



Yellowstone River Historical Retrospective Completion Report

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Table of Contents

Yellowstone River Historical Retrospective.....	1
Completion Report.....	1
Table of Contents.....	1
Introduction.....	1
Summary of Work Performed.....	1
Summary of Findings.....	3
Yellowstone National Park to Livingston, MT.....	4
Livingston to Clarks Fork River.....	6
Clark's Fork to Bighorn River.....	8
Bighorn to Powder River.....	10
Powder River to Confluence with Missouri River.....	13
Notes on Tributaries of the Yellowstone River.....	16
Recommendations for Comparisons between Historical and Recent Conditions and Additional Research.....	17
Literature Cited.....	18
Sources consulted.....	19
Other sources.....	35
Appendix A: Contact list.....	40
Appendix B: Copies of collected photographs.....	41
Appendix C: Copies of collected cartographic documents.....	48
Appendix D: Copies of collected textual documents.....	50

Introduction

The following report presents the results of an investigation of historic conditions along the Yellowstone River from the northern boundary of Yellowstone National Park to its confluence with the Missouri River. The purpose of this investigation was to characterize the pre-settlement conditions of the following river corridor attributes: hydrology, water quality, fluvial geomorphology, vegetation, wildlife, and fisheries. These historic attributes were characterized by consulting published studies on Yellowstone history, reviewing archived photographs, documents, and maps, and interviewing knowledgeable historians. The Montana Department of Environmental Quality (DEQ) commissioned this work to develop a historic baseline to compare with current conditions. Such comparisons will allow DEQ to evaluate the degree of impairment in the Yellowstone River due to human influences and will provide guidance regarding watershed restoration needs.

Summary of Work Performed

In an initial meeting on April 11, 2003 with key DEQ and Confluence personnel, we established that the focus of this project is on the main stem of the Yellowstone River prior to 1900. DEQ was particularly interested in information regarding fish, water quality, fluvial geomorphology, and vegetation. Confluence suggested that we also collect information regarding wildlife activity along the river. The information presented in this report is organized according to river reach and the above categories. In addition to historical information on the Yellowstone River, DEQ requested information on tributaries, particularly the Bighorn and Powder rivers and O'Fallon Creek. We discussed likely sources of information, including: steamboat logs; journals of trappers, explorers, settlers, military personnel; maps and surveys; and photographs.

Following the initial meeting, Confluence's historian began preliminary research. The first task entailed contacting people with relevant expertise regarding the historic condition of the Yellowstone River corridor (Appendix A). These contacts provided pertinent information such as primary sources and associated documents. In addition, these individuals contributed suggestions that led to other sources and avenues of research.

The next step of this process involved identifying collections most likely to house sources pertinent to this project and development of a plan to obtain these sources. Sources of relevant historical information included local libraries and collections in Bozeman, a variety of other in-state collections, and information archived at locations outside of Montana. The presence of a significant amount of information in locations across Montana and in other states necessitated development of a travel plan to obtain these sources in a cost-effective manner.

The Bozeman area had several locations with potentially relevant holdings. These included the Montana State University-Bozeman Library and the MSU Bozeman Special

Collections and Archives. The special collections and archives held unpublished documents, rare books, maps and photographs related to the Yellowstone prior to 1900. Conversely, initial inquiries and searches at the Bozeman Public Library, Museum of the Rockies, and Pioneer Museum indicated they did not house many sources for this project.

There were a number of collections within Montana but outside of Bozeman with potential to house applicable information. The Montana State Historical Society (MHS) was a source of early photographs and accounts or descriptions of the Yellowstone River. The State Historic Preservation Office (SHPO) was another potential source, however, conversations with SHPO records personnel indicated that the records held there would be less relevant than the MHS records. General Land Office (GLO) land survey plats drawn in the late 1800s were obtained from the Billings Bureau of Land Management. Originally, the Yellowstone National Park Archives appeared promising, but their holdings pertaining to the river itself were unlikely to have much useful information on the sections of the main stem outside of the park.

Inquiries to out of state sources began with archivists at the National Archives in Washington DC and College Park, MD. The archivists recommended a research trip to both Washington National Archives I and II. Research at the National Archives included searching in a variety of indexes, meeting with archivists and research assistants, and viewing textual, microfilm, cartographic and photographic records found in indexes. The National Archives holdings were organized by Record Group. National Archives Records Groups 57: Records of the U.S. Geological Survey, 77: Records of the Office of the Chief of Engineers, and 393: Records of U.S. Army Continental Commands, 1821-1920 each held information on the Yellowstone River prior to 1900. Cartographic and photographic records held survey maps and photographs depicting the Yellowstone River in the second half of the 19th Century. The Minnesota Historical Society held all of the records of the Northern Pacific Railroad. A librarian there suggested that a visit might turn up extensive documents pertaining to the Yellowstone River in the records and field books of the railroad collections. Research at the Minnesota Historical Society included index searches, file requests, microfilm review, and viewing and copying textual and cartographic records.

Of all of the records relating to the Yellowstone River prior to 1900, several emerged as the most useful historical records. The journals of the Lewis and Clark Expedition were the best expedition journal source. Clark made very careful observations each day that he was on the Yellowstone River. He recorded river depth and width, number of bends in the river, number of islands, and noted changes as the river flowed downstream.

Other outstanding sources were the photographs obtained at the National Archives and Montana Historical Society. These photographs show physical features more clearly than any journal or report could describe them, especially in the extent of vegetation and woody debris along the river. Finally, the GLO and Northern Pacific Railroad surveys made careful note of river width, depth, and location, as well as sometimes noting riparian vegetation.

The most comprehensive 19th Century survey of the Yellowstone River was that of the General Land Office, which was undertaken between 1887 and 1911. The records of the survey include detailed mapping of the left and right banks of the Yellowstone River. The bank surveys are mapped and listed in terms of a series of distance/bearing measurements. The maps appear to be of sufficient detail to allow digitization and direct incorporation into a GIS environment. The maps do have some mapped islands, although it is unclear as to the detail of that mapping. Typically, individual sides of the river were mapped independently, such that the mapping stops at the riverbank.

Summary of Findings

A catalogue of collected information was developed as an excel spreadsheet and includes notes from several different categories pertaining to activity on the Yellowstone River prior to 1900. The spreadsheet is included as an electronic file accompanying this document. The categories consist of descriptions of river geomorphology, riparian vegetation, fish in the Yellowstone or tributaries, wildlife spotted in or around the river, and mention of weather prior to 1900. Each piece of information is listed in the catalogue according to its location in one of five river sections, if the locations were specified. The river sections are: from Yellowstone National Park to Livingston, from Livingston to the entrance of Clarks Fork River, between Clarks Fork River and the entrance of the Bighorn River, between the Bighorn and the Powder River, and from the Powder River to the Yellowstone River's confluence with the Missouri River. Information pertaining to tributaries of the Yellowstone is presented in the same spreadsheet catalogue, and designated according to the tributary name.

The historical material, when examined according to location and category, conveys a general idea of the condition of the Yellowstone River in the 19th Century. Descriptions of geomorphology indicate that the river varied from wide, straight, and shallow in some places to narrow and rapid in other river sections. Photographs and textual documents reveal the extent of riparian vegetation along the river, including some vast cottonwood galleries in many locations along the river. Some early explorers on the Yellowstone recorded the amount and quality of the fish they caught, suggesting that the fish were plentiful in the Yellowstone prior to 1900. Most records describe the extent of wildlife along the river, perhaps because the authors depended on eating meat for their livelihoods, and also because the sheer numbers of wildlife amazed the explorers. Finally, some early records note weather conditions experienced along the Yellowstone. Reports and journals containing weather observations cannot tell us exactly what the climate was like at the time, but can suggest weather extremes (because people often took note of extremes in their journals or reports) and general ideas of weather on specific dates.

The specificity of recorded information varies, with some records being quantitative and including numbers and measurements to describe the river, wildlife, fish, or vegetation. In contrast, other records are narrative and contain estimations or generalizations as to the extent of these factors. In some cases, descriptions of the Yellowstone are only small

parts of a larger anecdote. However, all of the historical information on the Yellowstone River contributes to an understanding of pre-1900 river conditions and activity regardless of the manner in which explorers recorded their observations.

Yellowstone National Park to Livingston, MT

River Description/Geomorphology/Water Quality

This river section begins at the river's entrance to Yellowstone National Park in Gardiner. The river flows north through canyons and a large valley toward the end of this section in the town of Livingston. The journals of the Doane-Washburn Expedition, the Folsom-Cook Expedition, and Osborne Russell each describe this river section. While there are fewer descriptions of this river section than of downstream river sections, the available sources provide insight into the condition of the upper Yellowstone in the 19th Century. The overall picture drawn by these journals is of a deep, swift, and rocky river, varying in its morphology.

Specific geomorphic descriptors in these accounts include valley type, stream widths, and dominant streambed characteristics. Interestingly, there are no historical documents mentioning islands, sand bars, or divided channels. Not surprisingly, early expeditions observed the same landform features present today. In the upper portions of this reach were narrow canyons, including today's Yankee Jim Canyon. In the middle of this reach, records described a 25-mile long section of wide river with low bottoms. The canyons occurred in places where the foot of mountains crowded both sides of the rivers. The upper canyon forced the river to "half its usual size," and had no valley, "hugging the base of the mountains." (Haines 19) In the canyon, the fast current of the river tumbling over large boulders and drift alternated between pools and rapids (Bonney 237). The canyons continued for several miles, containing the large volume of water in a narrow space filled with boulders on a bed of drift and gravel and eventually creating "tremendous rapids" (Bonney 235).

Upon reaching the end of Yankee Jim Canyon at the entrance of Tom Miner Creek, the gradually widening valley allowed the river to spread out to approximately 200 yards wide (Russell 33). At the lowest, the river here was about four feet deep, and nearly too deep for horses to wade across (Russell 33). There was a large quantity of water, dark green in color (Bonney 232). The river flowed through a valley that was about 25 miles long and varied between 1 and 5 miles wide, comprised of rolling plateau. The bottom was low and subject to overflow, according to Doane's observations (Bonney 14). At the end of the long and wide valley, the channel forced the river into another narrow canyon. This canyon is a small canyon just upstream of present-day Livingston.

Riparian Vegetation

Few accounts discuss the vegetation in this area, mentioning it mostly in passing rather than devoting time to describing it. However, the written record makes it clear that there was ample vegetation. Doane indicated that there was plenty of timber as well as shrubbery, cedars (probably juniper), and black cherry trees (Doane 3). Sheridan's report mentions that the army built huts in this area out of cottonwood.

Although records do not name the types of grasses growing among the timber, Doane's records mention thick bunch grass on the surrounding foot hills, "luxuriant grass," and waist high growth of grass in the river bottoms. Additionally, Cook's account tells us that "fine grass in abundance" grew in the present Paradise Valley (Haines 18).

Fish

The upper Yellowstone River was a prime fishing location in the 19th Century. The pools and rapids provided excellent fish habitat, according to Lieut. Doane. "...The Yellowstone is famed for its trout," wrote Cook in 1869 (Haines 16). Anglers wrote that they did not have to wait very long to catch enough fish for a meal in this river. In a few minutes, Cook caught 10 lbs of fish (Haines 16). The following summer, Lieutenant Doane's expedition party members fished between Bottler's Ranch and Gardiner and discovered an "abundant and continued supply" of trout (Doane 3). The trout were fine and large and the water seemed "alive with them, all day long." Their flesh was bright yellow and had an "unsurpassed" flavor (Bonney 232). Note that native salmonids in this portion of the Yellowstone River include Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) and mountain whitefish (*Prosopium williamsoni*).

Wildlife

The Cook Folsom journals call the area "a hunter's paradise" (Cook, et al 18). Reports and journals mention antelope, bear, elk, deer, sheep, beaver, rabbit, duck, and grouse. Of particular interest are trapper Osborne Russell's journal entries mentioning extensive herds of elk and sufficient beaver for three weeks worth of trapping (Russell 33, 68).

Climate

Observations on climatic conditions are limited for this reach of the Yellowstone and don't provide a basis for inference regarding overall climate or trends. The following descriptions represent the available record from early expeditions:

- Lieutenant Doane took barometer and thermometer readings twice some days while traveling on this portion of the river;
 - On August 22, 1870, the barometer read 24.3 and the thermometer 54 in the morning;
 - At noon on the same day, the barometer read 25.25 and the temperature was 92 degrees F;
 - On August 25, the Barometer reading was 24.8 and the thermometer 49 when Doane took his morning reading at 5215 feet;
 - At noon on the same day and at an altitude of 7331 feet, the barometer and thermometer read 23.1 and 72 degrees respectively (Doane, 3);
- Doane noted that residents told him that snow seldom fell in this valley and that the climate was mild (Doane 3);
- The Cook- Folsom party woke to ¼ in of ice and 6 inches of fresh snow on the morning of September 18, 1869 (Folsom 14).

Livingston to Clarks Fork River

River Description/Geomorphology/Water Quality

In the 1800s, the character of the Yellowstone between Livingston and Clarks Fork River was different from the first section. The differences were mostly due to the entrances of several rivers and creeks; including the Shields River, Big Timber Creek, Boulder River, and White Beaver Creek. The creeks and rivers flowing into the Yellowstone added water volume and sediment. Notes from William Clark's journal in particular express what this section of the river was like prior to development of towns, roads, and railways along the river. The journals of Bradley, Raynolds, Stuart, and Anderson add to Clark's notes. Together, these reports describe a single thread channel with low bottoms. However, as more tributaries emptied into the Yellowstone, explorers recorded a trend where the river began to widen and braid, as it flowed through a narrower channel surrounded by buttes.

By all accounts, the river in between Livingston and Clarks Fork River was generally quite straight and 100 to 300 yards wide with a current of about 4.5 mph. At this point, the river was in a singular channel and on a fairly straight course, and deep from bank to bank (Raynolds 140, Moulton 189). The current was rapid, but smooth, and slow enough to make fording the river possible (Raynolds 140, Bradley 157). Anderson's journal called the water very clear. The river featured a low bank on each side and a bottom of coarse gravel, pebbles, and sand (Moulton 187). The bottoms averaged 1.5 to 2 miles wide between Livingston and Clarks Fork as the river began to widen. From here, the bottoms seemed to stay fairly wide and low for several miles (Moulton 187).

Shortly after leaving Livingston, the Shields River flowed into the Yellowstone. About three miles below the mouth of the Shields River, islands began to regularly punctuate the river (Moulton 189). On a stretch of the river that is located in present day Sweetgrass County, Clark noted 11 islands in 7 river miles, mostly small islands, two large, then later several small islands in 5 river miles. He neglected to mention whether or not they were vegetated (Moulton 191). Clark's journal expresses that the channel was continually divided with islands throughout the remainder of this river section.

Clark described some bends in the river, but not many. Clark often called the bends "gentle" conveying an impression that the river was not highly sinuous. Though Clark did not document many bends, Bradley wrote that the river mostly swept from side to side across the wide valley (Bradley 156). The two descriptions together suggest that the river did meander from side to side, but in broad, calm curves rather than sharp bends. When Clark was closer to Clarks Fork he called the Yellowstone "much divided and crooked", which demonstrates how the river changed between Livingston and Clarks Fork (Moulton 207).

As more creeks entered the Yellowstone, more accounts noted that the water was not very clear. Downstream of Big Timber Creek and Boulder River, Clark wrote that the water was milky colored. Stuart found the water muddy and bad tasting (Stuart 144). In addition, Clark wrote that all of the creeks entering the Yellowstone in this area had a

milky water color (Moulton 194). Stuart observed these conditions in the month of April, while Clark was on the Yellowstone in July.

Riparian Vegetation

Clark, Bradley, and Stuart each described the vegetation in this river section. William Clark found riparian vegetation consisting of blue gramma, buffalo grass, basin wild rye, silk grass, sunflower, wild indigo, currents, prickly pear, and choke cherry (Moulton 187-205). The horses of the expedition fed on high quality forage growing along the river. The islands were covered with cottonwood trees (Moulton 187). Bradley and Stuart both mentioned vegetation as well, particularly making note of prickly pear. Bradley noted good soil, and good grass while Stuart mentioned sagebrush, prickly pear and gramma grass, buffalo grass (Bradley 156, Stuart 144,153).

Journals and reports make it clear that this section of the river was heavily lined with trees in the 19th Century. The journals of James Bradley note the presence of ash, willow, pine, fir, and box elder trees (Bradley 157). The report of the Raynolds Expedition also described a dense pine forest in this area. Stuart specifically noted that the timber along the rivers extended from 1 to 10 miles back from the river on both sides (Stuart 146). When Lewis and Clark needed to make a canoe, their attention was particularly focused on trees. Clark's journal describes tall trees, "islands covered with cotton trees and willow", and refers to the abundance of large cottonwood trees for several entries in a row as the party traveled downstream (Moulton 192).

Fish

This upper section of the river was the location of fish activity recorded by Clark, Bradley, and Stuart on the Yellowstone. The Lewis and Clark Expedition made note of an unfamiliar fish, caught in present day Sweetgrass County area that was likely a mountain sucker (*Catostomus platyrhynchus*). The journals describe an 8-inch long fish, shaped like a trout, with a mouth like a sturgeon. This fish had a red streak down either side extending from the gills to the tail (Moulton 189). This description is consistent with the mountain sucker in breeding condition.

The other two authors who mentioned fish in this segment of the river both conveyed surprise that they had such luck fishing. Bradley and Stuart noted that they had heard that fish in this region were not abundant nor of good quality. However, both reported large quantities of good fish. Bradley noted that on one afternoon in April 1876, the party caught at least 200 lbs of trout, and on another day they caught about 300 lbs of trout. Bradley went on to say that the trout were of excellent quality and numbers, contrary to reports of others previously in the region (Bradley 156). Stuart's journal reports an abundance of whitefish and some fine trout when his party fished this reach in April of 1863. Like Bradley, Stuart made note that he had expected not to find such good fish (Stuart 143). The character of the Yellowstone changes a lot from Livingston to Clarks Fork. Differences in reported catch may relate to which section of the river was

fished. Unfortunately, Stuart's and Bradley's journals do not clarify exactly where they were when they had luck fishing.

It is clear from Bradley and Stuart's journals that trout and whitefish were plentiful, however, it is also important to note that others suggested that fish in this area were either no good or not many. It would be valuable to research the answers to the following: were other expeditions less successful in fishing here? Where on the Yellowstone were fish lacking? Why were numbers and quality of fish lacking or why were rumors circulating that fish were lacking here? The answers could be as simple as pinpointing exact locations and dates of successful fishing attempts.

Wildlife

There were several accounts of wildlife in this reach of the Yellowstone River. The journal of William Clark mentions much beaver sign in this area in 1806 (Moulton 191). Sixty years later, the Raynolds Expedition found the same thing – that this part of the Yellowstone River was filled with beaver dams (Raynolds 140). The Lewis and Clark Expedition also noticed a few pelicans during their travel of this stretch of the Yellowstone (Moulton 194-195). Other expeditions, possibly because of their interest in hunting large game, made extensive note of animals like buffalo, elk, and deer.

Climate

Records of weather along this reach of the Yellowstone are limited to the journals of James Bradley, who recorded rain, cold temperatures, wind, and 3 inches of snowfall during one night. All of these observations are from April 1876 and not enough by themselves to make any conclusions about the general climate in this region in the 1800s.

Clark's Fork to Bighorn River

River Description/Geomorphology/Water Quality

Raynolds, Anderson, Forsyth, and Clark each recorded information about the morphology of the river between Clarks Fork and Bighorn River. The first rapids along the river were in this reach. The river had increased in depth, width, turbidity, islands, and debris since leaving the mountains. The depth was as much as 20 feet in some places (Raynolds 143). Snags and rocks obstructed navigation in this braided stretch of river. Anderson's journal says that he found sharp pointed rocks along the channel, and reported that his boat struck a large snag and a rock and had to avoid others (Barrett 60).

The first rapids of the Yellowstone River were near Pompey's Pillar. Clark, Miegs, and W.P. Clark each wrote that the rapids were difficult to navigate. Miegs wrote that the riverbed near the rapids was rocky and gravelly with a 6 to 7 mph current (Moulton 220, Atwater 65). In W.P. Clark's 1876 voyage, he passed a rapid in this river section that he called "very dangerous" (Clark 1). It was between Clarks Fork and the Bighorn that the steamboat Josephine could no longer travel upstream. The current was so swift, about 8 or 9 miles per hour, that Forsyth's steamboat, heading upstream, only traveled 1/6 of a mile in an hour with the boat under a full head of steam (Forsyth 8). After making it

through this current and Hell Roaring Rapids (just upstream of Pompey's Pillar), the party continued upstream to scout and discovered that the river was divided and wide with a powerful current. Though there was a sufficient volume of water for the steamboat, the swift current precluded navigation by steamboats above this spot. (Forsyth 8).

With more tributaries emptying into the Yellowstone, the river steadily became muddier and deeper. When the Clark Fork joined the Yellowstone, it added turbid waters and produced a slight discoloration in the Yellowstone that was not detected above Clark's Fork (Raynolds 143). Audubon noticed that the river was quite muddy (Audubon 98). The river tended to shift channels constantly, according to a Northern Pacific Railroad letter written on the possibility of building bridges at Huntley and Coulson (Dodge 3).

Clark counted more than 36 islands in 69 river miles near the Clarks Fork confluence (Moulton 216). Between Fly Creek, which is just above Pompey's Pillar, and the entrance of the Bighorn, Clark counted about 23 islands or sandbars in 58 miles (Moulton 228). Clark described many of the bars or islands as small and/or stony (Moulton 233).

Vegetation

Clark, Quivey, Raynolds, Stuart and Russell recorded the historical conditions of vegetation in this river section. The earth was rich and covered with wild rye, fine grasses, currants, gooseberries, sagebrush, and greasewood. Some places had good soil, while others had soil too sandy for farming. Quivey noted that near Pryor's Creek the country became more barren than it had been upstream, with less grass and water (Quivey 239). Prickly pear was thick in some places. For example, the authors of the Raynolds Report and the Stuart Report complained of prickly pears everywhere. The historical record suggests that the soil and vegetation were variable between Clarks Fork and the Bighorn and not as rich as above, but overall able to grow vegetation well.

Osborne Russell noted large bottoms covered with large cottonwood timber and clear of underbrush along the Clarks Fork to Bighorn reach of the river (Russell 57). The Raynolds report describes a 60 foot high bluff along the right bank of the Yellowstone covered with pine trees, and also reports cottonwood groves on islands in the river and a cottonwood grove at Pompey's Pillar (Raynolds 143, 218). Clark's journals describe cedar along the river (probably juniper, as cedar is not found in this region), and many islands covered with cottonwood between Dry Creek and a point about 2 miles north of Pompey's Pillar. In addition to noting cottonwoods, Clark described scattered pine between the mouth of Fly Creek and the junction with the Bighorn River (Moulton 219, 225, 231). Despite other reports of timber in this stretch of the river, in 1863 Captain Stuart pointed out that there was no timber within 30 or 40 miles of Clarks Fork River mouth, except some scrubby cottonwood (Stuart 154). As Stuart's expedition headed downstream, it came across more trees, and eventually described an abundance of cottonwood trees closer to the mouth of the Bighorn than to the mouth of Clark's Fork. Stuart was on the Yellowstone River later than Clark, Russell, and Raynolds. It is possible that early activity along the river due to the growth of the steamboat and railroad

industries resulted in the cutting of trees downstream of the Clarks Fork mouth. Stuart also noted boxelder about 18 inches in diameter and 25 feet high, and noted a lack of pines along the river.

Fish

The Clarks Fork to Bighorn section of the Yellowstone River was home to catfish, trout and shiners during the 19th Century, according to a report by James Forsyth in 1875 and the Audubon journals of 1840. Forsyth noted the presence of trout, catfish, and shiners (Forsyth16). Audubon caught 16 quite large catfish in a half an hour at one point, and caught a dozen “fine catfish” when fishing near Fort Maynadier (Audubon 102).

Wildlife

The Clarks Fork to Bighorn River reach of the Yellowstone was heavily populated with buffalo and other large game. The Raynolds Report, The Yellowstone Expedition of 1863, Jan Anderson’s reconstructed journal, and William Clark’s journals all have repeated mention of large numbers of buffalo feeding along the riverbank. Some also mention deer, elk, bighorn, and antelope. Clark went so far as to say that he would not even estimate the number of animals on this river fearing that the numbers would make his account seem “incredible” (Moulton 219). In addition, Audubon’s journals mention a very large buck, and Clark mentioned that he killed the “fattest Buck I ever saw” in addition to a number of other bucks, elk, and buffalo killed by his party on this stretch of the river (Moulton 219). Clark, Anderson, and Audubon each mentioned evidence of beaver, but while Anderson indicated a great deal of beaver sign, Audubon mentioned them in the context of a failed beaver hunt (Barrett 60, Audubon 102).

Climate

While on this section of the Yellowstone, explorers mentioned heavy rain showers, strong winds, and cold temperatures in various accounts. These similar accounts of weather occurred in April 1863 (Stuart 156), August 1876 (Clark 1), July 1860 (Raynolds 144), and in July 1806 (Moulton 226). Perhaps this part of the state in the 19th Century was particularly susceptible to rain, cold, and wind during the summer, but it is also possible that these accounts are coincidental. As poor weather may stand out in one’s mind and make a trip more trying more than fair weather, it may be more likely to have been recorded, and may represent the only incidents of rain and cold in the summer. However, a closer inspection of weather records for the state of Montana during these years in the 19th Century would shed more light on whether or not the cold and wet weather described by Raynolds, Stuart, Clark, and Clark was typical.

Bighorn to Powder River

River Description/Geomorphology/Water Quality

The best sources of historical information for the Bighorn to Powder River section of the Yellowstone are the records of Bond, Raynolds, DeSmet, Stuart, Forsyth, and Clark. These records show that the Yellowstone received added sediment and water from large tributaries, particularly from the Bighorn and Tongue rivers. The added water and

sediment, increased current speed, as well as more bars and islands made this river section distinct.

From the Bighorn River to the Powder River, the Yellowstone continued to be wide with a powerful current, having many rocks, islands, and sandbars, with several creeks and brooks emptying into it. The Bighorn River introduced an “immense volume of water into the Yellowstone”, creating strong whirlpools, and making the river downstream of the Bighorn somewhat different than upstream. Clark measured the width of the river as often 400 to 600 yards wide. At one point Raynolds estimated the river to be 800 to 900 yards wide and deeper than 6 feet (Raynolds 144).

At the junction of the Yellowstone and Bighorn Rivers, the Yellowstone ran along a cliff at the north side and the Bighorn entered from the south. Below this point, the hills came down to the river (Stuart 160, Forsyth 8). The bottoms gradually sloped away from the river starting about 3 or 4 feet above the water (Forsyth 8). Beginning about 11 miles downstream of the Bighorn, there was a large bottom on the south bank of the river 21 miles long varying in width from ½ miles to four miles wide (Forsyth 8). In places where the bottoms were not gradually sloping, the sides of the river were lined with perpendicular bluffs of rock and clay (Sheridan 31).

The Tongue River, entering the Yellowstone between the Bighorn and the Powder rivers, also added a significant amount of water and sediment to the river. At the mouth of the Tongue, the river bottom was about 200 feet high and well wooded (Forsyth 7). After the Tongue River reached the Yellowstone, the Yellowstone became more muddy but not much wider or deeper, according to Raynold’s observations in 1860 (Raynolds 144). Below the confluence of the Tongue, the Yellowstone had more sand and gravel bars than above, according to Clark’s notes (Moulton 248). Between the Tongue River and O’Fallon Creek, Clark wrote that the river was approximately 500 yards to a half-mile wide. This part of the river had 15 islands or bars in 41 miles and 4 bends in the same distance. Clark said this part of the river had low bottoms on each side, with a gradual rise to the left bank and a 100 foot high cliff rising from the right river bank (facing downstream) (Moulton 252).

This reach held Buffalo Rapids and Bear Rapids. The Buffalo Rapids were 14 miles below the mouth of the Tongue River. “Ripples” disrupted the water surface, “indicating a broken or rocky condition in the bed of the channel,” a few miles upstream of Buffalo Rapids (Forsyth 7). Forsyth measured the current at Buffalo Rapids at about 6 miles an hour and the lowest depth of water was about 7 feet deep (Forsyth 7). Bond found many sunken snags and protruding rocks to cause difficulty to his party’s float through the rapids (Bond 3). As the river approached the Bear Rapids, it narrowed to about 300 to 400 yards wide. The river now had a number of large rocks, high waves, and a 2.75 to 3 mile per hour current (Moulton 253). Anderson’s journal mentions snags in the water and a roaring current, and Bond’s account mentions low water and projecting rocks (Barrett 61). Both Buffalo and Bear Rapids created navigation hazards and were later destroyed to improve navigability (Raynolds 145).

Vegetation

Clark, Forsyth, Sheridan, and members of the Yellowstone Expeditions of 1863 and 1873 made note of vegetation as they traveled along Yellowstone River. The most prevalent vegetation was cottonwood trees, willows, wild rose, prickly pear, buffalo berry, a sumac species, sage, and bunchgrass.

In July 1806, Clark observed cottonwood trees, willows, rose bushes, grapevines (editor suggests that this is riverbank grape), buffaloberry and skunkbush (Moulton 238). Forsyth's steamboat expedition noted that the south bank of the river and the river bottoms between the Bighorn and Powder River junctions was prairie covered with prickly pear, sagebrush and bunch grass, while the north bank was a sandstone bluff vegetated with sage and bunchgrass. Forsyth observed that the islands were covered with bunchgrass, wild rye, and sage (Forsyth 6, 7, 10). The Yellowstone Expedition journals from 1873 describe the valley of the river above the Powder River junction as richer than below with "rank and fine" grass and sage in the valleys (Frost 104). Stuart noted that the grass in a section just below the Bighorn River was scarce and consisting of bunch and buffalo grasses (Stuart 161).

Explorers descriptions convey that the Yellowstone between the Bighorn and the Powder rivers grew the largest cottonwood stands, particularly near the mouth of the Tongue River and upstream. Clark, Forsyth, Stuart, DeSmet, Russell, Anderson, and Bond each wrote that the cottonwood galleries were dense and vast. Cottonwoods clearly dominated the river bottoms, but were also accompanied by scrubby pine and larger pines beginning at the mouth of the Rosebud Creek and upstream.

Many parties traveling along the Yellowstone River in the 19th Century found that there was more timber in the middle and upper sections of the river than in the lower river. Parties traveling upstream, in particular Forsyth's steamboat journey, found that the amount of cottonwood timber "increases at each step of the route till you reach the rich timbered bottom of the immediate valley of the Tongue River" (Forsyth 7). Upon exploration of the Tongue River area, Forsyth and his party were pleased to find that the river bottom on the west side of the Tongue and south side of the Yellowstone was five miles long and two miles deep and was covered with vegetation and cottonwood trees (Forsyth 7). Forsyth continued to note extensive cottonwood forests as he traveled upstream. About 25 miles upstream of the Tongue River, he found a grove of cottonwood trees that were 3 to 6 feet in diameter, and noted islands covered with "heavy growth" of cottonwood trees (Forsyth 7, 10).

Other journals reflect the statement that the cottonwood galleries bordering the river were thick and plentiful in this river section. Osborne Russell wrote that the Yellowstone here was bordered with heavy cottonwood timber with little or no brush beneath (Russell 72). DeSmet observed that he was surrounded by groves of cottonwood, elm, ash, cedar, pine, and cherry trees and shrubs along the rivers and streams in this region (McFarling 206). Stanley and Grant found the same to be true in 1873, when they noted that the timber at the mouth of the Tongue River and above was abundant, the river being lined with "heavy cottonwood" as far as Pompey's Pillar (Frost 104).

Fish

William Clark's party caught 3 small, fat catfish between the Tongue River and O'Fallon Creek in July of 1806 (Moulton 248). Forsyth's report mentions shiners, catfish and jack-salmon (likely goldeye [*Hiodon alosoides*]) in this river section in June 1875, and Captain Stuart of the Yellowstone Expedition of 1863 reported plenty of catfish; including a catfish he caught weighing about 9 lbs just below the junction of the Yellowstone and Bighorn Rivers (Forsyth 16, Stuart 161).

Wildlife

Many accounts of travel along this part of the river cite deer, antelope, bears, elk, bison, mountain goats, rabbits, beaver, otter, and badgers in and around the river. DeSmet, Clark, and Bond each mentioned presence of beaver. Clark even mentioned that the number of beaver sign was more than he had observed above the Bighorn River (Moulton 237). As in other portions of the river, many reported huge herds of bison along the riverbanks. Clark noted large numbers of bison, and Reynolds said that their camp was "literally alive with buffalo" (Reynolds 144). In 1877, Sheridan only saw 4 bison in this area and commented that had he been there 10 years previously, he probably would have seen millions (Sheridan 31). While he attributes this decline to Indians, that is the subject of other research. Clark also saw a soft shell turtle and some snakes (Moulton 248).

Climate

There are a number of climate observations in the available sources but not enough information to draw conclusion about climatic conditions and trends. Father DeSmet recorded in his notes that the winter in this area was "said to be" extremely severe and lasting from November to April (McFarling 209). In addition, DeSmet himself experienced a severe thunderstorm on July 31, 1851. The Lewis and Clark expedition also encountered extreme weather with rain, strong wind, and thunder and lightening in July of 1806 while traveling between the Tongue River and O'Fallon Creek. General Sheridan was struck by the intense heat he experienced while traveling in this area in June of 1877, saying that the temperature was hot as Texas (Sheridan 30). That same evening, he reported a thunderstorm.

Powder River to Confluence with Missouri River

River Description/Geomorphology/Water Quality

Historical records describe a transition to a prairie riverine system with increased water volume, muddier flows, and decreased gradient between the entrance of the Powder River on the Yellowstone and the confluence with the Missouri River. An anomalous feature in this river section was the Wolf Rapids, located just below the mouth of the Powder River. The records of William Clark, Forsyth, Bond, and Meigs are particularly helpful in piecing together a history of this segment of the Yellowstone River.

The Wolf Rapids were near the mouth of the Powder River and, according to Forsyth, the most difficult section to navigate on the lower river. The rapids were about 250 feet long and ran along a 50 foot high perpendicular cliff on the south bank of the river (Forsyth 6). The river channel at the Wolf Rapids was narrow and deep, flowing with a large volume of water (Bond 6). The least depth of the channel was 8 feet, and the current was about 6 miles per hour. Like the Buffalo and Bear Rapids, the Wolf Rapids were eventually destroyed to facilitate navigation.

Downstream of the Wolf Rapids, the river current slowed and the channel broadened, separated by a number of mud and sand bars. The current slowed to 2 miles per hour, which Brisbin described as “sluggish and turbid” (Brisbin 68). The Powder River added increased sediment, contributing to turbidity in the Lower Yellowstone (Barrett 62). More sand bars and mud than usual characterized this lower section of the river (Moulton 268). Anderson observed that the bars were made of gravel above Powder River, but now mostly made of sand (Barrett 63). The average width of the river from Powder River to the Confluence with the Missouri was 300 yards (Forsyth 524). During July and August, the river in some places became 1000 feet wide, according to the notes from the Yellowstone Expedition of 1873 (Frost 103). These records show that, apart from the Wolf Rapids, this reach was clearly slower, broader, and muddier than preceding river sections.

By many accounts, the sides of the rivers were surrounded by different types of landforms than in upstream river sections. At the upper portion of this reach, Meigs described badlands rising 200-300 feet above the right bank, expressing that the opposite bank had gentle slopes while the right side had bluffs (Atwater 61). Most bluffs were on the north side of the river (Frost 105). At Iron Bluff, the river bottoms were made up of loose material, allowing the river to divide into three channels, the outer channels washing constantly away at the base of the bluff (Morrison 2, 3). From Powder River to Stanley Shoals the river was bounded by gravel bed and vertical banks (Forsyth 6).

Vegetation

Historical records vary considerably in their description of vegetation compared to descriptions of upper river sections. According to historical documents, the trees in this portion of the river were far less plentiful than in the middle and upper sections of the river in the 19th Century. The documents of Larocque, Anderson, Forsyth, Bond, Meigs, Lewis and Clark, and the Yellowstone Expedition of 1873 each support this statement.

Forsyth said that the riverbanks had “very little growing timber” (Forsyth 6). As Clark moved from the Upper to Lower sections of the river, his descriptions of trees ceased to use words like ‘abundant’, and began to say that there were small quantities of cottonwood trees, no timber on high lands, some trees along brooks, etc (Moulton 253-268). In the section between Glendive and Savage, Clark noted that the bottoms again contained timber, including cottonwood, ash, and willow (Moulton 273). Anderson specifically noted that there were very few trees along the river but he mentioned willows in passing (Barrett 64 – 65). Clark’s journal described young willows near the

confluence of the Yellowstone with the Missouri (Moulton 276). Meigs' correspondence recorded that the timber in this area was small cottonwood.

Fish

As in other river sections, there are not many reports mentioning fish here, but those that do mention fish express that there were plenty in the area. In October 1877, Fred Bond flat boated down the Yellowstone River. He noted that the lower section of the river was known for shovelnose sturgeon and caught a 3-foot long shovelnose sturgeon just above the Wolf Rapids (Bond 6). Because three feet is approximately the upper size limit for shovelnose sturgeon, there is some possibility that this was actually a pallid sturgeon (*S. albus*). The pallid sturgeon was not described until 1905 (Forbes and Richardson 1905). Forsyth recorded catching catfish in 1875, and the journals of John Ordway and Charles Floyd (members of the Lewis and Clark Expedition) reported catching several small fish in 1805 near the mouth of the river on the Missouri (Forsyth 16, Moulton 73).

Wildlife

Descriptions of wildlife in the lower section of the Yellowstone River during the 19th Century include several observations of bear, elk, and bison. Anderson's journal mentions that this area was home to plentiful game. Bond and Clark each observed beaver, though without specific notes on the abundance or the presence of beaver dams and lodges. Other descriptions convey that game was as prolific as was observed in the upper portions of the river. However, in 1873, Miegs wrote that he had seen comparatively little game in this region, including few buffalo and only occasional deer sightings (Atwater 60, 63).

Climate

The Lewis and Clark expedition, the Raynolds expedition, and travelers Anderson and Meigs each noted some weather conditions during their visit to this section of the Yellowstone River. Many of their journals recorded experiencing storm conditions. However, the number of records is not enough to base any conclusion upon regarding climatic conditions and trends.

In April 26, 1805, the Lewis and Clark expedition noted that the temperature in the morning was 32 degrees Fahrenheit and had been cold during the night. A year later, the party again was near the confluence with the Missouri and experienced hard frost and ice, and described the weather as chilly and cold. In the next week, the party experienced showers and some high wind (Moulton, vol.IV 73 Moulton vol. IX 138). In July 1860, the Raynolds Expedition party was between the Powder River and the confluence of the Yellowstone with the Missouri. On July 31, Raynolds recorded a violent and sudden rainstorm (Raynolds 145). Six years later in October, Anderson mentioned that there was rain during the night of the 3rd and "a perfect hurricane" three nights later (Barrett 66). In July of 1873, Montgomery Meigs reported in a letter that he had experienced rain three weeks earlier, but that now the country was dry, warm, and "delightful" (Atwater 58).

Notes on Tributaries of the Yellowstone River

In an historical search for information on the Yellowstone, the tributaries of the Yellowstone with the greatest available historical information are the Bighorn River, Powder River, and Tongue River. Records discussing the Yellowstone also mention a number of smaller creeks and streams. Some of the tributary names probably have been changed since the 19th Century. In addition, several historical documents describe streams emptying into the Yellowstone without being naming the streams.

From Yellowstone Park to Livingston, historical records discuss an unknown tributary. Between Livingston and Clarks Fork, explorers mentioned Shields River and Stinking Cabin Creek. In the Clarks Fork to Bighorn River reach are records describing Clarks Fork, Pryor's Creek, Shannon's River, and Little Bighorn River. In the Bighorn River to Powder River reach, records referred to Alkali Creek, Muggins Creek, Horse Creek, Gun Creek, Sunday Creek, Cabin Creek, Charbonneau River, Cherry Creek, Custer Creek, Rosebud Creek, Tullock Creek, Big and Little Porcupine Creeks. The river section between Powder River and the Confluence with the Missouri has historical descriptions of O'Fallon Creek, and Smith Creek. Descriptions of the smaller tributaries are in the spreadsheet catalogue of findings.

Records of the Bighorn River include the reports of Forsyth, Sheridan, Clark, and Stuart. In general, these reports described the Bighorn as wide with a swift current, well timbered and divided into several channels. Reports observed beaver and plenty of game. Captain Stuart mentioned that his party caught more catfish than they could eat (Stuart 164)!

Anderson, Larocque, Russell, Hayden, and Clark described the Powder River. Many accounts said that the water in the Powder was very muddy (Russell 84, Barrett 62, Larocque 66, Forsyth 6). The depth was shallow and the current was sluggish (Forsyth 6, Moulton 253). Reports express that there was not much timber growing along the Powder (Larocque 66).

The Tongue River was also quite muddy, with a fast current. Unlike the Powder, the Tongue was lined with large numbers of cottonwood trees. The cottonwood here was "practically inexhaustible" (Frost 112).

Recommendations for Comparisons between Historical and Recent Conditions and Additional Research.

This effort presents a description of conditions along the Yellowstone River as viewed by 19th Century explorers. The next step in the analysis and interpretation of these reports would be a comparison of the observed conditions with those occurring today. This would reveal the extent of changes over time and perhaps highlight the significance of certain 19th Century river conditions.

A number of specific recommendations comparing historic to current conditions would provide insight into the response of the Yellowstone River to alterations in geomorphology and vegetation beginning soon after settlement by Europeans and continuing to today. Actions that influence geomorphology include obliteration of rapids to facilitate steamboat navigation, armoring banks and river adjacent road construction, and construction of dams on several major tributaries including the Tongue and Bighorn rivers. Several investigations would shed light on the response of the Yellowstone River and its tributaries to these actions. First is a study of the implications of obliteration of rapids on channel stability and incision. This would involve a comparison between 19th Century and current conditions, in combination with an analysis of theoretical geomorphic response. In addition, comparisons of widths and depths measured in the 19th Century and today would also shed light on channel changes. Similarly, comparisons of historical photographs to recent photographs would provide useful information on trends since the 1800s.

Dams on the Bighorn and Tongue rivers have the potential to alter geomorphology by trapping sediment and buffering the hydrograph. The impact of these dams could be assessed in part by comparing the numbers of islands and bars per mile reported by William Clark in 1806 with numbers occurring there currently. Another valuable comparison is one of bed material between the 19th Century and today. Both bed material and presence of bars and islands have implications for pallid sturgeon. This species requires a dynamic, complex river with sand substrate (Bramblett 1996). It is theoretically possible that these dams have altered river morphology and sediment transport regimes in the Yellowstone River resulting in a decrease in the length of suitable habitat for pallid sturgeon.

Explorers in the 1800s provided detailed descriptions of vegetation characteristics, such as species composition and abundance, for much of the Yellowstone River. Historical photos collected in this effort also provided a clear portrayal of riparian vegetation communities. Comparisons of historic vegetation conditions with those present today would provide valuable information on response of vegetation communities to land uses adjacent to the Yellowstone River and flow alterations due to impoundment of tributaries. Related investigations would include a comparison of vegetation characteristics among different vintages of photographs. While vegetative species may be similar to current conditions, the extent of certain community types, such as willows and cottonwoods, are likely to be quite different. Digitizing the location of mature cottonwood stands and

willow flats visible in the historical photos, would provide a very valuable comparison with current riparian conditions in those locations. Current vegetation conditions could be assessed through recent aerial photos, Landsat land use data, or by attempting to replicate historical photo points.

Further research could include additional searches for historical photographs. Extensive research did not reveal many pictures of the river prior to 1900, but other locations may hold more photographs. Since photographs are such a useful way of evaluating the river conditions, further research into photographic archives may turn up additional valuable sources. Additional research into photographic archives at the National Archives or Montana Historical Society would likely be unsuccessful. However, perhaps the USGS Photographic Library in Denver might hold more photographs of the Yellowstone River prior to 1900. While this research location did not turn up as one of the most promising when the Confluence historian scheduled trips to Washington and St. Paul, it appears that the holdings of this library are extensive and well documented. Many of their archived photographs are unpublished and unavailable elsewhere.

Literature Cited

- Bramblett, R.G. 1996. Habitats and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri River, Montana and North Dakota. Doctoral Dissertation, Montana State University-Bozeman, Bozeman, Montana.
- Forbes, S.A. and R.E. Richardson. 1905. On a new shovelnose sturgeon from the Mississippi River. Bulletin of the Illinois State Laboratory of Natural History 7: 35-47.

Sources consulted

1. Annin, Jim *Eighty Years of Memories on the Banks of the Yellowstone*. Artcraft: Billings, MT. 1978
Montana State Historical Society

This is a locally published memoir of a longtime Montana resident. Annin's memoir is full of anecdotes about his years living along the Yellowstone River. Unfortunately for the purposes of this project, the anecdotes do not address a history of the river itself, nor do they contain information about environmental conditions along the river.

2. Atwater, Elizabeth Joan Rodgers. *Letters of Montgomery Meigs, written while engaged in the Survey of the Northern Pacific Railroad, 1872-1873*. Masters thesis. Bozeman: State University of Montana. 1937.
Montana State Historical Society

Atwater's 1937 thesis transcribed the letters of Montgomery Meigs, written to his family while he was working on the Northern Pacific Railroad Survey. Meigs made observations for the purpose of describing his surroundings and experiences to his parents. Meigs's company traveled throughout the Yellowstone Valley, though not entirely along the Yellowstone River. Three of his letters describe the lower/middle sections of the Yellowstone River. Meigs described the physical features of the river, vegetation, and weather. Meigs's letters are not specific in terms of measurements or numbers; they are more anecdotal in nature.

3. Audubon, Maria R. *Audubon and his Journals with Zoological and Other Notes by Elliott Coues*. New York: Dover Publications, Inc.
Montana Historical Society

Maria Audubon writes on the John Audubon journals. The entries recounting time spent on the Yellowstone River describe successful hunting and fishing attempts in 1840 on the Lower Yellowstone River. The most useful information in Audubon's journals is his mention of fish in the river. He recorded the number of fish he caught, the type of fish, and the length of time fishing it took to catch that count. He reports catfish, on one occasion catching 16 and on another catching 12. Audubon also observed beaver and described a pond created by a beaver dam. Other entries in his journal are general, but useful, descriptions of the river and wildlife.

4. Barrett, Glen, editor. *Mackinaws down the Missouri: John Anderson's Journal of a trip from St. Louis Missouri to Virginia City, Montana, and return in 1866*. Logan, Utah: Western Text Society. 1973.
Montana State University, Bozeman

John Anderson's journal of a trip in 1866 describes, among other things, his journey along the Yellowstone River. He traveled down the Yellowstone from the Livingston

area to the Missouri River. The editor's notes help to clarify some of Anderson's notes, and the editor also suggests that Anderson's original journal may have been added to, and edited after his trip was completed. Anderson made general comments about river morphology, water, vegetation, wildlife, and weather he experienced during the journey. The focus of this journal is not on the Yellowstone River, but the entries pertaining to the river are certainly useful to this research endeavor.

5. *Flatboating on the Yellowstone, 1877*. Manuscript of Fred G. Bond, editor unknown. 1925 edition.

Montana State Historical Society

Bond traveled down the Yellowstone River by flatboat in 1877. His journal is short, but it is a good source because it is one of only a few that makes a point to mention fish caught in the Yellowstone. Additionally, Bond's observations of the speed of current, and descriptions of his physical surroundings are a useful addition to others that are longer and more detailed.

6. Bonney, Orrin H. and Lorraine Bonney. *Battle Drums and Geysers: the life and journals of Lt. Gustavus Cheyney Doane, soldier and explorer of the Yellowstone and Snake River Regions*. Chicago: The Swallow Press, Inc. 1970.

Montana State University, Bozeman

The Bonneys' book explores the complete journals of Lt. Gustavus Cheyney Doane. In 1870, Doane was a leader of the Yellowstone Exploration, also known as the Doane-Washburn Expedition. Doane's journals contain little information pertaining to fish, wildlife, and morphology of the Yellowstone River, but the information that it does contain is specific and relevant. The journal appears to have been written at the time of the expedition in 1870. It contains notes regarding the Yellowstone River from Fort Ellis to Madison Junction and travel along the Madison River to Virginia City. Notes are specific but not scientific, sometimes not containing quantifying details. Doane estimates river and valley sizes, numbers of wildlife, and describes very successful fishing attempts.

7. Bradley, Lieutenant James H. *Journal of James Bradley: the Sioux campaign of 1876 under the command of General John Gibbon*. Journal of the Historical Society of Montana, v. 2.

Montana State University, Bozeman

Bradley's journal is long and mostly full of descriptions of encounters with the Sioux Indians. However, the first twenty pages also describe the morphology, riparian vegetation, and aquatic life in the Yellowstone River in the year 1876. Though Bradley's journals are not as detailed as some other accounts, they support information found in other accounts.

8. Brisbin, Gen. James S. *The Great Yellowstone Valley Described*, St Louis, MO. 1882. Montana State University, Bozeman- Microfilm

Many of Brisbin's observations are at Fort Keogh, while others are unspecific regarding location. Most of Brisbin's notes pertaining to the Yellowstone Valley are weather observations. He also describes the river in some places, and refers to large groves of cottonwood trees.

9. Brown, Mark H. *The Plainsmen of the Yellowstone: A History of the Yellowstone Basin*. New York: Putnam, 1961.
Montana State University, Bozeman

Brown's book covers everything from early explorations by La Verendrye to Northern Pacific Railroad Surveys and army movement along the Yellowstone River. The maps in this book are particularly helpful, as they clearly indicate which parties traveled along the river with the dates of travel. Brown's book quotes from many primary accounts of people on the Yellowstone River and in doing so, suggests sources for further exploration.

10. Clark, Lieutenant William P. *The Diary of William P. Clark*. Montana Historical Society Library. SC 538, Folder 1/1. 1876.
Montana Historical Society

The diary of Lieutenant William P. Clark is a short description of Clark's 1876 voyage from the Pompey's Pillar area as far as the Powder River. Clark described river morphology in general, and particularly made note of rapids that his party traveled on the Yellowstone River. This journal backs up information in other journals that are longer and more descriptive.

11. Derig, Anna. *A Brief History of the Yellowstone River 1805-1880: From Livingston to the Big Horn River with recommendations for management*. Boulder: Western Interstate Commission for Higher Education, 1974.
Supplied by Pat Newby

A Brief History of the Yellowstone River provides a useful timeline of activity along the Yellowstone. It is also a good starting point for research, as it refers to several other relevant sources. Unfortunately the report lacks complete citations, but it is a useful reference nonetheless. It lists sources by the following categories: Fur Trade/Early Exploration, Military, Indians, Miscellaneous, and General Reference. The report itself provides a timeline of activity along the Yellowstone during the 19th Century.

12. Douglas, Walter B. *Manuel Lisa*. New York: Argosy-Antiquarian Ltd. 1964.
Montana State University, Bozeman

Manuel Lisa was a trader who spent time along the Yellowstone River in the 1810s. Although Lisa's journals are among the earliest written records of the Yellowstone River area, this edition of this journals does not describe river morphology, aquatic life, vegetation, or wildlife.

13. Ewan, Joseph. *Rocky Mountain Naturalists*. Denver: University of Denver Press. 1950.

Montana State University, Bozeman

This book features chapters on 10 prominent naturalists who collected in the Rocky Mountains in the 19th Century. None of the featured naturalists worked near the Yellowstone River, but the book has a relevant appendix. Ewan lists and briefly describes the work of nearly 200 pages worth of naturalists. Each is given a short paragraph describing dates of work, regions, and connections with other naturalists, along with information regarding records or field notes of each collector.

14. Fawley, Paul G. *A History of the Yellowstone River Basin from the Earliest Explorations to 1865*. Masters thesis. Bozeman: State University of Montana, 1934.

Montana State University, Bozeman

Fawley's thesis summarizes early explorations on the Yellowstone River. Fawley devotes individual chapters to different expeditions. Chapter titles are the following: The Yellowstone Basin, The Crow Indians, Early French and English Fur Trade of the Yellowstone Basin, and Later Explorations and Expeditions. This thesis is particularly useful to research of the Yellowstone River because its text provides a general background of history of the Yellowstone basin and gives insight into applicable sources.

15. Folsom, David E. *The Folsom-Cook Exploration of the Upper Yellowstone in the year 1869*. St. Paul, 1894.

Montana State University, Bozeman

Although the Folsom-Cook Expedition of 1869 primarily spent time in the area that is now known as Yellowstone National Park, the party traveled along the Yellowstone River from Emmigrant to the park. The journals describe morphology, river bottoms, fish, and wildlife in the upper Yellowstone River.

16. Forsyth, J.W. and F.D. Grant. *Report of an Expedition up the Yellowstone River made in 1875*. United States War Department. Washington: Government Print Office. 1875

Montana Historical Society

Lieutenant Colonel Forsyth and company traveled up the Yellowstone River by steamboat from the Missouri. The letter from P.H. Sheridan ordering this expedition asked for a "careful examination made of the south bank of the Yellowstone and the mouths and immediate valleys of the rivers coming in from the Black Hills, and especially those of Tongue River, Rosebud, and Big Horn, and if you go higher up the Yellowstone, the Big Rosebud, giving an account of the timber, soil, and geological formation, also the depth of the water in a general way, and the character of any rapids passed over above the mouth of Powder River." The request yielded a report that thoroughly lists the characteristics of the river and describes the surroundings. Forsyth also mentions vegetation and fish in his report.

17. Frost, Lawrence A., editor. *Some Observations on the Yellowstone Expedition of 1873, Stanley and Grant*. Glendale, CA: A.H. Clark Company. 1981.
Montana State University, Billings, Special Collections

This report gives a good description of the main characteristics of the Yellowstone River. Stanley was concerned with finding a route for a railroad and also for making suggestions on the possibility of settlement or military posts along the Yellowstone. The notes describe the river in general and comments on different tributaries and sections/features of the river.

It may also be interesting in future studies to refer to this report for its recommendations on altering the Wolf and Buffalo Rapids to make upstream points more accessible. Another study might be interested in Stanley's comments on the necessity of driving out the Sioux living in the region.

18. Geiser, Samuel W. *Naturalists of the Frontier*. Dallas: Southern Methodist University. 1948.
Montana State University, Bozeman

This book looked promising according to its title, however it focused almost entirely on naturalists in Texas.

19. Goetzmann, W.H. *Army Exploration in the American West 1803-1863*. New Haven: Yale University Press, 1959.
Montana State University, Bozeman

Goetzmann's book is a good source because of its bibliography of materials pertaining to western exploration. This book concerns topographical surveyors in the 19th Century U.S. Army. It is specific regarding the holdings of the collections the author used for research. These sources are relevant to research on army exploration of the Yellowstone River.

20. Haines, Aubrey L. *The Valley of the Upper Yellowstone : An exploration of the headwaters of the Yellowstone River in the Year 1869, as recorded by Charles W. Cook, David E. Folsom, and William Peterson, edited and with an introduction by Aubrey L Haines*. Norman: University of Oklahoma Press.
Montana State University, Bozeman

Haines' edited volume of the Folsom, Cook, and Peterson diaries is apparently more comprehensive than previously published and abridged versions of the Folsom-Cook manuscripts (according to Haines' introduction). Although the Folsom-Cook Expedition of 1869 primarily spent time in the area that is now known as Yellowstone National Park, the party traveled along the Yellowstone River from Emmigrant to the park. The journals describe morphology, river bottoms, fish, and wildlife in the upper Yellowstone River. Parts of the journal were written at the time of the expedition, while other parts were later added in effort to "reconstruct" the diary of the expedition. Specifically, Mr. Cook added

to his diary in 1922, more than 50 years after the expedition. Peterson and Folsom both appear to have made changes long after their return.

21. Hayden, F.V. *Geological Report on the Exploration of the Yellowstone and Missouri Rivers*, 1859-1860.
Montana State University, Bozeman

This report contains a detailed assessment of geological features along the Yellowstone River. Hayden's report draws from the findings of his expedition to conclude what the Yellowstone Valley was like historically. However, Hayden does not specifically address the features that this report concerns, the geological information could be used in further studies interested in the types of rock and formations of the river.

22. Heldt, F. George. *Sir George Gore's Expedition (1854-1856) from conversation with Henry Bostwick, a member of the party*. Contributions to the Historical Society of Montana, v. I., pg.138.

Sir George Gore of Ireland spend about two years traveling around the American West for the purpose of exploration and hunting. This account of Gore's journey mentions little about the Yellowstone River.

23. Hoyt, Colgate. *An Account of a Trip through the Yellowstone Valley in 1878*. edited by Carroll Van West. Montana: The Magazine of Western History. 36(2)22-35.

In 1878, Colgate Hoyt traveled through the Yellowstone Valley by wagon and by steamboat. His account describes riparian vegetation and the appearance of the river itself. Hoyt's story does not lend a large amount of information to this research investigation.

24. Kirschten, Lorene E. *History of Fallon County, Montana*. 1940.
Provided by Pat Newby

Kirschten's account relates a general history of Fallon County, Montana. Kirschten's story is anecdotal and spans a broad time period. Although it describes changes in the area over time, it fails to focus on geomorphology, aquatic life, riparian vegetation, or wildlife pertaining to the Yellowstone River itself.

25. Knowles, Craig J. and Pamela R. *A Bibliography of Literature and Papers Pertaining to Pre-settlement Wildlife and Habitat of Montana and Adjacent Areas*. Boulder, MT: FaunaWest Wildlife Consultants. 1993.
Provided by Pat Newby

This compilation was invaluable in leading to a number of useful sources for research on the history of the Yellowstone River. The authors fully annotated a list of early explorations and literature pertaining to each exploration.

26. Lang, W. L., editor. *Stories from an Open Country: essays on the Yellowstone River Valley*. Billings: Western Heritage Press, 1995.
Montana State University, Bozeman

This book contains several essays on the Yellowstone River Valley, its people, history, characteristics, and stories. The notes section of this book lists a number of primary sources relating to the pre-1900 Yellowstone River. Particularly useful are bibliographical notes from Lang's essay *In the Yellowstone: river, myth, and environment*, and from John R. Peters-Campbell's essay *Imagining Montana: photographs by Frank J. Haynes, L.A. Huffman, and Evelyn Cameron*. Lang's essay briefly discusses early descriptions of the Yellowstone, and Peter-Campbell's gives information about the Haynes and Huffman photographic collections. Frank Jay Hanes was known for his photographs of Yellowstone National Park, photographs taken along the railroad. Huffman photographed "cowboys, Indians, hunting expeditions, and bison herds." (97) Cameron's focus was on domestic life. (98)

27. Langford, Nathaniel Pitt. *The Discovery of Yellowstone Park: Journal of the Washburn Expedition to the Yellowstone and Firehole Rivers in the Year 1870*. Lincoln: University of Nebraska Press. 1972.
Montana State University, Bozeman

Langford was a member of General Washburn's party that traveled from Bozeman to Yellowstone National Park in 1870. His journal mostly describes events and places within present day park boundaries, but also has entries referring to morphology and vegetation of the Yellowstone River. The information is anecdotal and often unspecific, but relevant. Langford wrote the journal during the expedition and added further notes and reconstruction later.

Most of the information concerns hunting, fishing, and some description of surroundings.

28. Larocque, Francois A. *The Journal of Francois Larocque*. Fairfield, Washington: Ye Galleon Press. 1981.
Montana State University, Bozeman

Larocque's journal is the earliest authenticated account of a white person on the Yellowstone River. Larocque traveled the entire length of the Yellowstone in 1805. The journal appears to have been written mostly at the time that he was traveling, though some entries were written at a later date. The information is anecdotal and general, but important because of its early date. Many of his notes pertain to interactions with Indians, but he also regularly described his surroundings and daily activities. Larocque wrote that the Yellowstone is a "fine large river in which there is a strong current, but the Indians say there are no falls. Fordable places are not easily found although I believe the water to be at its lowest. The bottoms are large and well wooded." (62)

29. Leiberg, John B. *Notes on the Flora of W. Dakota and E. Montana Adjacent to the Northern Pacific Railroad*. Botanical Gazette, vol. 9, No. 7 (Jul., 1884), 103-107.

Montana State University, Bozeman

Leiberg's article describes flora in the area near the Yellowstone River, but does not describe vegetation in the riparian corridor.

30. MacDonald, John G. *History of Navigation on the Yellowstone River*. Masters thesis, Montana State University, 1950.
Montana State University, Bozeman

MacDonald's thesis is particularly relevant to this project because it focuses completely on the Yellowstone River. MacDonald discusses early explorers, whether or not they traveled by land or water. If by water, MacDonald discusses the type of vessel used, and comments made by the explorers regarding the navigability. Though the thesis is not intended to describe the environmental conditions of the river, this information may be gleaned from the sources that he consulted in his research. MacDonald's bibliography lists a number of reports printed by the Government Print Office in the 19th Century that pertain to travel on/along the Yellowstone River.

31. McFarling, Lloyd. *Exploring the Northern Plains 1804-1876*. Caldwell, Idaho: The Caxton Printers, Ltd. 1955.
Montana State Historical Society

McFarling's compilation of journals and historical information on the northern plains does not focus on the Yellowstone River, but includes excerpts from journals of a number of pre-1900 explorers who spent time along the river. Of particular interest are the journal excerpts from Father DeSmet and an excerpt from notes on the Reynolds expedition. As with a number of other secondary sources relating to this topic, *Exploring the Northern Plains* is most useful for its comprehensive bibliography that leads to other sources.

32. Moulton, Gary E., Editor. *The Journals of the Lewis & Clark Expedition: June 10-September 26, 1806*. Lincoln and London: University of Nebraska Press. Vol. 9, 1983. Also excerpts from Vol. 4 and the Journals of Ordway and Floyd.
Bozeman Public Library

Lewis and Clark separated for a while in Montana during their 1805-1806 expedition. Clark followed the Yellowstone River from Livingston to its confluence with the Missouri, where he met up with Lewis's party again. Clark made very careful observations each day that he was on the Yellowstone River; the observations are extremely useful to an historical assessment of the Yellowstone River. He recorded river depth and width, distances, number of bends in the river, number of islands, and noted changes as the river flowed downstream. He described tributaries, vegetation, aquatic life, and game.

33. Neihardt, John G. *The River and I*. New York: Putnam and Sons. 1910.
Montana State Historical Society

This memoir recollects time spent on the Yellowstone River by John Neihardt. The content lacks in specificity (including dates). Neihardt's memories of the Yellowstone River include references to cottonwoods, some river description, and a few photographs.

34. Quivey, Addison M. *The Yellowstone Expedition of 1874*. Contributions to the Historical Society of Montana, Vol. I.
Montana State University, Bozeman

The Yellowstone Expedition of 1874 was also known as the "Wagon Road and Prospecting Expedition." This expedition traveled from the Pompey's Pillar area to the junction with the Missouri River. Quivey describes some vegetation along the river and along tributaries to the Yellowstone.

35. *Report on the Exploration of the Yellowstone River*. (Communicated by the Secretary of War, in compliance with a resolution of Senate, 40th Cong., 2nd Sess. [1866], Ex. Doc. No 77. and Preliminary report of the same expedition.
Montana State University, Bozeman

The Raynolds Report of Exploration on the Yellowstone is an excellent source for this project. Maynadier, the Lieutenant who traveled the length of the Yellowstone described the river and wildlife on it during his journey in July 1860. The report describes the river and its surroundings, and wildlife encountered during the journey. Many of the observations contain specific details, but others are general and more anecdotal. Raynolds Preliminary Report is a letter describing the routes taken by Raynold's Exploration; it was intended to precede the final report. It doesn't add anything that is not in the Raynold's Report

36. Russell, Osborne. *Journal of a Trapper: Nine Years in the Rocky Mountains 1834-1843*. Boise: Syms-York Company. 1921.
Montana State University, Bozeman

Russell was a trapper in the American West during the 1830s and 1840s. His journals span 9 years and provide a number of stories about his experiences living and working in the west. Russell spent plenty of time in the Montana area and along the Yellowstone River. His journal entries describing the Yellowstone River contribute historical information regarding geomorphology, vegetation, fish, and wildlife.

37. Sheridan, General P.H. and W.T. Sherman. *Reports of Inspection Made in The Summer of 1877* by Generals P.H. Sheridan and W.T. Sherman of Country North of the Union Pacific Railroad.
Montana State Library

Sheridan and Sherman wrote clear and detailed descriptions of river features, vegetation, trees, climate, and fish that the party encountered in its journey made in 1877. The party traveled the length of the river, beginning at the Missouri and following the Yellowstone

upstream. The report references a few earlier reports that may lead to even more comprehensive and earlier accounts of the Yellowstone River.

38. Silverman, A.J. and W.D. Tomlinsen. *Biohydrology of Mountain Fluvial Systems: The Yellowstone, Parts I and II*. Reston, Virginia: U.S. Department of the Interior Geological Survey. 1984.

Provided by Pat Newby

Silverman and Tomlinson present a thorough timeline of history on the Yellowstone River, describing early explorers, miners, military groups, farmers, ranchers, and others. Part I does not explore any of the accounts very deeply, but does mention almost all of the people who were documented as along the Yellowstone River in the 19th Century. Part II provides an annotated bibliography with good summaries and author's notes on over 150 documents, reports, etc. The bibliography also lists another hundred or so documents without adding a summary or review. This report was a very useful starting point.

39. Stuart, Captain James. *The Yellowstone Expedition of 1863*. With notes by Samuel T. Hauser and Granville Stuart, active members of the Historical Society of Montana. Contributions to the Historical Society of Montana, vol. 1.

Montana State University, Bozeman

Captain Stuart's records recall an 1863 expedition that traveled in the sections between Livingston and Powder River. Stuart wrote about geomorphology, vegetation, fish, and wildlife. Many of Stuart's writing generalizes sizes and amounts, but in some cases he used numbers and measurements to describe features of the Yellowstone.

40. Topping, E.S. *The Chronicles of the Yellowstone: an accurate and comprehensive history of the country drained by the Yellowstone River*. Minneapolis: Ross and Haines. 1968.

Montana State Library

Topping's book compiles a history of activity in the Yellowstone Basin. Like many other books consulted, it is especially helpful as a reference leading to other sources.

41. Warren, Lieutenant G.K. *Memoir to Accompany the Map of the Territory of the United States from the Mississippi River to the Pacific Ocean, Giving a Brief Account of Each of the Exploring Expeditions Since AD 1800*. 53rd Congress, 2nd Session. 1893.

Montana State Historical Society Library

Warren's memoir and accompanying map relate to the region around the Yellowstone River, but do not pay much specific attention to the Yellowstone. His survey seems to be very precise and would be worth looking into for information on other rivers, if needed.

42. Withington, Mary C., Compiler. *A Catalogue of Manuscripts in the Collection of Western Americana founded by William Robertson Coe Yale University Library*. New Haven: Yale University Press. 1952.
Montana State University, Bozeman

This catalogue mentions a few manuscripts not listed in other sources. Withington mentions several people who had been on the Yellowstone River prior to 1900. The journal of Edward Harris looks particularly promising, as no other accounts of his trip with John Audubon up the Missouri and Yellowstone Rivers were found.

43. *Letter from the Secretary of War Transmitting, with a letter from the acting chief of engineers, Reports on Examination and Survey of Yellowstone River, from its mouth to Billings, With a View to a 4-foot Stage of Water and the Building of a Lock at the United States Government Dam*. 62nd Congress, 1st Session, Document No. 83. 1911.
Montana State University, Bozeman

This letter discusses a survey of the Yellowstone River, but is beyond the scope which limits the time frame of this project to the years before 1900. Further studies might consult this letter for survey information post “improvements” and in the midst of alterations to the river.

44. *The Climate, Soil, and Resources of the Yellowstone Valley, with accurate maps of the Yellowstone Country, the transcontinental route and connections of the Northern Pacific Railroad and a Plat and Description of the Town of Glendive, at the junction of this railroad, with the steamboat navigations of the Yellowstone and Upper Missouri Rivers* (St. Paul: The Pioneer Press Company) 1882.
Montana Historical Society

This report provides a description of the Yellowstone River, its valley, and its climate. The author clearly hopes to grow settlement in the region, and scarcely says a negative word about the possibility of settlement and agriculture along the Yellowstone River. However, the report contains information useful to the historical assessment of environmental conditions on the Yellowstone River. Of special interest is the general statement made in the beginning of the report that the first white man to write about exploration of the Yellowstone Valley was a French priest in the late 18th Century. The author makes a point to say that this priest’s notes were more complete than those of William Clark. The research for this project did not turn up any other mention of a French priest who wrote extensively on the Yellowstone Valley. The maps accompanying the report were too large to photocopy and would require a special request to the Montana Historical Society Library.

45. *Letter from the Secretary of War, communicating the report of Lieutenant Gustavus C. Doane upon the so-called Yellowstone Expedition of 1870*. Senate Executive Document No. 51, 41st Congress, 3rd Session.
National Archives I

Doane's report describes the findings and experiences of the members of the Yellowstone Expedition of 1870. Doane led the party with General H.D. Washburn, surveyor general of Montana, for the purposes of surveying the upper Yellowstone River as far as the falls in present day Yellowstone National Park. Doane's report notes climatic conditions and elevation daily, as well as a summary of the journey with observations regarding fish, wildlife, physical features of the river, soil, and vegetation. Doane's account, being an official report, is specific in terms of measurements and numbers in many of his observations, but includes anecdotal information as well.

46. Montana the Magazine of Western History: volume 35, number 4, 1985.

- Heidenreich, C. Adrian "The Native Americans' Yellowstone" 2.
Heidenreich's article discusses the archaeological record along the Yellowstone River. He describes human life along the river, and characterizations of different groups living here thousands of years ago. Heidenreich's article presents a brief description of life in the Yellowstone Valley between 10,000 BC and the 20th Century. While this time period is exceptionally broad, the article still manages to mention some points of interest to this project. Heidenreich's article says that during the historic period the valley was rich in animal life, cottonwoods, willow tress, prunes, chokecherry and buffalo berries. (8) The article also has a few photographs that show the Yellowstone River during the 1800s. (5, 16, 17)
- Lass, William E. "Steamboats on the Yellowstone", 26.
Lass' article discusses steamboat activity on the Yellowstone. He describes the river from Forsyth's report. Discusses other steamboats including the *Chippewa Falls*, *Alone*, and *Key West*. This article is another source that makes a good starting point for research on the Yellowstone, particularly if the focus of research is navigation. This article has a photograph of a steamboat near Clarks Fork, it shows some river and bank in the background. (31)

47. Northern Pacific Railroad Records, including:

- a. J. Dodge to Northern Pacific Railroad Engineer in Chief. Correspondence. December 27, 1880,
- b. G. Morrison to Gen. A. Anderson, Chief Engineer Northern Pacific Railroad. Correspondence September 10, 1881,
 - a. Describes river and landform features around Glendive. Describes soils as "slippery clay", explains how river washes away at bluff banks.
- c. Contract with Mr. Herman Clark for the sale of Townsite of Coulson and certain lands in Clarks Fork Bottom, March 13, 1882,
 - a. describes the area around the confluence of Yellowstone River with Clarks Fork River.
- d. Contract between E.A. Williams and N.P.R.R.,
 - a. Contract for supply of railroad tie to N.P.R.R.
- e. Edwin Johnson, Eng. in Chief, to Capt. W. DeLacy. Correspondence. July 13, 1870,
 - a. discusses surveying to be completed by DeLacy. Asks DeLacy to be able to convey the "true character and probably cost of getting a Railway"

through the area. DeLacy went on to survey several reaches of the Yellowstone River.

- f. A. Anderson, Chief Engineer to E.H. Bly. Correspondence. Miles City, September 15, 1880.
 - a. Anderson wrote to Bly concerning his proposal to furnish cross ties and bridge timber for the N.P.R.R., attesting to the availability of timber in the area.
- g. J.B. Hubbell to Col. Dodge, Division Engineer N.P.R.R. Correspondence. October 16, 1880,
 - a. Regarding delivery of timber piles and ties. Attests to availability of timber near Yellowstone River.
- h. Field Survey books.

Minnesota Historical Society Old Vault File

The extension of the Northern Pacific Railroad into Montana was preceded by field investigations of the Yellowstone River Valley. In 1880, a field reconnaissance was undertaken to identify the optimal route of the line. The survey crew mapped the extent of bluff line and number of river crossings on both sides of the river, in an effort to identify the most cost effective approach to rail construction and operation. These efforts are summarized in a letter dated December 27, 1880, in which a division engineer for NPRR named J. Dodge wrote the following from Miles City to the NPRR Engineer in Chief:

“The question, which side of the Yellowstone the Northern Pacific’s Railroad ought to occupy from Miles City to Terry’s Landing, is by no means a simple one. Lines surveyed on both sides of the river show little difference in distance. They also show nearly 18 miles of Bluff work on the north and nearly 19 on the south side.....the question reduced to this, shall we cross the river twice in the first 44 miles or adhere to the south side till we reach Huntley or Coulson. By detailed estimates of 44 miles herewith; after equating for distance and curvature and further renewal of bridges, we find a balance of over \$100,000 in favor of south line”.

The results of subsequent NPRR surveys include a series of plats of the proposed rail line that locally include schematics of the adjacent river corridor. Survey notes dated 1881 include maps as well as field observations of portions of the Yellowstone River corridor. During the survey effort, observations were recorded for surveyed sections regarding the land surface, soils, vegetation, and water availability. In an area approximately 10 miles upstream of Glendive, there is little difference between the river location in 1881 and that of today, indicating that river migration is not particularly active in the reach. A further comparison of the survey data with current maps would allow a quantitative assessment of long-term migration rates in individual areas.

48. GLO Survey Plats

Bureau of Land Management, Billings, MT

Surveys conducted in the late 19th Century. The plats contain detailed information on river location and conditions. May be used as part of a future project to digitize and

compare the 19th Century Yellowstone River to the present river. These surveys are included with this report in Appendix C. Confluence collected surveys for the following Township Ranges:

Township Ranges					
1N26E	6N35E	7N45E	17N55E	1S17E	4S9E
1N27E	6N36E	7N46E	18N57E	1S18E	5S8E
2N27E	6N37E	8N47E	19N57E	1S25E	6S7E
2N28E	6N38E	949E	20N58E	1S26E	7S7E
3N28E	6N39E	9N48E	21N58E	2S10E	8S7E
3N29E	6N40E	10N49E	21N59E	2S19E	9S9E
3N30E	6N41E	11N50E	22N59E	2S20E	
3N31E	6N42E	12N51E	23N59E	2S22E	
4N32E	6N43E	12N52E	24N60E	2S23E	
4N33E	6N44E	13N53E	1S11E	2S24E	
5N33E	7N36E	14N54E	1S12E	2S25E	
5N34E	7N37E	15N55E	1S13E	2S9E	
6N34E	7N44E	16N56E	1S16E	3S9E	

49. Northern Pacific Railroad Surveyor Field Books Minnesota Historical Society, St. Paul, Old Vault Files

Field books showing river surveys in varying detail, often including written descriptions of vegetation, water, and soils. Copies of some of the field book surveys are included in Appendix C. Includes Box 134.B.9.12(4) records of Land Examinations for several sections in T14N54E and 14N 55E, a letter and drawing describing the reach of the river between Junction City and Miles City, and Box 136.K.11.5(b) descriptions and plats of several river reaches showing depot grounds for the railroad.

50. Cartographic Records Collected, National Archives II, College Park, MD

- Maguire, Edward. *Map: The Yellowstone River from Benson's Landing, MT to Fort Buford, DT*. Compiled from surveys made under the direction of the Chief Engineers of the Department in the years 1873 to 1876. National Archives II, RG 77, Q329 #35.

During 1873 and 1876, E. Maguire performed a navigational survey of the Yellowstone River for the U.S. Army Corps of Engineers. Maguire produced a series of seven map sheets that extends from Benson's Landing, MT (just upstream of the Shields River confluence), to Fort Buford, Dakota Territories (the Missouri River). The hand drawn maps include the channel course, valley wall trend, tributary confluences, and details such as individual islands and mapped rapids. The maps appear to be relatively accurate, as they locally correlate extremely well with modern river locations. As such, the maps could potentially be scanned and incorporated into the GIS to facilitate the comparison of historic and modern Yellowstone River planform, island occurrences, and bankline

location. Another map that bears Maguire's name is dated 1878; this map is much coarser and schematic than the COE survey maps, although it identifies several features that are not included in the 1873-1876 map series.

- Map-maker unknown, Sketch of the Missouri and Yellowstone Rivers and tributaries. Approximately 1810-1812. National Archives II, RG 92.
This sketch roughly shows the course of the Yellowstone River. Its value is in its early date – much earlier than most records of the Yellowstone other than Lewis and Clarks. The notes are not very legible, but they designate wildlife and landmarks.
- Maguire, Edward. Map of Yellowstone River.
National Archives II, RG 77
Shows stretch of Yellowstone between Fort Buford and the Powder River. Labels tributaries and shows islands and suggests vegetation.

51. *Photographs collected at Montana Historical Society Photographic Archives*, included in Appendix B.

- Fifteen pictures in the historical society collections show the Yellowstone River. Two by photographer R. Thossel (PAC96-18.1, PAC96-18.1) show the river, but do not identify the specific location.
- One photograph (951-837), by W.H. Jackson shows the Baronett Bridge built over the Yellowstone in the spring of 1871, probably located in the upper river section.
- Nine photos from the Haynes Collection (745, 1406, 873, 874, 705, 702, 960, 730, 312) show different views of the Yellowstone River probably taken in the Paradise Valley area in the 1880s, and some taken in the Glendive area. Close examination of these photographs can lead to conclusions on river morphology, bank conditions, and riparian vegetation in a specific location on a specific date.
- Two photographs taken in Miles City show the area (981-328, 981-526).
- The final photo collected at the state Historical Society shows the Pontoon Bridge at Savage. The banks and trees are not clear, but some conclusions about the prevalence of trees can be made based on this picture.

52. *Photographs collected at the Minnesota Historical Society*, included in Appendix B. Three photos (Box 136.k.12.1.b) show views of the Yellowstone River along the Northern Pacific Railway.

53. Various Yellowstone River Photos
National Archives II, Photographic Records, College Park, MD

Cabinet 25, drawer 3 holds photographs showing the Yellowstone River. Photo 97315 shows Men of the 22nd Infantry crossing the river in 1898. A Second Photo (85705) shows Miles City under water from the Yellowstone River flooding. Two other pictures

are taken near Fort Keogh and show the river during the winter and spring, frozen over.
(Pictures 97982 and 87089)

54. Photographs from the Yellowstone Expedition of 1873.
National Archives II, College Park, MD RG 106-YX, Box 1

About 100 photographs taken during the Yellowstone Expedition of 1873 are housed at the National Archives II. The photos were originally mislabeled as records of a geological survey in other parts of the west. Whoever caught the mistake recognized some locations on the Yellowstone River and crossed out the original notes. The problem remains that the specific locations along the river are not labeled.

Photo numbers

RG 106-YX	77	RG 106-YX	67
RG 106-YX	7	RG 106-YX	52
RG 106-YX	74	RG 106-YX	79
RG 106-YX	21	RG 106-YX	9
RG 106-YX	19	RG 106-YX	90
RG 106-YX	95	RG 106-YX	27
RG 106-YX	4	RG 106-YX	35
RG 106-YX	80	RG 106-YX	46
RG 106-YX	97	RG 106-YX	25
RG 106-YX	76	RG 106-YX	33
RG 106-YX	47	RG 106-YX	29
RG 106-YX	88	RG 106-YX	26
RG 106-YX	18	RG 106-YX	6
RG 106-YX	2	RG 106-YX	50
RG 106-YX	8	RG 106-YX	20
RG 106-YX	16	RG 106-YX	5
RG 106-YX	32	RG 106-YX	3
RG 106-YX	54	RG 106-YX	36
RG 106-YX	30	RG 106-YX	55
RG 106-YX	96	RG 106-YX	57
RG 106-YX	17	RG 106-YX	68
RG 106-YX	56	RG 106-YX	66

55. *Photos by Jackson 1869-1878*
RG 57 – GH/HS,
Archives II, College Park, MD

Books of Photostats contain pictures taken by William Henry Jackson on the Hayden survey. Obtained copies of five photos:

- RG 57-HS
- RG 77 H-8907P-29
- RG 77-H-8907P-30

- RG 77-H-8907P-31

The pictures depict the Yellowstone River below the National Park boundary. Each photo is on a fairly large scale, but shows river, banks, and vegetation.

56. Northern Pacific Railroad Records
Presidents File, Box 137.e.17.8f, MNHS

A letter of report contains the following table:

Analysis of Water Taken From Yellowstone River			
Analysis	Electric	Emigrant	Sphinx
Total Solids in Grains/Gallon,	13.06	10.49	22.39
<u>Incrusting Solids</u>			
Carbonates Lime and Magnesia	8.75	6.41	15.16
Sulphates Lime and Magnesia	1.2	1.21	
<u>Non Incrusting Solids</u>			
Alkali Carbonates			1.16
Alkali Sulphates	2.68	2.39	5.4
Alkali Chloride	.43	.48	.67

Other sources

The following list represents additional sources that were discovered but not consulted or collected for this report. Some of the following sources were located but not utilized because of time constraints and/or the lack of promising information compared to other sources. Some of the subsequent sources were referenced in other sources, indexes, or card catalogues but could not be located.

1. Stanford, Captain J.C. Letter 17580, "Vicinity of Glendive, MT, shows bank proposed to be protected, by Capt J.C. Stanford, 1896" National Archives II, RG 77.

Not found because index has insufficient record information.

2. Maguire, Lieutenant Edward, Letter 817GA 1877, "Geological section of the banks of the Yellowstone near the Mouth of Powder River, Lieut. Edw. Maguire" National Archives II, RG 77

Title found in cartographic records finding aids, but housed in textual records with different record numbers. The maps accompanying this letter were found and copied in cartographic records.

3. Letter 21892, "Yellowstone River in vicinity of Glendive, 1897" National Archives II, RG 77.

Not found because of discrepancies in department record information. The title is listed in Cartographic Records finding aids, but housed in Textual Records with different record numbers.

4. RG 77 and RG 393,
National Archives I, Washington, DC

National Archives I houses early records of troops stationed along the Yellowstone River. The finding aids are not specific about what sort of information is in the records, so Confluence's historian carefully reviewed each record in hopes of finding correspondence or reports referring to the Yellowstone River. Unfortunately, many of the reports or letters listed in finding aids turned up missing. Others contained records that focused on rations and supplies and Indian encounters. Many of the records make numerous references to the river, but only in passing. Archives I also holds a number of field notebooks from the Hayden expedition, but most of them relate to astrological observations and detailed chronometer calculations. In conversation with an archivist, it became clear that sometimes notes pertaining to a final report were removed from the rest of the record and never returned. Perhaps the best information we can find on observations by the Hayden party is in the reports printed by the GPO upon the completion of the explorations.

5. Hayden Survey Records
RG57, M 623,
National Archives II, College Park, MD

This is a set of microfilmed textual documents of the Hayden Survey. Again, the most relevant information to this research is in the final reports by Hayden and Reynolds.

6. Barlow. "Map of Yellowstone and Musselshell Rivers, Drawings accompanying reports of Oct. 16, 1872 concerning "Northern Pacific Survey", by Major Barlow."
National Archives I, RG 77, folder 208#1.

This map is small and well drawn, but does not provide much detail because it is a large scale. Its value to this project is in its early date.

7. Hayden Survey Maps
National Archives II, College Park, MD

- RG 77, Q392-1 is a map (1869-1880) by the Hayden survey showing geological features that his exploration covered.
- RG 77, Q392-2, "Parts of Idaho, Montana, and Wyoming Territories" 1871. Shows much of upper section of Yellowstone River.
- RG 77, Q392-3 "Montana and Wyoming Territories...Madison, Gallatin, and Upper Yellowstone Rivers. " This map is a topographic map showing the upper Yellowstone River. These maps are also available in the Hayden reports on microfilm at Montana State University, Bozeman.

8. War Department. Map of Yellowstone River between Glendive and its mouth.
National Archives II, RG 77, folder Q310

Highly detailed maps of the Yellowstone River between Glendive and the mouth of the river. They were made by the war department and might be useful for looking at the river morphology, depths, and vegetation coverage. Since there are twelve maps and they are not from the primary time period that this scope concerns, did not obtain copies of them. It is possible to contact the national archives (College Park, MD) to request copies of these maps to be sent if they interest DEQ)

9. Dawson County. Channel profile of the Yellowstone River. National Archives II, RG 77, Civil Works file, #1678 Flat 2.

These blueprints dated 1895-1897 by Dawson County show a channel profile at the point of the river in Glendive where a bridge was to be built. Upon request, copies may be ordered from the National Archives.

10. Photo boxes #2 and #43 of record group 57 contain photos by Ernest Burchard depicting mining in Montana between 1909 and 1922. Due to their date beyond the main focus of the scope of this project and the uncertainty that they contained photos of the Yellowstone, Confluence did not review these photos.

11. *Map of Yellowstone Expedition under Lieut. G.C. Doane*, September 1870. National Archives II Cartographic Records, RG 77 Q329-30.
Nice map, showing the area traveled by Doane, but less specific than others.

12. *Map of NPRR Surveys of the Yellowstone and Musselshell Rivers, 1873*. National Archives II, RG 77, Q329-29 Civil Works Map File.
This map shows a large scale view of the area surveyed by the Northern Pacific Railroad. It is quite large and lacking in detail compared to Macquire Survey maps.

13. Raynolds and Maynadier maps, very large maps, show larger scale geological information of most of Montana region 1859-1860. RG 77, Q106 National Archives II, College Park, MD
Also available at Montana State University, Bozeman.

14 -36. Various other records from Archives I and the Minnesota Historical Society, not obtained because of lack of information compared to those obtained, or because of inability of archival assistants to aid in acquiring these records.

Description	Date	Location					
			Record Group	Stack Area	Row	Compartment	Shelf
Map: Channel in Dawson County,	1895	Archives I	77	330	2	14	5-7

Yellowstone Historical Retrospective Completion Report
Confluence Consulting, Inc.

MT							
Surveys: Maguire	1878	Archives I	77	330	1	37	4-4
Sketch: part of Missouri and Yellowstone Rivers	1810-1812	Archives I	92	330	15	30	4-6
Map: Territory of Montana	1869	Archives I	49	OLD MAP FILE			
Map: Public Land Surveys	1869	Archives I	49	GLO OLD MAP FILE			
Map: War Department	1859-1860	Archives I	77	330	1	37	3/9
Map: NPRR Surveys	?	Archives I	77	Q329 FLAT			
Map: Route traveled by DS Stanley	1873	Archives I	77	Q329 Flat, #32			
Map: Yellowstone		Archives I	77	330	1	36	3/7
Map: USGS Survey of Territories	1872	Archives I	77	330	1	37	5/5
Map: Sioux of Dakota Territories, map 110		Archives I	75	330	13	30	5-6
Map: Yellowstone and Missouri	1869	Archives I	77	330	2	4	3-6
Drawings: Yellowstone and Musselshell		Archives I	77	330	2	2	Roll
Survey: USGS Of Snake, Madison, and Yellowstone		Archives I	77	330	1	37	5-5
Orders, Endorsements, Circulars, Correspondence, survey records, of Yellowstone Command	1870s	Archives I	393				
Report: Col. Grant on Yellowstone Expedition (MISSING)	1872	Archives I	393	Part I	e.2546	#2233	

Yellowstone Historical Retrospective Completion Report
 Confluence Consulting, Inc.

Report: Col. Bradley on Yellowstone Expedition (MISSING)	1872	Archives I	393	2546	#2901		
			Box #		File #		
Correspondence: NPRR letters discuss development of railroad along Yellowstone River	1880s	MNHS	136.k.11.7b		33-4, 33-5,		
Correspondence: NPRR letters discuss development of railroad along Yellowstone River	1880s	MNHS	136.k.11.5b		Folder 10, Folder 11		
Correspondence: Contains letters of report, building of bridges and dams, photographs	1880	MNHS	136.5.12.1b		47, 50,		
Other records researched, having little to no useful information	1880s	MNHS	136.k.12.2f, 136.k.12.5b, 136.k.12.4f, 136.k.12.6f, 136.2.13.1b, 136.k.13.5b		ALL		
Map: NPRR, near Pompey's Pillar	1880s	MNHS	138. e24.		93-34		
Yellowstone Division Records: estimates, bridges, contracts, agreements	1880s	MNHS	136.k.12.8f		Folder 108		

Appendix A: Contact list

1. Allen Scott, Kim, Montana State University, Bozeman, Renne Library (406) 994-4242.
2. American Heritage Center, Laramie (307) 766-2574.
3. Brownell, Joan, Montana Historian (406) 254.2601.
4. Bureau of Land Management, Billings (406) 896-5000.
5. Carmichael, Chris, Omaha Corps of Engineers (402) 221-3090.
6. Casler, Mike, Fort Union Trading Post, ND, (701) 572-9083.
7. Flores, Dan, University of Montana, (406) 243.4234.
8. Gordon, Chris, Missouri Historical Society, (314) 746-4599.
9. Kaag, Cindy, Washington State University, Pullman (509) 335-8000.
10. Karsmizki, Ken, Columbia Gorge Discovery Center, (541) 296-8600.
11. Koostra-Manning, Kevin Western Heritage Museum, (406) 256-6809.
12. Lang, Bill, Center for Columbia River History, (503) 725-8023.
13. Larson, Barbara, NARA, Barbara Larsen barbara.larsen@nara.gov.
14. Martinez, Rick, National Archives in Denver, (303) 236-0817.
15. Merigliano, Mike, University of Montana, mmerig@selway.umt.edu.
16. Murdo, Damon. State Historic Preservation Office, Helena, dmurdo@state.mt.us.
17. National Archives and Records Administration, Washington, DC and College Park, MD, (866) 272-6272.
18. Perry, Alan, Kansas City Federal Records Center (816) 926-6235 (fax).
19. Pugsley, Andrea, NARA, College Park, MD, (301) 837-1684.
20. Paul Schullery, Park Service, (307) 344-2220.
21. Schwartz, Joe, NARA, College Park, MD, (301) 837.2961.
22. Shields, Brigid, Minnesota Historical Society, (651) 296-2143.
23. Shovers, Brian, Montana Historical Society, (406) 444-2681.
24. South, Aloha, NARA, Washington, DC, (202) 501-5385.
25. Varley, John, Yellowstone Park Resource Center, (406) 344-2264.
26. Wallace, David, NARA, Washington, DC, (202) 501-5385, ext 226.
27. Whittlesey, Lee, Mammoth Library, Yellowstone Park, (406) 344-2264.

Appendix B: Copies of collected photographs

Photo Number	Photo description	Date	Location and citation information
1	Yellowstone Expedition	1873	National Archives RG 106 YX, 77 Box 1
2	Yellowstone Expedition	1873	National Archives RG 106 YX, 7 Box 1
3	Yellowstone Expedition	1873	National Archives RG 106 YX, 74 Box 1
4	Yellowstone Expedition	1873	National Archives RG 106 YX, 21 Box 1
5	Yellowstone Expedition	1873	National Archives RG 106 YX, 19 Box 1
6	Yellowstone Expedition	1873	National Archives RG 106 YX, 95 Box 1
7	Yellowstone Expedition	1873	National Archives RG 106 YX, 4 Box 1
8	Yellowstone Expedition	1873	National Archives RG 106 YX, 80 Box 1
9	Yellowstone Expedition	1873	National Archives RG 106 YX, 97 Box 1
10	Yellowstone Expedition	1873	National Archives RG 106 YX, 76 Box 1
11	Yellowstone Expedition - photo taken opposite Pompey's Pillar	1873	National Archives RG 106 YX, 47 Box 1
12	Yellowstone Expedition	1873	National Archives RG 106 YX, 88 Box 1
13	Yellowstone Expedition	1873	National Archives RG 106 YX, 18 Box 1
14	Yellowstone Expedition	1873	National Archives RG 106 YX, 2 Box 1

15	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	8
16	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	16
17	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	32
18	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	54
19	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	30
20	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	96
21	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	17
22	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	56
23	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	67
24	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	52
25	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	79
26	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	9
27	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	90
28	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	27
29	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	35
30	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1	46

31	Yellowstone Expedition	1873	National Archives RG 106 YX, 25 Box 1
32	Yellowstone Expedition	1873	National Archives RG 106 YX, 33 Box 1
33	Yellowstone Expedition	1873	National Archives RG 106 YX, 29 Box 1
34	Yellowstone Expedition	1873	National Archives RG 106 YX, 26 Box 1
35	Yellowstone Expedition	1873	National Archives RG 106 YX, 6 Box 1
36	Yellowstone Expedition	1873	National Archives RG 106 YX, 50 Box 1
37	Yellowstone Expedition	1873	National Archives RG 106 YX, 20 Box 1
38	Yellowstone Expedition	1873	National Archives RG 106 YX, 5 Box 1
39	Yellowstone Expedition	1873	National Archives RG 106 YX, 3 Box 1
40	Yellowstone Expedition	1873	National Archives RG 106 YX, 36 Box 1
41	Yellowstone Expedition	1873	National Archives RG 106 YX, 55 Box 1
42	Yellowstone Expedition	1873	National Archives RG 106 YX, 57 Box 1
43	Yellowstone Expedition	1873	National Archives RG 106 YX, 68 Box 1
44	Yellowstone Expedition	1873	National Archives RG 106 YX, 66 Box 1
45	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1
46	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1

47	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1
48	Yellowstone Expedition	1873	National Archives RG 106 YX, Box 1
49	Miles City, MT		National Archives, Cab 25, Drawer 3, 85705
50	Men of 22nd Infantry, near Ft Keough, MT	1889-1898	National Archives, Dr. 45A, Cab 25 Drawer 3, 97315
51	Cutting ice at Ft Keough	1899	National Archives 97982
52	Yellowstone River near Ft Keough	Springtime	National Archives 87289
53	Missouri River at Fort Benton	1853-1855	National Archives 96032
54	Valley of the Yellowstone, looking south from the first canyon	1871	National Archives, USGS Survey of the Territories, Hayden RG 57HS
55	Approach to Cinnabar Mtn. from below, looking up the Yellowstone from the standpoint of No. 207	1871	National Archives, USGS Survey of the Territories, Hayden 77H- 8907P-30
56	Valley of the Yellowstone		National Archives, USGS Survey of the Territories, Hayden, 77H- 8907P-31
57	Valley of the Yellowstone		National Archives, USGS Survey of the Territories, Hayden 77H- 8907P
58	Valley of the Yellowstone		National Archives, USGS Survey of the Territories, Hayden, 77H- 8907p-29
59	Eagle Butte, from west		Minnesota Historical Society, Northern Pacific Railroad records
60	Eagle Butte,		Minnesota Historical Society, Northern Pacific Railroad records

61	No caption information	No date	Minnesota Historical Society, Northern Pacific Railroad records
62	NPRR in the 2nd Canyon of the Yellowstone	1884	Montana Historical Society, Haynes Collection, 1406
63	Looking up the Yellowstone from Eagle Butte	1883	Montana Historical Society, Haynes Collection, 960
64	Yellowstone Valley from Point of Rocks	No date	Montana Historical Society, Haynes Collection, 873
65	Yellowstone Valley from Point of Rocks, Paradise Valley	1833	Montana Historical Society, Haynes Collection, 874
66	Skull Bluff, Yellowstone River, Northern Pacific Bridge	1882	Montana Historical Society, Haynes Collection, 745
67	Eagle Butte	1881	Montana Historical Society, Haynes Collection, 701
68	Terry's Landing, Yellowstone River	1882	Montana Historical Society, Haynes Collection, 730
69	Yellowstone Valley from Eagle Butte	1881	Montana Historical Society, Haynes Collection, 707
70	Down the Yellowstone River, at Glendive, MT	1880	Montana Historical Society, Haynes Collection, 312
71	Pontoon Bridge, Savage, MT	no date	Montana Historical Society, PAC 94-35.1
72	Yellowstone River, by R. Throssel	no date	Montana Historical Society, PAC 96-18.2
73	Yellowstone River, by R. Throssel	no date	Montana Historical Society, PAC 96-18.1
74	Baronette's Bridge across the Yellowstone River	1871	Montana Historical Society, 951- 837 neg.
75	Yellowstone Ferry near Miles City, copyright by Huffman	1908	Montana Historical Society, 981- 328

76	Miles City from North Terry Road	1884	Montana Historical Society, 981-526
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Appendix C: Copies of collected cartographic documents

1. GLO Survey Plats for the following Township Ranges:

Township Ranges					
1N26E	6N35E	7N45E	17N55E	1S17E	4S9E
1N27E	6N36E	7N46E	18N57E	1S18E	5S8E
2N27E	6N37E	8N47E	19N57E	1S25E	6S7E
2N28E	6N38E	949E	20N58E	1S26E	7S7E
3N28E	6N39E	9N48E	21N58E	2S10E	8S7E
3N29E	6N40E	10N49E	21N59E	2S19E	9S9E
3N30E	6N41E	11N50E	22N59E	2S20E	
3N31E	6N42E	12N51E	23N59E	2S22E	
4N32E	6N43E	12N52E	24N60E	2S23E	
4N33E	6N44E	13N53E	1S11E	2S24E	
5N33E	7N36E	14N54E	1S12E	2S25E	
5N34E	7N37E	15N55E	1S13E	2S9E	
6N34E	7N44E	16N56E	1S16E	3S9E	

2. Northern Pacific Railroad Surveyor Field Book Excerpts

3. Maguire, Edward. *Map: The Yellowstone River from Benson's Landing, MT to Fort Buford, DT*. Compiled from surveys made under the direction of the Chief Engineers of the Department in the years 1873 to 1876. National Archives II, RG 77, Q329 #35. Seven Maps.

4. Map-maker unknown, Sketch of the Missouri and Yellowstone Rivers and tributaries. Approximately 1810-1812. National Archives II, RG 92.

5. Maguire, Edward. Map of Yellowstone River. National Archives II, RG 77

Appendix D: Copies of collected textual documents

Documents are numbered according to the numbers in the sources consulted section of this report. In some cases, the document was only reviewed and not copied. A missing number indicates that a copy of the textual document is not available.

Many textual documents reviewed for this project address much more than the history of the Yellowstone River. In many cases, only the sections pertaining directly to the Yellowstone River or suggesting other useful sources were copied.

1. Annin, Jim *Eighty Years of Memories on the Banks of the Yellowstone*. Artcraft: Billings, MT. 1978
Montana State Historical Society
2. Atwater, Elizabeth Joan Rodgers. *Letters of Montgomery Meigs, written while engaged in the Survey of the Northern Pacific Railroad, 1872-1873*. Masters thesis. Bozeman: State University of Montana. 1937.
Montana State Historical Society
3. Audubon, Maria R. *Audubon and his Journals with Zoological and Other Notes by Elliott Coues*. New York: Dover Publications, Inc.
Montana Historical Society
4. Barrett, Glen, editor. *Mackinaws down the Missouri: John Anderson's Journal of a trip from St. Louis Missouri to Virginia City, Montana, and return in 1866*. Logan, Utah: Western Text Society. 1973.
Montana State University, Bozeman
5. *Flatboating on the Yellowstone, 1877*. Manuscript of Fred G. Bond, editor unknown. 1925 edition.
Montana State Historical Society
6. Bonney, Orrin H. and Lorraine Bonney. *Battle Drums and Geysers: the life and journals of Lt. Gustavus Cheyney Doane, soldier and explorer of the Yellowstone and Snake River Regions*. Chicago: The Swallow Press, Inc. 1970.
Montana State University, Bozeman
7. Bradley, Lieutenant James H. *Journal of James Bradley: the Sioux campaign of 1876 under the command of General John Gibbon*. Journal of the Historical Society of Montana, v. 2.
Montana State University, Bozeman
8. Brisbin, Gen. James S. *The Great Yellowstone Valley Described*, St Louis, MO. 1882.
Montana State University, Bozeman- Microfilm

9. Brown, Mark H. *The Plainsmen of the Yellowstone: A History of the Yellowstone Basin*. New York: Putnam, 1961.
Montana State University, Bozeman
10. Clark, Lieutenant William P. *The Diary of William P. Clark*. Montana Historical Society Library. SC 538, Folder 1/1. 1876.
Montana Historical Society
11. Derig, Anna. *A Brief History of the Yellowstone River 1805-1880: From Livingston to the Big Horn River with recommendations for management*. Boulder: Western Interstate Commission for Higher Education, 1974.
Supplied by Pat Newby
12. Douglas, Walter B. *Manuel Lisa*. New York: Argosy-Antiquarian Ltd. 1964.
Montana State University, Bozeman
13. Ewan, Joseph. *Rocky Mountain Naturalists*. Denver: University of Denver Press. 1950.
Montana State University, Bozeman
14. Fawley, Paul G. *A History of the Yellowstone River Basin from the Earliest Explorations to 1865*. Masters thesis. Bozeman: State University of Montana, 1934.
Montana State University, Bozeman
15. Folsom, David E. *The Folsom-Cook Exploration of the Upper Yellowstone in the year 1869*. St. Paul, 1894.
Montana State University, Bozeman
16. Forsyth, J.W. and F.D. Grant. *Report of an Expedition up the Yellowstone River made in 1875*. United States War Department. Washington: Government Print Office. 1875
Montana Historical Society
17. Frost, Lawrence A., editor. *Some Observations on the Yellowstone Expedition of 1873, Stanley and Grant*. Glendale, CA: A.H. Clark Company. 1981.
Montana State University, Billings, Special Collections
18. Geiser, Samuel W. *Naturalists of the Frontier*. Dallas: Southern Methodist University. 1948.
Montana State University, Bozeman
19. Goetzmann, W.H. *Army Exploration in the American West 1803-1863*. New Haven: Yale University Press, 1959.
Montana State University, Bozeman
20. Haines, Aubrey L. *The Valley of the Upper Yellowstone : An exploration of the headwaters of the Yellowstone River in the Year 1869, as recorded by Charles W. Cook*,

David E. Folsom, and William Peterson, edited and with an introduction by Aubrey L Haines. Norman: University of Oklahoma Press.
Montana State University, Bozeman

21. Hayden, F.V. *Geological Report on the Exploration of the Yellowstone and Missouri Rivers*, 1859-1860.
Montana State University, Bozeman

22. Heldt, F. George. *Sir George Gore's Expedition (1854-1856) from conversation with Henry Bostwick, a member of the party.* Contributions to the Historical Society of Montana, v. I., pg.138.

23. Hoyt, Colgate. *An Account of a Trip through the Yellowstone Valley in 1878.* edited by Carroll Van West. Montana: The Magazine of Western History. 36(2)22-35.

24. Kirschten, Lorene E. *History of Fallon County, Montana.* 1940.
Provided by Pat Newby

25. Knowles, Craig J. and Pamela R. *A Bibliography of Literature and Papers Pertaining to Pre-settlement Wildlife and Habitat of Montana and Adjacent Areas.* Boulder, MT: FaunaWest Wildlife Consultants. 1993.
Provided by Pat Newby

26. Lang, W. L., editor. *Stories from an Open Country: essays on the Yellowstone River Valley.* Billings: Western Heritage Press, 1995.
Montana State University, Bozeman

27. Langford, Nathaniel Pitt. *The Discovery of Yellowstone Park: Journal of the Washburn Expedition to the Yellowstone and Firehole Rivers in the Year 1870.* Lincoln: University of Nebraska Press. 1972.
Montana State University, Bozeman

28. Larocque, Francois A. *The Journal of Francois Larocque.* Fairfield, Washington: Ye Galleon Press. 1981.
Montana State University, Bozeman

29. Leiberg, John B. *Notes on the Flora of W. Dakota and E. Montana Adjacent to the Northern Pacific Railroad.* Botanical Gazette, vol. 9, No. 7 (Jul., 1884), 103-107.
Montana State University, Bozeman

30. MacDonald, John G. *History of Navigation on the Yellowstone River*. Masters thesis, Montana State University, 1950.
Montana State University, Bozeman
31. McFarling, Lloyd. *Exploring the Northern Plains 1804-1876*. Caldwell, Idaho: The Caxton Printers, Ltd. 1955.
Montana State Historical Society
32. Moulton, Gary E., Editor. *The Journals of the Lewis & Clark Expedition: June 10-September 26, 1806*. Lincoln and London: University of Nebraska Press. Vol. 9, 1983. Also excerpts from Vol. 4 and the Journals of Ordway and Floyd.
Bozeman Public Library
33. Neihardt, John G. *The River and I*. New York: Putnam and Sons. 1910.
Montana State Historical Society
34. Quivey, Addison M. *The Yellowstone Expedition of 1874*. Contributions to the Historical Society of Montana, Vol. I.
Montana State University, Bozeman
35. *Report on the Exploration of the Yellowstone River*. (Communicated by the Secretary of War, in compliance with a resolution of Senate, 40th Cong., 2nd Sess. [1866], Ex. Doc. No 77. and Preliminary report of the same expedition.
Montana State University, Bozeman
36. Russell, Osborne. *Journal of a Trapper: Nine Years in the Rocky Mountains 1834-1843*. Boise: Syms-York Company. 1921.
Montana State University, Bozeman
37. Sheridan, General P.H. and W.T. Sherman. *Reports of Inspection Made in The Summer of 1877* by Generals P.H. Sheridan and W.T. Sherman of Country North of the Union Pacific Railroad.
Montana State Library
38. Silverman, A.J. and W.D. Tomlinsen. *Biohydrology of Mountain Fluvial Systems: The Yellowstone, Parts I and II*. Reston, Virginia: U.S. Department of the Interior Geological Survey. 1984.
Provided by Pat Newby
39. Stuart, Captain James. *The Yellowstone Expedition of 1863*. With notes by Samuel T. Hauser and Granville Stuart, active members of the Historical Society of Montana. Contributions to the Historical Society of Montana, vol. 1.
Montana State University, Bozeman

40. Topping, E.S. *The Chronicles of the Yellowstone: an accurate and comprehensive history of the country drained by the Yellowstone River*. Minneapolis: Ross and Haines. 1968.

Montana State Library

41. Warren, Lieutenant G.K. *Memoir to Accompany the Map of the Territory of the United States from the Mississippi River to the Pacific Ocean, Giving a Brief Account of Each of the Exploring Expeditions Since AD 1800*. 53rd Congress, 2nd Session. 1893.

Montana State Historical Society Library

42. Withington, Mary C., Compiler. *A Catalogue of Manuscripts in the Collection of Western Americana founded by William Robertson Coe Yale University Library*. New Haven: Yale University Press. 1952.

Montana State University, Bozeman

43. *Letter from the Secretary of War Transmitting, with a letter from the acting chief of engineers, Reports on Examination and Survey of Yellowstone River, from its mouth to Billings, With a View to a 4-foot Stage of Water and the Building of a Lock at the United States Government Dam*. 62nd Congress, 1st Session, Document No. 83. 1911.

Montana State University, Bozeman

44. *The Climate, Soil, and Resources of the Yellowstone Valley, with accurate maps of the Yellowstone Country, the transcontinental route and connections of the Northern Pacific Railroad and a Plat and Description of the Town of Glendive, at the junction of this railroad, with the steamboat navigations of the Yellowstone and Upper Missouri Rivers* (St. Paul: The Pioneer Press Company) 1882.

Montana Historical Society

45. *Letter from the Secretary of War, communicating the report of Lieutenant Gustavus C. Doane upon the so-called Yellowstone Expedition of 1870*. Senate Executive Document No. 51, 41st Congress, 3rd Session.

National Archives I

46. Montana the Magazine of Western History: volume 35, number 4, 1985.

- Heidenreich, C. Adrian “The Native Americans’ Yellowstone” 2.
- Lass, William E. “Steamboats on the Yellowstone”, 26.

47. Northern Pacific Railroad Records, including:

- a. J. Dodge to Northern Pacific Railroad Engineer in Chief. Correspondence. December 27, 1880,
- b. G. Morrison to Gen. A. Anderson, Chief Engineer Northern Pacific Railroad. Correspondence September 10, 1881,
 - a. Describes river and landform features around Glendive. Describes soils as “slippery clay”, explains how river washes away at bluff banks.
- c. Contract with Mr. Herman Clark for the sale of Townsite of Coulson and certain lands in Clarks Fork Bottom, March 13, 1882,

- b. describes the area around the confluence of Yellowstone River with Clarks Fork River.
- d. Contract between E.A. Williams and N.P.R.R.,
 - c. Contract for supply of railroad tie to N.P.R.R.
- e. Edwin Johnson, Eng. in Chief, to Capt. W. DeLacy. Correspondence. July 13, 1870,
 - d. discusses surveying to be completed by DeLacy. Asks DeLacy to be able to convey the “true character and probably cost of getting a Railway” through the area. DeLacy went on to survey several reaches of the Yellowstone River.
- f. A. Anderson, Chief Engineer to E.H. Bly. Correspondence. Miles City, September 15, 1880.
 - e. Anderson wrote to Bly concerning his proposal to furnish cross ties and bridge timber for the N.P.R.R., attesting to the availability of timber in the area.
- g. J.B. Hubbell to Col. Dodge, Division Engineer N.P.R.R. Correspondence. October 16, 1880,
 - f. Regarding delivery of timber piles and ties. Attests to availability of timber near Yellowstone River.