

IDT, workgroup, and partner recommendations for monitoring stations on the Trinity River and tributaries to the Trinity River, finalized August 2, 2018.

Key:		Recommend continue	Recommend discontinue	Suggested addition to network	Consensus recommendation not reached
Gage	Parameter	Uses			
Trinity River at Lewiston	Bedload ^a	BOR: Used to determine changes in gravel storage and the degree to which augmented gravel is mobilized by releases. YT: Scientific investigations: sediment transport, sediment budget, gravel augmentation. Management objectives: increase coarse sediment storage. Management actions: flow, gravel augmentation. HVT: This should be shelved for a few years (~5 years), and re-initiated after a significant change in management (change in flow regime, change in gravel augmentation) Initial Recommendation: Until the TRRPs physical science program is critically reviewed to recommend potential changes to its approach to sediment management, this parameter should continue to be monitored at this station. Physical WG recommendation (2/26/18): Monitor bedload transport with hydrophones and calibrate/verify hydrophone rating curve with periodic measurements of transport at this station. IDT recommendation (8/2/18): Support physical WG recommendation.			
	SS ^a	YT: Scientific investigations: sediment budget. Management objectives: reduce fine sediment storage. Management actions: flow, gravel augmentation. FWS: Unnecessary to continue fine sediment monitoring because dam blocks fine sediment input to river and only Deadwood Ck exists between TRAL and Lewiston Dam. HVT: Not needed, no source of fine sediment Initial Recommendation: Discontinue for reasons provided by FWS and HVT. Physical WG recommendation (2/26/18): Fine sediment is not currently monitored at this station.			
Trinity River abv Rush Creek	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Discontinue, replace with temperature monitoring on Trinity River at Weir Hole. IDT recommendation (8/2/18): Support flow WG recommendation.			
Trinity River at Weir Hole	Water temperature	Flow WG recommendation (3/15/18): Add this station to replace the temperature monitoring station on the Trinity River abv Rush Creek. IDT recommendation (8/2/18): Support flow WG recommendation.			
Rush Creek nr Lewiston	Flow	BOR: Used to estimate sediment inputs from this tributary. Suggest directly measuring sediment inputs using topographic differencing, may not be possible to use bathymetric differencing in really wet years with safety of dams releases. The sediment inputs from this tributary helps program scientist understand how sediment inputs affect channel morphology. YT: First major tributary below Lewiston Dam. Historic uses: tribute tributary sediment transport and sediment supply estimates. Current uses: unclear. Long term use: climate change impacts – this is the only tributary gage in restoration reach that operates year around that captures flow response / snow melt out of the Trinity Alps. CDFW: Often used to coordinate field crew activity. Great tributary to scientifically monitor inferences of natural flow from tributaries. Consider analyzing relevant data to determine whether Rush Creek and Grass Valley Creek are both necessary given that they are in such close proximity. These data are not used directly by CDFW. FWS: Bedload rating curve outdated for this station, so no known need for gaged flows at this station. Update rating curve and continue to gage flows to predict sediment contributions from this tributary, or quantify sediment input from Rush Creek by some other way and remove the gage. HVT: More important than downstream tribs, particularly if we want to reinstate the TRFE management objective for Rush Creek delta Initial Recommendation: Pending review of physical program, suggestion is to compare cost and accuracy of estimating sediment input from Rush Creek using bedload rating curve and flow measurements versus delta surveys. If delta surveys relatively accurate and inexpensive, remove gage and fund delta surveys. If updating bedload rating curve and continuing funding for gage is less expensive and more accurate than delta surveys, fund the former measurements. Flow WG recommendation (3/15/18): Continue stream flow gage because it is a major north side tributary to river near Lewiston dam and a significant contributory of sediment to Trinity River. IDT recommendation (8/2/18): Support flow WG recommendation.			
Grass Valley Creek nr Lewiston	Flow	YT: Second major tributary below Lewiston dam. Replacement for GVC at fawn lodge gage. uses: estimate mainstem flow; estimate temporal distribution of sediment supply to Hamilton Ponds, and by extension, evaluate the effectiveness of \$70 million watershed restoration efforts in the 1980’s and 90’s to control fine sediment delivery to the Trinity River. Buckhorn Dam is a run of the river dam so likely has little effect on tributary flow record with possible exception of summer evaporation effects. One of only two tributary gages of the rainfall dominated southern watersheds on the south side of the mainstem. CDFW: Consider analyzing relevant data to determine whether Rush Creek and Grass Valley Creek are both necessary given that they are in such close proximity. These data are not used directly by CDFW. FWS: Buckhorn Dam impacts gaged flows to some degree so gage may not provide information on basin yield that is reliable. Buckhorn Dam is a sediment sink, and Hamilton ponds capture sediment transported downstream of dams, so there is no need to use flows to predict sediment transport in this channel. This gage can be removed. HVT: Probably not needed anymore? May be more important if we start getting sediment routing through Hamilton Ponds again. Initial Recommendation: Discontinue because flow record is not used for any current TRRP function or for any function that is currently being considered for future implementation. If future decision is made to estimate sediment contribution from Grass Valley Creek using a sediment rating curve and streamflow data, gage can be reinstalled and operated then. Flow WG recommendation (1/11/18): Discontinue funding operation of gage because discharge impacted by flow storage by Buckhorn dam and bedload contributions by flow not factored into sediment budgeting. IDT recommendation (8/2/18): Support flow WG recommendation.			
Trinity River nr Grass Valley Creek	Bedload ^a	Physical WG recommendation (2/26/18): Continue monitoring bedload transport at this station to enable sediment budgeting for restoration reach. IDT recommendation (8/2/18): Supports physical WG recommendation, but undertake analysis to verify monitoring methods meet but not exceed information needs of program.			
Trinity River below Limekiln Gulch	Flow	YT: Flow gaging supports sediment transport monitoring / sediment budget. Primary sediment gaging station to evaluate mainstem fine sediment impacts from Grass Valley Creek and on-going recovery. Scientific investigations: sediment budget. Management objectives: reduce fine sediment storage. Management actions: flow, gravel augmentation. FWS: This gage can be removed because all flow contributions upstream of it are currently gaged. However, if Rush Creek and/or Grass Valley Creek gages are removed, this gage should be retained. HVT: If we needed to delete a mainstem gage, This one could probably go. Need to keep either this one or the Douglas City, but probably don’t need both anymore. Initial Recommendation: Because flow monitoring at Grass Valley Creek is not suggested to be curtailed, no change is recommended for this station. Flow WG recommendation (3/15/18): Continue funding to enable sediment transport calculations for sediment budgeting in restoration reach. IDT recommendation (8/2/18): Support flow WG recommendation.			
	Bedload ^a	BOR: Used to determine changes in gravel storage and whether gravel augmented upstream has reached this part of the river. Determine if gravel supplies limit habitat creation in this part of the river. YT: Scientific investigations: sediment transport, sediment budget, gravel augmentation. Management objectives: increase coarse sediment storage. Management actions: flow, gravel augmentation. HVT: This should be shelved for a few years (~5 years), and re-initiated after a significant change in management (change in flow regime, change in gravel augmentation) Initial Recommendation: Until the TRRPs physical science program is critically reviewed to recommend potential changes to its approach to sediment management, this parameter should continue to be monitored at this station. Physical WG recommendation (2/26/18): Continue monitoring bedload transport at this station to inform sediment budgeting for the restoration reach. IDT recommendation (8/2/18): Support physical WG recommendation, but undertake analysis to verify monitoring methods meet but not exceed information needs of program.			
	SS ^a	YT: Primary sediment gaging station to evaluate mainstem fine sediment impacts from Grass Valley Creek and on-going recovery. Long term record of fine sediment transport. HVT: This should be shelved for a few years (~5 years), and re-initiated after a significant change in management (change in flow regime, change in fine sediment supply) Initial Recommendation: Until the TRRPs physical science program is critically reviewed to recommend potential changes to its approach to sediment management, this parameter should continue to be monitored at this station. Physical WG recommendation (2/26/18): Discontinue monitoring suspended sediment and turbidity at this station; consider reinstating measurements if also on tributaries. IDT recommendation (8/2/18): Support physical WG recommendation.			
Indian Creek nr Douglas City	Flow	YT: Indian Creek has had major historic impacts and is the biggest fine sediment contributor to the mainstem (since GVC was dealt with in the 1990’s). Developing fine sediment supply estimates ceased after 2006 but should be reinstated to evaluate management objective of reducing fine sediment supply and inform / evaluate current and future watershed restoration efforts (for habitat and sediment reduction). Continued flow gaging would be needed to do so. Flow gaging also informs current watershed restoration projects in design. One of only two tributary gages of the rainfall dominated southern watersheds on the south side of the mainstem. CDFW: Great tributary to scientifically monitor for inferences of natural flow from tributaries to the mainstem Trinity River. HVT: Probably a low priority, as the Indian Creek delta does not seem to be aggrading anymore due to the ROD flows. Initial Recommendation: For reasons stated by YT and because the Indian Creek gage is used by the state water board as a case study for recommending potential changes to regulations pertaining to stream water use for marijuana cultivation, no change is recommended to this station. Flow WG recommendation (3/15/18): Continue gage for reasons stated by YT and CDFW. IDT recommendation (8/2/18): Support flow WG recommendation.			
	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Continue temperature monitoring at this station for reasons stated by YT. IDT recommendation (8/2/18): Support flow WG recommendation.			
Trinity River at Douglas City	Flow	YT: Gage is a temperature compliance point. Flow is needed to help evaluate temperature effects. Captures tributary accretion from two major ungaged tributaries – Weaver and Reading. Gage located at a major transition in in the flow and sediment regimes in the river. Flow gage supports sediment transport monitoring. CDFW: Used to determine timing for installation and removal of Junction City Weir. HVT: Probably higher priority than Limekiln. Would recommend adding turbidity again, as it is important for fish growth and potentially helpful in S3 model Initial Recommendation: No change. Flow WG recommendation (3/15/18): Continue gage for reasons stated above. IDT recommendation (8/2/18): Support flow WG recommendation.			
	Bedload ^a	BOR: Used to determine whether gravel augmentations are successfully increasing gravel storage upstream and for refining target transport rates in the upper river. YT: Conducted at the first location on the river where sediment transport is no longer sediment supply limited. Provides unimpaired transport estimates used to develop overall gravel augmentation recommendations for upstream areas. As such, is one of the most important gages on the river. Flow records are also used to assess high flow impacts to infrastructure in the Douglas City area (especially near Indian Creek). HVT: This should be shelved for a few years (~5 years), and re-initiated after a significant change in management (change in flow regime, change in gravel augmentation) Initial Recommendation: Until the TRRPs physical science program is critically reviewed to recommend potential changes to its approach to sediment management, this parameter should continue to be monitored at this station. Physical WG recommendation (2/26/18): Continue monitoring bedload transport at this station. IDT recommendation (8/2/18): Support physical WG recommendation, but undertake analysis to verify monitoring methods meet but not exceed information needs of program.			
	SS ^a	YT: Closes the fine sediment budget. Evaluates mainstem fine sediment impacts and recovery from impaired tributaries - Indian, Weaver, and Reading creeks and recovery. HVT: This should be shelved for a few years (~5 years), and re-initiated after a significant change in management (change in flow regime, change in fine sediment supply) Initial Recommendation: Until the TRRPs physical science program is critically reviewed to recommend potential changes to its approach to sediment management, this parameter should continue to be monitored at this station. Physical WG recommendation (2/26/18): Discontinue monitoring suspended sediment and turbidity at this station; consider reinstating measurements if also on tributaries. IDT recommendation (8/2/18): Support physical WG recommendation.			

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Gage	Parameter	Uses
Trinity River at Junction City	Flow	YT: Informs on-going channel rehab design efforts in the Junction City area. Can be subtracted from the TR above NF trinity gage to estimate flow from Canyon Creek, the largest tributary in the restoration reach (which also drains the alps so is snow melt dominated). If the flow here can be adequately estimated based on other gages, continued gaging at this site is likely not warranted. CDFW: Used to estimate accretion to mainstem Trinity River between Douglas City and Junction City to estimate actual stream flow at Junction City Weir site. FWS: Gage can be removed because it provides little information of use to the TRRP. HVT: If we needed to delete a mainstem gage, This one could probably go. Need to keep either this one or the NF Trinity River, but probably don’t need both anymore. Initial Recommendation: Daily average flow at this station can be predicted with a linear relationship to flow gaged on the Trinity River near the North Fork Trinity River with 98% accuracy (see figure below). Therefore, no need exists to continue funding this streamgage. Flow WG recommendation (1/11/18): Continue funding operation of gage for information provided by YT and CDFW. IDT recommendation (8/2/18): A consensus decision was not reached regarding this flow gage.
Trinity River abv Canyon Creek	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Discontinue because information not needed for temperature compliance or model development or any other known need in TRRP. IDT recommendation (8/2/18): Support flow WG recommendation.
Canyon Creek	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Continue temperature monitoring at this station because Canyon Creek is a snowmelt system and major tributary to lower restoration reach. IDT recommendation (8/2/18): Support flow WG recommendation.
Trinity River abv NF Trinity River	Flow	YT: Bottom end of Restoration reach. Gage captures flow contributions from Canyon Creek. Flow records help assess tributary accretions, temperature compliance, smolt outmigration at pear tree, and habitat estimates for the canyon creek – north fork reach. Real-time flow records here are needed to assess real-time flow impacts on infrastructure in Junction City area. HVT: Probably prioritize this one over Junction City because it has turbidity Initial Recommendation: No change. Flow WG recommendation (3/15/18): Continue gage for reasons stated by YT and HVT. IDT recommendation (8/2/18): Support flow WG recommendation.
North Fork Trinity River at Helena	Flow ^a	YT: Need unclear. I’ve heard USFS uses the gage during their summer fish surveys. FWS: This gage should be removed because it serves no direct purpose in the TRRP. HVT: I don’t think we’re really using this for anything, other than potentially for temperature modeling? If it is important for temperature modeling, then maybe keep it, but if not, it could probably be cut despite its value as a long-term gaging location in a larger unimpaired watershed. The TR abv Coffee Creek gage could perform this role of ungaged stream, evaluate potential effects of climate change, etc. Initial Recommendation: Gage is not used for temperature modeling, so recommend discontinue funding for this gage for reasons provided above. Flow WG recommendation (1/11/18): Discontinue funding operation of gage because it is seasonal and provides no information need in the TRRP. IDT recommendation (8/2/18): Support flow WG recommendation.
North Fork Trinity River	Water temperature	Initial Recommendation: This temperature monitoring station is located only 1 mile downstream of temperature monitoring that is funded by BOR on the North Fork Trinity River at Helena, which has a longer period of record than this one. The recommendation is therefore made to no longer fund this station. Flow WG recommendation (3/15/18): Discontinue for reason stated above. IDT recommendation (8/2/18): Support flow WG recommendation.
Trinity River abv Big French Creek	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Discontinue because information not needed for temperature compliance or model development or any other known need in TRRP. IDT recommendation (8/2/18): Support flow WG recommendation.
Big French Creek	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Discontinue because information not needed for any known need in TRRP. IDT recommendation (8/2/18): Support flow WG recommendation.
Trinity River nr Burnt Ranch Gorge	Flow	YT: Long term gage. Captures most major tributaries downstream of Lewiston Dam that drain the Alps (the snowmelt dominated tributaries). Useful for detecting climate change trends. Used to backcast hydrology for ungagged basins. Used by recreational interests. FWS: This gage should be removed because it serves no direct purpose in the TRRP. HVT: Not sure this really helps the TRRP, so I see the main reason for keeping it as to maintain a long-term gaging location. But if you gotta cut, this may be a place to cut. Initial Recommendation: TRRP nor any known outside entity is using flow data collected at this gage for any reason stated by YT, so recommend discontinue funding for this gage. Flow WG recommendation (1/11/18): Continue funding operation of gage with the exception the HVT recommends discontinuing funding for this gage. IDT recommendation (8/2/18): Support flow WG recommendation.
Trinity River at Burnt Ranch transfer station	Water temperature	Initial Recommendation: No change. IDT recommendation (8/2/18): Continue operation of this station.
Trinity River abv SF Trinity River	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Discontinue because information not needed for temperature compliance or model development or any other known need in TRRP. IDT recommendation (8/2/18): Support flow WG recommendation.
SF Trinity River	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Continue monitoring temperatures at this station because SFTR is a major fish bearing tributary of the mainstem Trinity River. IDT recommendation (8/2/18): Support flow WG recommendation.
South Fork Trinity River blw Hyampom	Flow	YT: Only gage in the South Fork. South fork has different geology and hydrology than other gaged basins. Spring chinook in South Fork are unique and nearly extinct. Flow records used for ongoing spring chinook recovery and watershed restoration efforts. Long term gage used to track impacts of climate change and impacts of cannibus cultivation (very extensive in South Fork Basin). Flow record also used for design of mainstem large wood projects. CDFW: Gauge in since 1911 important to monitor changes to the Trinity basin in California’s longest undammed river and major tributary to the Trinity. This guage is used to coordinate field crew activity in the South Fork Trinity. HVT: This is a nice long-term record, but not sure why the TRRP is paying for this. A weak linkage to the watershed program. Initial Recommendation: Recognize comment by HVT, but agree with points made by YT regarding cannibus cultivation effects on streamflow and endangered fish populations, which could potentially impact fishing opportunities (which to increase is a goal of TRRP) if regulators choose to curtail fishing downstream of the SF Trinity River confluence to protect the increasingly endangered run of salmon in this system. For this reason, recommend no change to this station. Flow WG recommendation (3/15/18): Continue monitoring flow at this station because SFTR is a major fish bearing tributary of the mainstem Trinity River. IDT recommendation (8/2/18): Support flow WG recommendation.
Trinity River at Weitchpec	Water temperature	Initial Recommendation: No change. Flow WG recommendation (3/15/18): Continue monitoring temperatures at this station because it is a temperature compliance point. IDT recommendation (8/2/18): Support flow WG recommendation.

^aMeasured seasonally.