572 ± 440 yr BP [9440–7590 cal yr BP] (Table 1; Fig. 7). Although the mussel shell was not found in situ, and given that it may have eroded out of Qf1 deposits, the 14C date provides a maximum age for the middle section of lithofacies 7a to Early Holocene with a mean probability age of ~8440 cal yr BP. Nonetheless, the stratigraphy and ages at the site indicate two episodes of geomorphic modification at the site, including major Snake River aggradation at ~13.2 ka followed by alluvial fan deposition bounding ~8.4 cal ka.

*Soils-geomorphology*

 Soils exposed at Site Qf1/Qt1 include a moderately to well-developed soil with a Bk horizon extending across SB 4 from the lower section of lithofacies 7a into the upper section of lithofacies 4a, as well as possible buried and less developed soils in the upper section of lithofacies 7a. The degree of Bk-soil development observed within Qf1 soils is greater than the soil described at other sites on younger Qf2 deposits. (See Supplemental Material for detailed soil descriptions).

*Qt2 terrace (~11.3 and 8.8 ka)*

 The stratigraphy of Qt2 terrace deposits consists of four lithofacies units (Fig. 5). The basal unit (lithofacies 1 and 2) consists of ~18 m-thick package of gravel and basalt blocks emplaced by the Bonneville Flood. The basal units are overlain by ~2.0 m-thick, massive, silty sand deposit of lithofacies 4b (Fig. 7). The bottom of lithofacies 4b is a planar depositional boundary defined by SB 2. The top of lithofacies 4b is marked by a wavy erosional boundary with alluvial fan facies that defines SB 9. The overlying alluvial fan facies consists of a thin ~0.75 m-thick deposit of poorly sorted silty sand with fine gravel of lithofacies 7c (Fig. 7).

 Site Qf2/Qt2 is located on the west side of the river below steep canyon walls in areas upstream of channel constriction #3 (Figs. 2C and 3). Stratigraphy described at site Qf2/Qt2 is well exposed along bluffs and shows a ~7 m thick section of post-flood Snake River channel fill deposits overlain by alluvial margin and alluvial fan deposits, consisting of four lithofacies units (Fig. 7). The basal unit of lithofacies 2 is a ≥8 m-thick Bonneville Flood gravel and is overlain by ~2.0 m-thick silty sand Qt2 terrace deposits of lithofacies 4b, which have a lower boundary defined by SB 2 (Figs. 5 and 6). The top of lithofacies 4b is marked by a planar boundary with fluvial/alluvial margin facies that defines SB 3. The fluvial/alluvial margin facies consists of a ~1–2 m-thick deposit of moderately stratified, well- to poorly-sorted sands with fine gravel of lithofacies 6a (Fig. 7). The entire section of fluvial and fluvial/alluvial margin sediments is overlain by an ~3 m of poorly-stratified and -sorted alluvial fan deposits assigned to lithofacies 7a and 7b, which are separated by wavy erosional contacts and buried soils defined by SB 4 and SB 7 and correlate to alluvial fan map units Qf1 and Qf2, respectively, based on 14C dates, relative soil development defined by buried soils, and cross-cutting relations with Qt1 and Qt2 terraces (Figs. 3 and 7).

 Luminescence analysis of samples from sites Qt2-1 and Qt2-2 near the base of lithofacies 4b at depths of 1.7 and 0.8 m returned OSL ages of 8.78 ± 0.58 and 11.29 ± 1.11 ka, respectively (Table 2; Figs. 3 and 7). Although the *De* distributions from these samples suggest that both have been sufficiently bleached prior to deposition, and the two ages are from depths near the base of lithofacies 4b, the 1σ uncertainties of the ages do not overlap. Taken together, the OSL ages indicate two episodes of Qt2 aggradation centered at ~11.3 and 8.8 ka. A lack of Qt2 aggradation between ~10.2 and 9.4 ka is supported by the age of three mollusk shells sampled from shell-rich gravel lag (lithofacies 3a) fluvial facies within Qt4 terrace deposits (Fig. 7). The in situ and well preserved shells returned reservoir-corrected 14C ages between 11,740 and 8460 cal yr BP, indicating the river was much lower and supported a diverse mollusk population structure at this time prior to the later episode aggradation (Table 1). The range of median 14C ages of the mollusks fall within the gap of the 1σ uncertainties between the two OSL ages and collectively provide an estimate for the timing and magnitude of two post-flood Snake River cut-and-fill cycles during the Early Holocene (Fig. 8A).

 An age constraint for alluvial fan deposition on the Qt2 terrace is from 14C analysis of detrital charcoal within thin alluvial fan deposits at ~0.2 m below the top of the exposure at site Qt2-1 (Fig. 7). The charcoal yielded a modern 14C date of 77 ± 25 yr BP (Table 1). The date indicates the youngest Qf3 alluvial fan units, represented by lithofacies 7c deposits and defined by sequence boundary 9, are actively being deposited in the study area.

*Soils-geomorphology*

 Soils at sites Qt2-1 and Qt2-2 have been eroded and/or modified by agricultural activities and erosion along the edge of the terrace. A very thin (<25 cm) surface soil has formed on lithofacies 7c and appears to overprint the remnants of a truncated, moderately to strongly developed calcic soil that formed on lithofacies 4b. The stratigraphic section of site Qf2/Qt2 in the southern reach of the study area, however, is more complete and composed of numerous buried soils indicating periods of geomorphic stability and soil formation punctuated by depositional events during the Early Holocene. Multiple, thin (~10–50 cm), buried Bwk-Ck horizons observed on lithofacies 4b are likely controlled in part by subtle variations in the sedimentology and stratigraphy of sediments in the deposit. Evidence of bioturbation (fine and very fine faunal burrows) mark the upper parts of B horizons formed in silty fine-grained sand, very similar to subtle floodplain soils observed on Late Holocene islands on the lower Snake River (e.g., McDonald and Bullard, 2001). The buried soils in lithofacies 4b indicate brief periods (possibly decadal scale) of relative surface stability and soil formation.

 Soils at site Qf2/Qt2 within fluvial/alluvial margin facies (lithofacies 6a) consist of at least two recognizable buried soils, in the form of transitional, calcic ABk horizons and Bk horizons. The multiple, thin (~50 cm), buried ABk-Bk horizons within lithofacies 6a reflect the depositional environment and subtle variations in the grain size of sediments in the deposit. Abundant evidence of bioturbation (fine and very fine faunal burrows, root casts) is present throughout these buried soils and favors an interpretation of a riparian or wetlands environment characterized by robust floral and faunal activity along the river margin. The fluvial/alluvial margin deposits are overlain by a sequence of alluvial fan deposits (Fig. 7). The oldest buried soil on lithofacies 7a (Qf1) consisting of calcium-carbonate-rich, truncated Bwk horizons defined by SB 7, which is in turn overlain by deposits of lithofacies 7b (Qf2) (Fig. 7). The relative degree of development of buried soils on Qt2 terrace and alluvial fan deposits support the Early Holocene OSL ages judging from Early Holocene soils described by McDonald and Bullard (2001) on Snake River islands at DFNWR (see Supplemental Material for detailed soil descriptions). The soils described at site Qf2/Qt2 support an age assignment and correlation of the fine-grained channel fill deposits to be equivalent to lithofacies 4b dated at sites Qt2-1 and Qt2-2 (Fig. 7).

*Qt3 terrace (~4.5 ka)*

 The stratigraphy at the site Qt3 consists of two lithofacies units (Fig. 5). The basal unit (lithofacies 2) consists of ~13.5 m-thick gravel of the Bonneville Flood. The basal gravel is overlain by ~2.5 m-thick, massive to poorly stratified, silty sand deposit of fluvial lithofacies 4c. The bottom of lithofacies 4c is a wavy unconformity boundary defined by SB 5 (Fig. 7).

 Two luminescence samples, which are separated by ~40 cm, were taken at a depth of 2.1 m near the base of lithofacies 4c and returned OSL ages of 4.75 ± 0.31 and 4.27 ± 0.24 ka (Table 2). The 1σ uncertainties of the two ages overlap and result in a mean age of 4.5 ± 0.4 ka. Confidence in the ages is high because the sediment showed little evidence of disturbance from mass-wasting processes, and no evidence of bioturbation.

*Soils-geomorphology*

 The upper part of lithofacies 4c displays a moderate- to well-developed soil that has a dark, well-developed, carbonate-rich, organic Ak horizon overlying a buried soil consisting of a 100 cm-thick Bk horizon, a 140 cm-thick Ck horizon, and 300 cm of exposed C horizon. The characteristics of the Ak horizon, which include dark color, and massive-to-loose structure, but lacks evidence of clay films or silt coatings, suggest a young surface soil has developed on a thinly bedded sheet wash deposit that locally buried the soil associated with Qt3. This sheet wash deposit is localized and thin, and therefore not assigned to a specific facies association. The upper part of the section exposed at site Qt3 includes the modern ground surface. The degree of soil development on the Qt3 terrace is relatively similar to the soils on the Qt2 terrace at sites Qt2-1 and Qt2-2 (Fig. 3). Although they appear similar, the upper soil of the Qt2 terrace at both sites clearly has been truncated by slope erosion and tilling, thus these are incomplete profiles and preclude making confident comparisons solely on the basis of soil development (see Supplementary Material for detailed soil descriptions). Nonetheless, the progressive lower morpho-stratigraphic positions between the Qt2 and Qt3 terraces are consistent with the OSL analysis of decreasing age with lower tread height.

*Qt4 terrace (~2.9 ka)*

 The stratigraphy at sites Qt4-1, Qt4-2, and Qt4-3 are generally similar in composition and depositional style, and each site has up to six lithofacies units (Figs. 3 and 5). The basal unit (lithofacies 2) consists of 3.5–4.5 m-thick gravel of the Bonneville Flood. The basal gravel is overlain by ~1 m thick, shell-rich deposits of poorly stratified and moderately sorted sandy gravel to cobble that discontinuously outcrop between sites Qt4-1 and Qt4-2. The shell-rich deposits are separated into two distinct lithofacies at both sites based on 14C dates and shell assemblages; the two lithofacies are composed mostly of well-preserved snail and disarticulated mussel shells in sandy gravel (lithofacies 3a) at site Qt4-1, and well-preserved snail and articulated clam shells in gravelly sand (lithofacies 3b) at site Qt4-2 (Fig. 7).

 The planar erosional lower contacts of the older lithofacies 3a and younger lithofacies 3b are designated SB 2 and SB 6, respectively, based on 14C dating of mollusk shells. There different ages indicate a cut-and-fill stratigraphic position between the different shell-rich gravel lag deposits (Fig. 5). The shell-rich lithofacies are overlain by a massive, silty sand deposit of lithofacies 4d (Fig. 7). The bottom of lithofacies 4d is a wavy boundary and also defined by SB 6 that represents a ravinement surface developed across older deposits of lithofacies 2 and 3a at site Qt4-1, as well as a conformable and time-stratigraphic equivalent boundary between lithofacies 3b at site Qt4-2 (Fig. 5). An additional massive silty sand facies described near the upper section of Qt4 terrace deposits at site Qt4-3 was separated into lithofacies 5a based on it containing few poorly-preserved snail and articulated mussel shells (Fig. 7). All three sites are capped by up to 2 m of Qf2 deposits of lithofacies 7b (Figs. 5 and 7).

 Numerical age control of Qt4 terrace deposits is from 14C and luminescence analyses. Radiocarbon analysis was performed on eight mollusk shells from lithofacies 3a (n=3), 3b (n=3), and 5a (n=2), and a luminescence age was obtained for one sediment sample from lithofacies 4d. Numerical age control at site Qt4-1 is from one well-preserved snail shell identified as a member of the family Hydrobiidae at a depth of 4.5 m and two well-preserved mussel shells (*Margaritifera* sp.) at depths of 4.75 and 5.50 m within sandy gravel of lithofacies 3a (Fig. 7). The snail shell yielded a 14C date of 11,149 ± 35 yr BP, which was corrected for reservoir effect to 8647 ± 440 yr BP [11,060–8540 cal yr BP]. The mussel shell at 4.75 m depth returned a 14C date of 11,094 ± 42 yr BP, which was corrected for reservoir effect to 8590 ± 440 yr BP [10,700–8460 cal yr BP]. Similarly, the shell sample from a lower depth of 5.50 m returned a 14C date of 11,671 ± 38 yr BP that was corrected for reservoir effect to 9188 ± 440 yr BP [11,740–9290 cal yr BP] (Table 1; Fig. 7). The 14C dates from snail and mussel shells constrain the age of lithofacies 3a and SB 6 to Early Holocene with median ages ranging from 10,410 to 9630 cal yr BP.

 Numerical age control at site Qt4-2 is from a single well-preserved snail shell identified as a member of the family Hydrobiidae at a depth of 5.0 m and two moderately- to well-preserved clam shells (*Pisidium* sp.) at depths of 5.01 and 5.02 m within gravelly sand of lithofacies 3b (Fig. 7). The snail shell yielded a 14C date of 5994 ± 32 yr BP that was corrected for reservoir effect to 3304 ± 440 yr BP [4810–2470 cal yr BP]. The clam shell recovered from a depth of 5.01 m was articulated and yielded a 14C date of 6375 ± 27 yr BP that was corrected for reservoir effect to 3699 ± 440 yr BP [5290–2970 cal yr BP]. The *Pisidium* sp. shell recovered from a depth of 5.02 m was disarticulated and returned a14C date of 6245 ± 28 yr BP that was corrected for reservoir effect to 3564 ± 440 yr BP [5040–2770 cal yr BP] (Table 1; Fig. 7). The 14C dates from snail and clam shells constrain the age of lithofacies 3b and SB6 to Late Holocene with median ages ranging from 4080 to 3570 cal yr BP.

 Additional dates obtained using 14C were from a single moderately preserved snail shell (*Physa* sp.) from a depth of 3.35 m and a single moderately preserved and articulated mussel shell (*Margaritifera* sp. or *Gonidea* sp.) from a depth of 3.5 m in silty sands of lithofacies 5a (Table 1; Fig. 7). The single luminescence sample was extracted from silty sands of lithofacies 4d at a depth of 3.6 m (Table 2; Fig. 7).

 The snail shell yielded a14C date of 6057 ± 32 yr BP that was corrected for reservoir effect to 3370 ± 440 yr BP [4840–2500 cal yr BP]. The mussel shell returned a14C date of 6718 ± 28 yr BP that was corrected for reservoir effect to 4055 ± 440 yr BP [5600–3400 cal yr BP] (Table 1; Fig. 7). The 14C dates from snail and mussel shells provide maximum age of fluvial lithofacies 5a to Late Holocene with median ages ranging from 4540 to 3660 cal yr BP. The mean 14C ages of the shell-rich gravelly lag (lithofacies 3b) and overlying shell-rich silty sand channel fill (lithofacies 5a) deposits overlap within their 1σ uncertainties. The ages and stratigraphic relations indicate that the shells from lithofacies 5a were likely reworked and originally sourced from the underlying gravelly lithofacies 3b given that the species of mollusks prefer their environment to be dominated by a gravelly substrate.

 The luminescence sample collected at site Qt4-3 provides a direct age determination of the channel fill (lithofacies 4d) fluvial facies stratigraphically below the shell-rich layer of lithofacies 5a (Fig. 7). The luminescence analysis returned an OSL age of 2.93 ± 0.15 ka for the fine-grained deposits of the Qt4 terrace (Table 2). The OSL age is about 700–1000 years less than the youngest shell dates from underlying lithofacies 3b and in stratigraphic agreement. However, the OSL age is about 800 years younger than the age of the youngest shell date from the overlying lithofacies 5a, providing supporting evidence for the shells likely being reworked, given that the species of mollusk prefer a gravel substrate habitat (Fig. 7).

 Additional supporting information of a Late Holocene age for the Qt4 terrace comes from previous archeological investigations by Idaho State University (ISU) at a site situated ~100 m downstream of site Qt4-3 on the Qf3 map unit (Site ISU-F2; Figs. 2C and 3). Radiocarbon dates from charcoal sampled from two separate alluvial fan stratigraphic units in ISU test excavation F2 yielded dates of 3460–3260 to 3490–3350 cal yr BP from depths of ~150–210 cm and 490–300 to 490–310 cal yr BP from depths of ~40–70 cm (Lohse, 2013). Given the thickness of alluvial fan deposits of lithofacies 7b described at nearby site Qt4-3, it is likely that the 14C dates from the deeper section of the ISU’s test excavation correspond with the same Qf2 deposits exposed along nearby bluffs (Fig 7). The 14C dates of ~3400 cal yr BP from the deeper deposits at site ISU-F2 provides a constraining age for the Qt4 terrace. This Qf2 deposit age is within the uncertainties of mean ages of the gravelly and silty sand facies of Qt4 fluvial deposits, thereby indicating a period of rapid Snake River aggradation and alluvial fan deposition (Qf2) constrained between ~3.6 and 2.9 ka in the area, which was followed by another period of rapid alluvial fan deposition (Qf3) bounding ~0.4 ka (Fig. 3).

*Soils geomorphology*

 The soils observed on the Qt4 terrace are less developed than on the older Qt3 terrace. Soils exposed at the Qt4 sites include a weakly to moderately developed soil within the alluvial fan deposits (Qf2) of lithofacies 7b. The upper boundary of lithofacies 4d near SB7 also shows evidence of soil development that includes distinct soil horizons, soil structure, silt-lining pores, accumulation of salts, and bioturbation by invertebrates. The relative degree of soil development is consistent with Late Holocene age when compared to dated soils on Snake River islands within the DFNWR (McDonald and Bullard, 2001). (see Supplemental Material for detailed soil descriptions).

*Qt5 terrace (~1.1 ka)*

 The stratigraphy of the site Qt5 includes four lithofacies units (Fig. 5). A gravel unit is exposed ~0.5 m above the water’s edge and is interpreted to be the basal gravel of the Bonneville Flood (lithofacies 2). The basal gravel is overlain by ~4-m thick, massive silty sand of lithofacies 4e. The stratigraphic contact between lithofacies 4e and the basal gravels of lithofacies 2 was poorly exposed along the bluff, but is defined by SB 8 based on morpho-stratigraphic position of the Qt5 terrace and dating at the site. The upper 25–30 cm of the fluvial deposit is composed of massive, silty fine sand, and because the upper deposit contains sparse disarticulated bivalve shells it was separated into lithofacies 5b. Both lithofacies 4e and 5b exhibited evidence of bioturbation in the form of indurated root casts, which were identified by iron staining and relief resulting from differential erosion of surrounding sediment matrix, and recent insect burrows present on the exposure face. The top of the fluvial lithofacies 5b is marked by a wavy erosional boundary defined by SB 9 and a buried soil. Lithofacies 5b is overlain by a ~0.8 m-thick deposit of interbedded, moderately stratified, moderately-sorted, silty sands and well-sorted sand with detrital charcoal of lithofacies 6b. Lithofacies 6b represents deposition within the fluvial/alluvial margin facies association.

 Numerical age control at site Qt5 is from two samples of detrital charcoal, three shell samples, and two luminescence sediment samples (Fig. 7). Detrital charcoal was sampled from lithofacies 6b, whereas shells were sampled from lithofacies 5b. Luminescence samples were obtained in lithofacies 4e sediments. Detrital charcoal samples were obtained 0.60 and 0.70 m below the surface at the base of interbedded fluvial/alluvial terrace deposits (lithofacies 6b) and ~5 cm above the top of the erosional boundary (SB9) cut on fluvial deposits of lithofacies 5b and a buried soil. Charcoal from a depth of 0.60 m yielded a modern 14C date of 65 ± 28 yr BP [N/A cal yr BP], whereas the sample from a depth of 0.70 m yielded a 14C date of 133 ± 24 yr BP [270–10 cal yr BP] (Table 1; Fig. 7). The 14C dates constrain the age of lithofacies 6b to historical to modern.

 Three shells were sampled from lithofacies 5b at depths ranging from 1.0 to 1.1 m below the surface and consisted of disarticulated bivalves identified as the mussel *Margaritifera* sp. (Fig. 7). The mussel samples were poorly to moderately preserved and consisted of 60–100% complete shells. It is likely the mussels were reworked into the upper section of the silty sand deposits because of their poor preservation and occurrence in a different aquatic habitat. The shell recovered from a depth of 1.0 m yielded a 14C date of 3699 ± 27 yr BP that was corrected for reservoir effect to 926 ± 440 yr BP [1690–0 cal yr BP]. The shell sampled from a depth of 1.02 m returned a 14C date of 3742 ± 23 yr BP that was corrected for reservoir effect to 970 ± 440 yr BP [1720–0 cal yr BP]. Similarly, the mussel shell from a lower depth of 1.1 m yielded a 14C date of 3922 ± 27 yr BP that was corrected for reservoir effect to 1157 ± 440 yr BP [2040–160 cal yr BP] (Table 1; Fig. 7). The 14C dates from bivalve shells provide a maximum age of lithofacies 5b to Latest Holocene with median ages ranging from 1100 to 890 cal yr BP.

 The luminescence samples collected at the site were situated stratigraphically below lithofacies 5b and provide direct age determinations of the silty sand of lithofacies 4e (Fig. 7). The luminescence analysis returned OSL ages of 1.49 ± 0.11 ka for the sample at a depth of 1.35 m, and 1.05 ± 0.06 ka for the sample at a depth of 2.05 m (Table 2). The OSL ages are not in stratigraphic agreement or within their uncertainties. However, the OSL ages are in stratigraphic agreement with the overlying maximum age constraints from shells. Collectively, the 14C and OSL ages indicate a single and rapid episode of Latest Holocene aggradation at ~1.1 ka.

 Alluvial fan Qf3 deposits are also mapped on the Qt5 terrace in the vicinity of site Qt5, indicating a maximum age constraint of the Qf3 map unit to less than ~1.1 ka. This maximum age constraint does not conflict with the 14C dates or stratigraphy at site ISU-F2 that shows a period of rapid alluvial fan Qf3 deposition beginning sometime prior to ~0.4 ka (Fig. 3).

*Soils geomorphology*

 The soils observed on the Qt5 terrace are also relatively less developed than on the older Qt4 terrace (i.e., very weak buried soils formed on lithofacies 5b and a weak-to-moderate soil formed in lithofacies 4e). The relative degree of soil development of the upper buried soils is consistent with very young (historical) soils, and Latest Holocene age for the soil formed in lithofacies 4e relative to dated, similarly developed soils along the Snake River within the DFNWR (McDonald and Bullard, 2001). (see Supplemental Material for detailed soil descriptions).

*Qt6 and Qt7 terraces (<0.13 ka)*

 Terraces Qt6 and Qt7 are the lowest fluvial treads in the study area with heights of ~2–3 and 1–2 m above modern bankfull, respectively (Figs. 2A, 2B, and 3). They occur mostly as relatively narrow and continuous treads along both banks of river, grade to the top of basalt boulders and blocks that form rapids at channel constrictions #2 and #3, and grade to the steps on the expansion boulder deposits at channel constriction #1 (Figs. 2B and 4). The surfaces of Qt6 and Qt7 terraces primarily consist of sparsely-vegetated gravels and cobbles with fewer localities overlain by a thin cap of moderately stratified silty sand in areas with dense riparian vegetation. Given the uniform particle size across surfaces, it is likely that the source of the gravel and cobbles is reworked basal canyon fill of the Bonneville Flood (lithofacies 2), and therefore is placed in lithofacies 3c (Fig. 5). Both terraces also exhibit signs of historical to recent flood plain inundation in areas devoid of dense vegetation and the presence of fresh woody debris near channel constrictions #1 and #2 (Fig. 2A and 2B).

 Numerical age control at site Qt7 is from two OSL samples collected from a large depositional bar that forms the lowest Qt7 terrace near constriction #1 to provide age control and information on the potential for partial bleaching of fluvial deposits in the study area. Luminescence analysis of the two samples taken from ~1 m above the water’s edge on the active bank and ~2 m above the water’s edge near the top of the depositional bar confirm the youthfulness of Qt7 terrace deposits. The lowest sample from a depth of ~30 cm in sandy gravels of the active bank returned an OSL age of 0.31 ± 0.06 ka. The other sample from a ~0.5 m thick sandy facies of the gravelly bar containing partially buried pieces of plywood and plastic at a depth of ~30 cm yielded an OSL age of 0.68 ± 0.16 ka (Table 2). The ages are in morpho-stratigraphic agreement and within their 1σ uncertainties. The range in age of both samples from different parts of the gravel bar also provide a minimum constraint of Qt7 terrace inundation and deposition to as recently as 80–110 yr and a maximum constraint of 300–500 yr. The maximum age constraint of the Qt7 terrace sediments containing modern plastic and plywood debris suggest that OSL ages from fluvial sediments in the Snake River system have the potential to be partially bleached.