11 Novemebr 2002

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Eldorado Irrigation District
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Richard Floch
Richard Floch and Associates
P.O. Box P.O. Box 285
Rescue, California 95672

Subject: **Preliminary Draft**
Technical Memorandum Number 15 –2002 Riparian Vegetation Recruitment Monitoring

Dear Dr. Shewbridge and Mr. Floch:

As part of the relicensing of the El Dorado Irrigation District FERC Project #184, monitoring of riparian vegetation recruitment was conducted on Caples Creek and Kirkwood Creek in 2000 and 2002. Permanent photo points were established during the initial year of monitoring. The photopoints were revisited in 2002, and pictures were taken of the same locations established in 2000. This report presents the 2002 monitoring results along with pictures at the corresponding photopoints.

EIP Associates
Russell Kobayashi
Joshua Boldt
Roy Leidy

Should you have any questions or wish to discuss this report please contact me.

Sincerely,

Roy Leidy

Roy Leidy
Principal
Director, Fisheries and Aquatic Sciences

Attachment

EL DORADO IRRIGATION DISTRICT FEDERAL ENERGY REGULATORY COMMISSION PROJECT NUMBER 184

2002 Riparian Vegetation Recruitment Monitoring

Introduction

As part of the relicensing of the El Dorado Irrigation District FERC Project #184, monitoring of riparian vegetation recruitment was conducted on Caples Creek and Kirkwood Creek in 2000 and 2002. Permanent photo points were established during the initial year of monitoring. The photopoints were revisited in 2002, and pictures were taken at the same locations established in 2000. This report presents the 2002 monitoring results along with pictures at the corresponding photopoints.

Methods

Data was collected at two locations, Caples Creek and Kirkwood Creek. Sites 1-14 were located on Caples Creek below its confluence with the Caples Lake Spillway channel. The control sites, 15-24, were located on Kirkwood Creek below Highway 88. Kirkwood Creek was chosen as a control because it does not have any major dams on it. Both study areas are located in meadows with similar riparian vegetation compositions, primarily *Salix spp...* The areas are also grazed to a limited extent by horses from the nearby stables.

Twenty-four sites were initial chosen during the 2000 visits. These locations where chosen because they were on or near fluvial deposits where recruitment would be expected. Methods of Platts et. al.(1987) were generally followed to establish the photopoints. Each site was photographed across, downstream and upstream. In addition to the photographs taken at each site, observations were recorded on the following: 1) presence or absence of any form of plant regeneration on fluvial deposits; 2) flowering and fruiting of willows; 3) herbivory; and 4) land user impacts.

Results

Below, a site-by-site tabulation of survey results is presented below. The survey was performed too late in the season to be able to observe flowering of *Salix* spp. However, seed production by willows was examined and found to be nearly absent this season along both Caples Creek and Kirkwood Creek. These results are similar to what was observed during the year 2000 surveys. Additionally, flowering by willows was lacking during year 2000 surveys. Further investigations would be needed to produce a reasonable explanation for these deficiencies in the reproductive

capacity of *Salix* spp. in the vicinity of the Study Area. However, this does imply that the only potential sources of seed for either area would be drift from upstream or wind dispersal from other streams. Neither of these sources are considered significant.

Willow regeneration within the Study Area consisted entirely of root layering, either from terraces onto terrace banks or into the interface with fluvial deposits. A total of 29 occurrences of layering, at six sites, were observed at both streams. Five of the sites (28 occurrences) were observed on Caples Creek, and one site (one occurrence) was observed on Kirkwood Creek. Plant recruitment was almost exclusively herbaceous, consisting of grasses, sedges, annual forbs, and horsetail. Additional recruitment of woody vegetation observed within the Study Area consists of limited occurrences of lodgepole pine (*Pinus contorta* ssp. *murrayana*) seedlings and mountain alder (*Alnus incana* ssp. *tenuifolia*) layering. Recruitment was most vigorous in sites protected by woody debris, near the littoral edges of bars, and near the bar/bank interface.

The survey was performed late in the summer, when flows were likely at their lowest levels of the season, and bars were most exposed. On both streams it is evident that these bars were deposited at much higher flows, and at the present time, would only be inundated during bankfull or higher discharges. There is evidence of bar evolution at some locations on Caples Creek (esp. Caples site #1), with deposition or removal of sediment occurring.

Caples meadow has been subjected to extensive alterations by beaver for many years. At the present time, beaver are active both above and within the Caples Creek Study Area. Browsing reduces both the cover and height of willows adjacent to the stream. It is unknown if browsing reduces the ability of plants to produce flowers and seed. Since seed production is also limited on Kirkwood Creek, other factors may be influencing reproduction.

Both sites are subjected to horse traffic and grazing. Trampling on bars and barren trails are evident. It did not appear that horses have a significant impact overall on willow recruitment.

An infestation of an unidentified fungus (rust) was observed on the foliage of the vast majority of willows in both the Caples Creek and Kirkwood Creek Study Areas. This disease was observed as yellow to orange pustules on the undersides of leaves. The upper surfaces of infected leaves displayed yellow mottling. In advanced stages, the fungus seemed to produce early leaf drop. It is not known how this infestation is impacting flowering or seed production.

Sample Site	Description	Willow Seedlings or Sprouts Present?	Herbaceous Vegetation Present? Percent Cover?	Comments
Caples 1-Old	Gravel bar	No	>80% (~85%)	Bar shown in year 2000 photos is gone. Vegetation recruitment protected behind log. Horsetail recruitment on bank.
Caples 1-New	Gravel bar	No	<20% (~15%)	Vegetation on upstream and uppermost part of bar.
Caples 2	Debris bar, sand/silt	Yes, layering (<5 sprouts)(3)	80%	Willow layering at back of bar, behind photopoint, near bar/bank margin
Caples 3	Gravel sand bar	Yes, layering (<5 sprouts)(3)	<1%	Willows in protected site near log. Horse trampling is evident.
Caples 4	Point bar, gravel	No	<50% (~30%)	During high water, bar is mid-channel bar. At this time, it is connected to bar at sample site 5
Caples 5	Point bar, gravel	Yes, layering (~15 sprouts)	<50% (~50%)	Layering at back of bar.
Caples 6	Gravel sand bar	No	<80% (~60%)	Recent log-fall across downstream part of bar. Site immediately below beaver dam. Most vegetation at water level.
Caples 7	Floodplain, sand/silt	No	>80%	Immediately below incomplete beaver dam. Adjacent bar <5% vegetation cover. No willows on bar.
Caples 8	Point bar, gravel	No	<20% (~10%)	Alder seedling on backbar protected by grasses. Mature willows on upper bank. No horsetails seen. Bar across from incomplete beaver dam.
Caples 9	Point bar, gravel	Yes, layering (<5 sprouts)(3)	<10% (~5%)	Willow layering at upstream end of bar, growing in debris pile.

Caples 10	Gravel bar with silt drape	No	<80% (~80%)	Downstream of unnamed tributary.
Caples 11	Point bar, gravel	No	<20% (~20%)	4 willow saplings on upper bank. Vegetation at water level.
Caples 12	Gravel-sand bar	No	<10% (~10%)	Sand bar at junction of Caples Creek and Kirkwood Creek. Vegetation at water level. Mature willows on upper bank.
Caples 13	Debris bar, gravel	No	<30% (~25%)	Recent debris deposited upstream of bar. Vegetation cover significant immediately behind log, less so dowstream of debris. Mature willows on upper bank. Immediately downstream of incomplete beaver dam.
Caples 14	Sand-silt bar	Yes, layering (<5 sprouts)(4)	<30% (~25%)	Most vegetation on downstream and lower segement of bar. Beaver dam immediately upstream of bar.
Kirkwood 15/16	Gravel bar/floodplain	No, but dense mature willow	>80% (~80%)	Adjacent bar barren.
Kirkwood 17	Gravel bar	No, but dense mature willow	>80%	Adjacent bar with ~5% vegetation cover.
Kirkwood 17A	Gravel bar	Yes, layering (1 sprout)	>80% (~85%)	Willow on upper bar. Mature willows and grasses on upper bank. Horsetails and grasses dominant.
Kirkwood 18	Floodplain	No, but dense mature willow	>50%	Adjacent gravel bar with ~50% vegetation cover. Horsetail dominant
Kirkwood 19	Gravel bar/floodplain	No, but dense mature willow	>80%	Adjacent gravel bar with ~10% vegetation cover. Mature willows and grasses on upper bank. Horsetail dominant.
Kirkwood 20	Floodplain	No	>80%	Adjacent gravel bar with ~35% vegetation cover.
Kirkwood 21	Gravel bar	No	<20% (~15%)	Mature willows and grasses on upper bank.

Kirkwood 22	Gravel bar/floodplain	No, but dense mature willow	>80%	Adjacent to Site 21
Kirkwood 23/24	Gravel bar/floodplain	No	<80%(~70%)	Mature willows and grasses on upper bank.

Caples Creek Site 1

Across Creek

Looking Downstream

El Dorado Irrigation District
FERC Project # 184
El Dorado County, CA

EIP ASSOCIATES

2002 Riparian Recruitment
Monitoring Study
Photos taken 9/23/02

Caples Creek Site 1

Looking Upstream

El Dorado Irrigation District
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Caples Creek Site 2

Across Creek

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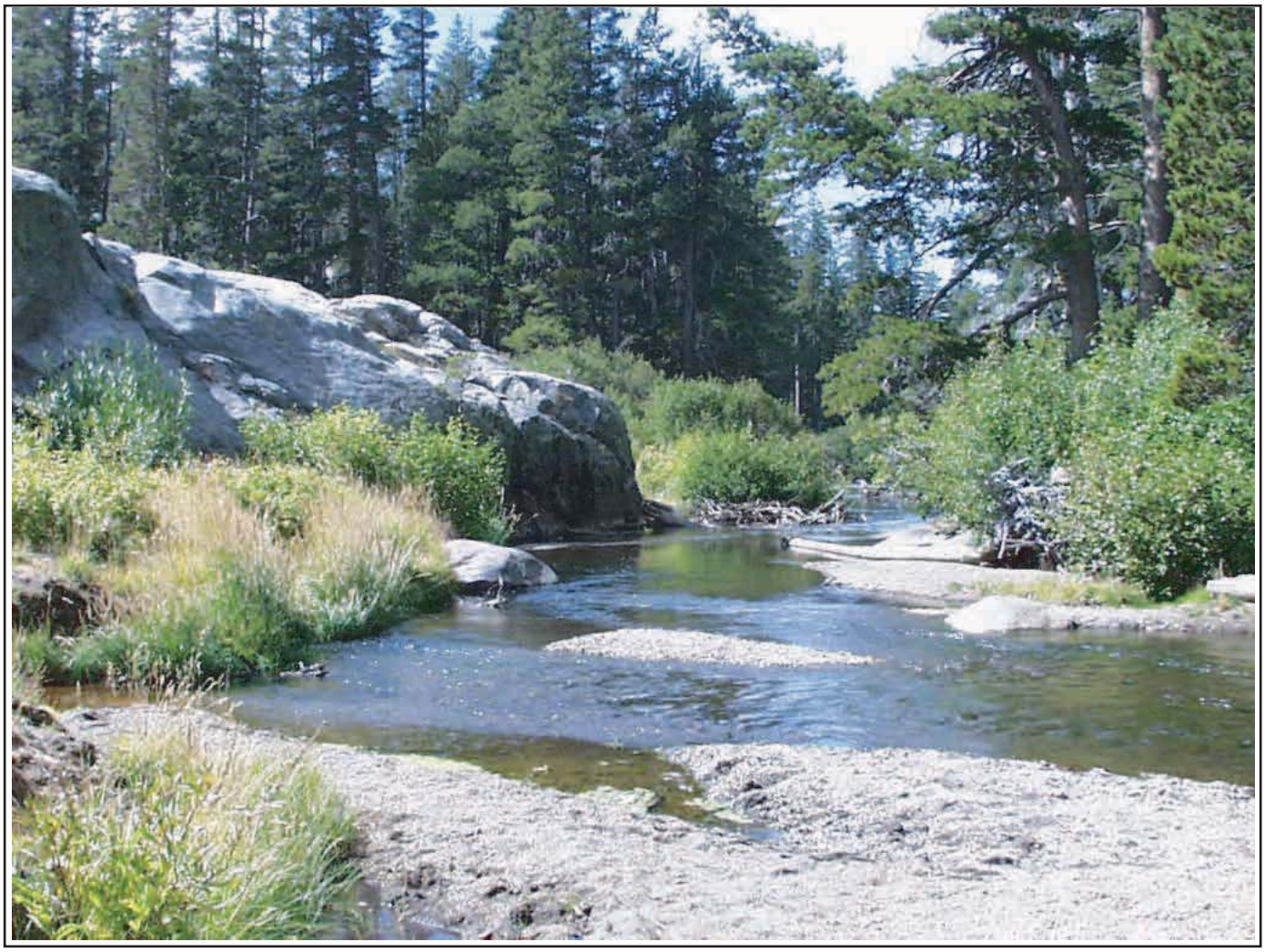
Caples Creek Site 2



Looking Downstream

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Caples Creek Site 2

Looking Upstream

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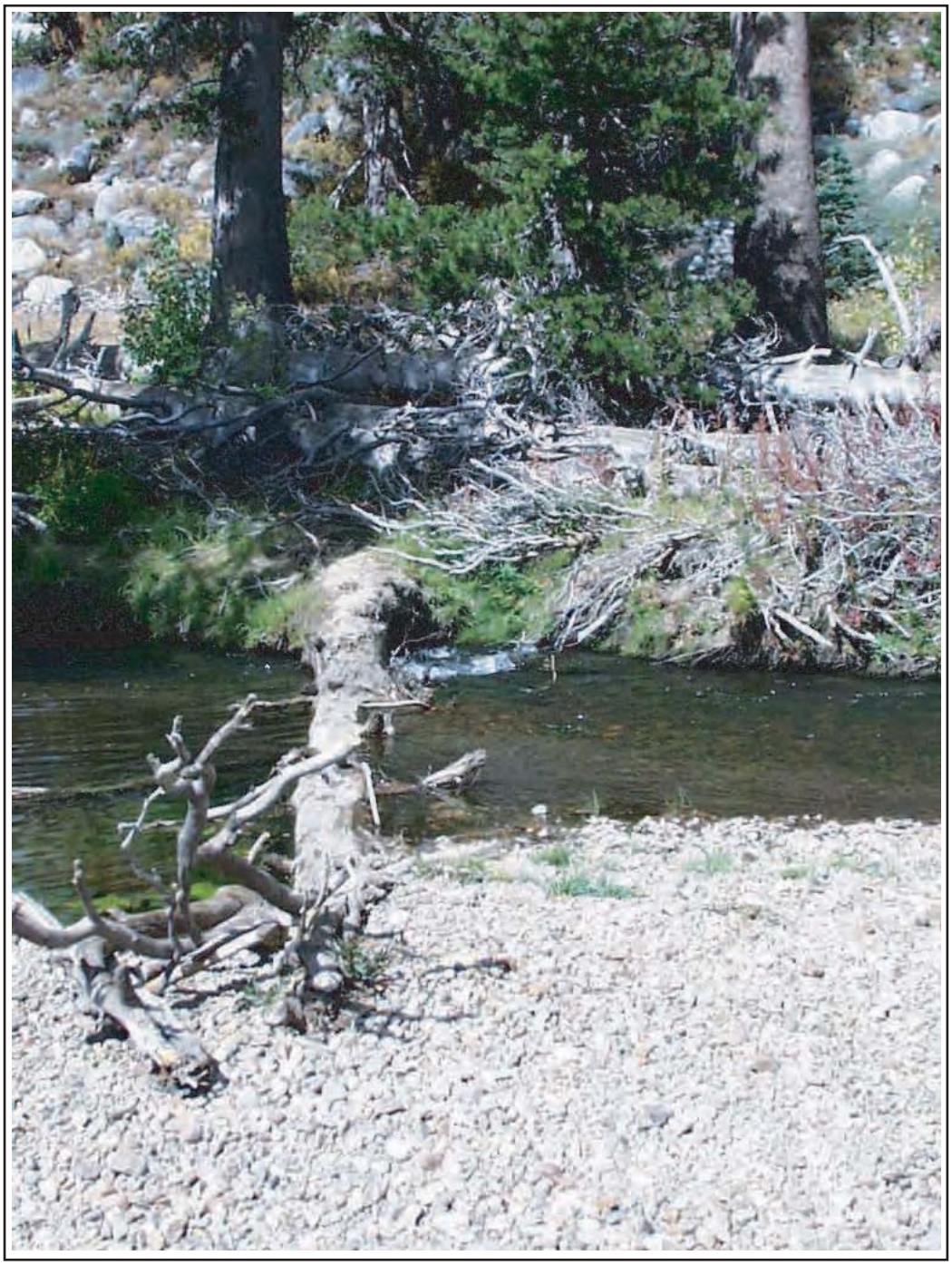
Caples Creek Site 3



Across Creek

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Caples Creek Site 3

Looking Downstream

Looking Upstream

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Caples Creek Site 3

Looking Upstream

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Caples Creek Site 4

Across Creek

Looking Downstream

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Caples Creek Site 4

Looking Downstream

Caples Creek Site 5

Looking Across/Upstream

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Caples Creek Site 6

Across Creek

Looking Downstream

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Caples Creek Site 6

Looking Upstream

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Caples Creek Site 7

Across Creek

Looking Downstream

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Caples Creek Site 7

Looking Upstream

Looking Upstream

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Caples Creek Site 8

Across Creek

Across Creek

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Caples Creek Site 8

Across Creek

Looking Downstream

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Caples Creek Site 8

Looking Upstream

Caples Creek Site 9

Across Creek

Across Creek

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Caples Creek Site 9

Looking Downstream

Looking Upstream

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Caples Creek Site 9

Looking Downstream

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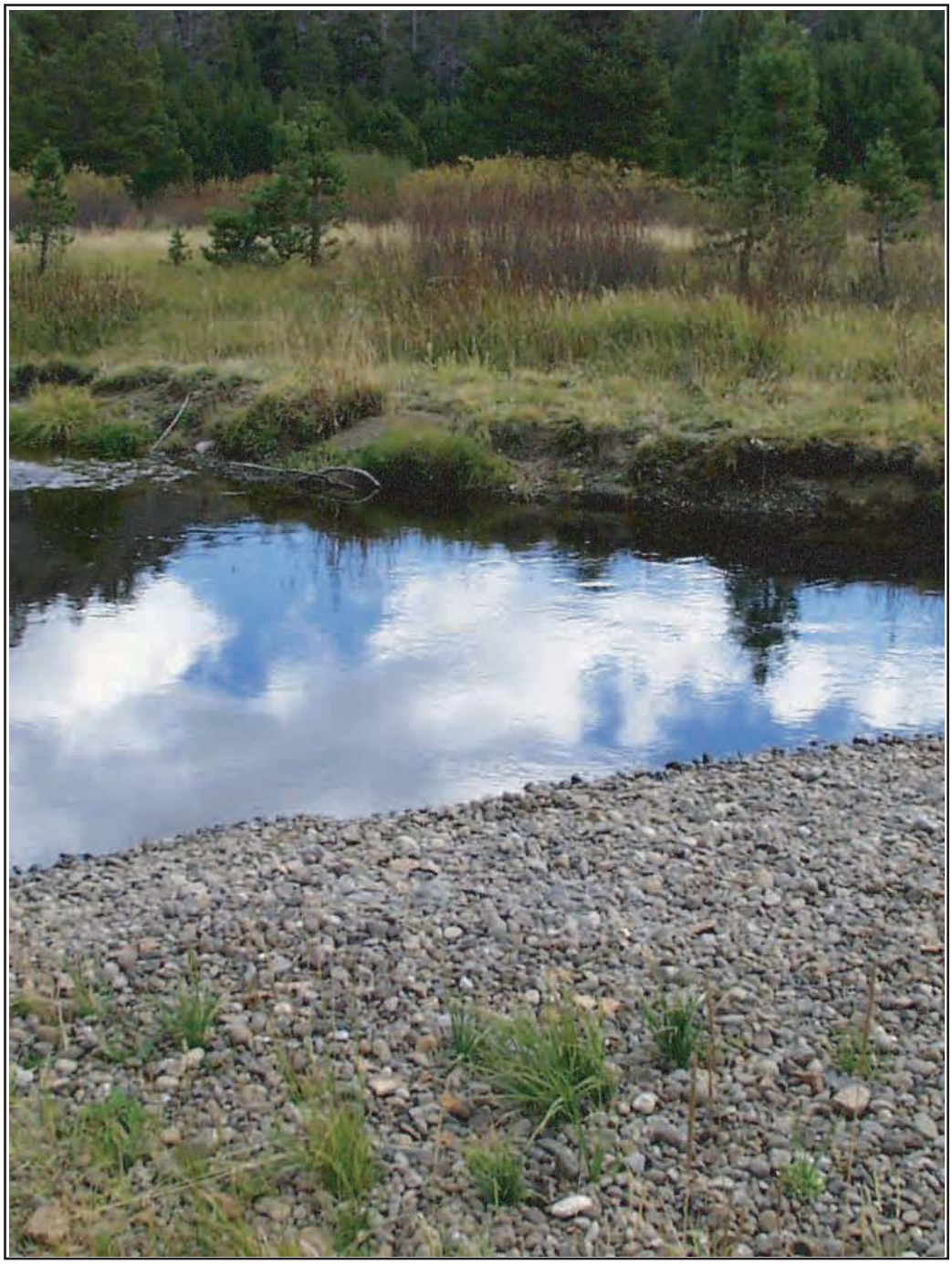
Caples Creek Site 10



Across Creek

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Caples Creek Site 10

Looking Downstream

Looking Upstream

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Caples Creek Site 11

Looking Upstream

Across Creek

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Caples Creek Site 11

Looking Downstream

Looking Upstream

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Caples Creek Site 12

Across Creek

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Caples Creek Site 12

Looking Downstream

Looking Upstream

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Caples Creek Site 12

Looking Upstream

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Caples Creek Site 13

Across Creek

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Caples Creek Site 13

Across Creek

Looking Downstream

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Caples Creek Site 13

Looking Upstream

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Caples Creek Site 14

Across Creek

Caples Creek Site 14

Looking Downstream

Looking Downstream

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Caples Creek Site 14

Looking Upstream

Looking Upstream

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Kirkwood Creek Site 15/16

Across Creek

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Kirkwood Creek Site 15/16

Looking Downstream

Looking Upstream

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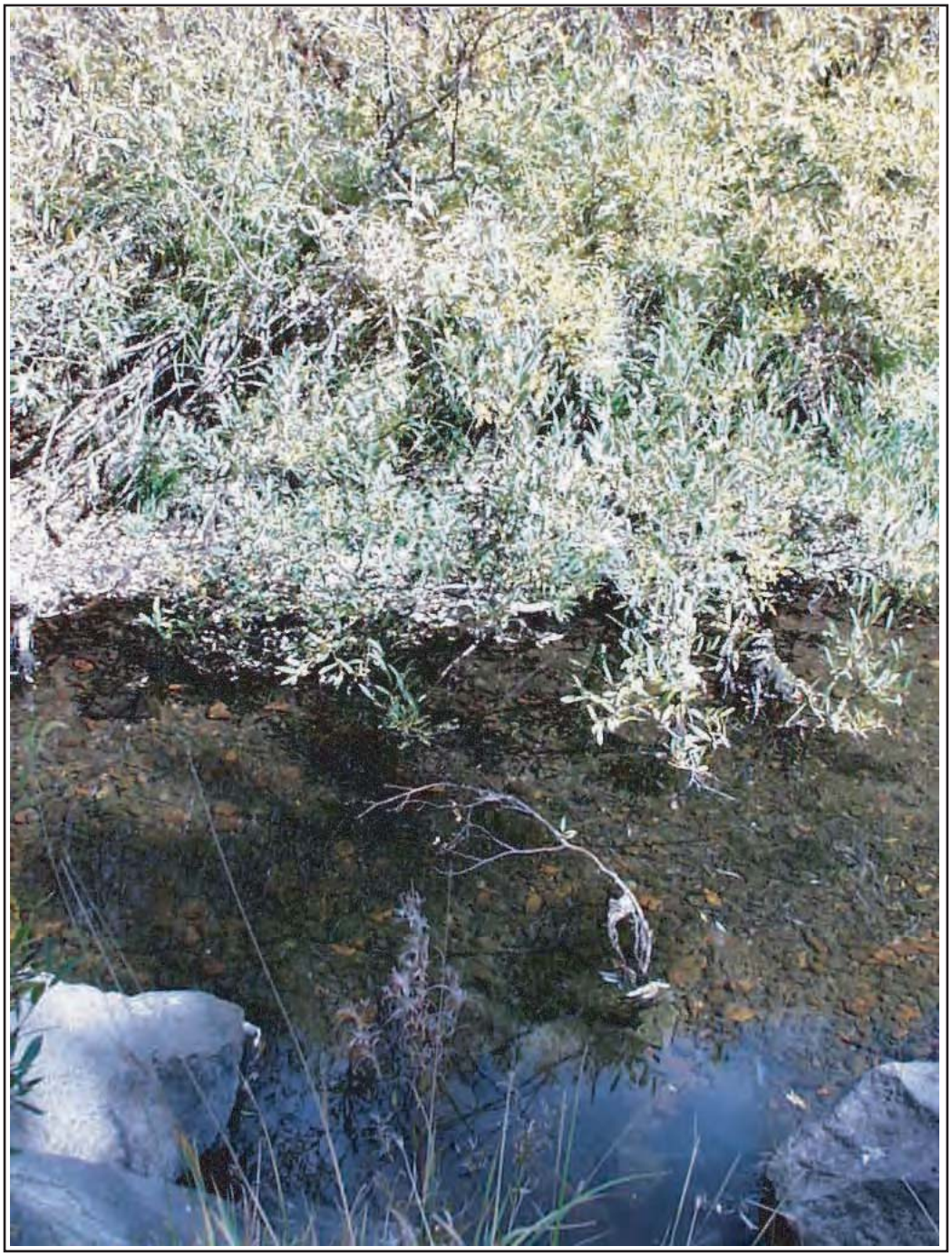
Kirkwood Creek Site 17



Across Creek

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Kirkwood Creek Site 17

Looking Downstream

Looking Downstream

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Kirkwood Creek Site 17

Looking Upstream

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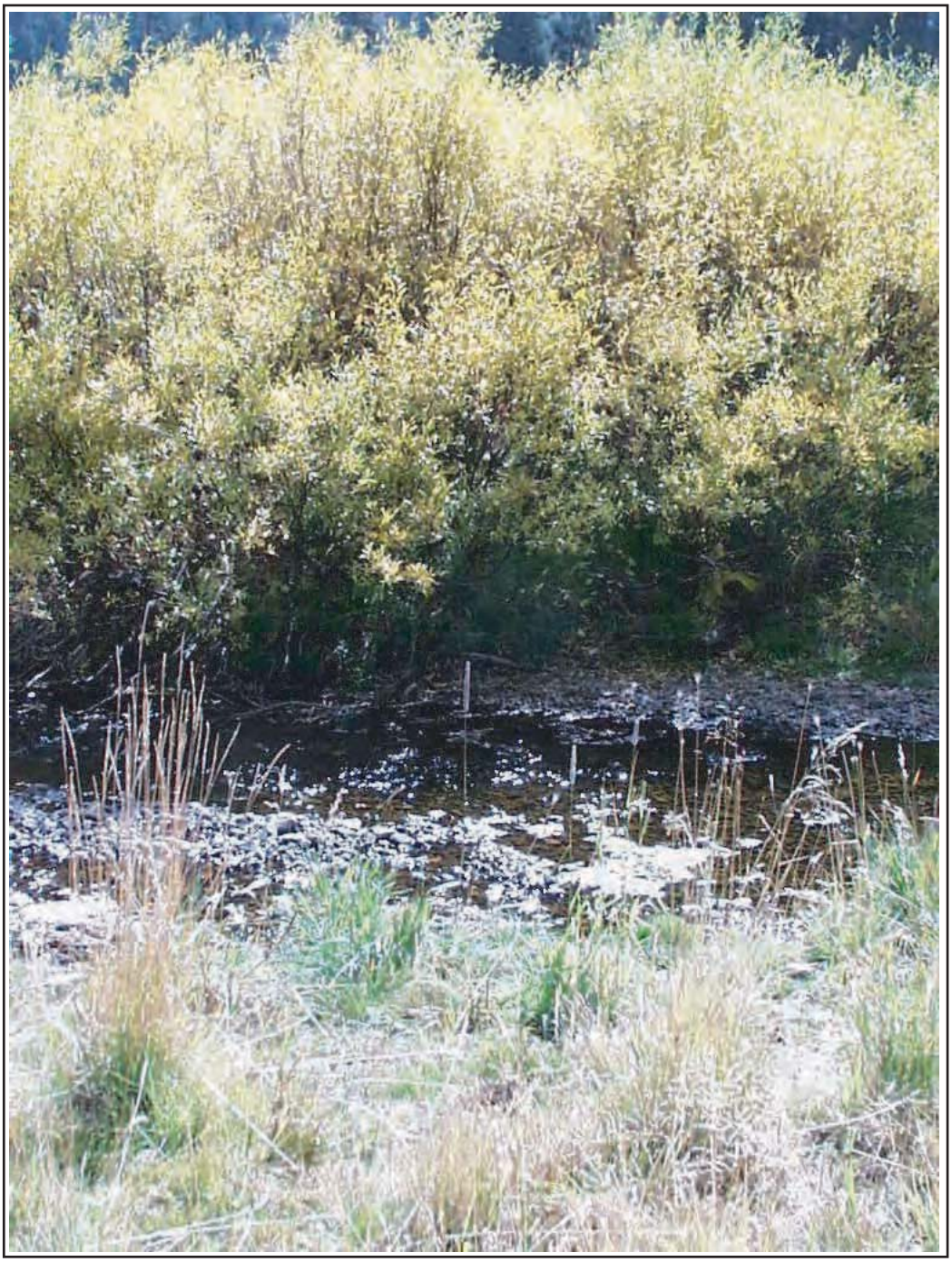
Kirkwood Creek Site 17A



Across Creek

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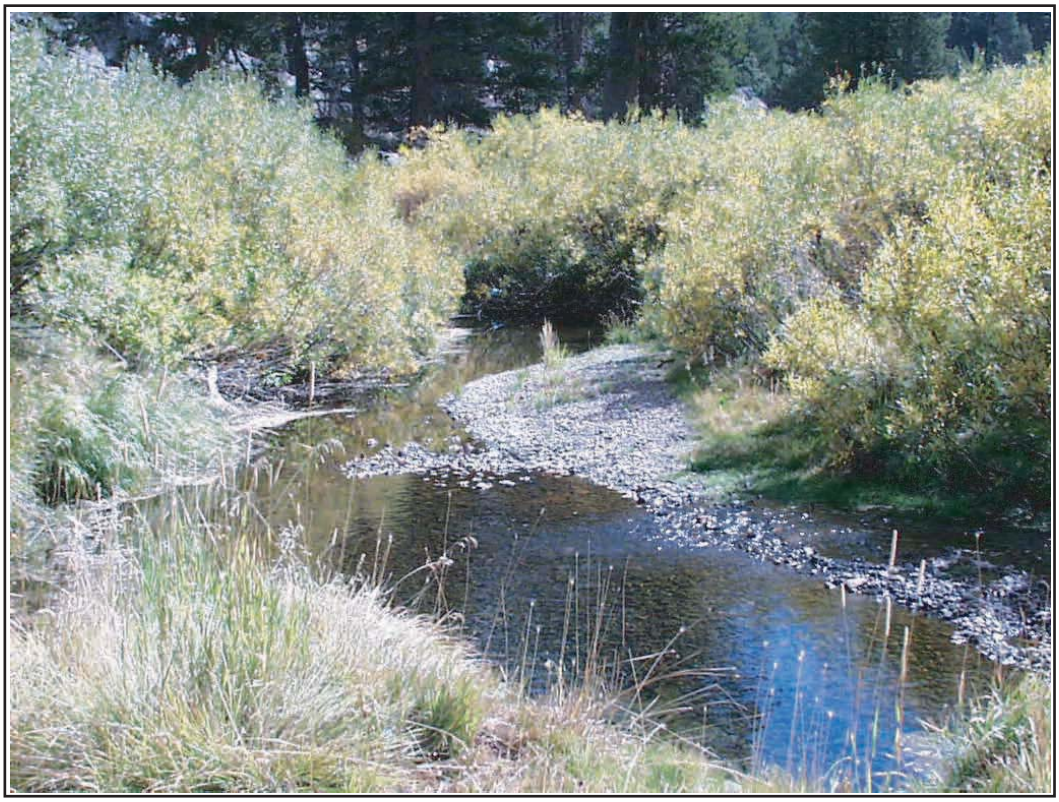
Kirkwood Creek Site 17A



Looking Downstream

Looking Upstream

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Kirkwood Creek Site 18

Across Creek

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Kirkwood Creek Site 18

Looking Downstream

Looking Upstream

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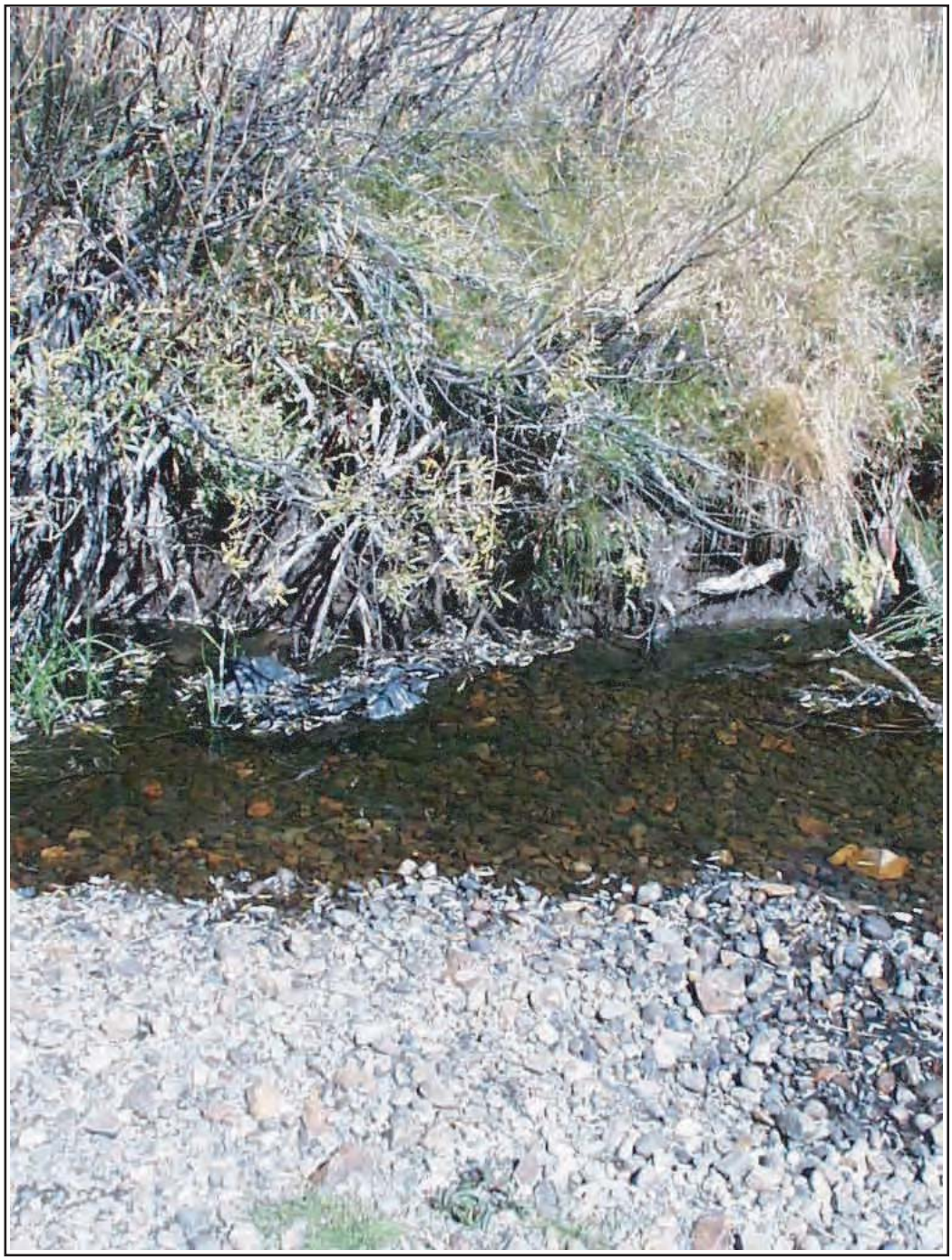
Kirkwood Creek Site 19



Across Creek

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Kirkwood Creek Site 19

Looking Downstream

Looking Upstream

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Kirkwood Creek Site 20

Across Creek

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Kirkwood Creek Site 20

Looking Downstream

Looking Upstream

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Kirkwood Creek Site 21

Across Creek

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Kirkwood Creek 21

Looking Downstream

Looking Upstream

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Kirkwood Creek Site 22

Across Creek

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Kirkwood Creek Site 22

Looking Downstream

Looking Upstream

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Kirkwood Creek Site 23/24

Across Creek near Hwy 88

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Photo taken 9/23/02

Kirkwood Creek Site 23/34

Looking Downstream

Looking Upstream

El Dorado Irrigation District
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2002 Riparian Recruitment
Monitoring Study
Photos taken 9/23/02