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Wallace Canyon Creek Watershed

Wallace Canyon Creek Watershed supports naturally reproducing trout populations. Surveys conducted in 1991 and 1992 indicated that there are moderate numbers of brown trout throughout the main channel and its two main tributaries. A population of brook trout were observed in a portion of Little Wallace Canyon Creek in 1992. According to a survey done in 1973, rainbow trout were present in the lower 1.2 miles of Wallace Canyon Creek. Data collected in 1973, and 1986 indicated that trout biomass was at about the average value for comparably sized Northern Sierra streams. All age classes were reported to be present throughout, indicating recent reproductive success (Thomas, 1993). A Western Pond turtle was observed adjacent to Little Wallace Canyon Creek in 1991. There are no other reports of amphibians or riparian dependent reptiles in this watershed (Elliott, 1993)

AQUATIC ECOSYSTEM

Little Wallace Canyon Creek, South Fork of Wallace Canyon Creek, and the North Fork of Wallace Canyon Creek were surveyed in 1992 to assess the condition of the stream channels and fish habitat (Thomas, 1993). The upper two mile section of the North Fork of Wallace Canyon Creek was surveyed in 1986 (Genrich, 1986). The mainstem of Wallace Canyon Creek was surveyed from near the confluence of Long Canyon Creek to approximately one-eighth mile upstream of the confluences of the North and South Forks of Wallace Canyon Creek in 1973 (Week, 1973). Table 1 summarizes selected stream data from the 1993 stream surveys, including stream reach location, length, gradient, channel description, and sensitivity.

The surveys indicated that portions of the watershed may be adversely impacted from direct and/or indirect effects of past land-disturbing activities. Direct effects are immediate impacts directly associated with points of disturbance. Typical direct effects include soil displacement and compaction associated with road construction, change in ground cover that results from timber harvest, or streambed disturbance at river crossings. Indirect effects are long-term responses to disturbances that may be remote from the disturbance that precipitated them. Typical indirect effects might include changes in the magnitude of streamflow fluctuations which may result in high spring floods, low summer flows, and high summer water temperatures, and increased erosion and sedimentation, as a result of decreased infiltration from road construction and

timber harvest. The results of these surveys are summarized below.

Little Wallace Creek

During a survey conducted in the mainstem of Wallace Canyon Creek in August 1973, the flow at the mouth of Little Wallace Canyon Creek was estimated to be 0.5 cubic feet per second (cfs) (Week, 1973). In the September 1992 survey, the upper 705 feet of the stream was reported to have intermittent flow with numerous dry sections (Thomas, 1993). The channel in the lower 2,332 feet of the stream is well confined and predominantly steep with the gradient ranging between 4 and 16 percent. The middle portion of the stream is moderately confined and becomes less steep with an average gradient of 3.5 percent. The upper portion of the stream is confined and steepens slightly, with the average gradient ranging between 4 and 7 percent. Bedrock and cobbles are the dominate substrate material in the lower and upper reaches, and cobbles are dominate in the middle reach (Thomas, 1992; 1993).

The stream survey identified most habitat factors for trout to be at low to medium capability, except for stream shade, which was at high capability. Stream shade averaged 85 percent throughout the surveyed reaches. Instream cover averaged 30 percent of the stream surface area and is dominated by boulders. Pools compose 16 percent of the channel length, which is below the optimum of 45 to 55 percent. However, runs and step runs which provide good habitat for juvenile trout, were heavily represented. The fine sediment component found in low gradient riffles was 20 percent, which is considered to be medium habitat capability for trout. Spawning gravel in riffle areas is at low levels which may be limiting trout reproduction. Large woody debris densities within the bankfull channel averaged 8 pieces per 1,000 feet of stream channel, which is below the optimal level of 20 pieces per 1,000 feet (Thomas, 1993).

Moderate numbers of brown trout were found throughout the lower 1.3 miles of the stream. A small population of brook trout was present approximately one-half mile from the confluence. All age classes of both brook and brown trout were reported to be present, indicating reproductive success (Thomas, 1993).

South Wallace Creek

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The lower one-eighth mile of this creek was surveyed in 1973 (Week, 1973), and the entire length of South Wallace Creek was surveyed in 1992 (Thomas, 1993). In August 1973, flow in this creek was estimated to be 1 cfs at its confluence with Wallace Canyon Creek (Week, 1973). In September 1992, the upper 4,123 feet of the stream were reported to have intermittent flow, with numerous dry sections (Thomas, 1993). The channel is confined in the lower portion with an average gradient between three and four percent. The upper portion is moderately confined with an average gradient between two and four percent. Bedrock, boulders and cobbles are the dominate substrate material for the entire channel length (Thomas, 1992; 1993). The lower one-eighth mile of the channel was reported to be in good condition in 1973 and sedimentation was not observed (Week, 1973).

The stream survey identified most habitat factors for trout to be at low to medium capability except for stream shade, which was at high capability. Stream shade averaged 68 percent throughout the surveyed reaches. Instream cover averaged 26 percent of the stream surface area. Boulders and aquatic vegetation are the dominant cover types. Pools composed 11 percent of the channel length, which is below the optimum of 45 to 55 percent. However, runs and step runs, which provide good habitat for juvenile trout, were heavily represented. The fine sediment component found in low gradient riffles was 16 percent, which is considered to be medium habitat capability for trout. Spawning gravel in riffle areas is at low levels which may be limiting trout reproduction. Large woody debris densities within the bankfull channel averaged 4 pieces per 1,000 feet of stream channel, which is well below the optimal density of 20 pieces per 1,000 feet (Thomas, 1993).

According to the 1973 survey, the abundance of brown trout, less than eight inches in length, ranged between few and common in the lower one-eighth mile of the stream (Week, 1973). During the 1992 survey, moderate numbers of brown trout were observed throughout the lower 2.4 miles of the stream. All age classes of trout were present throughout, indicating recent reproductive success (Thomas, 1993).

North Wallace Creek

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The entire length of North Wallace Creek was surveyed in 1992 (Thomas, 1993), the upper two miles of the creek was surveyed in 1986 (Genrich, 1986), and the lower one-eighth mile was surveyed in 1973 (Week, 1973). Several springs contribute to the creek's flow. In August 1973, flow in this creek was estimated to be at less than 0.5 cfs at its confluence with Wallace Canyon Creek and the stream was reported to be subterranean in several places in the lower one-eighth mile (Week, 1973). In August 1986, flow in the upper portion of the creek was estimated to be 1 cfs (Genrich, 1986). In September 1992, flow in the upper 3,750 feet of the creek was reported to be intermittent (Thomas, 1993).

North Wallace Creek is fairly steep and confined in the lower and upper sections. Gradients in these reaches average between 10 and 14 percent. The middle section of the creek is moderately confined and less steep, with gradients in this reach ranging between 1.25 and 6.3 percent. Bedrock, boulders, and cobbles are the dominant substrate material in the lower and middle sections, and boulders and cobbles are predominant in the upper section (Thomas 1992; 1993). Sedimentation and bank erosion were observed in the upper portion of the watershed at an elevation of approximately 5,480 feet in the 1986 survey and channel stability was reported to be moderate to unstable in this area (Genrich, 1986). Channel degradation in this area was reported to have occurred during a storm event which also left debris jams in the creek that were further aggravating bank erosion (Genrich, 1986). The 1973 survey also reported light to moderate amounts of silt in the stream due to upstream logging activity and the proximity of a forest road 14N19 to the stream channel (Week, 1973).

The stream survey identified most habitat factors for trout to be at low to medium capability except for fines which were at high capability. Stream shade averaged 56 percent throughout the surveyed reaches. Shade cover was described as light to moderate in the upper reach. Instream cover averaged 27 percent of the stream surface area and is dominated by boulders and small woody debris. Pools compose 16 percent of the channel length, which is below the optimum of 45 to 55 percent. However runs, step runs, and step pools, which provide good habitat for juvenile trout, were heavily represented. The fine sediment component found in low gradient riffles was 14 percent, which is considered to be high habitat capability for trout. Spawning gravel in riffle areas is at low levels which may be limiting trout reproduction. Large woody debris densities within the bankfull channel averaged 4 pieces per 1,000 feet of stream channel,

which is well below the optimal density of 20 pieces per 1,000 feet (Thomas, 1993).

A few brown trout were reported in scattered pools up to one-eighth mile from the confluence with Wallace Canyon Creek in 1973 (Week, 1973). Brown trout were also reported in the upper portion of the creek in 1986 (Genrich, 1986). In the 1992 survey, moderate numbers of brown trout were reported throughout the stream except in the upper 3,750 feet, where the stream was intermittent with numerous dry sections. All age classes of trout were present, indicating recent reproductive success (Thomas, 1993).

Wallace Canyon Creek

The mainstem of Wallace Canyon Creek was surveyed in 1973 (Week, 1973). August flow in the lower and middle sections was estimated to be 3 cfs, and 1 to 2 cfs in the upper section. In addition to the tributary streams discussed above, several unnamed tributary streams and springs contribute flow to this creek. The stream gradient is moderate for the entire length of the creek. Numerous rock falls form barriers in the lower and middle section, and a waterfall near the creek's mouth forms a complete upstream migration barrier from Long Canyon Creek. A log jam in the lower section was also reported to form a total barrier, and slash in the stream channel in the lower and middle sections were reported to form partial barriers.

Channel erosion and sedimentation caused from a combination of an unvegetated road fill, a water chance, and cattle use, were observed immediately downstream from the bridge crossing on forest road 14N081 in the middle reach of the creek. In addition, logging equipment was observed to have crossed the stream channel immediately downstream of the bridge. Increased sedimentation was noted to extend up to one-eighth mile downstream from this area. Sedimentation was also observed in the reach between the bridge crossing and the confluence of North and South Wallace Canyon Creeks. It was reported that upstream logging activity and logging roads were contributing sediment into the stream system. An old water hole located approximately one-quarter mile upstream from the bridge was also reported to be contributing sediment into the stream (Week, 1973).

Shade canopy is dense throughout the length of the mainstem. Bedrock and boulder formed pools are abundant in the lower and middle sections, and boulder formed pools are reported as few to common in the upper section. Riffles are abundant in the lower section and common in the middle and upper sections. Bedrock, rubble, and gravels are the dominant substrate materials in the lower section, and rubble, gravel, and sand, are the dominant substrate materials in the middle and upper sections (Week, 1973). According to the 1973 survey, brown trout were common (15-20 per 100 feet) in the lower and upper sections and abundant (30-40 per 100 feet) in the middle section. Low numbers (1 per 100 feet) of rainbow trout were observed in the lower section. Reproduction is fair to good in the lower section and good in the upper section. Aquatic food was rated as few to common in the lower and middle sections and common in the upper section (Week, 1973).

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Wallace Canyon Creek

Electrofisher Surveys

Crew: Robert Fischer
Kris Ivarson

10/31/95

Location: Clydesdale Mine Trail footbridge.
Effort: 1553 seconds, 387 feet upstream.
Time: 1300 Water temperature: 42 F

Species	Length (mm)	Weight (g)
BNT	158	55
BNT	173	65
BNT	198	95
BNT	177	50
BNT	230	120
BNT	143	35
RBT	126	--
RBT	136	--

Captured/observed but not measured: BNT 6; RBT 4; Unidentified; 3

11/03/95

Location: Forest Service boundary at section 17/18 line.
Effort: 645 seconds, 280 feet upstream.
Time: 1420 Water temperature: 43 F

Species	Length (mm)	Weight (g)
BNT	260	--
BNT	139	30
BNT	178	55
BNT	207	95
BNT	234	--

Captured/observed but not measured: BNT 9; Unidentified; 4

Discharge: 1.15 cfs, pigmy meter, spin test 72 seconds.

11/02/95

Location: 100 ft upstream of confluence with Little Wallace Canyon Creek.
Effort: 704 seconds, 320 feet upstream.
Time: 1205 Water temperature: 45 F

Species	Length (mm)	Weight (g)
BNT	167	60
BNT	245	--
BNT	168	55
BNT	215	--
BNT	169	55
BNT	164	--
BNT	203	100

Observed but not measured: BNT 10; Unidentified; 3

Discharge: 0.95 cfs, pigmy meter, spin test 62 seconds. Measured approx. 0.5 mile upstream at forest road 14N08.1 crossing.

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