JORDAN CREEK

2010 Stream Survey Report
Salmon-Challis National Forest
Yankee Fork Ranger District

Prepared by: United State Department of Agriculture, Forest Service
Stream Survey
La Grande Ranger District- Wallowa-Whitman National Forest
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Cover Photo - River Mile 0.7, Reach 2, approximately SO 30 (Photo Courtesy of Bureau of Reclamation)

CHAPTER 1: STREAM SURVEY

OVERVIEW

Dates Surveyed: September 20th – 21st, 2010
Survey Type: Region 6 Stream Inventory Methodology, Version 2.10, Level II
Mouth Location: 044º 22' 41.69"' N, 114º 43' 15.34" W
Headwater Location: 044º 28' 13.23" N, 114º 46' 29.20" W
USGS Quadrangle: Custer
Subbasin (4th field): Upper Salmon
Watershed (5th field): Yankee Fork
Subwatershed (6th field): Jordan Creek
Tributary To: Yankee Fork
NFS Watershed No.: 170602010503
Stream Class at Mouth: I
Distance Surveyed: 3.61 miles
Stream Length: 7.8
Surveyors: Chris Mello, Sam Fiorito and Andrew Flynn

SUMMARY

Jordan Creek was surveyed from the confluence with the Yankee Fork upstream to a small tributary on the left bank, just upstream of the Moon family private property. A restoration project was performed on the first reach (approximately 0.4 miles) of the channel that was funded by Hecla Mining Company. The Grouse Creek Mine (owned by Hecla Mining Company) is currently in the reclamation phase. The Jordan Creek stream channel was dredge mined from its confluence with Yankee Fork approximately 1.2 miles upstream. A short section that contained bedrock near the top of reach two was not dredged (Stephens 1991). A small section within reach two is private property, but the majority of the land in this drainage and surveyed reaches are administered by the Salmon-Challis National Forest. National Forest Road 172 runs close to Jordan Creek for the length of the survey. Important wildfires have occurred in the Yankee Fork watershed and the Potato Fire of 2006 burned approximately 622 acres within the Jordan Creek sub-watershed (Vacirca 2006). Jordan Creek currently contains rearing habitat for juvenile spring Chinook salmon (*Oncorhynchus tshawytscha)*, spawning and rearing habitat for summer steelhead (*Oncorhynchus mykiss),* westslope cutthroat trout (*Oncorhynchus clarki lewisi*) and bull trout (*Salvelinus confluentus)* populations.

We conducted a Level II stream habitat survey protocol which is part of the Pacific Northwest Stream Inventory Program (USDA 2010). Many parameters were added to the basic Level II protocol for this survey. Bank orientation in the data is all facing downstream, unless in a photo in which it is noted in the picture title. Global Positioning System (GPS) coordinates were saved for numerous points throughout the survey including the start and end of reaches, measured habitat units, pools greater

than three feet deep, side channels, large pieces of wood and Wolman Pebble Counts. GPS points are displayed on the survey maps (see Appendix B). Each habitat unit (fast water, slow water, etc.) is designated a sequence order (SO) number during the survey. Those numbers are used to reference specific habitat units throughout this report.

The riparian management objectives (RMOs) derived from PACFISH (although some were modified and added by the biological opinions), were not met for pool frequency or large woody debris. The RMO for bank stability was met with the banks being greater than 90% stable in each reach. The RMO for width/depth ratio was met with the ratio being less than 27 for reaches one, three, and four, which are all Rosgen stream type B. Reach two is Rosgen stream type G and the RMO is not met for width/depth ratio because the ratio exceeds the standard of 10. The RMO for temperature was not addressed because the temperature readings taken on this survey were instantaneous and are not applicable to be used toward state water quality standards. The RMO for lower bank angle and sediment were also not addressed because bank angle information is not collected as part of the NR9 Stream Inventory protocol. A discharge measurement was taken at the beginning of the survey and was calculated to be 4.15 ft^3/second on September 13, 2010. A Marsh McBernie Flowmate was the instrument used to collect the data. The watershed acres contributing to the measurement point are 10,643 acres.

The Jordan Creek survey is within one sixth field hydrologic unit code (HUC). Level one (i.e. 17) is the region level and level six (i.e. 03) is the subwatershed level. The start of the survey through the end is in HUC6# 170602010503.

BASIN DESCRIPTION

Watershed and Flow Regime

General Characteristics

- **Location:** The Jordan Creek stream survey began at the mouth and ended at a tributary on the left bank (looking downstream) just upstream of the Moon family property which is on the left bank also. National Forest Road 172 is adjacent to Jordan Creek throughout the length of the survey.

- **Stream Order:** Strahler method (Handbook 2010)

    - Third order throughout the survey.

- **Flow:** A discharge measurement was taken at the beginning of the survey with a Marsh McBirney flow meter. The accuracy of the Marsh McBirney Flo-Mate Model 2000 is ± 2% of the reading (Marsh-McBirney 1990).
    - The discharge was calculated to be 4.15 ft^3/second on September 13, 2010.

    - The location of the flow was N 44° 22.695' W 114° 43.264', just upstream of the survey start point.

- **Elevation and General Gradient:** The survey began at 6,368 feet in elevation and ended at 6,900 feet, making the gradient for the entire survey 2.78%.
    - Elevation and length values used to determine gradient were derived from the Digital Elevation Model (DEM) and the measure tool in ArcMap 9.3.1.

- **Sinuosity:** The sinuosity for the length of the survey was low at 1.04.
    - Mapped channel length and valley length were determined using the measure tool in ArcMap 9.3.1.

- **Rosgen Channel and Valley Type:** The Rosgen channel type for each reach is B and the Rosgen valley type for every reach is II (moderately steep, gentle sloping side slopes often in colluvial valleys) (Rosgen 1996).
    - Rosgen channel and valley types were determined using gradient, sinuosity, width/depth ratio and entrenchment ratio for each reach.

Interim Riparian Management Objectives

- Interim Riparian Management Objectives (RMOs) from PACFISH applies to all watersheds with anadromous fish bearing streams. For general habitat conditions to be considered good for anadromous fish the following objectives must be met or exceeded (USDA 1995).

Table 1.1. Summary of interim riparian management objectives (RMOs) (USDA 1995).

Habitat Feature	Interim Objectives								
Pool Frequency (kf) (all systems)	Varies by channel width, see below.								
Wetted Width in Feet	10	20	25	50	75	100	125	150	200
Number of Pools Per Mile	96	56	47	26	23	18	14	12	9
Water Temperature (sf) (all systems)	Compliance with state water quality standards, or maximum <68ºF/20ºC[1]. For steelhead and Chinook salmon, <64°F in migration and rearing areas and <60°F in spawning areas except in steelhead spawning areas within steelhead priority watershed during the spawning and incubation period where the RMO is <45°F[2]. For bull trout, maximum water temperatures below 59°F within adult holding habitat and below 48°F within spawning and rearing habitats[3].								
Large Woody Debris (sf) (forested systems)	East of Cascade Crest in Oregon, Washington and Idaho. >20 pieces per mile; >12 inch diameter; >35 foot length.								
Bank Stability[4] (sf) (non-forested systems)	>90 percent stable (in a priority watershed)								
Lower Bank Angle (sf) (non-forested systems)	>75 percent of banks with <90 degree angle (i.e. undercut)								
Width:Depth Ratio (sf) (all systems)	<10 or by channel type as follows[5] (mean wetted width divided by mean depth): • A Channel: 21 • B Channel: 27 • C Channel: 28								
Sediment[6]	Areas where Chinook salmon, steelhead, and bull trout spawn within priority watershed, <20% surface fine sediment which is substrate <0.25 in (6.4 mm) in diameter in spawning habitat or <30% cobble embeddedness in rearing habitat. All other areas, no more than a two percent increase over existing levels and where existing levels are at 30% or above new activities that would create additional stream sedimentation would not be allowed (Land Resource Management Plan for the Challis National Forest)								

kf = key feature sf = supporting feature

[1] In this case, maximum water temperature is expressed as the 7-day moving average of daily maximum temperature measured as the average of the maximum daily temperature of the warmest consecutive 7-day period.
[2] The PACFISH environmental assessment established a riparian management objective for water temperature of <64°F in migration and rearing areas and <60°F in spawning areas. However, during consultation this standard was changed to <45°F in steelhead spawning areas within steelhead priority watersheds during the spawning and incubation period.
[3] This standard was established by INFISH and is being applied to areas occupied by bull trout within the area covered by PACFISH.
[4] The PACFISH environmental assessment established a riparian management objective for bank stability of 80%. However, during consultation this standard was increased to 90% within priority watershed.
[5] These values are based on the mean values observed for streams in natural condition within the Salmon River (Overton et al. 1995)
[6] The PACFISH environmental assessment did not include a riparian management objective for sediment was established within Chinook salmon, steelhead, and bull trout spawning areas within priority watersheds. In all other areas, the objective established by the Land Resource Management Plan for the Challis National Forest applies.

Reach Summaries

- **Definition of Stream Classification:** The Blue Mountain Stream Survey Program (Wallowa-Whitman, Malheur and Umatilla National Forests) uses the three-class system.
    - **Classification I =** municipal watershed and/or fish-bearing stream (perennial or intermittent).
    - **Classification III =** non fish-bearing, perennial streams
    - **Classification IV** = non fish-bearing, intermittent streams

- All of the reaches in the Jordan Creek stream survey were Class I streams.

Confluence with Yankee Fork, start of survey at RM 0.0, SO 1 (Photo courtesy of Bureau of Reclamation)

Tributaries

- **Access to Fish out of the Mainstem:** Ten tributaries entered Jordan Creek throughout the survey.
    - Approximately one half mile of Montana Gulch contains cutthroat trout. This is the only fish-bearing tributary in the Jordan Cr drainage (SCNF 2008).

Table 1.2. Tributaries encountered on Jordan Creek.

Tributary Name/ Number	Reach	SO (Sequence Oder)	River Mile (RM)	% Flow Contribu-tion*	Tributary Temper-ature ºC**	Down-stream Bank Orientation	% Gradient At Mouth+
1	2	25	0.52	10	8.5	RB	3
2	2	59	1.22	5	5	LB	20
3	2	91	1.67	5	6	LB	3
4	3	107	2.06	20	8	RB	5
5	3	118	No coordinates	2	6	LB	20
6	3	146	No coordinates	5	6	RB	3
7	4	169	2.99	15	8	RB	6
8	4	188	3.31	10	7.5	RB	15
9	4	201	3.42	30	11	RB	10
10	4	211	3.64	10	8	LB	7

* = percent flow contribution for tributaries is determined by the observer estimating the percent of flow contributed by the tributary to the mainstem stream flow below the tributary (Handbook 2010).
** = temperature was measured with a handheld thermometer
+ = gradient was measured with an abney level which is in compliance with the R6 Stream Inventory Protocol

- Fish were observed from above the surface of the water by crew members in each reach of the survey.

Special Cases

- **Special Cases (culverts, dams, marshlands, waterfalls and chutes):** Special cases are designated as artificial structures for culverts and dams (ARTIF), falls (WF), chutes (CH) and marshlands (CHUNITM). Information is entered both on the channel unit form and the special cases form.
    - There were no special cases on this survey, therefore special case units made up 0% of the total channel units on the survey.

IN-CHANNEL HABITAT

Water Temperature

- The temperature was taken at the start of every day and at every measured unit on the main channel. Readings were taken with a handheld thermometer and were submerged for at least one minute to ensure an accurate reading.

- The range of temperatures recorded throughout the Jordan Creek survey was from 5.5ºC to 12.5ºC.

Table 1.3. Average and maximum temperature readings by reach.

Reach	Average Temp ºC	Maximum Temp ºC	Date(s) Temperature Collected	Time Range Readings Collected In	Number of Readings
1	11.75	12.5	09/20/2010	1418-1520	4
2	7.42	12	09/20/2010 – 09/21/2010	0915-1808	12
3	7.6	9	09/21/2010	1121-1440	10
4	10.05	11	09/21/2010	1504-1756	10

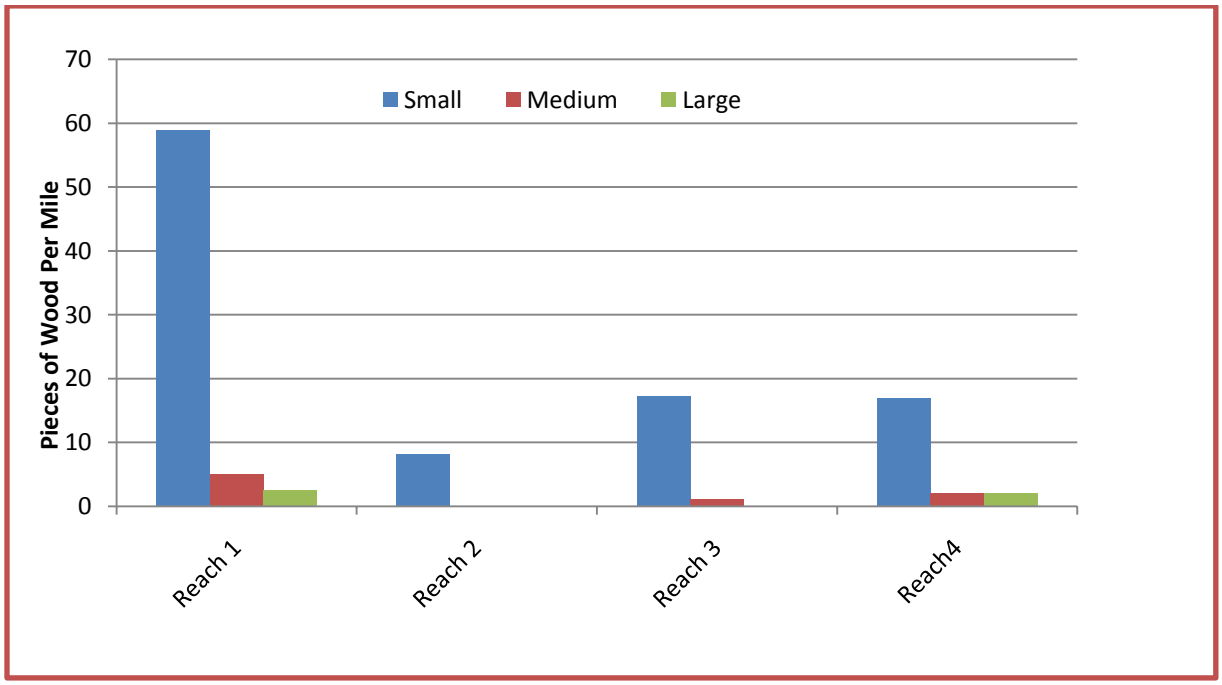
- These temperature readings are instantaneous and therefore cannot be used to relate to the Idaho Department of Environmental Quality Surface Water Quality Standards.

Woody Debris

- Woody debris size categories for the east side of the Cascade Mountains can be found in the table below.

Table 1.4. Definitions of woody debris size categories (Handbook 2010).

Size	Diameter	Length
Small	>6 inches at 20 feet from large end	>20 feet or 2X bankfull width
Medium	>12 inches at 35 feet from large end	>35 feet or 2X bankfull width
Large	>20 inches at 35 feet from large end	>35 feet or 2X bankfull width



Graph 1.1. Wood distribution per mile by reach.

- The countable wood found in Jordan Creek did not meet the criteria for the RMO for large woody debris. To meet the RMO for wood there needed to be greater than twenty pieces of medium and large sized wood combined per mile of stream. See Wood Summary in Chapter 2.

SO 5 – Debris jam, Reach 1, RM 0.2

- Of the countable wood found throughout this survey, 89% of the wood was small sized, 7% was medium and 4% was large.
- Photo is representative of the lack of wood in the channel found throughout the survey.
- Note: Wood is not counted in side channels.

SO 26 (approximately) - Photo in reach 2 (oriented downstream) from RM 0.6, (Photo courtesy of Bureau of Reclamation)

Pools

- A pool, or slow water unit, is defined as a portion of the stream that usually has reduced surface turbulence and has an average depth greater than fast water units when observed during low flow conditions. There is a hydraulic control on the downstream end of a pool, better known as the pool tail crest. This hydraulic control functions as a dam which will retain water in the pool even after streamflow has ceased (Handbook 2010).

- **Pool Quality:** The average residual pool depth, which is the difference between the maximum pool depth and the maximum depth along the pool tail crest, for this survey was 1.49 feet. This is the depth of water that would be persisting if water stopped flowing out of the pool.

Table 1.5. Pool Quality Data by Reach.

Reach	Pool Count	Pools Per Mile	Average Residual Pool Depth (Ft)	Average Wetted Width (Ft)
1	5	12.82	1.98	14.5
2	34	25.23	1.06	14.4
3	22	23.71	1.44	12.0
4	26	27.49	1.47	13.6

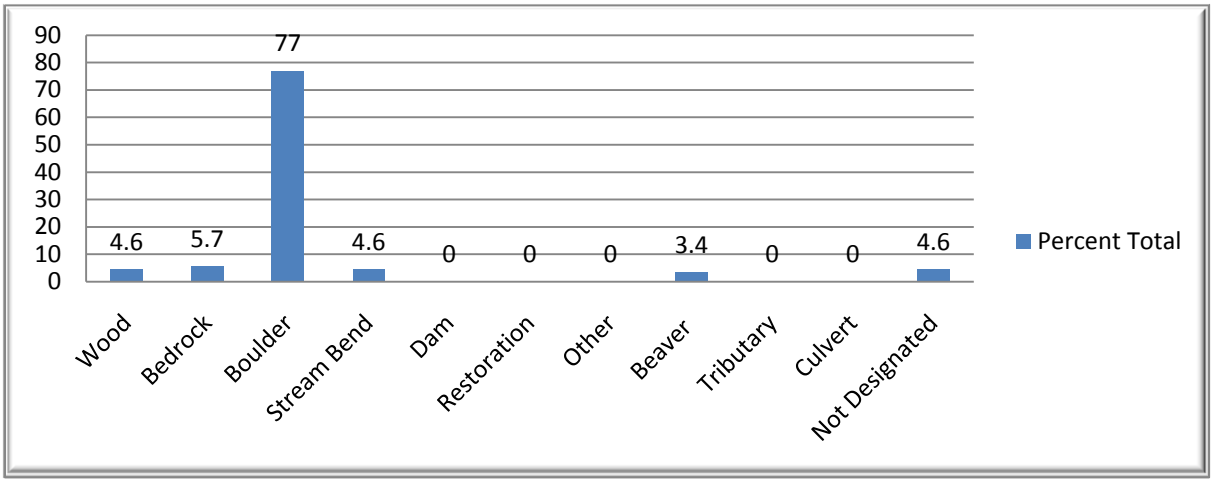
- The pool per mile criteria varies by channel width. The RMO for pool frequency was not met. For steams with an average wetted width of 10'-20', there must be at least 56 pools per mile to meet the RMO criteria. See Table 1.2, 1.5 and the Pool Summary in Chapter 2.

SO 147– beaver dam formed pool, Reach 4, RM 2.7

SO 176 – beaver dam formed pool, Reach 4, RM 3.0

Pool Forming Forces: For each pool the major pool forming forces were noted (Graph 1.2). The options for pool forming features are those that are most commonly encountered on the stream. Options are wood, bedrock, boulder, stream bend, dam, restoration, beaver, tributary, culvert, other and not designated (Handbook 2010).

- The survey crews were unable to positively identify the pool forming features on some of the pools within this survey.



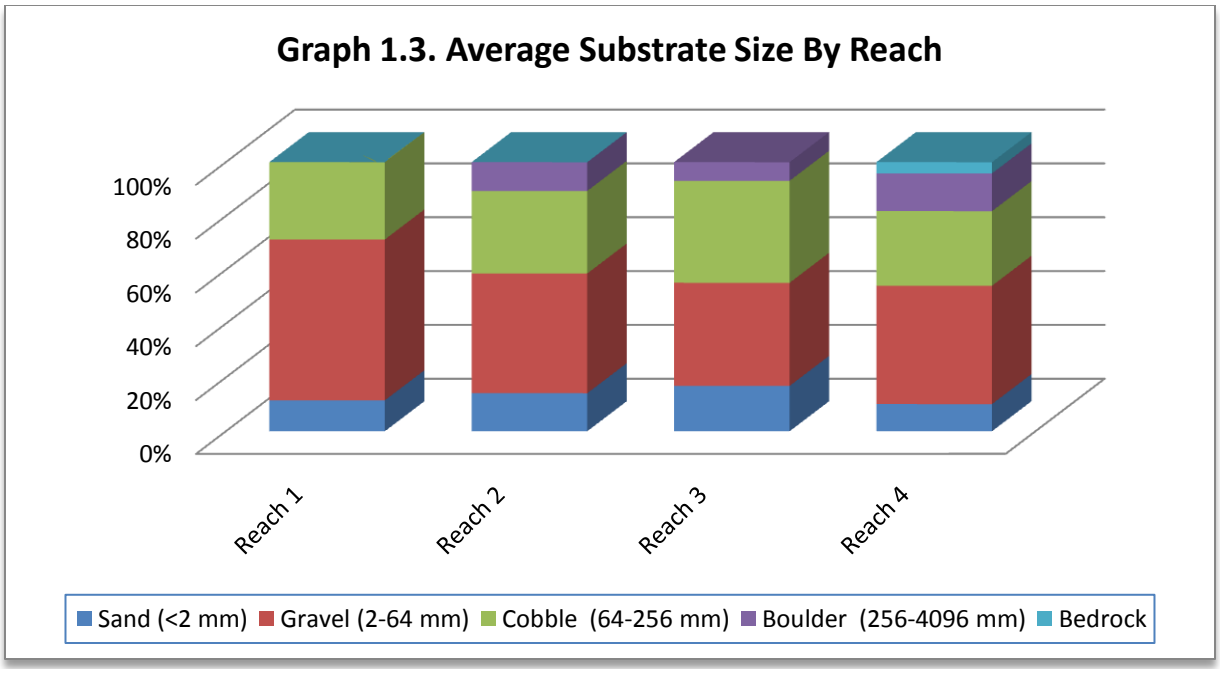
Graph 1.2. Average percent total of pool formation factors for survey.

Pebble Counts

- For each reach two Wolman Pebble Counts were performed, the first being approximately 1/3 and a second 2/3 of the way through each reach. The site chosen was in fast water and representative of what was perceived to be normal conditions for fast water units already observed.

- The procedure for performing a pebble count is that you randomly select at least one hundred pebbles (without bias) from the streambed along a transect that traverses the stream from the edge of the bankfull channel on one bank to that on the opposite bank. The first particle touched is measured and tallied for each sample. (Handbook 2010)

- The D16, D50 and D84 were determined for each reach. At bankfull flow particles smaller then the D50 (50^{th} percentile) will be mobile. Substrate larger than the D84 (84^{th} percentile) are considered immobile during bankfull flow (Handbook 2010). See Appendix 1A for these values.



- Gravel (2-64 mm) was the dominant substrate size found in each of the four reaches followed by cobble (64-256 mm).

- Graphs representing each reach's pebble counts can be found in Appendix 1A.

Percent Substrate Composition

- The percent substrate composition is a visual estimate of the makeup of the substrate on measured units of the wetted channel. Size class categories are: sand (<2 mm), gravel (2-64 mm), cobble (64-256 mm) boulder (256-4096 mm) and bedrock (>4096 mm). All estimates in the raw data were rounded to 10 percent and the streambed substrate is to total 100 percent for each unit (Handbook 2010). Averages in the following table are rounded to the nearest tenth.

Table 1.6. Average percent substrate composition per reach.

Reach	**Sand** <2 mm	**Gravel** 2-64 mm	**Cobble** 64-256 mm	**Boulder** 256-4096 mm	**Bedrock** >4096 mm
1	28.8	28.8	32.5	10.0	0
2	13.1	28.1	29.2	17.3	12.3
3	17.0	27.0	34.0	21.0	1.0
4	14.0	35.0	35.0	15.5	0.5

Special Habitats

- **Side Channels:** A side channel is a secondary channel that flows roughly parallel to the mainstem channel with an island that will not be breached during bankfull condition between the two. Oftentimes woody plants and/or a well developed soil layer and vegetation are in indicator that an island is stable (Handbook 2010).
    - Side channels comprised 7.0% of the total habitat units on the Jordan Creek stream survey. See the Percent Area Habitat Summary in Chapter 2 for more detailed information by reach.

- **Braided Channels:** A braided channel is a series of three or more roughly parallel channels structured during bankfull flow and separated from each other by unstable islands. Braided channels appear distinct at flows less than bankfull stage. At bankfull stage, the islands separating the multiple channels are overtopped, and the channel appears to be a single broad channel. Vegetation on these unstable islands is typically non-woody annual plants, very young seedlings, or willow. A braided channel is the result of sediment supply that exceeds the power of the stream to transport all of the sediment through a specific channel segment. (Handbook 2010)

    - There was only one braided channel found on the survey and it was in reach one and made up 1.7% of the total habitats surveyed.

RIPARIAN HABITATS

Riparian Vegetation

- The riparian vegetation was noted on measured habitat units for the inner riparian zone only (100 feet on both banks). The class is broken down by diameter at breast height (dbh) and the classes are as follows (Handbook 2010):
    - NV = No Vegetation (bare rock/soil, dbh not applicable)
    - GF = Grassland/Forb Condition (dbh not applicable)
    - SS = Shrub/Seedling Condition (1.0 – 4.9 in. dbh)
    - SP = Sapling/Pole Condition (5.0 – 8.9 in. dbh)
    - ST = Small Trees Condition (9.0 – 20.9 in. dbh)
    - LT = Large Trees Condition (21 – 31.9 in. dbh)
    - MT = Mature Trees Condition (>32 in. dbh)

- The overstory vegetation is defined by the species that from an overhead view occupies the most overstory area along both banks. It is an average of both banks' condition.

- The understory is denoted by which species are growing in this lower vegetative layer. It too is an average of both banks' condition.

Table 1.7. Riparian vegetation classes and species observed.

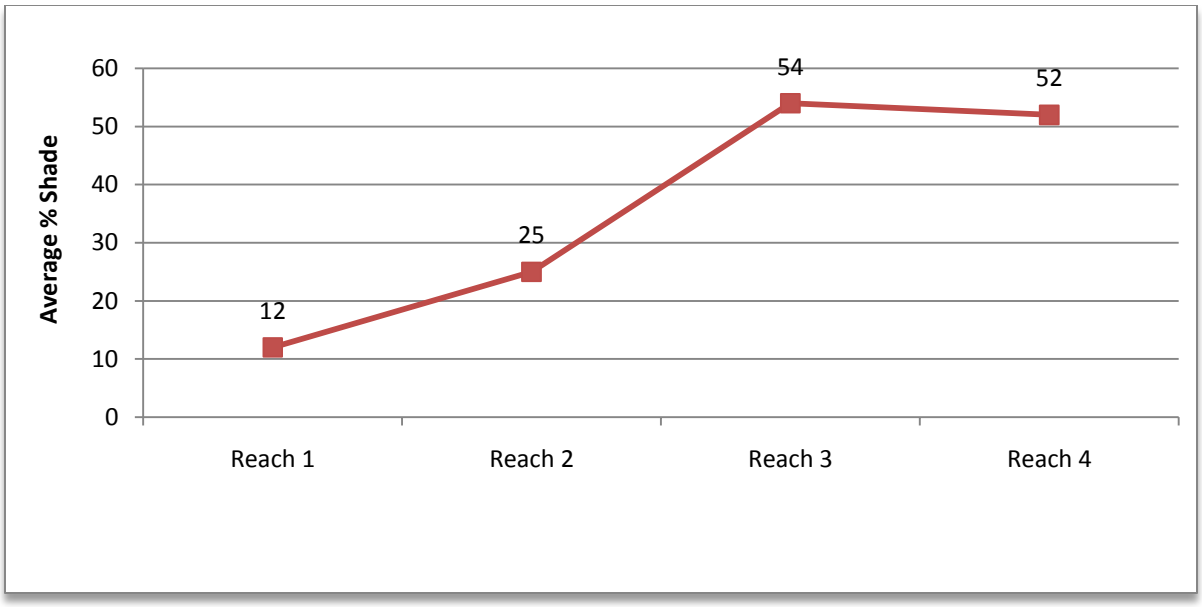
Reach	Riparian Class	Overstory	Understory
1	▪ Shrub/seedling	▪ Willow (*Salix* sp.)	▪ Grassland/forbs
2	▪ Small tree ▪ Shrub/seedling	▪ Willow (*Salix* sp.) ▪ Lodgepole pine (*Pinus contorta)*	▪ Shrub seedling ▪ Grassland/forbs ▪ Douglas fir (*Pseudotsuga menziesii)* ▪ Lodgepole pine (*Pinus contorta)*
3	▪ Small tree ▪ Alder (*Alnus* sp.)	▪ Small tree ▪ Sapling pole ▪ Lodgepole pine (*Pinus contorta)*	▪ Shrub seedling ▪ Alder (*Alnus* sp.)
4	▪ Small tree	▪ Alder (*Alnus* sp.)	▪ Lodgepole pine (*Pinus contorta)* ▪ Grassland/forbs

Solar Radiation

- Solar radiation was taken at every measured unit with a solar pathfinder to determine the percent of shade and was normalized for the latitude in which it was used and the month of September. The surveyor stood in the middle of the channel while assessing the shade.

SO 5-6 (approximately) - near RM 0.3 in reach 1. Photo orientation is facing upstream. (Photo courtesy of Bureau of Reclamation)

- The above photo shows the lack of shade on the channel in the lower portion of the survey. The lack of stream side vegetation is the origin of the low percent of shade for reaches 1 and 2.



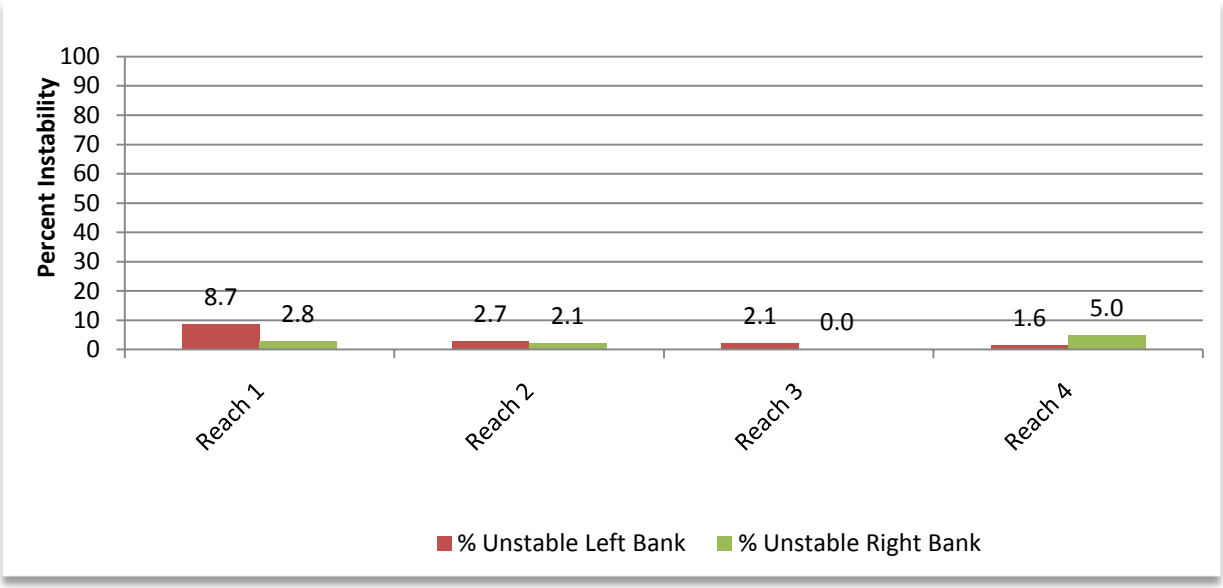
Graph 1.4. Average percent shade on the channel for each reach.

Bank Stability

- The banks on the Jordan Creek stream survey met the RMO for bank stability, being more than 80% stable.

- For more detailed information by reach see Graph 1.5 and the Unstable Bank Summary in Chapter 2.

SO 155 – Unstable banks, right bank (Photo oriented downstream), Reach 4, RM 2.8



Graph 1.5. Percent of unstable banks observed by reach.

- Note: Unstable banks were not measured on side channels.

MANAGEMENT ACTIVITIES / IMPACTS

Roads

- Jordan Creek is accessed by traveling east from Stanley, Idaho, on state highway 75/National Forest Road 26 or traveling west from Challis, Idaho, on State Highway 75/National Forest Road 26 until you reach Sunbeam. At Sunbeam turn north up National Forest Road 013 and follow it until the 172 spur road. National Forest Road 172 follows Jordan Creek closely for the surveyed length.

SO 38 – Old bridge crossing, Reach 2, RM 0.9

- There were a few nonfunctioning culverts located in the channel near the end of reach one.

SO 20 – culverts lying in channel, Reach 2, RM 0.4

SO 75 – Old road ford, Reach 2, RM 1.4

Mining

- Historically parts of the Yankee Fork and Jordan Creek were mined for gold intermittently from 1940 to 1952. Jordan Creek was dredge mined from the confluence with Yankee Fork upstream about 1.2 miles. (Stephens 1991) This dredging re-routed, straightened, and entrenched the channel and has confined the river between dredge piles. Therefore, at high flows in many areas, stream power and sediment transport capacity is increased.

Stream Enhancement Projects

Previously restored section of Jordan Creek near RM 0.5, Reach 1 (Photo courtesy of Bureau of Reclamation)

- A restoration project was performed on the first reach of this survey (nearly 0.4 miles) in the early 1990's funded by Hecla Mining Company. Grouse Creek Mine, owned by Hecla Mining Company, was a gold-silver mine located 3 miles up

Jordan Creek that closed in the 1990's. The Grouse Creek Mine only operated from November 1994 through April 1997. On May 1, 1997 the mine was placed on temporary suspension and operations were permanently suspended on May 1, 2000 (USDA 2003). The tailings impoundment was under CERCLA jurisdiction from 2000-2009. Currently, the EPA is the lead agency managing this site and ongoing reclamation activities.

Grazing

- There are no cattle allotments within the surveyed area.

CHAPTER 2: STREAM SURVEY SUMMARY REPORTS

Hydrology Summary

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

Reach	Valley Form	Mapped Gradient	Mapped Sinuosity	Average Width/Depth Ratio	Average Entrench-ment Ratio	Dominant Substrate Size Class	Rosgen Stream Class
1	8	1.7	1.00	11.1	3.9	Gravel (2-64 mm)	B4
2	3	2.9	1.04	10.9	1.7	Gravel (2-64 mm)	G4
3	5	2.5	1.06	16.9	3.1	Gravel (2-64 mm)	B4
4	3	3.3	1.03	14.8	1.9	Gravel (2-64 mm)	B4c
Average		**2.6**	**1.03**	**13.4**	**2.7**		

Hydrology Summary (continued)

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

Reach	Surveyed Length in Feet*	Mapped Channel Length in Feet	Mapped Minimum Elevation in Feet	Mapped Maximum Elevation in Feet	Stream Order	Discharge Cubic Feet per Second	Average Corrected Wetted Width	Average Bankfull Depth in Feet	Average Bankfull Max Depth in Feet	Average Bankfull Width in feet	Average Floodprone Width in Feet	Mapped Valley Width in Feet	Mapped Valley Length in Feet
1	1,910	2,059	6,368	6,401	3	4.15	14.5	1.80	2.00	9.1	79	236	1,904
2	7,286	7,116	6,401	6,611	3	-	14.4	2.15	2.66	10.3	40	212	6,998
3	4,938	4,900	6,611	6,735	3	-	12.0	1.39	1.70	10.0	69	175	4,672
4	4,984	4,994	6,735	6,900	3	-	13.6	1.54	2.17	10.2	44	97	4,821
Average	**19,118**	**19,069**				**4.15**	**13.6**	**1.72**	**2.13**	**9.9**	**58**	**180**	**18,395**

* = Surveyed Length in Feet is determined using ArcMap 9.3.1.

Percent Habitat Area Summary

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

Reach	% Slow Water	Number of Slow Water Units	% Fast Water	Number of Fast Water Units	Fast Water/Slow Water Ratio	% Side Channel	Number of Side Channel Units	% Special Case	Number of Special Cases	% Braided Units	Number Braided Units	% Tributary	Number of Tributaries
1	25.0	5	55.0	11	2.20	15.0	3	0.0	0	5.0	1	0.0	0
2	45.3	34	50.7	38	1.12	0.0	0	0.0	0	0.0	0	4.0	3
3	43.1	22	47.1	24	1.09	3.9	2	0.0	0	0.0	0	5.9	3
4	40.0	26	44.6	29	1.11	9.2	6	0.0	0	0.0	0	6.2	4
Total / Average	**38.4**	**87**	**49.4**	**102**		**7.0**	**11**	**0.0**	**0**	**1.3**	**1**	**4.0**	**10**

Slow water (pool) = A habitat unit with a hydraulic control, usually with reduced surface turbulence and has an average depth greater than riffles when viewed during low flow conditions.

Fast Water = A habitat unit without a hydraulic control, usually with relatively fast velocity and usually relatively shallow.

Side Channel = A lateral (i.e., secondary) channel with an axis of flow roughly parallel to the mainstem channel. This secondary channel transports water from an upstream confluence with the mainstem channel to a downstream confluence with the mainstem channel.

Special Habitats = A category for other habitats, waterfalls, chutes, culverts, marshes, braids, dry sections, man-made dams and structures.

Braid = A braided channel is a series of three or more roughly parallel channels structured during bankfull flow and separated from each other by unstable islands. Vegetation on these unstable islands is typically non-woody annual plants, very young seedlings, or willow.

Tributary = A secondary channel system that occupies a distinct drainage basin and has a unique headwater origin. The drainage basin of a tributary is a portion of the larger drainage basin of the mainstem channel.

Wood Summary

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

			Number of Pieces of Wood per Mile				
Reach	Miles		Small	Medium	Large	Total	Frequency of Large Pieces of Wood*
1	0.39		59.0	5.1	2.6	66.7	0.007
2	1.35		8.2	0.0	0.0	8.2	0
3	0.93		17.2	1.1	0.0	18.3	0
4	0.95		16.8	2.1	2.1	21.1	0.005
Total	**3.62**	**Average**	**25.3**	**2.1**	**1.2**	**114.2**	**0.003**

* Frequency of Wood = Number of Large Pieces of Wood/(Corrected Channel Length/Average Corrected Wetted Channel Width).

Pool Summary

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

								Percentage of Pools Formed By										
Reach	Miles	Number of Pools	Number of Pool/Surveyed Mile of Stream	Frequency of Pools*	Number of Pools >3 Feet Deep/Surveyed Mile of Stream	Frequency of Pools >3 Feet Deep*	Average Residual Pool Depth**	Beaver	Wood	Bedrock	Boulder	Stream Bend	Tributary	Culvert	Dam	Restoration	Other	Not Designated
1	0.39	5	12.82	0.035	0.6	0.007	1.98				60	40						
2	1.35	34	25.23	0.069	1.06	0.002	1.06			6	94							
3	0.93	22	23.71	0.054	1.23	0.005	1.44			14	77	9						
4	0.95	26	27.49	0.07	0.88	0.005	1.47	12	15		58							15
Total/Average	**3.62**	**87**	**22.3125**	**0.057**	**0.9425**	**0.00475**	**1.4875**	**12**	**15**	**20**	**289**	**49**						**15**

* Frequency of Pools = Number of Pools/(Corrected Channel Length/Average Corrected Wetted Channel Width).

** Residual Pool Depth = Maximum Depth – Depth at Pools Tail Crest

Unstable Bank Summary

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

Reach	Miles	Sum Unstable Left Bank	% Unstable Left Bank	Sum Unstable Right Bank	% Unstable Right Bank	% Unstable Both Banks
1	0.39	180	8.7	57	2.8	11.5
2	1.35	190	2.7	150	2.1	4.8
3	0.93	104	2.1	0	0.0	2.1
4	0.95	80	1.6	250	5.0	6.6
Total/Average	**3.62**	**554**	**3.8**	**457**	**2.5**	**6.3**

Count of Special Habitat Units

Stream Name: Jordan Creek

Hydrologic Unit Code: 170602010503

Protocol Name: R6 Eastside Aquatic Inventory

Date: 09/20/2010 – 09/21/2010

Reach	Number of Waterfalls	Maximum Height of Waterfalls (ft)	Number of Chutes	Number of Braids	Number of Marshes	Number of Dams	Number of Dry Channels	Total Length of Dry Channels	Number of Culverts
1	0		0	1	0	0	0	0	0
2	0		0	0	0	0	0	0	0
3	0		0	0	0	0	0	0	0
4	0		0	0	0	0	0	0	0
Total	**0**		**0**	**1**	**0**	**0**	**0**	**0**	**0**

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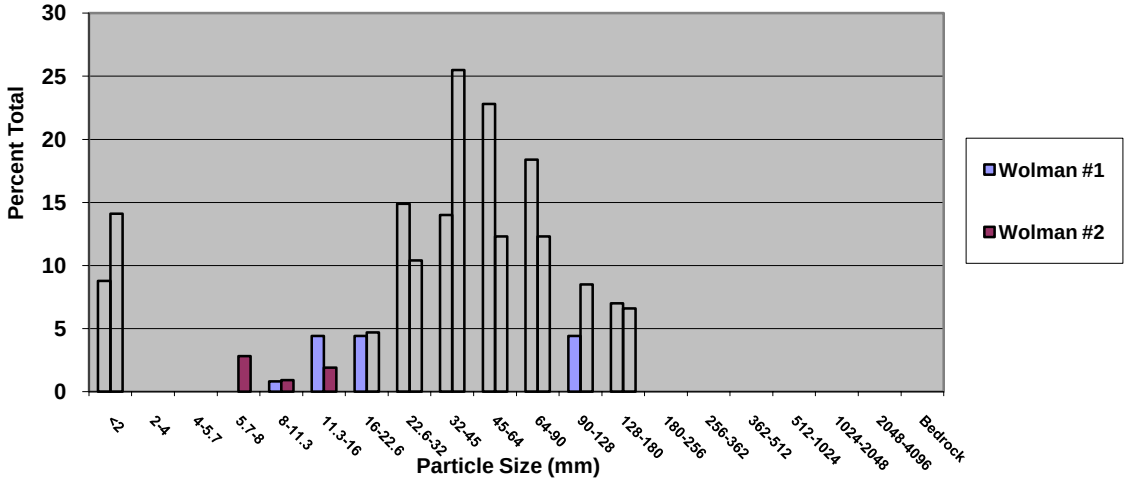
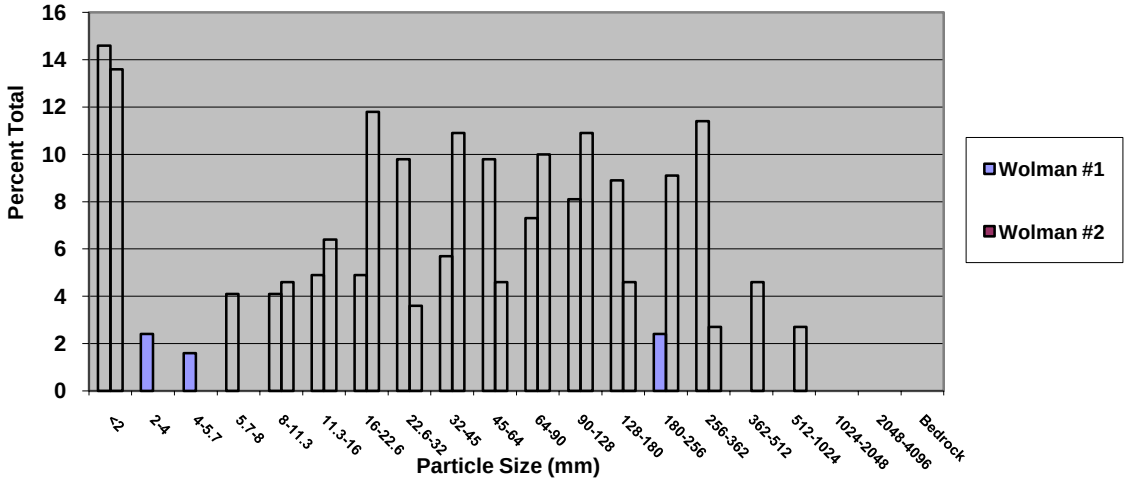
APPENDICES

APPENDIX A: Wolman Pebble Count Graph by Reach

Reach 1
D16 – 12.5 mm
D50 – 43 mm
D84 – 85.5 mm

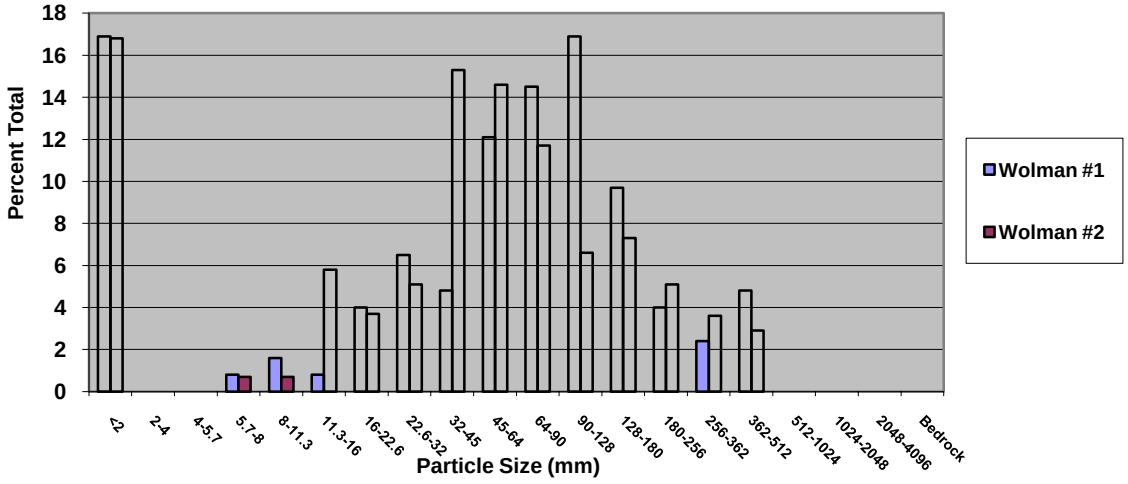


Reach 2
D16 – 6.5 mm
D50 – 42 mm
D84 – 184.5 mm

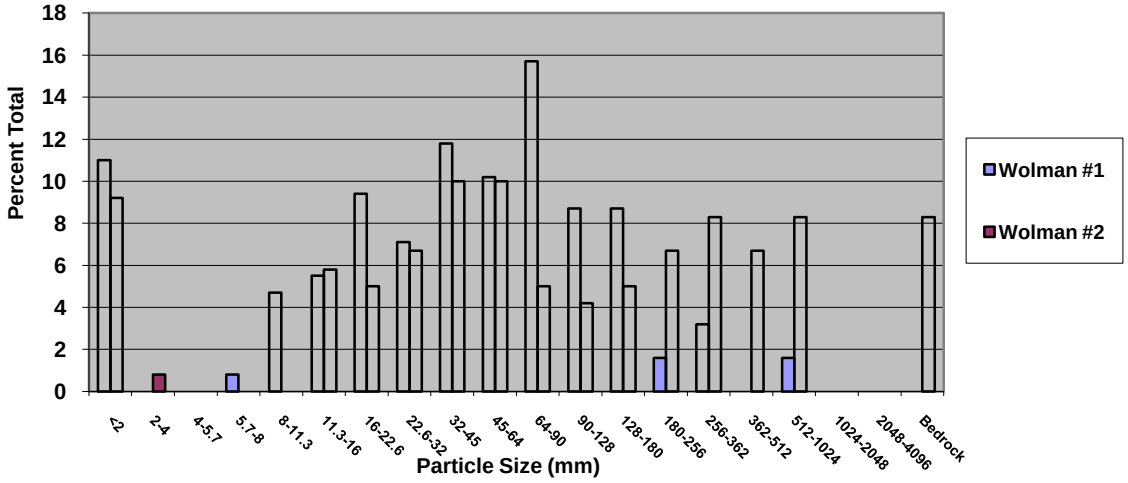


APPENDIX A (Continued)

Reach 3
D16 – 2 mm
D50 – 57.5 mm
D84 – 149.5 mm

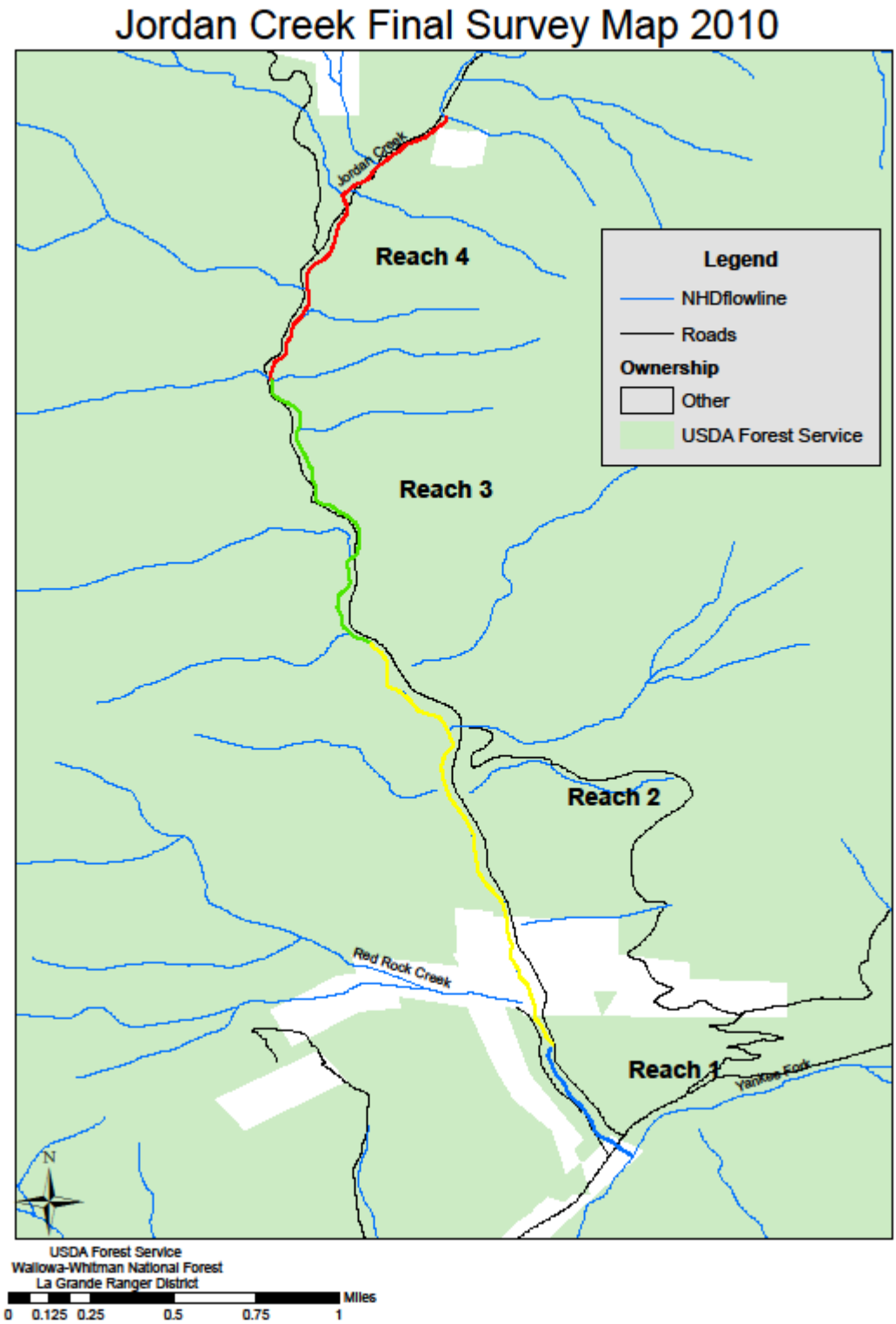


Reach 4
D16 – 13 mm
D50 – 52 mm
D84 – 245.5 mm

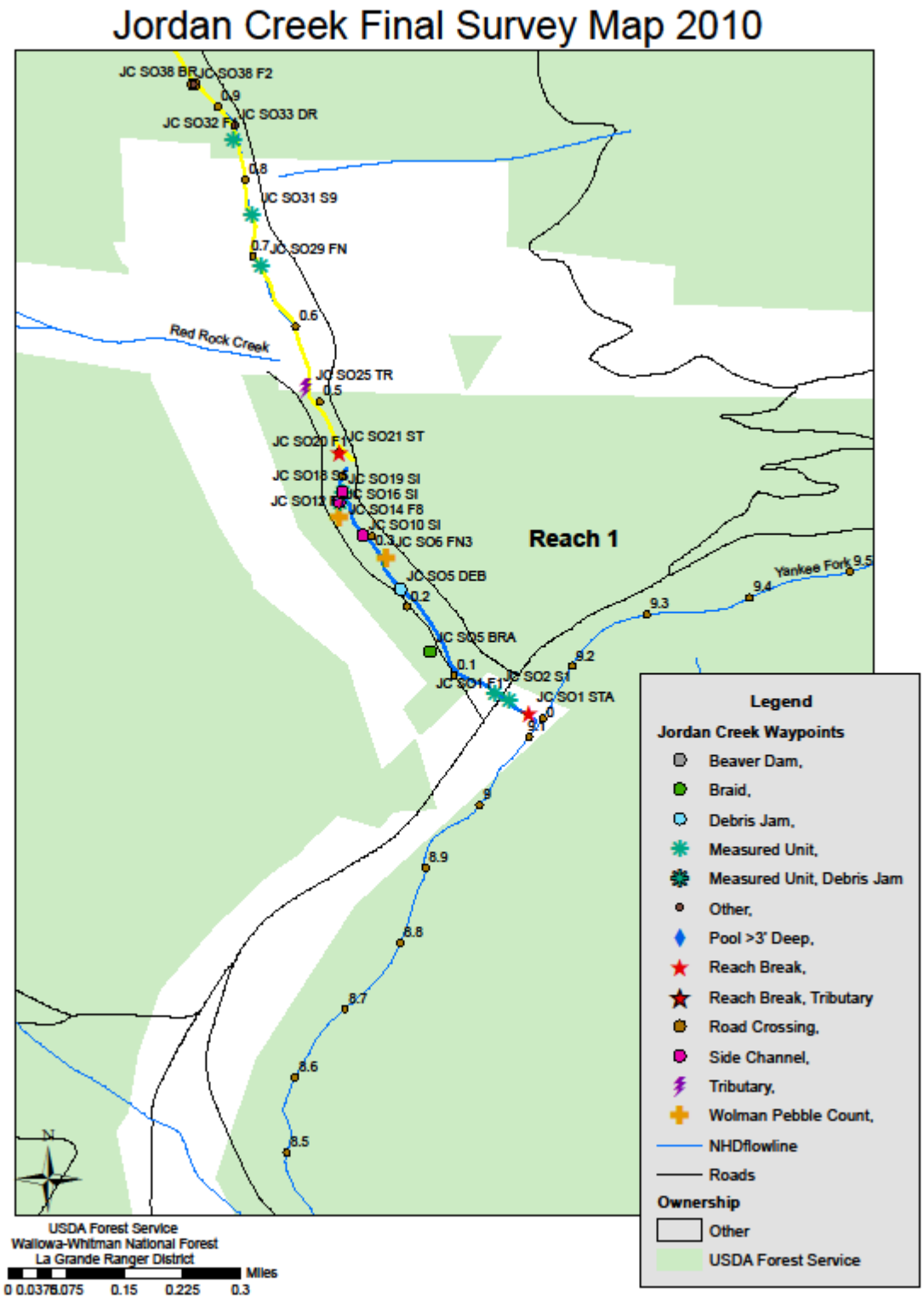


APPENDIX B - Maps

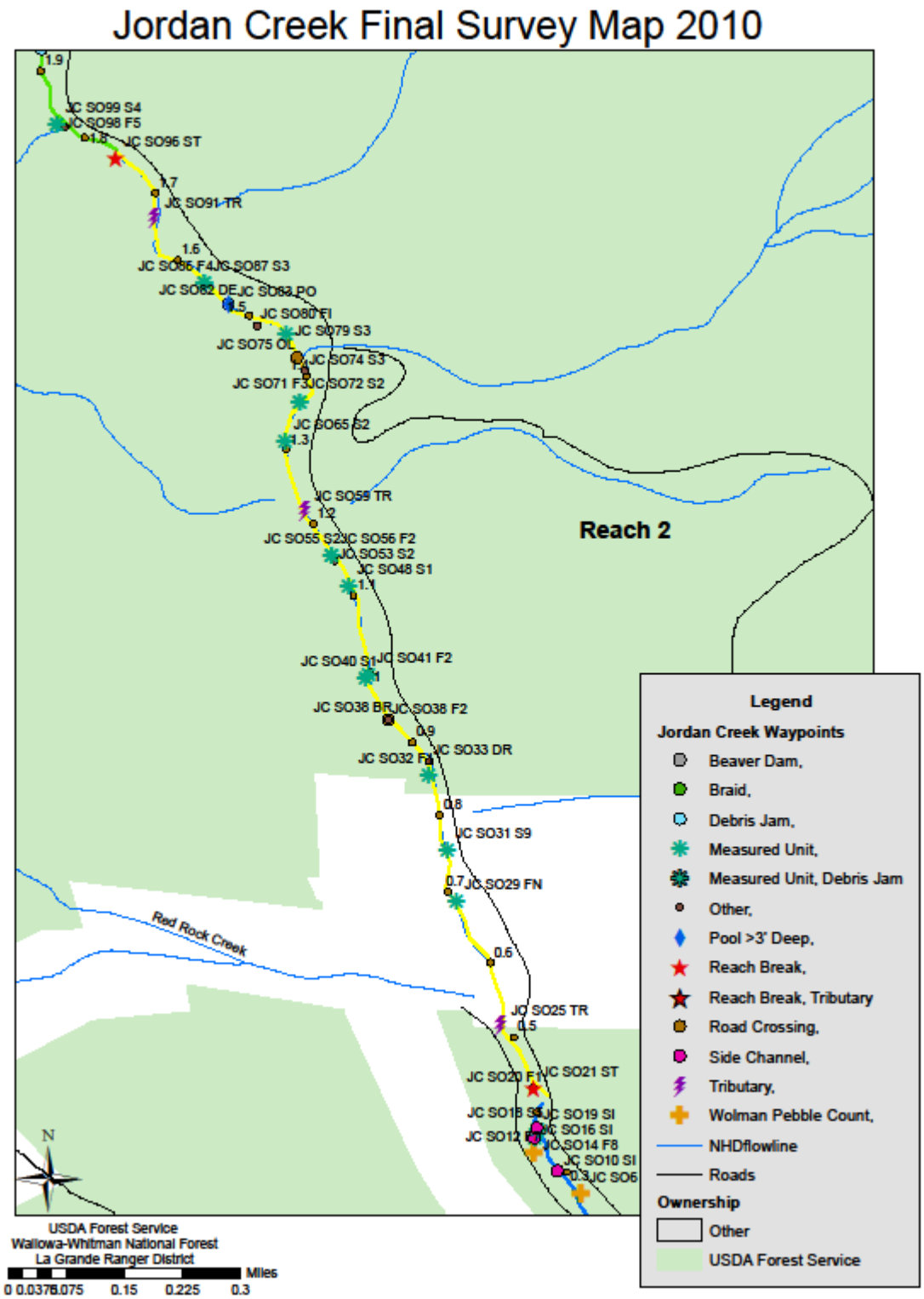
Map 1. Yankee Fork Stream Survey – Final Survey Map



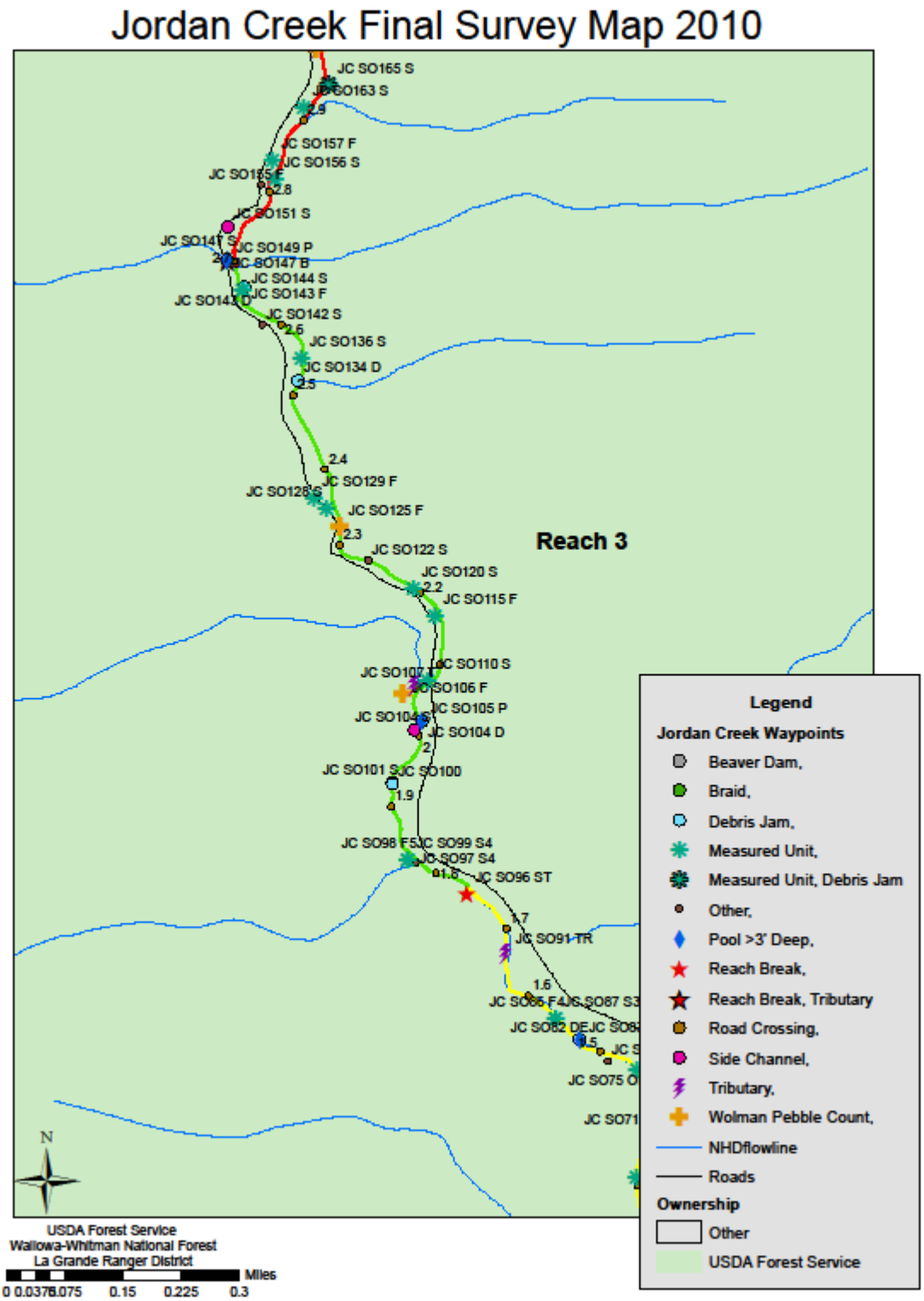
Map 2. Yankee Fork Stream Survey – Reach 1



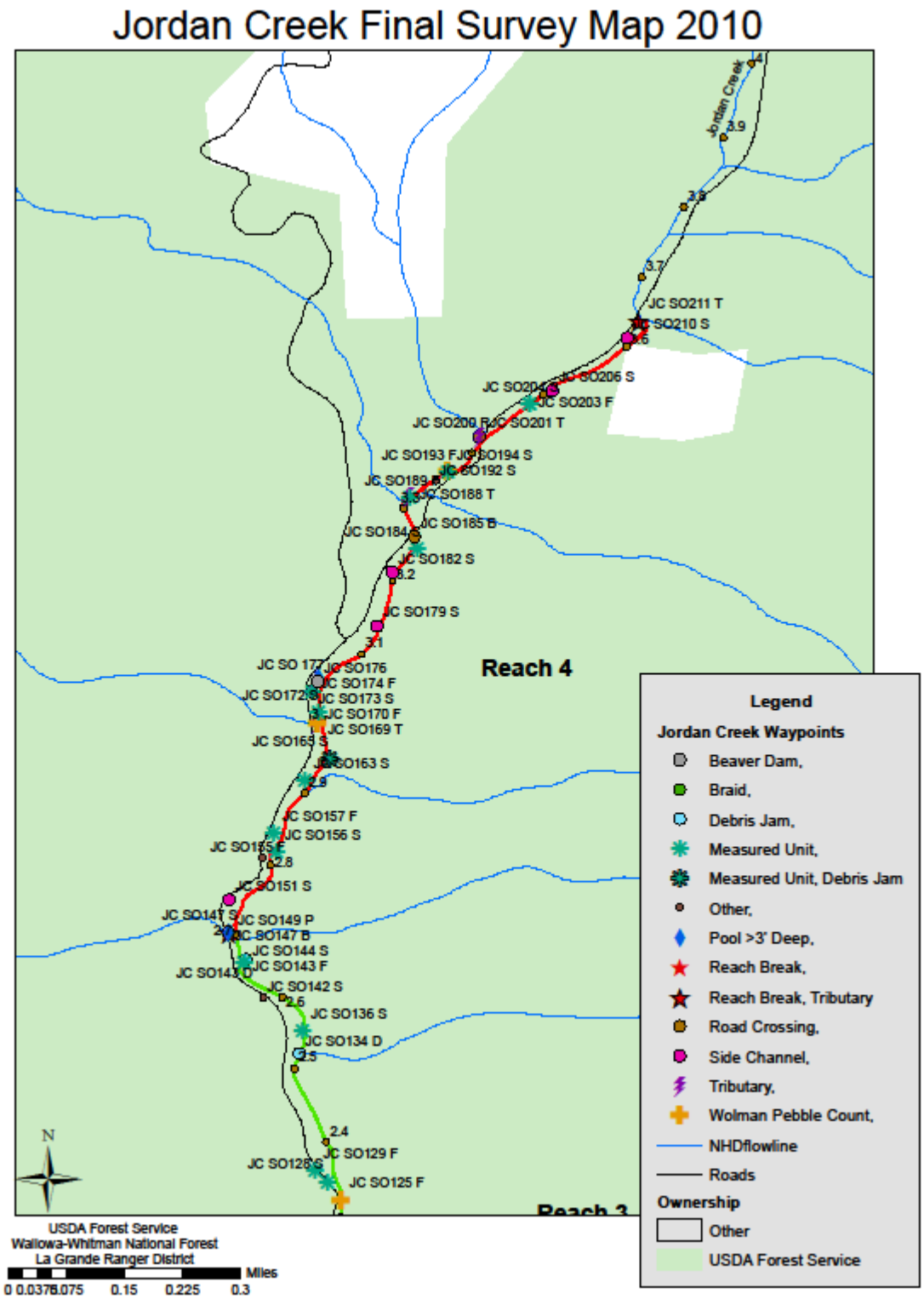
Map 3. Yankee Fork Stream Survey – Reach 2



Map 4. Yankee Fork Stream Survey – Reach 3



Map 5. Yankee Fork Stream Survey – Reach 4



APPENDIX C – Photos & Raw Data Sheets