State of California
Department of Fish and Wildlife

M e m o r a n d u m

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To: Kevin Thomas
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Subject: Barrier Evaluation to Delineate Hybridization Zones within the Upper Truckee River Lahontan Cutthroat Trout Restoration Project Expansion Area, El Dorado County, California

Summary

On Sunday July 19th, 2015 Mitch Lockhart, Environmental Scientist, with the California Department of Fish and Wildlife (CDFW) and one CDFW volunteer conducted a visual assessment of three fish passage impediments on the Upper Truckee River and within the Upper Truckee Lahontan Cutthroat Trout Restoration Expansion Area (Figure 1). Impediments B36A, B36B, and B36C were assessed to determine the potential for the stream features to wholly preclude upstream movement of resident rainbow trout. The purpose of the assessment was to identify an upper limit on the Upper Truckee River where hybridization between nonnative rainbow trout and Lahontan cutthroat trout is a concern.

Mitch Lockhart concluded feature B36B should be considered the upper limit of the Upper Truckee River where hybridization between Lahontan cutthroat trout and rainbow trout may occur. All Lahontan cutthroat trout sampled below feature B36B should be considered hybridized and lethally removed from the project area pursuant to the Amendment of the Biological Opinion for the Upper Truckee Lahontan Cutthroat Trout

Restoration Project. However, assessing the barrier during high flow would be valuable to help validate and lend confidence to these conclusions.

In addition, because feature B36B is upstream of the confluence with Showers Lake tributary, a similar barrier assessment is necessary on Showers Lake tributary.

Background

While implementing brook trout removal actions in 2010, Lake Tahoe Basin Management Unit (LTBMU) staff found a previously unknown population of nonnative rainbow trout and possible rainbow trout-Lahontan cutthroat trout hybrids downstream of feature B34 (Figure 1). LTBMU requested an amendment to the U.S. Fish and Wildlife Service (USFWS) biological opinion (BO; File #: 2008-F-0434-BO) to permit the lethal take of potentially hybridized Lahontan cutthroat trout. The USFWS concludes in the Amendment of the Biological Opinion for the Upper Truckee Lahontan Cutthroat Trout Restoration Project (BO; File #: 2008-F-0434-BO-R001) that all Lahontan cutthroat trout captured downstream of feature B34 and from all future treatment reaches where rainbow trout are found should be lethally removed from the treatment area to eliminate the risk of salvaging and moving hybridized Lahontan cutthroat trout into pure populations upstream.

CDFW is also concerned with Lahontan cutthroat trout hybridization within the Upper Truckee Lahontan Cutthroat Trout Restoration Area and supports the USFWS conclusions. However, CDFW has found reason to believe that feature B34 is not a true fish passage barrier and that the hybridization zone should be extended upstream to the next nearest fish barrier. It is assumed by CDFW that nonnative rainbow trout are present in the Upper Truckee Lahontan Cutthroat Trout Restoration Expansion Area via upstream migration from waters lower in the watershed and historically planted with rainbow trout (e.g. Lake Tahoe and Elbert Lake). This assumption is supported by CDFW and LTBMU electrofishing data that indicate rainbow trout are not present in the upper watershed. Given this assumption, evidence that B34 is not a functional fish barrier is provided by LTBMU catch data: significant numbers of rainbow trout were captured upstream of feature B34 and downstream of feature B36B in 2010, 2011 & 2012 as reported in LTBMU's annual reports to the USFWS for those years.

As per the Amendment of the Biological Opinion for the Upper Truckee Lahontan Cutthroat Trout Restoration Project, during the years 2010 to 2012 LTBMU euthanized all Lahontan cutthroat trout captured downstream of B36B due to the potential of hybridization with rainbow trout. However, annual reports for 2013 and 2015 indicate Lahontan cutthroat trout captured during those years and between features B34 and B36B were returned to the Upper Truckee River rather than euthanized. CDFW is concerned these actions run counter to the intent of the USFWS conclusions within the Amendment of the Biological Opinion for the Upper Truckee Lahontan Cutthroat Trout Restoration Project and may jeopardize the long term conservation of Lahontan cutthroat trout within the Upper Truckee River watershed.

As a result, CDFW conducted visual assessments of impediments B36A, B36B and B36C. The three features are upstream of impediment B34 and upstream of the locations of captured rainbow trout. The purpose of the assessment was to identify a fish barrier, if possible, to firmly delineate where rainbow trout and Lahontan cutthroat trout hybridization may occur. Once identified, Lahontan cutthroat trout can be lethally removed downstream of the feature for the entire duration of the project or until such time when new data indicate and CDFW, USFWS and LTBMU agree it is no longer necessary.

Assessments

Mitch Lockhart concludes that B36C is a small impediment and does not serve as a barrier during low flow conditions (Figures 2 and 3). The ample bedrock surrounding the feature may serve as a suitable foundation to construct an artificial barrier. However, the stream gradient is low and the stream is not entrained in a canyon or deep channel. This provides ideal conditions for the stream to reorient and bypass a constructed impediment during flood conditions.

Feature B36B is a low flow barrier and may be a barrier in a variety of flow conditions but additional field visits during high flow conditions would be necessary to validate (Figures 4 and 5). This feature also marks a point at which the gradient of the Upper Truckee River changes dramatically. Upstream of feature B36B, the Upper Truckee River is characterized by steep boulder cascades and bedrock slides. Downstream, the

river is a low to moderate gradient stream with more heterogeneous habitat.

Feature B36A is a high quality low flow barrier and was the most significant single barrier feature observed during the assessment (Figures 7 and 8). However, an alternate high flow channel bypasses B36A and has no impeding features that would preclude trout from migrating above B36A.

Finally, the reach extending from B36B to B36A is a steep boulder cascade, 150 to 200 feet in length. Taken in total, this feature functions as a fish passage barrier and precludes upstream movement of resident rainbow trout and Lahontan cutthroat trout in high or low flow conditions (Figure 6). This conclusion is further supported by LTBMU electrofishing catch data - no rainbow trout have been captured upstream of feature B36B.

Conclusions

In conclusion, B36B should be considered the upper limit of the Upper Truckee River where hybridization between Lahontan cutthroat trout and rainbow trout may occur. All Lahontan cutthroat trout captured below feature B36B should be considered hybridized and lethally removed from the project area pursuant to the Amendment of the Biological Opinion for the Upper Truckee Lahontan Cutthroat Trout Restoration Project (BO; File #: 2008-F-0434-BO-R001). However, assessing the barrier during high flow would be valuable to help validate and lend confidence to these conclusions.

Moreover, feature B36B is upstream of the confluence between the Upper Truckee River and the Showers Lake tributary. If rainbow trout can pass over feature B34, they may also move upstream into Showers Lake tributary and potentially hybridize with Lahontan cutthroat trout. As a result, a similar assessment must be completed on Showers Lake tributary such that the zone of potential hybridization is firmly delineated on all streams currently treated by LTBMU.

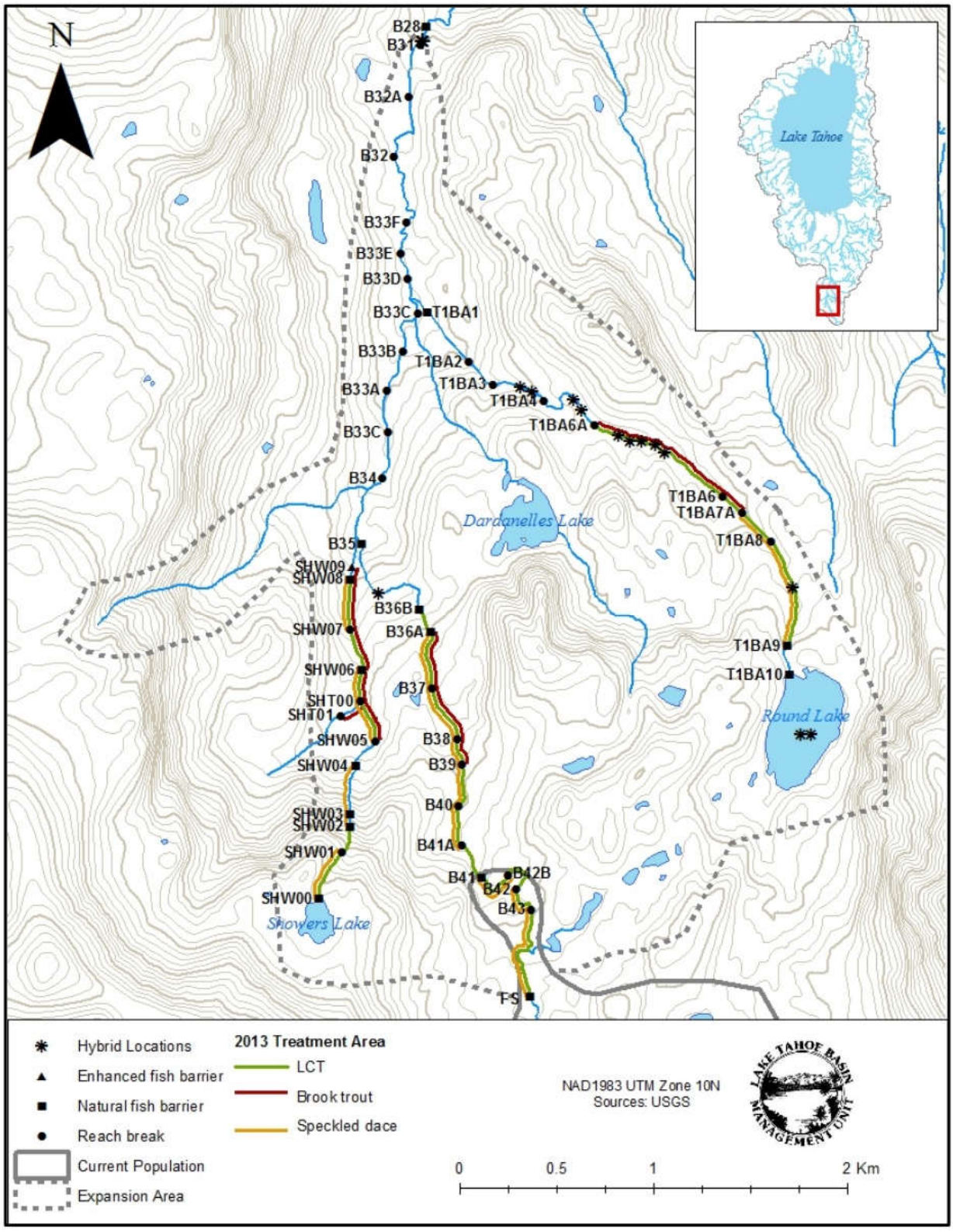

Figure 1: Upper Truckee River Lahontan cutthroat trout restoration project expansion area (LTBMU 2013). Impediments B36A, B36B and B36C (not shown) were evaluated on July 19th, 2015. The author concludes that B36A and B36C are seasonal impediments while feature B36B is a definitive fish barrier preventing upstream movement of rainbow trout.

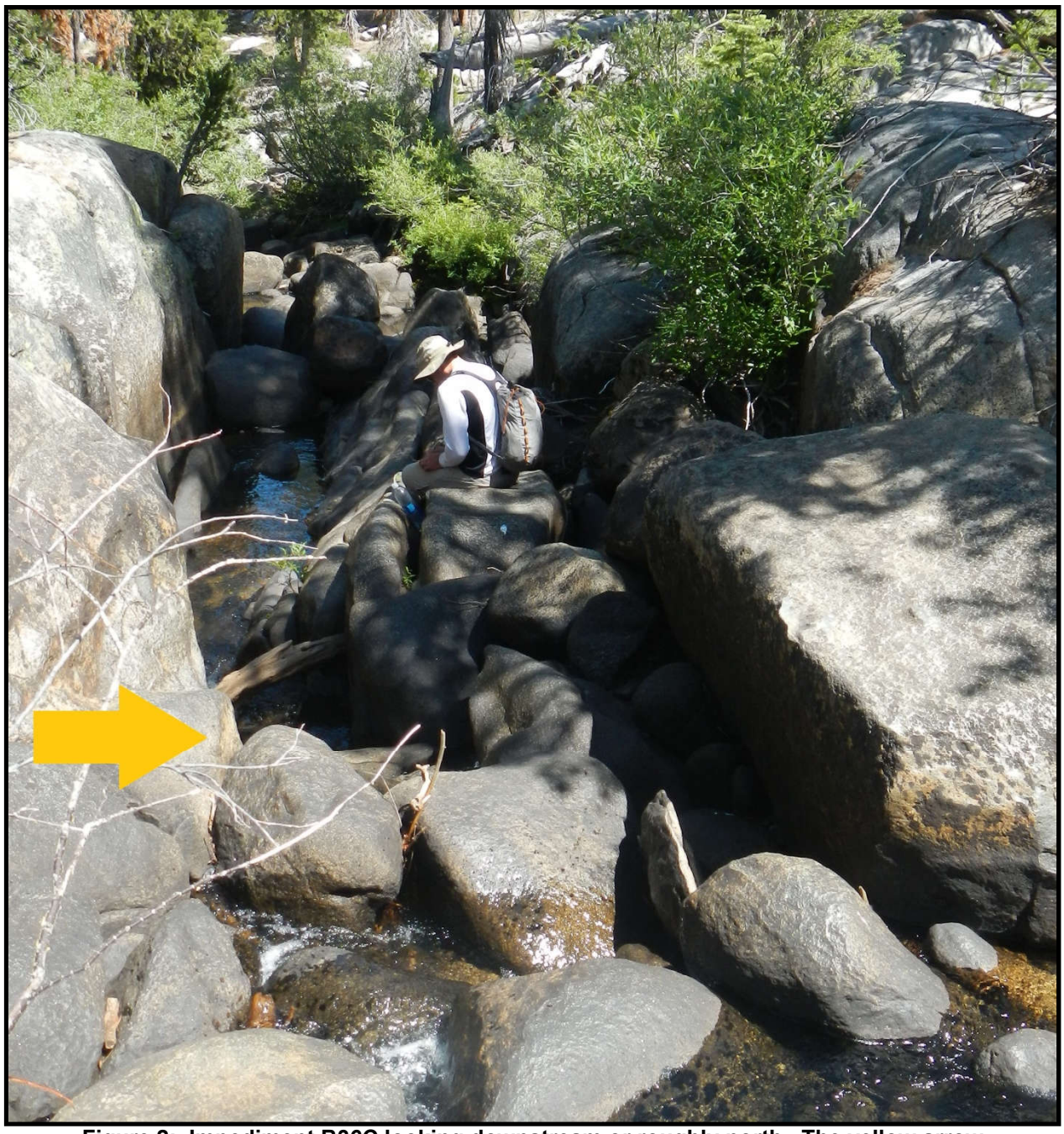

Figure 2: Impediment B36C looking downstream or roughly north. The yellow arrow points at the impeding feature, a 2.5 ft drop in elevation with a jump pool. The reach is a granite bedrock pinch, low gradient, with small to medium sized boulders. The feature is insufficient to impede upstream movement of rainbow trout. Photo taken July 19th, 2015 (CDFW).

Figure 3: The Upper Truckee River immediately upstream of impediment B36C looking roughly north. This photo illustrates the low stream gradient and the absence of impeding features immediately upstream of B36C that may have been out of frame of the previous photo. Photo taken July 19th, 2015 (CDFW).

Figure 4: The Upper Truckee River at impediment B36B looking upstream or roughly south. At low flow the impediment is a 3 to 4 foot elevation plunge onto boulders with no jump pool. The yellow arrow points at the boulders below the plunge. There are alternate high flow paths with similar features. While this feature is likely a barrier during low flow conditions, it is unclear if it impedes upstream movement during high flow. However, this feature is the downstream endpoint of a 150-200 foot reach characterized by steep gradient and large boulders. Photo taken July 19th, 2015 (CDFW).

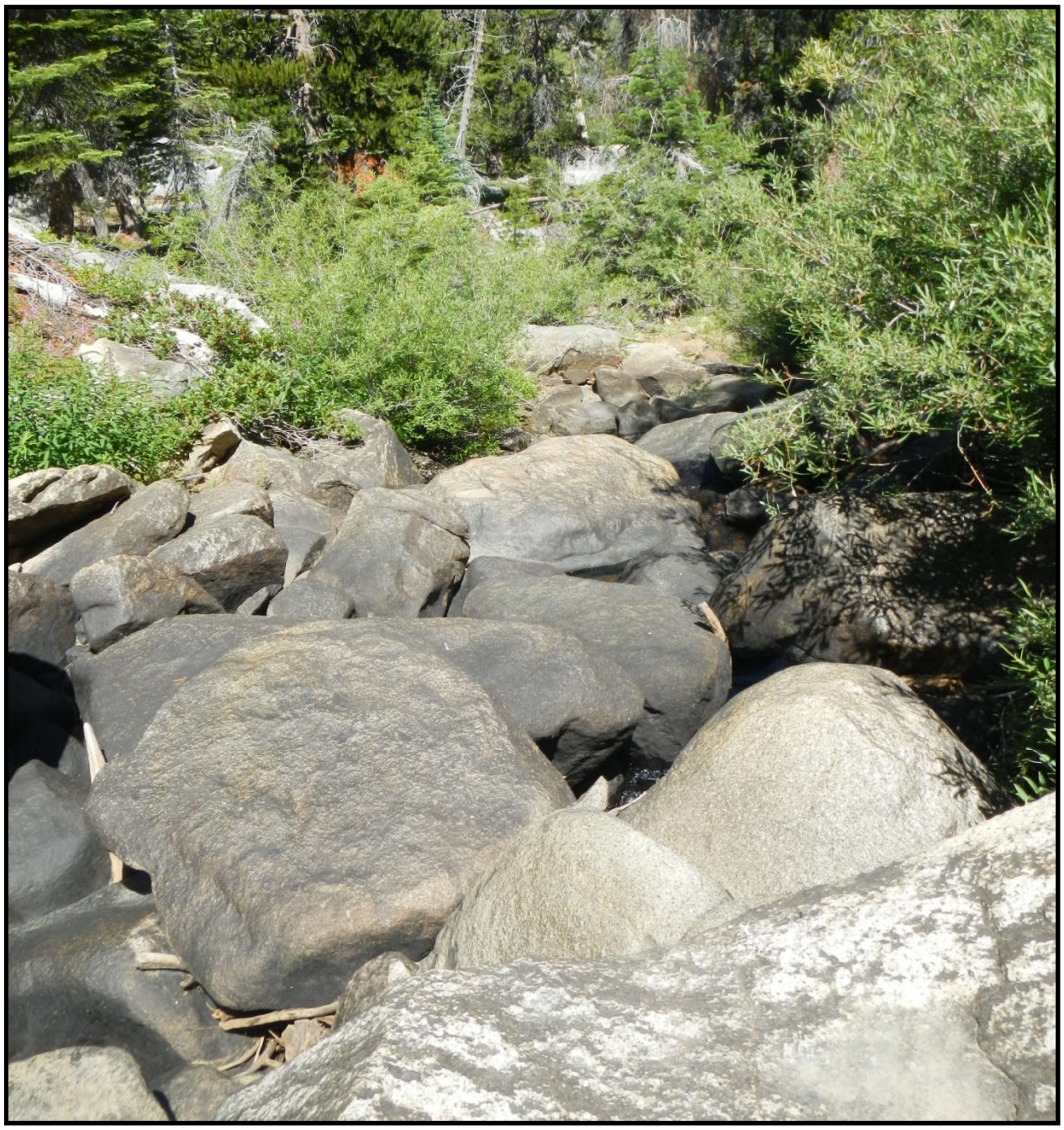

Figure 5: The Upper Truckee River at impediment B36B looking downstream or roughly north. This photo illustrates the low stream gradient and absence of impeding features immediately downstream of feature B36B. Photo taken July 19th, 2015 (CDFW).

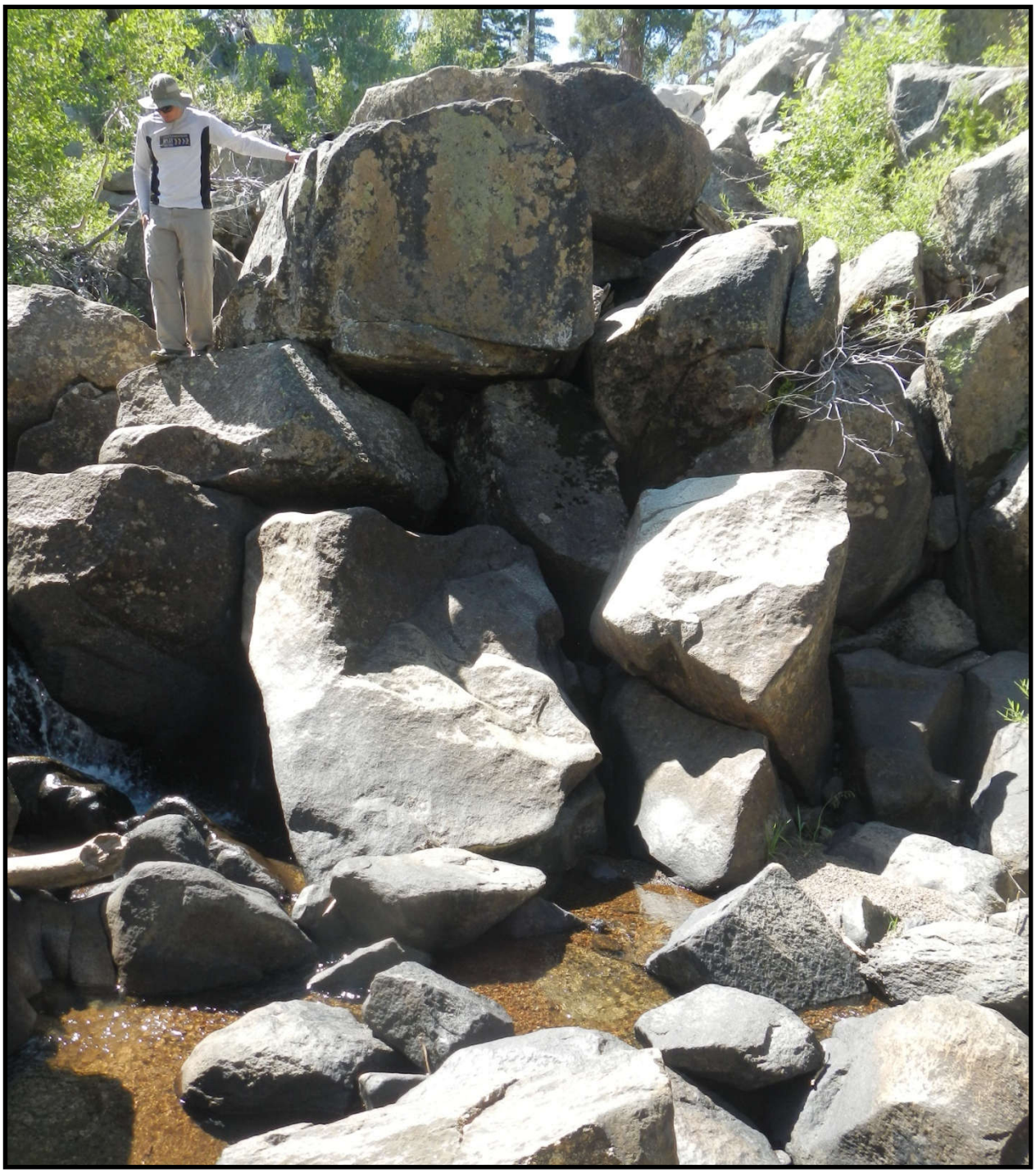

Figure 6: Boulder features to the photographer's right of impediment B36B. These boulders characterize the habitat of the approximately 150 to 200 foot reach upstream of impediment B36B and below B36A. The reach is steep with large, roughly hewn boulders. The water course flows through the boulder field, often out of view, and plunges an uncountable number of times over and under boulders. Taken in total, this steep, boulder strewn reach between B36A and B36B serves as a year round barrier to upstream trout movements through a variety of flow conditions. Photo taken July 19th, 2015 (CDFW).

Figure 7: The Upper Truckee River at impediment B36A looking upstream or roughly south. The feature is a 15 foot long, high-angle slide that ends in a 4 foot overhanging plunge with a jump pool. This feature is a barrier during low flow conditions; however, alternate high flow channels bypass this feature on the east side of the river. In addition, this feature marks the upstream endpoint of the 150-200 foot steep, boulder strewn reach that the author concludes is a functional barrier to upstream trout movements. Photo taken July 19th, 2015 (CDFW).

Figure 8: The Upper Truckee River at impediment B36A looking downstream or roughly north. The feature is a 15 foot long, high-angle slide that ends in a 4 foot overhanging plunge with a jump pool. The steep, boulder strewn reach can be seen, in part, in the distance. Photo taken July 19th, 2015 (CDFW).