Chapter 2. Project Description and Alternative Development

This chapter describes the objectives of the Proposed Project and discusses the process used to develop the Proposed Project as analyzed in this document. It also describes the design criteria, design concepts, and site location associated with the Bucktail site. Two alternatives are considered in this document: the No Project alternative and the Proposed Project alternative. Alternatives considered but not selected for evaluation are also discussed. The CEQA term "Proposed Project" is used rather than the NEPA term "Proposed Action"; however, the terms should be considered synonymous.

2.1 Background

To meet the project objectives, the TRRP identified a number of discrete activities (see Chapter 2 of the Master EIR), most of which have been incorporated into the Proposed Project as described later in this chapter. In addition to these activities, several earthwork and habitat construction activities, which were identified in the Master EIR, have grown in scope in recent projects. The addition of wood (i.e., LWD or large wood) is elaborated on in this document as an important rehabilitation tool. In the Master EIR, LWD placement was included within sediment management activities and activities common at each site. However, in the Wheel Gulch EA/IS (Regional Water Board, Reclamation, and BLM 2011), large wood installation, including construction of both large wood habitat structures, which are designed during construction in the field, and larger Engineered Log Jams (ELJs), which are designed in the office, was identified as a stand-alone construction activity. The increasing use of wood to create aquatic habitat and hydraulic complexity (scour) at channel rehabilitation sites and recommendations for additional wood use at future sites (Cardno Entrix and CH2M Hill 2011) require that this important rehabilitation activity be highlighted as a common activity planned for both the Proposed Project and for future sites. Similarly, construction of a split flow channel, which divides Trinity River flow into two branches of similar volume, is proposed and identified as an individual activity; a similar split flow channel was constructed at the Lowden Ranch project in 2010 and Wheel Gulch in 2011. The impacts associated with implementation of these activities do not rise above those identified and analyzed in the Master EIR, but their increasing use and visibility require that these activities be clearly identified for the reader.

2.2 Goals and Objectives

The TRRP has developed a number of restoration objectives for the channel rehabilitation sites that help frame the alternative development process. These objectives are intended to be used to identify specific activities that could be implemented at Trinity River locations. Ultimately, the goal of the activities described in the Master EIR is to increase the quantity and quality of suitable rearing habitat for native anadromous salmonids and other native fish species, while reestablishing geomorphic processes required to enhance alluvial features, such as alternate point bars and meander sequences, in the Trinity River. These objectives were used by the design team to identify specific activities that could be applied within the Proposed Project. This document focuses on these activities that are

intended to restore fluvial processes through the rescaling of the river channel and floodplain for the purpose of creating, restoring, and enhancing habitats for all life stages of native anadromous fishes, including salmon and steelhead. Designs at the Bucktail site have considered effects to salmonid adult holding habitat. In areas near log jams, scouring and deepening are expected (unless they are completely underlain by bedrock), which should result in development of additional holding habitat.

With input from stakeholders, the lead agencies considered a number of objectives in the alternative development process (see Master EIR, Section 2.2 for these objectives). For the Proposed Project, the specific in-channel (within the active low water channel) and riverine (within the ordinary high water mark [OHWM], but not contiguous with the active channel) activities proposed are intended to assist in reestablishing fluvial processes and interactions. Conceptually, the objective is to increase connectivity between the project area, the Trinity River, and their shared floodplain. The proposed rehabilitation activities could result in the development of a larger and more complex expanse of river and floodplain habitat. Based on successful TRRP rehabilitation projects constructed in the past, it is anticipated that fluvial processes will affect a larger area than the defined limits of activity within the project area boundaries. This habitat expansion is expected to increase habitat suitability and availability for salmonids and other native fish and wildlife species at various river flows.

2.3 Alternative Development

The President's CEQ guidelines and CEQA guidelines (Section 1508.9(b)) state that an EA or EIR shall describe a range of reasonable alternatives to the Proposed Project that would feasibly attain most of the basic objectives of each project, but would avoid or substantially lessen significant effects in comparison to the Proposed Project (Section 2.5 later in this chapter provides brief descriptions of alternatives considered but eliminated from further evaluation). Section 15126.6(c) of the CEQA guidelines states that among the factors which may be taken into account when addressing the feasibility of alternatives is site availability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site.

The alternative development process for the TRRP considered input from stakeholders, particularly local residents and resource agency personnel; existing engineering data; and social, physical, and biological factors. Consistent with the AEAM Program, the Proposed Project designs reflect the collective experience of the TRRP and the TMC from the implementation of previous mechanical channel rehabilitation projects (e.g., Upper Junction City, Lorenz Gulch, and Douglas City, among others). Information derived from the implementation of these projects, coupled with information on the biological and physical responses to these projects, was considered in the alternative development process.

The following criteria were applied to evaluate the ability of the Proposed Project to meet the objectives discussed in Section 2.2 of this document. Pursuant to NEPA, the purpose and need (presented in Chapter 1) were also considered in this evaluation.

- Effectiveness – The methods, materials, and performance of previous Trinity River restoration projects (including the original pilot projects constructed in the 1990s and the recent TRRP channel rehabilitation projects) in similar environments.

- Implementation – Practical execution, including potential public acceptance issues, permitting issues, and land use issues, was considered. Constructability and the complexity of maintaining the rehabilitation site over time were also considered.

- Environmental – Benefits and impacts to environmental resources with emphasis on special status species, including native anadromous salmonids, and humans were considered. The impacts considered included both short-term construction-related impacts and long-term maintenance impacts associated with post-ROD flows. Aquatic habitat, jurisdictional wetlands, accessibility, and consistency with land use planning were considered in the type and location of proposed activities.

- Cost – The relative cost of each alternative, including construction and revegetation costs, was considered. Cost was used to identify alternatives that were significantly out of proportion with other alternatives.

A number of alternatives were initially evaluated in the Master EIR using the criteria outlined above; as a result, three alternatives were included in that analysis – No Project alternative, Proposed Project alternative, and Alternative 1. The Proposed Project alternative was determined to most efficiently meet TRRP objectives and was selected as the preferred alternative in the Master EIR. Alternative 1 was analyzed in the Master EIR in response to input provided by stakeholders, including landowners along the river corridor, and represented a reduction in the size, intensity, and magnitude of rehabilitation activities, particularly those in close proximity to residential or recreational developments. Alternative 1 was expected to reduce significant impacts to various resources, especially to the human environment (e.g., traffic, noise near residential areas, etc.); however, it was not expected to expand Trinity River aquatic habitat complexity and quantity or to enhance natural river processes to the same extent as the Proposed Project alternative. Consequently, benefits to fish and wildlife populations would have been reduced compared to the Proposed Project alternative. As a result, Alternative 1 was not selected as the preferred alternative in the Master EIR and is not carried forward for analysis in this EA/IS.

As stated previously, the ROD for the Trinity River FEIS/EIR (December 19, 2000; USDI 2000) directed USDI agencies to implement the Flow Evaluation Alternative, which was identified as the Preferred Alternative in the Trinity River FEIS/EIR (USFWS et al. 2000a). The ROD specified that mechanical channel rehabilitation activities would be implemented on the mainstem Trinity River between Lewiston Dam and the North Fork Trinity River in order to create complex fish habitat similar in form to that which existed prior to the construction of the TRD. A number of sites were identified for potential channel rehabilitation activities based on conditions where the maximum amount of habitat for native anadromous fishes could be produced through construction projects, and then enhanced or maintained by a combination of river flows plus coarse sediment augmentation. Because of the selection of this alternative in the ROD, and the need to address mainstem habitat degradation associated with the construction/operation of the TRD, the TRRP continues to prioritize restoration of the mainstem Trinity River.

2.4 Description of Alternatives

A description of the two alternatives that are carried forward in this analysis is presented in this section. Both the Proposed Project and No Project alternatives are described. The No Project alternative is presented first to provide a comparison of impacts to the Proposed Project.

2.4.1 No Project Alternative

The No Project alternative represents ongoing activities and operations of the TRRP and other entities involved in restoring the Trinity River with the exception of the Proposed Project. Under this alternative, no action would be taken at the Bucktail site at this time. Consistent with CEQA Guidelines, Section 15126.6, subdivision (e)(2), existing conditions are defined as those that "would be reasonably expected to occur in the foreseeable future if the project were not approved" (Association of Environmental Professionals 2009). This is consistent with the NEPA definition of the No Action alternative involving federal decisions (42 USC 4321–4347). Collectively, actions and activities authorized in the ROD and incorporated into the No Project alternative include:

- Implementation of the annual flow release schedule based on recommendations of the TMC to Reclamation; and
- Implementation of watershed restoration and rehabilitation projects within the Trinity River Basin, including those funded by the TRRP and members of the TMC, BLM, and TCRCD.

2.4.2 Proposed Project

The Proposed Project includes specific activities within the Bucktail project area boundaries. The activities proposed are similar to those implemented at previous channel rehabilitation sites and include: reducing riparian encroachment; large wood placement; physical alteration of alluvial features (e.g., floodplains and side channels); construction of large wood hydraulic and habitat structures; and removal/replacement of riparian and upland vegetation at strategic locations. Extensive revegetation of native riparian vegetation (woody and wetland species) is also planned. The specific activities that would occur within the project area boundaries are described below. Consistent with the CEQA Guidelines (Section 15176 (a) and (c)), the information contained in this section describes the timing, type, size, intensity, and location of the activities associated with the Proposed Project as currently planned. Designers are continuing to refine designs that are presented in this document. Conditions in the field at the actual time of construction may result in slight changes to designs, as presented here. Assumptions were made in the analysis that would accommodate minor design changes. If substantial changes are made to the Proposed Project that would result in additional impacts above those analyzed in this document, then subsequent NEPA/CEQA analyses would be conducted.

Because a portion of the land within the project area boundaries is managed by the BLM, a BLM Right-of-Grant (a.k.a., Right-of Way), would be issued to Reclamation, pursuant to Title V of the Federal Land Policy and Management Act (43 USC 1761 et seq.). All environmental commitments, project design features, mitigation measures, and best management practices (BMPs) developed through this EA/IS would be considered for incorporation into all BLM project authorizations.

Mechanical Channel Rehabilitation Activities

The TRRP has developed objectives for the Proposed Project as well as specific activities that would occur at defined locations in support of project goals. The rehabilitation objectives for the Bucktail site are linked with the overall river restoration strategy of the TRRP and detailed in the TRFEFR and the Channel Design Guide (HVT et al. 2011).

The overall objectives of the proposed designs are to:

- Increase fry and juvenile salmonid rearing habitat;
- Increase or maintain adult salmonid holding habitat;
- Increase adult salmonid spawning habitat;
- Increase and enhance wildlife habitat;
- Increase and enhance riparian and wetland habitat, and enhance upland habitats;
- Increase channel complexity;
- Promote fluvial processes;
- Minimize adverse impacts to existing infrastructure; and
- Minimize uncertainty related to project performance.

Table 1 contains general descriptions of the rehabilitation activities included in the Proposed Project. These activities were described and analyzed in the Master EIR (refer to Section 2.3.2 of the Master EIR for more information about each of these general activity types. For the Proposed Project, specific activities fall within the broader categories outlined in Table 1 below - Master EIR Activities. Activities, P, Q, and W, fall within the level of impacts originally analyzed in the Master EIR, but are described separately in this analysis to clarify the intent of the activities for the reader. While this section describes the general types of activities that occur related to rehabilitation projects, Section 2.4.2.2 of this EA/IS contains the actual site-specific activity area descriptions for the Proposed Project at Bucktail.

Table 1. Rehabilitation Activities from Master EIR

Label	Activity Type
A	Recontouring and vegetation removal
B	Construction of inundated surfaces (450 cfs)
C	Construction of inundated surfaces (1,000 – 4,500 cfs)
D	Construction of inundated surfaces (6,000 cfs)
E	Low-flow side channels (300 cfs)
F	Medium-flow side channels (1,000 cfs)
G	Alcoves (450 cfs; 6,000 cfs)
H	Grade control removal
I	Sediment management (coarse and fine)
J	Placement of excavated materials
K	Staging/use areas (includes gravel processing* and stockpiling)
L	Roads, existing
M	Roads, new

Table 1. Rehabilitation Activities from Master EIR

Label	Activity Type
N	Temporary channel crossings (Trinity River and tributaries)
O	Revegetation

*No gravel processing is proposed in the Bucktail Project

Activity A (Recontouring and Vegetation Removal)

The ground surface would be modified to reduce riparian encroachment and minimize the risk of stranding of juvenile salmonids. Vegetation would be cleared at some locations, but would be maintained where possible. Activity A, sometimes referred to as the grading of banks and floodplains, or simply as "banks and floodplains," includes grading to construct or enhance topographic features that could develop into functional riparian habitat; excavation and fill would be balanced such that there is no net change in the volume of earthen material within the activity area. Trees may be marked for selective removal in order to enhance safety of the work site and to improve local conditions for individual tree growth and wildlife, and these would be used in large wood habitat structures. If additional trees are needed, beyond those removed as stated above, a separate area would be located and analyzed for tree removal with approval from a BLM Authorized Officer.

Removed vegetation would be used for in-river placement as large wood, chipped/masticated, or spread/buried in revegetation areas in order to increase nutrients and water holding capability of the soils. Activities would be accomplished using a variety of methods, including hand tools and heavy equipment, such as excavators, bulldozers, scrapers, and dump trucks. Only the minimum amount of riparian vegetation that is necessary for project implementation would be removed.

Activities B, C, and D (Construction of Inundated Surfaces)

Activities associated with the construction of inundated surfaces would enhance the connection of these surfaces to the river at various flows. As a reference point, the OHWM correlates to a 1.5-year recurrence flow. (On figures, the OHWM is estimated by hydraulic modeling.) These activities are intended to expand the surface area of the channel that could be inundated by reoccurring flows below the OHWM. Vegetation would be cleared as necessary, and earth would be excavated to meet design elevations for periodic inundation.

Newly inundated surfaces would provide important rearing and slow-water habitat for juvenile salmonids and other native anadromous fish. They would also provide low points that could enhance sinuosity and thereby provide the habitat variability that was historically present and is required to support rapid growth of native fishes.

These treatment areas would rely on a combination of natural recruitment of native riparian vegetation and riparian planting to enhance the establishment of a diverse assemblage of native vegetation. If initial revegetation establishment is less successful than anticipated, additional efforts would be made by Reclamation consistent with requirements and commitments outlined the Riparian Mitigation and Monitoring Plan (Reclamation 2016). This plan is currently being finalized by Reclamation and members of the TMC. This plan requires supplemental efforts (e.g., in-planting,

weed control, irrigation) as necessary to establish riparian vegetation consistent with the CDFW policy of no net loss in riparian vegetation from pre-project levels. The definition of riparian revegetation is vegetation patches that are dominated by phreatic vegetation (e.g., cottonwood, willows).

Activity E and F (Side Channels)

Modifications to create or change side channels would reconnect the Trinity River with its floodplain at targeted flows. Side channels constructed for 300 cfs flows would provide off-channel, low-velocity habitat for a variety of aquatic organisms, including juvenile salmonids at base flow conditions. Side channels constructed for 1,000 cfs flows would provide habitat for salmonid rearing when water is flowing through the channels. As flows recede during the year, these side channels would drain naturally, reducing the likelihood of stranding aquatic organisms. It is important to note that side channels do not necessarily flow year round. Side channels would evolve over time and partially vegetate. While the duration of side channel flow would be dependent upon their evolution over time and the river's water surface elevation (WSE), even when water is not flowing, riparian and wildlife habitat diversity would be increased.

Side channels would be constructed to leave earthen berms near the upstream and downstream ends to protect water quality during construction. These berms would be removed at the end of construction if the water in the side channel is of appropriate quality for discharge to the river or the water in the side channel would be left in place for removal by subsequent high flows. Side channels may be pumped to uplands and dewatered during construction, or slowly metered into the mainstem post-construction. These techniques reduce the amount of turbid water that ultimately reaches the Trinity River during side channel connection.

Activity G (Alcoves)

Alcoves would be excavated to design elevations at the downstream end of side channels or other appropriate locations. They would be continuously inundated (approximately 1-2 feet deep during low flows), scoured/maintained during high flows, and would provide year-round juvenile fish habitat.

Activity H (Grade Control Removal)

Grade control structures, including constructed features, would be removed to increase channel complexity via promotion of channel migration, increased sinuosity, reduced fine sediment storage, increased coarse sediment transport, and restoration of bars. Activity H would not occur as part of the Proposed Project.

Activity I (Sediment Management, Coarse and Fine)

In addition to site-specific creation and enhancement of alluvial features (bars), sediment management activities would occur at various sites. Sediment management activities include augmentation of coarse sediment (e.g., spawning gravel) and removal of fine sediment (0.5-0.8 millimeter size fraction) at key locations. Long-term, large-scale coarse sediment augmentation sites would be established at select locations to encourage channel migration and the development of

alternate bars. Augmentation activities also include efforts required to provide a long-term supply of coarse sediment and ensure that the TRRP has the administrative access necessary to implement these activities at specific locations. Selected vegetation would be removed to facilitate the introduction of this coarse sediment along the channel margin. As appropriate, salvaged LWD would be retained and incorporated into riverine/in-channel activities to provide additional habitat complexity. The use of large wood is a vital component of channel rehabilitation work and includes incorporation of ELJs/hydraulic structures (wood and/or rock), habitat wood structures, skeletal bars, or boulder habitat placement. Coarse sediment would be introduced via mechanized equipment (e.g., conveyor, mechanical placement below the OHW) into the river channel under various high-flow conditions in a manner that facilitates the river's ability to route the coarse sediment downstream during high-flow periods.

Activity J (Placement of Excavated Materials)

Excavated materials would be placed in spoil areas so that there would be no increase in the elevation of the 100-year flood to comply with the requirements of Trinity County's Floodplain Ordinance. Appropriate, site-specific spoil areas are identified and verified through hydraulic analysis to have no effect on the 100-year flood elevation, or only within established ordinance parameters. Spoiled materials would be spread in uniform layers that blend with the natural terrain. In general, revegetation of upland areas, including efforts required for erosion control, would be consistent with agency requirements and with authorization from land managers and owners. Refer to Activity O – Revegetation – for more information. Placement of excavated and cleaned coarse sediment or cobbles may alternatively be used to create an infiltration gallery to allow sub-surface water flow.

Activity K (Staging/Contractor Use Areas)

Excavated materials would be transported across the staging area to stockpile areas. Water would be applied for construction purposes, including dust abatement, as directed by the Contracting Officer. Activity in these areas would include maintaining existing water wells and other infrastructure. The staging area may also be used for processing and storage of coarse sediment required for long-term sediment management activities or to obtain and store boulders for use in constructing hydraulic structures and boulder habitat placements.

Activity L and M (Roads, Existing and New)

The location of the activity areas within the project area would require construction of one new access road and three temporary access roads for specific project purposes. Since a portion of the current paved access road to the existing boat launch area would be decommissioned to construct a floodplain feature, a new paved permanent access road would be built to allow access to this area. The new road would be constructed to the same standard in terms of width and surfacing. The temporary access roads would be graded and unsurfaced. For the new access road to the BLM boat ramp, maintenance activities related to drainage and surfacing would occur periodically as the need arises. Site-specific design would consider factors like topography, soils, existing vegetation, and the need for future vehicle access. BMPs would be used to reduce the impacts of road-related sediment on the riparian and aquatic environments.

Activity N (Temporary Channel Crossings)

Temporary crossings occur in "X" activity areas on the figures, and may include constructed fords, temporary bridges, or other site improvements to facilitate access for construction-related traffic. If required, temporary bridges would be used when crossings are needed outside of the summer (July 15-September 15) in-channel work window. Fords would be constructed using imported clean gravel and native alluvial materials excavated from the bed and bank of the Trinity River or adjacent sources. Where equipment crossings are needed outside of the summer (July 15-September 15) in-channel work window (e.g., to perform wet season revegetation on the right bank) temporary, permitted conditions would be created to prevent spawning in the crossing until all crossings have been completed. All temporary crossings would be designed and constructed to meet the requirements for heavy equipment such as trucks and excavators. With the exception of rip-rap or other stabilizing materials, material would be primarily extracted from activity areas within identified, permitted sites. The use of fords to cross the river would be minimized, and would not be used to transport excavated materials across the channel. All extracted material would be placed on the same side from which it was taken.

Temporary crossings would provide access across the river at the Bucktail site. Only constructed fords are planned at this site. Due to requirements to retain passage for fish and boats, at least 1/3 of a ford crossing would be submerged to a minimum depth of 1 foot under low-flow conditions. The construction of the temporary crossings would likely require some vegetation removal at entrances and exits to the channel. All temporary crossings would be constructed in a manner that does not impede navigability at the specific site.

Activity O (Revegetation)

Impacts to vegetation are anticipated in most activity areas. Revegetation of riparian and upland areas would rely on a combination of planting and natural recruitment of native species consistent with Reclamation's Riparian Mitigation and Monitoring Plan (Reclamation 2016) and the needs of BLM and other cooperating and trustee agencies. Native willows from the impact areas would be replanted as clumps during construction to speed recovery of vegetation. Replanting of impacted native vegetation (e.g., willows and cottonwoods) would be completed after construction in accordance with a site specific plan. In general, the TRRP objective is to ensure that riparian vegetation is minimally impacted by TRRP activities and is replaced at a 1:1 ratio (no net loss of riparian area habitat) within the Trinity River corridor. Revegetation would provide aquatic refugia at high flows, improve terrestrial habitat for birds and other wildlife, provide future wood recruitment, and provide future terrestrial nutrient input to the river. Additional planting, seeding mulching, and irrigation in the upland areas would occur using a 3:1 ratio using native seed and root stock available to Reclamation. Reclamation would also implement measures to control or inhibit the reestablishment of noxious and invasive plant species. This activity potentially includes watering during the first three years post-planting. Revegetation details would be included in the site-specific plan, which is under development for the Proposed Project. General planting details are described under the Activity Area and Revegetation headings below.

2.4.3 Detailed Master EIR Activities Described to Provide Additional Clarity for the Reader beyond Table 1

Activity P (In-River Installation of LWD [Hydraulic and Habitat Structures], Skeletal Bars, and Boulder Habitat)

Activity P impacts were covered in the Master EIR within Activity I (Sediment Management, as well as within other activities which facilitated side channel construction and maintenance (e.g., excavation of in-channel and riverine areas - activities E, F, and G). The TRRP would use appropriate materials to cause and enhance geomorphic action that would also enhance aquatic and wildlife habitat. Addition of large rock (>6 inch as in the ROD's skeletal bars) or rock/wood structures would remain in place and confine the river, thereby increasing stream power to scour and maintain adult salmonid holding habitat.

As appropriate, salvaged large wood and accompanying slash would be retained and incorporated into riverine/in-channel activities to provide additional hydraulic and habitat complexity. This could include large wood placement as individual pieces, small accumulations, and large habitat structures. The addition of large wood would develop topographical and hydraulic complexity and increase bank length to provide additional rearing habitat over a wide range of flows. Incorporation of woody material would improve anadromous fish spawning and rearing habitat.

Woody material is a natural part of healthy rivers. It provides important habitat for aquatic species by providing cover from high flows and predators. Its low velocity areas collect suitable spawning materials and its organic materials are a food source for aquatic insects. It can help create and maintain beneficial habitat features such as pools, islands, and gravel bars. Activity P may also include the construction of ELJs to further engage the flow and act as a catalyst for natural processes of scour and channel migration. Construction of larger habitat structures or ELJs may incorporate the use of rock and boulders as ballast to ensure that the structures do not migrate with high flows. Furthermore, ELJs may specifically be built with downstream "skeletal bars," thus forming habitat complexes that would grow in depositional areas. Processed alluvial construction material would be obtained and imported from off-site gravel processing areas, or purchased from local vendors for delivery. Unprocessed material or "pit-run" dirt and gravel from onsite excavation may be used in the construction of features and for habitat enhancement, using methods that would be continuously monitored for compliance with turbidity standards when in or near the river channel.

All large wood installations would be designed so that local velocities would be safe for navigation during relatively low river flows (less than approximately 2,000 cfs). Natural wood material would be placed in a manner to reduce the chances of hazardous contact with swimmers and boaters. Over time, woody material would collect on the structures to create areas of slower flow, which would direct water flow and, consequently, boaters away from the large wood. This would minimize the hazard of these structures to people.

The Proposed Project would place wood (e.g., in alcoves) to improve the quality of habitat in this design element by providing cover for juvenile fish, enhancing roughness and complexity, and increasing shading. Because of uncertainties in the availability, types, shapes, and sizes of the wood and the planned construction methods, the exact amounts and locations of wood placement are not

known at this time. Trees, tree tops and branches for use in constructing large wood structures would be obtained on-site (see Activity A) and/or opportunistically from other lawful sources (e.g., public or private construction areas where clearing has occurred) and delivered to the project area. The final locations and dimensions of wood and large rock placement would be determined in the field based on direction from Reclamation's field engineer.

Activity Q (Construction of Split Flow Channels)

Similar to Activity P, impacts from activities identified within Activity Q were covered in the Master EIR under Activities E or F. A new channel would be excavated to accept between 30 and 60 percent of the mainstem Trinity River flow during low flow conditions. The constructed split flow channel would be excavated through the existing floodplain, generally behind the existing riparian berm and vegetation. Similar construction methods to those noted for low flow side channels (Activity E) would be employed.

Activity W (Wetland Complexes – Rearing Ponds)

Activities identified within Activity W were covered in the Master EIR under Activities A, B, C, or D. Ponds would be created off the mainstem Trinity River. At W-1 the water holding capability would be enhanced through use of the proposed Beaver Dam Analog (BDA-1; see page 33 for description). The ponds would provide slow backwater refugia and year round rearing habitat for juvenile salmonid species. Groundwater infiltration and surface water in-flow from side channels would supply the ponds with a cold water environment. Existing tree/shrub canopy would be saved during construction to provide food sources, shade, and protection from predation. The ponds would contain deeper pools that have a connection to groundwater to supply needed cold water. Existing vegetative cover and revegetation planting would be incorporated into the ponds for food productivity.

2.4.4 Activity Areas

Table 2 lists the site-specific activity areas associated with the Proposed Project and Figure 3 illustrates these activities and construction areas. As the table shows, each activity area has been assigned a unique alphabetic label that corresponds to the type of activity area. For example, U-1 is the identifier for upland activity area 1. These labels are used throughout this document. For the Proposed Project, discrete activity areas were defined by the design team to include riverine areas, upland areas, and construction support areas. While these areas are intended to encompass the full range of activities, typically the actual area that would be treated will be smaller. Riverine areas are labeled with an R preceding the site number (e.g., R-1, R-2); upland areas are labeled with a U (e.g., U-1, U-2); in-channel work areas are labeled with an IC; construction staging/contractor use areas and access roads are labeled with a C; wetland/pond areas are labeled with a W; engineered log jams are labeled with an ELJ; and temporary crossings are labeled with an X. Table 2 also shows the size of the activity areas, the estimated volume of material that would be excavated or filled, if known, and the primary use anticipated for each area.

Table 2. Activity Areas at the Proposed Bucktail Rehabilitation Project Site.

Activity Area[a]	Primary Activity	Activity/ Treatment Area (acres)[b]	Earthwork (CY)[c]	Fill (CY)[c]
IC-1	Point Bar	0.50	0	2,000
IC-2	Side Channel	1.71	14,100	200
IC-3	Mainstem Channel Fill	0.30	0	2,650
IC-4	Mainstem Channel Relocation 63,408	1.02	5,550	0
IC-5	Mainstem Channel Splitflow	0.38	470	470
IC-6	Side Channel	0.69	3,900	0
IC-7	Side Channel	0.79	8,130	0
IC-8	Point Bar	0.33	0	1,850
	IC Subtotal =	***5.72***	***32,150***	***7,170***
R-1	Floodplain	0.60	3,600	0
R-2	Upland Planting	0.99	5,100	0
R-3	Floodplain	0.46	2,700	0
R-4	Floodplain	0.40	2,570	0
R-5	Floodplain	1.24	11,100	0
R-6	Backwater	0.98	12,700	0
	R Subtotal =	***4.67***	***37,770***	***0***
ELJ-1	Engineered Log Jam	0.13	0	250
ELJ-2	Engineered Log Jam	0.09	0	200
ELJ-3	Engineered Log Jam	0.09	0	150
	ELJ Subtotal =	***0.31***	***0***	***600***
W-1	Wetlands	2.31	0	0
	W Subtotal =	***2.31***	***0***	***0***
BDA-1	Beaver Dam Analog	0.03	0	0
	BDA Subtotal =	***0.03***	***0***	***0***
C-1	Contractor Use Area	1.01	0	0
C-2	Contractor Use Area	0.82	0	0
C-3	Contractor Use Area	0.89	0	0
C-4	Contractor Use Area	0.94	0	0
C-5	Contractor Use Area	0.42	0	0
C-6	Access Road	0.09	0	0
C-7	Access Road	0.89	0	0
C-8	Access Road	0.23	0	0
C-9	Access Road	1.99	0	0
C-10	Contractor Use Area	0.79	0	0
C-11	Contractor Use Area	2.71	0	0
C-12	Contractor Use Area	0.25	0	0
C-13	Contractor Use Area	0.04	0	0

Table 2. Activity Areas at the Proposed Bucktail Rehabilitation Project Site.

Activity Area[a]	Primary Activity	Activity/ Treatment Area (acres)[b]	Earthwork (CY)[c]	Fill (CY)[c]
	C Subtotal =	***11.07***	***0***	***0***
U-1	Upland Storage	4.85	0	58,200
U-2	Plantings	0.90	0	5,700
U-3	Storage	4.1	0	5,550
	U Subtotal =	***9.85***	***0***	***69,450***
X-1	Temporary River Crossing	0.11	0	300
	X Subtotal =	***0.11***	***0***	***300***

a IC = in-channel work area; R = riverine work area; U = upland activity area; C = construction staging/contractor use areas and access roads; X = temporary river crossing; BDA = dam structure; W = wetlands; ELJ = engineered log jam.
b Area calculated from project geographical information system (GIS).
c Provided by TRRP; CY = cubic yard.

Activity Area Details

The following section provides information about the specific activities proposed at the Bucktail site. Channel rehabilitation details are provided in Table 2, and revegetation details for this site are included at the end of this section. Actions at this site are proposed for construction in 2016 as funding is available. Prior to removal of any mature conifers or hardwoods (greater than 12 inches diameter at breast height), Reclamation will require authorization from BLM to remove these trees. Trees authorized for removal for clearing or safety considerations by BLM would be used by Reclamation for restoration activities. Additional large wood required for the project will be provided by Reclamation from off-site sources. In addition, Reclamation will make every attempt to avoid "creating" hazard trees by limiting driving over tree root systems, piling soil around bases of trees, and other similar practices.

Plans for replacing the Bucktail Bridge are currently being considered by the Trinity County Department of Transportation and funding sources are being sought. It is the intent of the TRRP to construct the Proposed Project in coordination with the building of a new Bucktail Bridge. A new Bucktail Bridge would reduce constriction, increase conveyance, and eliminate the backwater effect that exists currently; for example, the new bridge would allow for more gravel addition upstream without affecting downstream water surface elevations. However, the decision to construct a new bridge is one that is outside the jurisdiction of the TRRP. The implementation of the 2015 Proposed Project is not dependent upon construction of a new bridge; the 2015 design would function with or without the presence of a new bridge.

IC-1, Point Bar

Area IC-1 is located at RM 106.15 in the mainstem channel along the right bank. This feature would be a constructed right bank skeletal bar designed to inundate at 2,500 cfs that would improve overall channel complexity and help steer mainstem flows into the left bank at the upstream end of Area IC-3. Overtime this setup should develop a riffle pool riffle sequence, with riffles providing benthic

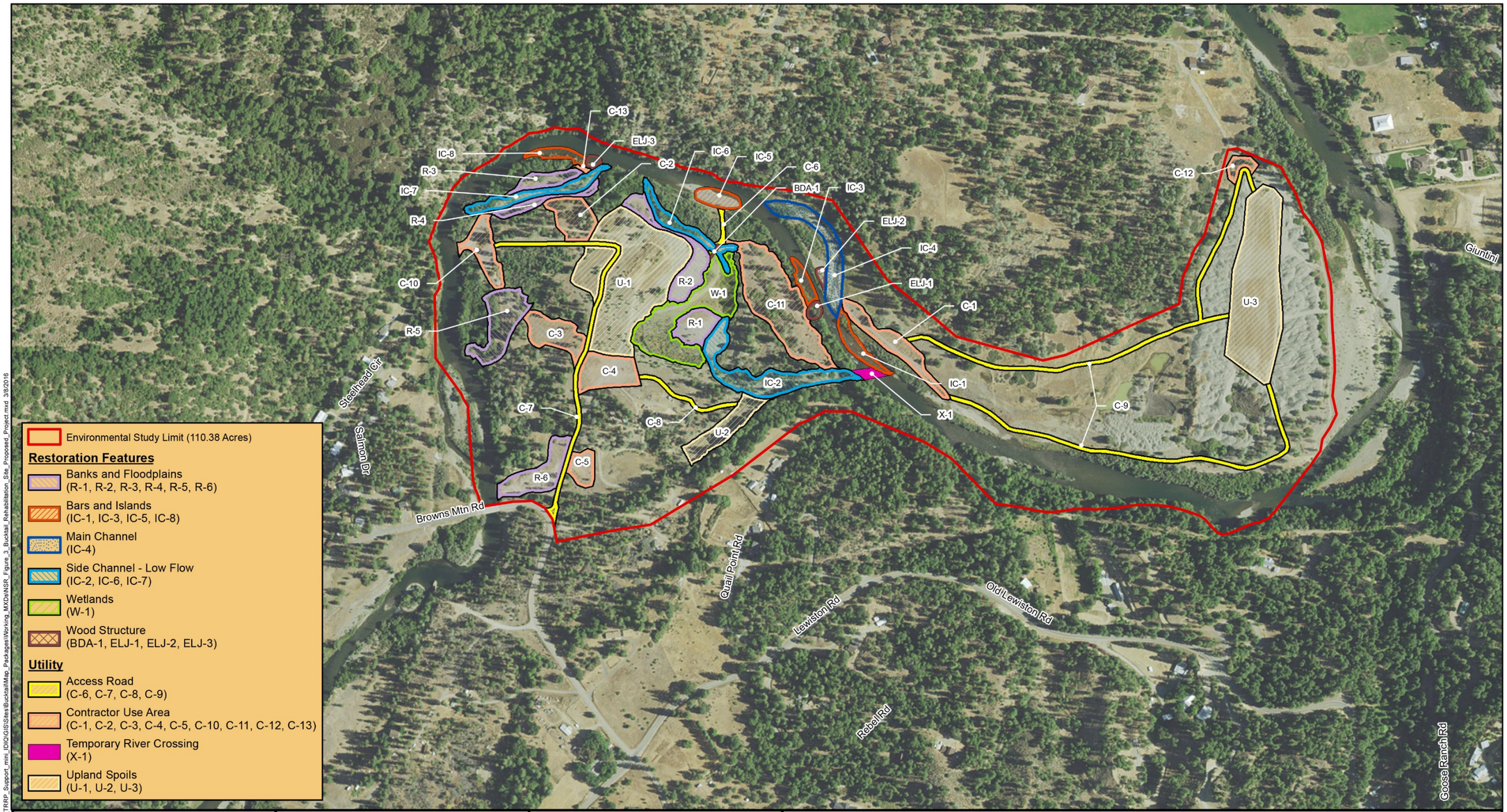
macroinvertebrate (BMI) habitats over a range of flows; the pool would become deeper increasing the opportunity for adult holding and the pool tail would provide spawning habitat.

IC-2, Side Channel

Area IC-2 starts as a high flow scour channel entrance at RM 106.2. This area is a low flow side channel, approximately 900 feet in length that is designed to deliver approximately 5 to 10 percent of the mainstem flow into areas R-1, W-1, and IC-6. The side channel meets recommended guidelines described in the Trinity River Channel Design Guide, including: 1) entrance is located just upstream of a riffle control; 2) entrance is located on the outside of a meander bend; and 3) entrance is at a 40 degree angle to the mainstem channel (HVT et al. 2011). This feature would provide connectivity between existing floodplain surfaces and a seasonal pond. The constructed channel is designed to capture 5 to 10 percent of summer/winter baseflows (15 to 45 cfs), maintaining lower streamflow velocities and shallower depths over a wider range of flows. During construction, substrate within the upper 350 feet of the side channel entrance would be evaluated for hyporheic connectivity. If necessary, a layer of cobble 2 feet deep, below design grade, may be added to act as an infiltration gallery. Constructed riffles within area IC-2 would provide adult salmonid spawning areas and productive BMI habitat that would increase food resources for fry and juvenile salmonids during critical winter and spring rearing periods. Area IC-2 combined with IC-6 and BDA-1 provides up to 90,000 square feet of fry and juvenile rearing habitat that meets criteria for depth, velocity, and with the placement of habitat structures, cover.

IC-3, Mainstem Channel Fill

Area IC-3 is the existing mainstem channel from RM 106.1 to 106.2. The existing channel in this location is steep with large cobble substrate. The left bank has wood placed as part of the 2008 Dark Gulch Project. Area IC-3 would consist of a combination of coarse sediment, revegetation, and large wood bar apex jam (ELJ-1) filling the existing channel such that 70 to 80 percent of flows up to 6,050 cfs are directed into the Area IC-4. Construction of a left bank bar in combination with ELJ-1 is designed to initiate a flow split into area IC-4. As flows increase, surrounding areas would be inundated at flows ranging between 4,500 cfs and 8,000 cfs. IC-3 would increase low water bank length by incorporating a left bank alcove. Construction of IC-3 would provide slow water refuge within a constructed alcove that would provide fry and juvenile habitat at flows ranging between 300 cfs and 4,500 cfs.


C-13
ELJ-3
IC-8
R-3
IC-7
R-4
C-2
IC-6
IC-5
C-6
BDA-1
IC-3
C-12
ELJ-2
IC-4
ELJ-1
C-1
C-10
R-5
U-1
R-2
W-1
C-11
R-1
C-3
C-4
IC-2
IC-1
X-1
C-9
U-3
Giuntini
C-7
C-8
U-2
C-5
R-6
Steelhead Cir
Salmon Dr
Browns Mtn Rd
Quail Point Rd
Lewiston Rd
Old Lewiston Rd
Rebel Rd
Goose Ranch Rd
Environmental Study Limit (110.38 Acres)
Restoration Features
Banks and Floodplains
(R-1, R-2, R-3, R-4, R-5, R-6)
Bars and Islands
(IC-1, IC-3, IC-5, IC-8)
Main Channel
(IC-4)
Side Channel - Low Flow
(IC-2, IC-6, IC-7)
Wetlands
(W-1)
Wood Structure
(BDA-1, ELJ-1, ELJ-2, ELJ-3)
Utility
Access Road
(C-6, C-7, C-8, C-9)
Contractor Use Area
(C-1, C-2, C-3, C-4, C-5, C-10, C-11, C-12, C-13)
Temporary River Crossing
(X-1)
Upland Spoils
(U-1, U-2, U-3)
G:\Projects\12_10200_010_Multiyear_TRRP_Support_mm_IDIQ\GIS\Sites\Bucktail\Map_Packages\Working_MXDs\NSR_Figure_3_Bucktail_Rehabilitation_Site_Proposed_Project.mxd 3/8/2016
Prepared by:
North State Resources, Inc.
5000 Bechelli Lane Suite 203
Redding, CA 96002 Phone (530) 222-5347
Fax (530) 222-4958 www.nsrnet.com
Prepared for:
Bureau of Reclamation
Trinity River Restoration Program
PLSS T33N, R09W, Section 23 & 24
California State Plane Zone 1, NAD83 Feet
N
0 175 350 700
Feet
1:5,000
TRINITY RIVER RESTORATION PROGRAM - BUCKTAIL
PROPOSED CHANNEL REHABILITATION SITE ENVIRONMENTAL ASSESSMENT/INITIAL STUDY
Figure 3
Bucktail Rehabilitation Site – Proposed Project
March 2016

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IC-4, Mainstem Channel Relocation

Area IC-4 extends from RM 106.05 to 106.2, beginning in the mainstem channel and along the left bank and then crossing into an existing right bank low flow side channel constructed in 2008 (RM 106.05 to 106.15). Area IC-4 proposes construction of a split flow channel intended to capture 70 to 80 percent of flows up to 6,050 cfs. This involves excavation of the constructed 2008 side channel to become the new mainstem channel, which would increase channel length, complexity, and sinuosity and reduce slope and radius of curvature. ELJ-2 is proposed along the right bank at RM 106.1 to direct additional flow into IC-4 when flows are greater than 6,050 cfs. As flows increase, surrounding areas are inundated at flows ranging between 4,500 cfs and 8,000 cfs. Area IC-4 and surrounding areas would provide shallow depths and slow velocities across a wider range of streamflows than the existing mainstem channel configuration. Increasing the mainstem channel length and reducing slope would improve adult spawning opportunities. In addition, by increasing channel sinuosity and complexity, this feature would provide fry and juvenile rearing opportunities at a wide range of flows over existing conditions. Area IC-4 should provide suitable BMI habitat for food production for increased local drift availability. Herbaceous vegetation would be planted along the toe of the mainstem channel slopes at the low water edge.

IC-5, Mainstem Channel Splitflow

Area IC-5 (RM 106.0) is located along the back side of the original feathered edge site constructed in 1993. As part of the 2008 Dark Gulch Project, coarse sediment was placed atop the bar as a high flow gravel recruitment pile. Under the Proposed Project, this area would be re-contoured to expedite mobility and transport downstream of the remaining coarse sediment associated with the 2008 high flow recruitment pile. Re-contouring the existing bar would allow flows of 2,500 cfs to inundate the bar completely and flows of or in excess of 6,050 cfs would mobilize and redeposit coarse sediment downstream. This feature would increase off-channel fry and juvenile rearing opportunities at a wide range of flows over existing conditions. No planting is proposed in this location; however, lowering this surface to inundate at flows of 2,000 cfs or greater should increase the potential for natural riparian regeneration.

IC-6, Side Channel

Area IC-6 extends from the existing wetland and gravel spoils pile in area R-2 to the mainstem channel intersecting both a terrace and riparian berm at RM 105.94. Area IC-6 is a 300 cfs side channel designed to drain areas R-1, IC-2, and W-1. At the inflow to IC- 6, a beaver dam analog (BDA-1) would be designed to provide variable backwater elevations into the seasonal wetland and areas R-1 and IC-2. The constructed side channel would increase low water bank length and provide an outlet to the seasonal wetlands fed by IC-2. If needed, coarse sediment, between ¼ inch and 5 inches, would be added to the constructed side channel to provide a suitable medium for macro invertebrate production and salmonid spawning. The constructed channel would have 5-10 percent of summer/winter baseflows (15-45 cfs) providing lower streamflow velocities and shallower depths over a wider range of flows. Area IC-6, combined with IC-2 and BDA-1, provides up to 90,000 square feet of fry and juvenile rearing habitat that meets criteria for depth, velocity, and with the placement of habitat structures, cover. Constructed riffles within area IC-6 would provide areas of productive BMI habitat that increase food resources for fry and juvenile salmonids during critical

winter and spring rearing periods. This feature would increase inundated area for groundwater recharge providing more suitable areas for wetland and riparian establishment.

IC-7, Side Channel

Area IC-7 extends from RM 105.76 to 105.9, passing along the backside of an historic right bank bar and current riparian berm. Area IC-7 proposes a side channel designed to capture approximately 5 to 10 percent of summer/winter baseflows (15-45 cfs) and has lower streamflow velocity and shallower depths over a wider range of flows. A large wood structure (ELJ-3) is proposed to maintain entrance conditions and meter flow into the side channel. ELJ-3 would be woven into the existing trees between the upstream end of the IC-8 point bar and entrance to IC-7 side channel. This feature increases low water bank length and provides improved surface and groundwater connectivity between constructed floodplains R-3 and R-4. Construction of IC-7 would provide fry and juvenile rearing habitat from 300 cfs to 4,500 cfs that meets cover (with the addition of habitat features), depth, and velocity criteria.

IC-8, Point Bar

Area IC-8 is a riparian berm located from RM 105.72 to 105.85 on the left bank. Area IC-8 was previously treated with berm notching and a large wood habitat structure protruding from the bank into the mainstem. Under the Proposed Project, approximately 1,850 CY of coarse sediment would be added to the left bank immediately increasing coarse sediment storage by creating a self-sustaining point bar with an alcove at the downstream end. This feature would increase low water bank length, sinuosity, and expansion and contraction zones. The top of the IC-8 point bar is designed to completely inundate at 4,500 cfs providing shallow depths and slow velocities across a wider range of streamflows than the current left bank channel configuration. In addition an alcove has been designed into the downstream end of the bar. The point bar and alcove would provide slow shallow rearing habitat for flows ranging from 300 cfs to 2,500 cfs. A pool on the outside of the bend along the right bank bedrock would be maintained to preserve adult holding opportunities. Herbaceous vegetation would be planted along the toe of IC-8 at the low water edge.

R-1, Floodplain

Area R-1 contains a gravel spoils pile, low lying floodplain area, and a portion of a wetland pond. The area is currently inundated through a hyporheic connection with the mainstem channel and begins to backwater through a gravel berm at flows of 4,500 cfs. This area would be lowered to target inundation elevations ranging between 1,500 cfs and 4,500 cfs to provide slow shallow rearing habitat. At flows of 300 cfs, IC-2 would provide water into area R-1. A beaver dam structure located at the entrance to IC-6 would backwater into area R-1 to help portions of R-1 function as a seasonal wetland. Construction of R-1 would result in shallow depths and slow velocities across a wider range of streamflows than those currently provided. This surface is expected to support riparian plantings featuring willows and cottonwoods and natural regeneration from seed deposited during overbank flows.

R-2, Upland Planting

Area R-2 contains a gravel spoils pile, low lying floodplain area, and a portion of a wetland pond. The area is currently inundated through a hyporheic connection with the mainstem channel and begins to backwater through a gravel berm at flows of 4,500 cfs. Under the Proposed Project, the area would be lowered to target inundation elevations ranging between 1,500 cfs and 4,500 cfs to provide slow shallow rearing habitat. At flows of 300 cfs, area IC-2 would provide water into area R-2. A beaver dam located at the entrance to IC-6 would backwater into area R-2 to improve planting and natural recruitment success. Construction of area R-2 would result in shallow depths and slow velocities across a wider range of streamflows than those currently provided.

R-3, Floodplain

Area R-3 runs between the riparian berm on the backside of IC-8 and the IC-7 side channel. Under the Proposed Project, the area would be lowered to a functional floodplain elevation to inundate at flows ranging between 1,000 cfs and 4,500 cfs to provide slow shallow rearing habitat. Lowering the existing right bank along IC-7 would provide bank complexity and surfaces that would initiate floodplain deposition. The area would provide areas with shallow depths and slow velocities across a wider range of streamflows than those currently adjacent to the mainstem channel. Excavated material would be stockpiled at U-1 for future gravel augmentation. The floodplain would be revegetated with riparian hardwood species.

R-4, Floodplain

Area R-4 is located along the right bank of the IC-7 low flow side channel. This area would be lowered to a functional floodplain elevation that would inundate at flows ranging between 1,000 cfs and 4,500 cfs, providing bank complexity and surfaces that would initiate floodplain deposition. This would provide areas with shallow depths and slow velocities across a wider range of streamflows than those currently adjacent to the mainstem channel. The proposed constructed surfaces would provide slow shallow rearing habitat. Excavated material would be stockpiled at U-1 for future gravel augmentation. The floodplain would be revegetated with riparian hardwood species.

R-5, Floodplain

Area R-5 begins at RM 105.6 and connects an existing riparian hardwood stand consisting of mixed willows into a historic settling pond, primarily vegetated with narrow-leaf willow. Construction in this area is intended to backwater at flows of 4,500 cfs connecting an historic settling pond depression within the interior of the Bucktail site to the mainstem channel. This feature would provide areas with shallow depths and slow velocities across a wider range of streamflows than those currently adjacent to the mainstem channel. The area would provide slow shallow rearing habitat for streamflows ranging from 1,500 cfs to maximum fisheries flow of 11,000 cfs. Approximately 11,100 CY of material would be excavated and stockpiled at area U-1 for features, potential processing, and future gravel augmentation. The surface would be planted with riparian hardwood species.

R-6, Backwater

Area R-6 is at the downstream end of an existing high flow scour channel. The area is primarily open sand, gravel, and cobbles with non-native grasses. Flows in excess of 8,000 cfs enter the high flow scour channel at RM 106.2, exiting through R-6 just upstream of the Browns Mountain Road Bridge. The area would be designed to backwater at flows ranging between 450 cfs and 2,500 cfs, providing areas with shallow depths and slow velocities across a wider range of streamflows than those currently available. Approximately 12,700 CY of material would be excavated and stockpiled at Area U-1 for future gravel augmentation. The floodplain would be revegetated with riparian hardwood species.

Wood Habitat Structures

Wood habitat structures would be distributed throughout constructed side and mainstem channels. Wood would be buried into constructed banks and bars without piles or boulder ballast making it available for transport downstream. Some angled piles may be used to allow time for vegetation to grow into place and secure habitat structures. Large boulders may be used in combination with wood for additional complexity. These structures would create areas of local scour and deposition, and would provide immediate cover, depth, and velocity refugia for all salmonid life stages over flows of 300 cfs. Large wood used for construction would be a combination of that obtained on-site during vegetation removal and that obtained from other lawful sources and delivered to the site.

ELJ-1, Engineered Log Jam

Construction of ELJ-1 would incorporate large wood and coarse sediment into existing vegetation along the left bank to form a large wood jam at the upstream end of IC-3. Wood placement combined with coarse sediment and vegetation is designed to meet the design objective of directing 70 to 80 percent of flows up to 6,050 cfs into the newly constructed channel (IC-4). Some wood posts would be used to pin the structure in place. The structure would be constructed with a matrix of woody and fill material to provide hydraulic cover, allowing for riparian plantings and regeneration within area IC-3. The structure is designed to withstand forces exerted by the maximum fisheries flow of approximately 11,000 cfs. This structure increases the complexity of the stream bank and creates a scour pool upstream of the wood placement. Over time, ELJ-1 would create holding habitat for adults through the creation of local scour and capture of woody material mobilized by high flows. ELJ-1 provides adequate summer rearing habitat for juvenile salmonids, enhances hydraulic and escape cover along the channel margin, reduces the distance to cover from adjacent spawning areas (IC-3 and IC-4), and increases channel complexity and salmonid habitat for all life stages at a wide range of flows.

ELJ-2, Engineered Log Jam

ELJ-2 proposes construction of a medial bar jam at the head of the 2008 split flow medial bar at RM 106.1. ELJ-2 is designed to maintain a split flow channel when streamflow is greater than 6,050 cfs. Wood would be used in combination with boulders and vegetation to create a stable configuration at the upstream end of the 2008 medial bar downstream of the IC-4 confluence with the mainstem Trinity River channel. This structure is designed to direct flows in excess of 6,050 cfs into IC-4. This feature would increase the complexity of the stream bank and provide hydraulic and escape

cover for juvenile salmonids during all flows. Smaller wood would be placed along the wetted perimeter of the larger wood placements to add hydraulic and escape cover for fish. The structure also creates physical complexity by creating refugia for juvenile residents and salmonids. The scour pool and cover provided by the wood placed at the apex of the medial bar would create summer rearing habitat in the form of feeding stations and holding features.

ELJ-3, Engineered Log Jam

Positioned at the head of IC-8, ELJ-3 sits within an existing riparian berm and subtle point bar. ELJ-3 would be designed to mitigate a 95/5 percent flow split between the mainstem channel and the low-flow side channel (IC-7). The feature proposes weaving large wood into existing vegetation between IC-7 and IC-8, providing a stable hard-point along the left bank of the channel. ELJ-3 would be designed to meter flows into IC-7 such that at a flow of 300 cfs, 5 to 10 percent (15 cfs to 30 cfs) enters the side channel. Flows in excess of 6,050 cfs are expected to inundate the entire site. Weaving logs into existing vegetation at the head of an existing riparian berm is expected to increase the diversity of aquatic habitats by creating connection to off-channel habitats, side channels, and floodplains. This feature would increase the complexity of the stream bank and increase salmonid habitat for all life stages at a wide range of flows including providing hydraulic and escape cover for juvenile and adult salmonids, providing holding habitat for adults through the creation of local scour pools, and providing adequate summer rearing habitat for juvenile salmonids.

W-1

No earthwork is proposed for area W-1. Post-project, the area would be planted with emergent wetland and sedge wetland vegetation. This would include mugwort, torrent sedge, common rush, spreading rush, scouring rush, basket sedge, and small-fruited bulrush.

BDA-1, Beaver Dam Analog

The proposed BDA-1 would be located at the downstream end of the existing seasonal wetland built in 2008. Currently, the area is void of vegetation, and consists of gravel and cobbles. Proposed construction of a beaver dam analog at the upstream end of IC-6 would allow an adaptive approach to raise water surface elevations at various flows to backwater area R-1. The proposed beaver dam analog at the upstream end of IC-6 would consist of buried posts (12 inches in diameter) that provide a framework for willow cuttings to be woven between the posts. This would regulate water depth in the wetland upstream. The beaver dam analog could be managed in a way that allows high winter and spring flows to pass without obstruction. This would reduce fine material from depositing within the channel alignment. During periods of high flow, fine sediment is expected to deposit on the floodplain and seasonal wetland surfaces. During summer and winter baseflows, BDA-1 would backwater into area R-1 providing up to 2 acres of wetland habitat. During winter and summer rearing periods, this feature could backwater up to 90,000 square feet providing large areas that meet velocity, depth, and cover criteria for fry and juvenile salmonid rearing habitat. An adaptive approach would be necessary to successfully achieve riparian and wetland plant success as well as encouraging fine sediment deposition outside the low flow channel thalweg.

X-1, River Crossings

A temporary crossing would provide access across the river. The temporary crossing would be a constructed ford to facilitate access for construction-related traffic. If required, temporary bridges would be used when crossings are needed outside of the summer (July 15-September 15) in-channel work window. All temporary crossings would be designed and constructed to meet the requirements for heavy equipment such as trucks, excavators, and scrapers. All temporary crossings would be constructed in a manner that does not impede navigability at the site.

U-1, Upland Storage

Area U-1 consists of the majority of the high terrace area in the center of the Bucktail site. This area primarily consists of roads, non-native grassland, and sparse conifers. Area U-1 would serve as the primary contractor use area and provide a location above the 100-year floodplain to stockpile coarse sediment for future local coarse sediment augmentation. Post-project, upland plantings and wood habitat piles are proposed for those areas not needed for storage to increase stand complexity providing a variety of avian, reptilian, and mammalian habitat.

U-2, Plantings

Area U-2 is an existing high flow channel that currently overtops at 7,000 cfs to 8,000 cfs. Existing vegetation is a sparse mix of riparian and upland vegetation. The construction of U-2 entails placement of excavated alluvial material in a manner that fill this feature to an elevation that allow it to function as an upland terrace below flows of about o 11,800 cfs.. This would should promote mainstem scour, channel migration, and complexity into the future. Placement of fill at this area also reduces the risk that the existing paved road near area R-6 would be scoured from high flows. Post-project, this area would be planted with upland vegetation, creating more complex upland woodland that over time may be recruited by a migrating channel, increasing large wood supply to the Trinity River. Successful upland plantings would provide a complex upland vegetation community that supports a variety of mammalian, reptilian, and avian species.

U-3, Storage

Area U-3 is located on top of an existing tailings pile and 2008 spoils area. This area would serve as the coarse sediment stockpile area for all materials excavated from area IC-4. This area also provides a location above the 100-year floodplain to stockpile coarse sediment for future gravel augmentations for the Trinity River. Post-project, native grasses would be planted on top of the graded surface to provide open grasslands that support a variety of mammalian, reptilian, and avian species.

C-1, C-2, C-3, C-4, C-5, C-10, C-11, C-12, and C-13, Contractor Use Areas

Contractor use areas would be used for construction access, staging, stockpiling, mobilization, gravel processing, and other necessary construction activities during implementation. No earthwork is proposed for area C-1. Post-project this area would be planted with willow trenches to increase roughness, which should create areas of water that meet depth, velocity, and cover criteria when flows are 2,000 cfs and greater. The addition of a complex riparian community would provide off-channel high flow refuge for rearing salmonids. No earthwork is proposed for area C-2. This area

would be planted with upland vegetation, creating more complex upland woodland that over time may be recruited by a migrating channel, increasing large wood supply to the Trinity River. Upland plantings in this area would provide a complex upland vegetation community that supports a variety of mammalian, reptilian, and avian species. This area inundates at flows between 6,000 cfs and 8,500 cfs; therefore, slow shallow rearing habitat is not expected until flows exceed 6,000 cfs.

C-6, C-7, C-8, and C-9, Access Roads

Construction access roads are required to complete the Proposed Project. Within the site, existing access roads would predominantly be utilized. Because scrapers would likely be utilized for excavation of channels and floodplains, these roads would be essential for safety and efficiency. Post-project, access roads would be returned to pre-construction condition, decommissioned, or left as improved, according to landowner approval.

Revegetation

Revegetation details are presented in Table 3.

Table 3. Revegetation Types and Species Proposed for the Bucktail Site.

Planting Type	Species	
Wetland Zonal	torrent sedge *Carex nudata* common rush *Juncus effuses* small fruited bulrush *Scirpus microcarpus*	scouring rush *Equisetum hyemale* spreading rush *Juncus patens* hard stemmed bulrush *Schoenoplectus acutus*
Emergent Wetland Zonal	mugwort *Artmesia douglasiana* scouring rush *Equisetum hyemale* spreading rush *Juncus patens*	torrent sedge *Carex nudata* common rush *Juncus effusus* small fruited bulrush *Scirpus microcarpus*
Toe Zonal[a]	torrent sedge *Carex nudata*	common rush *Juncus effusus*
Slope Zonal[b]	mugwort *Artmesia douglasiana* cottonwood *Populus trichocarpa* red willow *Salix laevigat* shiny willow *Salix lasiandra*	scouring rush *Equisetum hyemale* California rose *Rosa californica* arroyo willow *Salix lasiolepis*
Riparian Cluster	Cottonwood Cluster cottonwood *Populus trichocarpa* red willow *Salix laevigata* shiny willow *Salix lasiandra* snowberry *Symphoricarpos albus* California grape *Vitus californica* Mixed Willow Cluster mugwort *Artmesia douglasiana* American dogwood *Cornus sericea ssp. occidentalis* scouring rush *Equisetum hyemale* cottonwood *Populus trichocarpa*	Mixed Alder Cluster white alder *Alnus rhombifolia* mugwort *Artmesia douglasiana* American dogwood *Cornus sericea ssp. occidentalis* scouring rush *Equisetum hyemale* Oregon ash *Fraxinus latifolia* Arroyo Willow Cluster mugwort *Artmesia douglasiana* cottonwood *Populus trichocarpa* arroyo willow *Salix lasiolepis* California rose *Rosa californica*

Table 3. Revegetation Types and Species Proposed for the Bucktail Site.

Planting Type	Species	
	red willow *Salix laevigata* shiny willow *Salix lasiandra* arroyo willow *Salix lasiolepis*	snowberry *Symphoricarpos albus*
Upland Cluster and Upland Infill	ponderosa pine *Pinus ponderosa* canyon live oak *Quercus chrysolepis* interior live oak *Quercus wislizeni* greenleaf manzanita *Manzanita patula*	ghost pine *Pinus sabiana* redbud *Cercis occidentalis* whiteleaf manzanita *Manzanita viscida* honeysuckle *Lonicera hispidula*

a Toe zonal plantings would occur within 24 inches of the water surface along the excavated side channels.
b Slope zonal plantings would occur on side channel slopes.

Revegetation design objectives include:

- Increase the plant species richness used in revegetation,
- Increase the potential future large wood supply,
- Increase riparian vegetation quality and quantity along the side channel and constructed benches,
- Increase upland vegetation quality and quantity between side channels, constructed benches, and the existing upland,
- Provide structural complexity, plant species diversity, and cover to enhance and increase wildlife and fish habitat, and
- Maintain continuous corridors of riparian vegetation with a more variable upland vegetation ecotone.

Revegetation consists of site layout, preparing planting areas, planting a mixture of upland and riparian plant species, and some degree of irrigation. If irrigation is required, equipment would include pumps, tanks and lines. In addition irrigation, maintenance of revegetated areas may include measures such as weeding, mulching, browse protection and in-planting. Plant species would be assigned to different riparian or upland patches. The grading plan avoids removing patches of existing riparian vegetation within the site that currently provide cover and a readily available seed source immediately after construction. Efforts would be made to minimally impact riparian vegetation along the left bank side channels as high quality vegetation conditions currently exist in these locations. The banks of constructed side channel slopes would be planted with riparian plant species to provide cover for wildlife and fish, shade the channel, speed riparian vegetation recovery, and increase woody plant and age class diversity. Constructed benches and bars are specifically targeted for woody riparian revegetation. Wetland species would be planted in areas appropriate for an individual species' tolerance to varying lengths of inundation. Planted material may be collected from local stocks or nursery grown native species. Their sizes may vary by plant species.

The TRRP anticipates that most planting areas would not require watering post project. However, given recent drought years, some intermittent watering of planted areas, during dry conditions may increase plant survival. If this subsequent irrigation is needed, gasoline pumps and hoses would be brought into the site, probably via river rafts. Equipment would be used to water plants as needed, stored on site for use during dry periods or brought in as water demands require. Any irrigation measures would be temporary in nature, and would assist the plants in establishing their roots and in long-term survival. Revegetation maintenance Irrigation measures would be undertaken to meet permit and/or and land owner/agency requirements; most of maintenance measures are expected to occur within the only in the first three years post-construction., would be used to restore the land to its natural condition, and would have only minimal and temporary impacts on the surrounding environment.

Connected Activities and Construction Criteria and Methods Associated with the Proposed Project

In addition to the activities included in Table 2, several other activities are common to all activity areas to varying degrees. Earthmoving equipment that may be used at the site to complete the construction activities includes off-road articulated dump trucks, wheel loaders, tracked excavators, dozers, push-pull scrapers, water tenders, and graders. Expected quantities of materials transported to the Bucktail site from locations outside the project area are listed in Table 4. It is assumed that trucks capable of hauling 10 CY would be used to bring materials to the site. All large wood brought to the site for use in activity area features would be obtained from locations in Trinity County and would be disease-free; potential locations include the Trinity Pines subdivision near Hayfork and Lance Gulch near Weaverville. Large boulders and cobbles for use in activity area features would be obtained from a local commercial source, and gravel would be transported from clean stockpiles stored at TRRP channel rehabilitation/gravel processing sites, potentially including stockpiles at the Sawmill, Lowden Ranch, Lower Junction City and Upper Junction City sites.

Table 4. Estimated Quantities of Off-Site Materials Needed for Civil Design Features.

Description	Quantity	Location	Estimated Trips
Large Wood – Logs	161	Trinity County	30
Large Woody Debris	144 CY	Trinity County	10
Clean Gravel, Cobble	7,450 CY	TRRP l Sites	700
Large Boulders	67 (2'-3')	Local Commercial Source	7

Environmental Commitments and Project Design Features

For the purposes of NEPA, the environmental commitments and project design features presented in the following section have been developed for, and are included as part of, the Proposed Project in order to reduce or avoid adverse effects of the action. This section is organized by resource topic. In some instances, these commitments and features have been developed to address more than one resource but are not repeated for each resource. Although many of the commitments and features presented below respond to significant impacts as defined under CEQA and have been incorporated

in their entirety by reference to the Mitigation Monitoring and Reporting Program (MMRP) in Appendix E of the Master EIR, Appendix B of this EA/IS provides a comprehensive and project specific MMRP consistent with CEQA requirements. Monitoring would occur as a required element of the Proposed Project and responds to the TRRP management objectives, as well as the MMRP.

Fluvial Geomorphology, and Soils

Reclamation will implement the following features during construction activities:

- Areas where ground disturbance will occur will be identified in advance of construction and limited to only those areas that have been approved by Reclamation.
- All vehicular construction traffic will be confined to the designated access routes and staging areas.
- Disturbance will be limited to the minimum necessary to complete all rehabilitation activities.
- All supervisory construction personnel will be informed of environmental concerns, permit conditions, and final project specifications.

Reclamation will prepare a Storm Water Pollution Prevention Plan (SWPPP) to prevent erosion and control sediment into adjacent water bodies. Measures for erosion control will be prioritized based on proximity to the Trinity River. Reclamation will provide the SWPPP for review by associated agencies (e.g., BLM, the Regional Water Board, NMFS, and CDFW) upon request. Reclamation's project manager will ensure the preparation and implementation of an erosion and sediment control plan prior to the start of construction. The following features will be used as a guide to develop this plan:

- Restore disturbed areas to pre-construction contours to the fullest extent feasible.
- Salvage, store, and use the highest quality soil for revegetation.
- Discourage noxious weed competition and control noxious weeds.
- Clear or remove roots from steep slopes immediately prior to scheduled construction.
- Leave drainage gaps in topsoil and spoil piles to accommodate surface water runoff.
- To the fullest extent possible, cease excavation activities during significantly wet or windy weather.
- Use bales, wattles, and/or silt fencing as appropriate.
- Before seeding disturbed soils, work the topsoil to reduce compaction caused by construction vehicle traffic.

- Rip feathered edges (and floodplain surfaces where appropriate) to approximately 18 inches deep. The furrowing of the river's edge will remove plant roots to allow mobilization of the bed, but will also intercept sediment before it reaches the waterway.

- Spoil sites will be located such that they do not drain directly into a surface water feature, if possible. If a spoil site will drain into a surface water feature, catch basins will be constructed to intercept sediment before it reaches the feature. Spoil sites will be recontoured and revegetated to reduce the potential for erosion.

- Sediment control measures will be in place prior to the onset of the rainy season to ensure that surface water runoff does not occur. Project areas will be monitored and maintained in good working condition until disturbed areas have been seeded and mulched or revegetated in another fashion. If work activities take place during the rainy season, erosion control structures will be in place and operational at the end of each construction day.

Water Quality

The project will comply with the applicable general permits issued by the Regional Water Board in 2015 to ensure its meets the water quality objective for turbidity levels in the Trinity River, as listed in the Basin Plan for the North Coast Region (North Coast Regional Water Quality Control Board 2011). These conditions are summarized below.

- Turbidity levels will not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

- Due to the nature of the proposed restoration activities and the clarity of the Trinity River during low flow conditions, the Regional Water Board has determined that an allowable zone of turbidity dilution is appropriate and necessary in order for Trinity River restoration activities to be accomplished in a meaningful, timely, and cost-effective manner that fully protects beneficial uses without resulting in a violation of the water quality objective for turbidity.

- Project activities that occur in areas outside of the active river channel will not increase turbidity levels by more than 20 percent above naturally occurring background levels. During in-river construction activities and until the first extended period of post-construction high flow (i.e., flows of at least 6,000 cfs inundate the project areas and floodplain for a minimum of 7 days) a zone of turbidity dilution within which higher percentages will be tolerated are defined in the 2015 general discharge permits as the full width of the river channel within 500 linear feet downstream of any project activity that increases naturally occurring background levels, provided that all other required controls and appropriate BMPs for sediment and turbidity control are in place and downstream beneficial uses are also fully protected. When naturally occurring background levels are less than or equal to 20 NTUs, turbidity levels immediately downstream of the zone of turbidity dilution shall not exceed 20 NTUs. If naturally occurring background levels are greater than 20 NTUs, turbidity levels

immediately downstream of the 500 linear foot zone of dilution shall not be increased by more than 20 percent above the naturally occurring background level.

To ensure that turbidity levels do not exceed the thresholds described in the general permits during in-river project construction activities, Reclamation shall monitor turbidity levels upstream within 50 feet of project activities (i.e., natural background) and 500 feet downstream of the in-river construction activities that could increase turbidity. At a minimum, field turbidity measurements shall be collected whenever a visible increase in turbidity is observed. Monitoring frequency shall be a minimum of every two hours during in-river work periods and when activities commence that are likely to increase turbidity levels above any previously monitored levels.

- If grab sample results indicate that turbidity levels exceed 20 NTU at 500 feet downstream from construction activities, remedial actions will be implemented to reduce and maintain turbidity at or below 20 NTU immediately downstream of the 500 linear foot zone of dilution. Potential remedial actions include halting or slowing construction activities and implementation of additional BMPs until turbidity levels are at or below 20 NTU.

Fill gravels used on the streambeds, stream banks, and river crossings will be composed of clean, spawning-sized gravels from a local Trinity River Basin source. Gravel will be cleaned to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Clean gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater.

To minimize the potential for increases in turbidity and suspended sediments entering the Trinity River as a result of access routes (e.g., roads), Reclamation will implement the following design features:

- Keep bare soil to the minimum required by designs. Erosion control devices/measures will be applied to areas where vegetation has been removed as needed to reduce short-term erosion prior to the start of the rainy season.

- Keep runoff from bare soil areas well dispersed. Dispersing runoff keeps sediment on-site and prevents sediment delivery to streams. Direct any concentrated runoff from bare soil areas into natural buffers of vegetation or areas with more gentle slopes where sediment can settle out.

- Disconnect and disperse flow paths, including roadside ditches that might otherwise deliver fine sediment to stream channels or other water bodies.

- Decompact or rip floodplain areas so that surfaces are permeable and no surface water runoff occurs.

To reduce the potential for the access routes to continually contribute soil materials to the Trinity River following project construction, thereby increasing turbidity and total suspended solids in the river, these routes will be stabilized or decommissioned upon completion of work in those areas. Decommissioning is defined as removing those elements of a road that reroute hillslope drainage and present slope stability hazards.

Reclamation will prepare and implement a spill prevention and containment plan in accordance with applicable federal and state requirements.

Reclamation will ensure that any construction equipment that will come in contact with the Trinity River be inspected daily for leaks prior to entering the flowing channel. External oil, grease, and mud will be removed from equipment using steam cleaning. Untreated wash and rinse water will be adequately treated prior to discharge if that is the desired disposal option.

Reclamation will ensure that hazardous materials, including fuels, oils, and solvents, not be stored or transferred within 150 feet of the active Trinity River channel. Areas for fuel storage, refueling, and servicing will be located at least 150 feet from the active river channel or within an adequate secondary fueling containment area. Gas pumps and engines will be stored and maintained on impermeable barriers so that any leaking petroleum products are isolated from the ground. In addition, the construction contractor will be responsible for maintaining spill containment booms onsite at all times during construction operations and/or staging of equipment or fueling supplies. Fueling trucks will maintain a spill containment boom at all times.

Fishery Resources

The proposed construction schedule avoids in-channel work during the period in which it could affect spawning spring- and fall-run Chinook salmon, coho salmon, and steelhead or their embryos once in the gravel. As directed by the 2000 Biological Opinion (National Marine Fisheries Service 2000), Reclamation will ensure that all in-channel construction activities are conducted during late-summer, low-flow conditions (e.g., July 15-September 15).

Alluvial material used for coarse sediment additions will be composed of washed, spawning-sized gravels (3/8- to 5-inches diameter) from a local Trinity River Basin source. Gravel will be washed to remove any silts, sand, clay, and organic matter; will be free of contaminants, such as petroleum products; and will pass Caltrans cleanliness test #227 with a value of 85 or greater.

Construction specifications will include the following features to reduce potential impacts associated with accidental spills of pollutants (fuel, oil, grease, etc.) on vegetation and aquatic habitat resources within the project boundary:

- Equipment and materials will be stored away from wetland and surface water features.
- Vehicles and equipment used during construction will receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of materials. Maintenance and fueling will be conducted in an area at least 150 feet away from waters of the Trinity River or within an appropriate secondary fueling containment area. Gasoline engines and pumps operated on the floodplain will be isolated from the ground by an impermeable barrier.

To avoid or minimize potential injury and mortality of fish during riverine activities (e.g., addition and grading of coarse sediment), equipment will be operated slowly and deliberately to alert and scare adult and juvenile salmonids away from the work area.

Reclamation will minimize potential injury and mortality of fish during the use of low-flow channel crossings. This will be accomplished by minimizing vehicle traffic and by operating equipment and vehicles slowly and deliberately to alert and scare adult and juvenile salmonids away from the crossing area, or by having a person wade ahead of equipment to scare fish away from the crossing area.

To avoid or minimize potential injury and mortality of fish during excavation and placement of fill materials in the active low-flow channel, equipment will be operated slowly and deliberately to alert and scare adult and juvenile salmonids away from the work area. Reclamation will ensure that before submerging an excavator bucket or laying gravel below the water surface, the excavator bucket will be operated to "tap" the surface of the water, or a person will wade ahead of fill placement equipment to scare fish away from the work area. To avoid impacts to mobile life stages of salmonids that may be present in the water column, the first layers of clean gravel that are being placed into the wetted channel will be added slowly and deliberately to allow fish to move from the work area.

Monitoring of the constructed inundation surfaces for salmon fry stranding will be performed by a qualified fishery biologist immediately after recession of flood flow events designated as a 1.5- year or less frequent event (i.e., Q >6,000 cfs) for a period of 3 years following construction. These flows, and associated fry stranding surveys, will typically occur between January and May. If substantial stranding is observed, Reclamation will take appropriate measures to return stranded fishes to river habitats and to subsequently modify the constructed surfaces prior to the next managed flow release to reduce the likelihood of future occurrences of fry stranding.

Prior to the start of construction activities, Reclamation will retain a qualified biologist to identify potential construction access routes necessary for the projects to ensure that these features avoid and/or minimize to the fullest extent impacts to riparian habitats and wetland waters. In addition, Reclamation will clearly identify, and flag in the field, biologically sensitive areas (e.g., jurisdictional waters and riparian habitat) to be protected, and will provide the contractor with specific instructions to avoid any construction activity within these features. Reclamation will inspect and maintain flagged areas on a regular basis throughout the construction phase.

Reclamation will initiate a 10-year mitigation monitoring program after the first growing season following project implementation. After a period of 5 years, the need for additional riparian habitat and wetland enhancement will be evaluated in a written report. At that time, Reclamation, in consultation with the USACE, Regional Water Board, and CDFW, will determine whether there is a need to further enhance or create additional areas of riparian habitat or jurisdictional wetlands within the project boundary so that there will be no net loss of riparian habitat after a 10-year monitoring period. In addition, wetlands will be redelineated 5 years post-project implementation to ensure no net loss of wetland habitat. Riparian habitat reporting 5 years after project implementation and wetland delineation 5 years after implementation will provide Reclamation with needed data in a timely fashion to take additional pro-active measures towards meeting the goals of no net loss of riparian and jurisdictional wetland habitat within rehabilitation site boundaries after 10 years.

Low water crossings will only be constructed and used between July 15 and September 15. Fill gravels used on the low-water crossings, streambeds, and stream banks will be composed of washed, spawning-sized gravels from a local Trinity Basin source. Gravel will be cleaned to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Clean

gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater. Abutment and embankment materials used for bridges will be native alluvium available from the project area.

Reclamation will construct the low-flow channel crossings to allow adequate depths and velocities for adult and juvenile salmonids to pass safely. Flows associated with storm events are not considered critical because the width and hydrologic conditions associated with low-flow channel crossings in the Trinity River are not considered to limit fish passage at elevated flows and would be comparable to hydrologic conditions in local riffle-and-run features. For Trinity River low-flow channel crossings at base flows, velocities will not exceed 2 feet per second to allow for juvenile fish passage and water depths will not be less than 12 inches in two-thirds of the river channel to provide adequate depth for adult salmon and steelhead passage.

Reclamation will not impede the physical features or hydraulic process of the Trinity River in a fashion that would be inconsistent with the 2000 Biological Opinion (National Marine Fisheries Service 2000), or result in a temporary impairment to fish passage related to a bridge.

Vegetation, Wildlife, and Wetlands

Prior to the start of construction activities, Reclamation will retain a qualified biologist to identify potential construction access routes to ensure that these features avoid and/or minimize to the fullest extent impacts to jurisdictional waters. In addition, Reclamation will clearly identify, and flag in the field, biologically sensitive areas (e.g., jurisdictional waters and riparian habitat) to be protected, and will provide the contractor with specific instructions to avoid any construction activity within these features. Reclamation will inspect and maintain marked areas on a regular basis throughout the construction phase.

Prior to the start of construction, a qualified biologist will conduct a survey of the rehabilitation sites to determine whether suitable nesting habitat for the little willow flycatcher is present. If suitable habitat is present, the following features will be implemented.

- Grading and other construction activities will be scheduled to avoid the nesting season to the extent possible. The nesting season for this species in Trinity County extends from June 1 through July 31. If construction occurs outside of the breeding season, no further mitigation is necessary. If the breeding season cannot be completely avoided, the following commitments will be implemented.

    - A qualified biologist will conduct a minimum of one pre-construction survey for the little willow flycatcher within the rehabilitation sites and a 250-foot buffer around the sites. The survey will be conducted no more than 15 days prior to the initiation of construction in any given area. The pre-construction survey(s) will be used to ensure that no nests of this species within or immediately adjacent to the rehabilitation site will be disturbed during project implementation. To the extent possible given timing for construction and with the contract award, pre-construction surveys will conform to methodologies identified in a Willow Fly Catcher Survey Protocol for California available online at: http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html#Birds . If an active nest is found, CDFW will be contacted prior to the start of construction to determine the appropriate mitigation measures.

- If vegetation is to be removed by the projects and all necessary approvals have been obtained, potential nesting substrate (e.g., shrubs and trees) that will be removed by the projects will be removed before the onset of the nesting season, if feasible. This will help preclude nesting and substantially decrease the likelihood of direct impacts.

If any construction in the Trinity River channel will occur prior to August 1 of any construction season, a pre-construction survey for the foothill yellow-legged frog larvae and/or eggs will be conducted by a qualified biologist. This survey will be conducted within the construction boundary no more than 2 weeks prior to the start of in-stream construction activities. If larvae or eggs are detected, the biologist will relocate them to a suitable location outside of the construction boundary.

In the event that a foothill yellow-legged frog is observed within the construction boundary, the contractor will temporarily halt in-stream construction activities until qualified personnel have moved the frog(s) to a safe location within suitable habitat outside of the construction limits. Planned locations for placement of transferred animals will be downstream of the construction limits and will be reported to the CDFW prior to construction.

A minimum of one survey for western pond turtle nests will be conducted during the nesting season (generally late June-July) prior to construction. A qualified biologist will be retained by Reclamation to conduct the survey. If a western pond turtle nest is found, the biologist will flag the site and determine whether construction activities can avoid affecting the nest. If the nest cannot be avoided, the nest will be excavated by the biologist and reburied at a suitable location outside of the construction limits.

Prior to construction in open water habitat, a qualified biologist will trap and move western pond turtles out of the construction area to nearby suitable habitats.

During construction, in the event that a western pond turtle is observed within the construction limits, the contractor will temporarily halt construction activities until qualified personnel have moved the turtle(s) to a safe location within suitable habitat outside of the construction limits. Planned locations for placement of transferred animals will be downstream of the construction limits and will be reported to the CDFW prior to construction.

Prior to the start of construction, a qualified biologist will conduct surveys of the rehabilitation sites to determine whether suitable nesting habitat for the species is present. If suitable habitat is present, the following commitment will be implemented.

- Grading and other construction activities will be scheduled to avoid the nesting season for these species to the extent possible. The nesting season for these species in Trinity County extends from March 15 through July 31. If construction occurs outside the breeding season, no further mitigation is necessary. If construction during the breeding season cannot be completely avoided, the following measures will be implemented.

  - A qualified biologist will conduct a minimum of one preconstruction survey for these species within the rehabilitation sites and a 250-foot buffer around the sites. The survey will be conducted no more than 15 days prior to the initiation of construction in any given area. The preconstruction surveys will be used to ensure that no nests of these species

within or immediately adjacent to the rehabilitation sites will be disturbed during project implementation. If an active nest is found, a qualified biologist will determine the extent of a construction-free buffer zone to be established around the nest.

- If vegetation is to be removed by the project and all necessary approvals have been obtained, potential nesting habitat (e.g., shrubs and trees) that will be removed by the projects will be removed before the onset of the nesting season, if feasible. This will help preclude nesting and substantially decrease the likelihood of direct impacts.

Due to the removal of the bald eagle from the endangered species list, and the availability of the National Bald Eagle Management Guidelines provided by the US Fish and Wildlife Service to protect the bald eagle, additional commitments are outlined below. These measures are now stricter than those outlined in the 2009 Master EIR/Programmatic EA, and provide additional protections for the bald eagle to abide by directives within the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d):

Prior to the start of construction, a qualified biologist will conduct a survey of the rehabilitation sites to determine whether suitable habitat for Bald Eagle and/or northern goshawks is present. If suitable habitat is present, the following commitment will be implemented.

- Construction will be scheduled to avoid the nesting season for bald eagles and northern goshawks to the extent feasible. The nesting season for most raptors in Trinity County extends from February 15 through July 31. Thus, if construction can be scheduled to occur between August 1 and February 14, the nesting season will be avoided and no impacts to nesting bald eagles and/or northern goshawks. If it is not possible to schedule construction during this time, the following measures will be implemented.

  - Pre-construction surveys for bald eagles and nesting northern goshawks will be conducted by a qualified biologist to ensure that no disturbance will occur during project implementation. These surveys will be conducted no more than 14 days prior to the initiation of construction activities. The biologist will conduct surveys immediately adjacent to the impact areas for bald eagles and northern goshawk nests. If eagles or an active nest are found within 500 feet of the construction areas to be disturbed by these activities, the biologist, in consultation with the CDFW and the National Bald Eagle Management Guidelines, will determine the extent of a construction-free buffer zone to be established.

  - If vegetation is to be removed as part of the project and all necessary approvals have been obtained, potential nesting habitat (i.e., trees) that will be removed by the projects will be removed before the onset of the nesting season, if feasible. This will help preclude nesting and substantially decrease the likelihood of direct impacts. Directives under the Bald and Golden Eagle Management Protection Act will be adhered to.

Pre-construction surveys for roosting bats and ring-tailed cats will be conducted prior to the start of construction activities. The surveys will be conducted by a qualified biologist. No activities that will result in disturbance to active roosts of special status bats or dens of ring-tailed cats will proceed prior to completion of the surveys. If no active roosts or dens are found, no further action is needed.

Because bats are known to abandon young when disturbed, if a maternity roost is located, a qualified bat biologist will determine the extent of a construction-free zone to be implemented around the roost. If a bat maternity roost or hibernaculum is present, or a ring-tailed cat den is present, the following commitment will be implemented. CDFW will also be notified of any active bat nurseries within the disturbance zones.

- If an active maternity roost or hibernaculum is found, the projects will be redesigned to avoid the loss of the tree or structure occupied by the roost, if feasible. If the projects cannot be redesigned to avoid removal of the structure, demolition of that structure will commence before bat maternity colonies form (i.e., prior to March 1) or after young are volant (flying) (i.e., after July 31). The disturbance-free buffer zones described above will be observed during the bat maternity roost season (March 1–July 31). If a non-breeding bat hibernaculum is found in a tree or structure to be razed, the individuals will be safely evicted under the direction of a qualified bat biologist, by opening the roosting area to allow air to flow through the cavity. Demolition will then follow no sooner than the following day (i.e., there will be no less than one night between initial disturbance for air flow and the demolition). This action will allow bats to leave during dark hours, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight. Trees with roosts that need to be removed will first be disturbed at dusk, just prior to removal that same evening, to allow bats to escape during darker hours.

- Ring-tailed cats are fully protected species under Fish and Game Code Section 4700. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research. If an active ring-tailed cat nest is found, the projects will be redesigned to avoid the loss of the tree occupied by the nest if feasible. If the projects cannot be redesigned to avoid removal of the occupied tree, the CDFW will be contacted for their input. If approved by CDFW, demolition of the tree will commence outside of the breeding season (February 1 to August 30). If a non-breeding den is found in a tree scheduled to be removed, prior to disturbance, the CDFW will be notified to review and approve proposed procedures to ensure that no take occurs as a result of the action. Trees with dens that need to be removed will first be disturbed at dusk, just prior to removal that same evening, to allow ring-tailed cats to escape during the darker hours.

When using imported erosion control materials (as opposed to rock and dirt berms), use only certified weed-free materials, mulch, and seed. Preclude the use of rice straw in riparian areas. Limit any import or export of fill to materials to those that are known to be weed free.

Ensure all construction equipment is thoroughly washed prior to entering and leaving the worksite. Equipment will be inspected to ensure that it is free of plant parts as well as soils, mud, or other debris that may carry weed seeds.

Use a mix of native grasses, forbs, and non-persistent non-native species for seeding disturbed areas that are subject to infestation by non-native and invasive plant species. Where appropriate, a heavy application of mulch will be used to discourage introduction of these species. Use of planting plugs of native grass species may also be used to accelerate occupation of disturbed sites and increase the likelihood of reestablishing a self-sustaining population of native plant species.

Within the first 3 to 5 years post-project, if it is determined that the project has caused non-native invasive vegetation to out-compete desired planted or native colonizing riparian vegetation, opportunities to control these non-native species will be considered. When implementing weed control techniques, the approach will consider using all available control methods known for a weed species.

Within the first 3 to 5 years post-project, if it is determined that on-site revegetation/post-project conditions do not meet landowner requirements, opportunities to revisit the site and remedy the concern will be considered.

Recreation

Reclamation shall provide precautionary signage to warn recreational users of the potential safety hazards associated with project construction activities. Signs and/or buoys shall be placed within and directly adjacent to the project boundaries along the Trinity River in accordance with the requirements specified in Title 14, Article 6 of the California Code of Regulations. Notification signs shall be posted at public river access areas located within the project area and managed by BLM. Additionally, public notification of proposed project construction activities and associated safety hazards shall be circulated in the local Trinity Journal newspaper prior to the onset of project construction.

Reclamation will repair and/or replace any facilities associated with the Proposed Project that are impacted by project activities. This feature includes installation of interpretive signage consistent with the requirements of the BLM. Preconstruction meetings between Reclamation and landowners/land managers will identify the amount of vegetative screening to be retained at each recreation site within the project area.

Cultural Resources

Prior to initiation of construction or ground-disturbing activities, all construction workers will be alerted to the possibility of discovering cultural resources. This includes prehistoric and/or historic resources. Personnel will be instructed that upon discovery of buried cultural resources, work within 50 feet of the find will be halted and Reclamation's designated archaeologist will be consulted. Once the find has been identified, Reclamation will be responsible for developing a treatment plan for the cultural resource including an assessment of its historic properties and methods for avoiding any adverse effects, pursuant to the PA and in compliance with the NHPA.

Implementation of the proposed project could potentially result in disturbance of undiscovered human remains.

If human remains are encountered during construction on non-federal lands, work in that area will be halted and the Trinity County Coroner's Office will be immediately contacted. If the remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) will be notified within 24 hours of determination, as required by PRC, Section 5097. The NAHC will notify designated Most Likely Descendants, who will provide recommendations for the treatment of the remains within 24 hours. The NAHC will mediate any disputes regarding treatment of remains. If Native American human remains and associated items are discovered on federal lands, they will be

treated according to provisions set forth in the Native American Protection and Repatriation Act (25 USC 3001) as well as Reclamation's Directives and Standards LND 02-01. If the find is determined to be a historical resource or a unique archaeological resource, as defined by CEQA, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or other appropriate mitigation will be made available. Work may continue on other parts of the project while mitigation for historical or unique archaeological resources takes place.

Air Quality

Reclamation will implement a dust control program to limit fugitive dust and particulate matter emissions. The dust control program will include the following elements as appropriate:

- Inactive construction areas will be watered as needed to ensure dust control.
- Pursuant to the California Vehicle Code (Section 23114), all trucks hauling soil or other loose material to and from the construction site will be covered or will maintain adequate freeboard to ensure retention of materials within the truck's bed (e.g., ensure 1-2 feet vertical distance between top of load and the trailer).
- Excavation activities and other soil-disturbing activities will be conducted in phases to reduce the amount of bare soil exposed at any one time. Mulching with weed-free materials will be used to minimize soil erosion.
- Watering (using equipment and/or manually) will be conducted on all stockpiles, dirt/gravel roads, and exposed or disturbed soil surfaces, as necessary, to reduce airborne dust.
- All paved access roads, parking areas, and staging areas will be swept (with water sweepers), as required by Reclamation.
- Paved roads will be swept (with water sweepers) if visible soil material is carried onto adjacent private and public roads, as required by Reclamation.
- All ground-disturbing activities with the potential to generate dust will be suspended when winds exceed 20 mph, as directed by the NCUAQMD.
- Reclamation or its contractor will designate a person to monitor dust control and to order increased watering as necessary to prevent transport of dust offsite. This person will also respond to citizen complaints.

Reclamation will comply with NCUAQMD Rule 104 (4.0) Particulate Matter. This compliance could occur by using portable internal combustion engines registered and certified under the state portable equipment regulation (Health & Safety Code 41750 through 41755).

Construction activity occurring within 300 feet of elementary schools will be limited to the period when school is not in session.

Construction activity occurring within 300 feet of residences will be limited to Monday through Saturday, from the hours of 9 a.m. to 5 p.m.

Reclamation will notify residences within 300 feet of the site and project activity and elementary schools will be notified of construction activity located near the school prior to site construction activities.

Reclamation will ensure that a notice is posted at/adjacent to the rehabilitation site, which contains a phone number for the public to contact for concerns related to air quality.

Noise

Construction activities near residential areas will be scheduled between 7:00 a.m. and 7:00 p.m., Monday through Saturday. No construction activities will be scheduled for Sundays or other hours and days established by the local jurisdiction (i.e., Trinity County). The contractor may submit a request for variances in construction activity hours, as needed.

Reclamation will require that all construction equipment be equipped with manufacturer's specified noise muffling devices.

Reclamation will require placement of all stationary noise-generating equipment as far away as feasibly possible from sensitive noise receptors or in an orientation minimizing noise impacts (e.g., behind existing barriers, storage piles, unused equipment).

Public Services and Utilities/Energy

Reclamation will require that staging and construction work, including temporary road or bridge closures occurs in a manner that allows for access by emergency service providers.

Reclamation will provide 72-hour notice to the local emergency providers and affected users prior to the start of temporary closures.

Reclamation will coordinate road closures occurring during the school year (mid-August through mid-June) with the appropriate school districts to avoid disruption of school attendance and student access to bus service.

Transportation/Traffic Circulation

Reclamation will post signs during gravel haul activities notifying travelers of trucks entering the roadway. Reclamation will ensure that gravel trucks maintain a speed limit of 15 mph on residential and private roads and operate only between the hours of 7 a.m. and 7 p.m., Monday through Saturday.

Reclamation will perform a pre-construction survey of local federal and state roads to determine the existing roadway conditions of the construction access routes, and will consult with the relevant agencies/private parties about road conditions prior to construction activity and post construction activity. An agreement will be entered into prior to construction that will detail the pre-construction conditions and post-construction requirements for potential roadway rehabilitation.

Reclamation will prepare and implement a traffic control plan that will include provision and maintenance of temporary access through the construction zone, reduction in speed limits though the construction zone, signage and appropriate traffic control devices, illumination during hours of

darkness or limited visibility, use of safety clothing/vests to ensure visibility of construction workers by motorists, and fencing as appropriate to separate bicyclists, pedestrians, and equestrians from construction activities. Reclamation will obtain encroachment permits from the appropriate entities to work within road easements. These permits will require traffic control and signage to meet California standards.

Tentative Schedule

Development of preliminary designs for this site began in 2011 and designs for the current Proposed Project, which incorporates land manager and TRRP design input, was completed in 2015. The Proposed Project is planned for construction in 2016, if funding is available. Some staging of materials, such as trees and gravel, could be staged on site before construction begins. Construction associated with the Proposed Project would not begin until the environmental process is completed. In addition, the following will have been completed: the final designs, plans, contract specifications, and cost estimates; award of contract(s) for work; acquisition of rights-of-way; BLM vegetation removal contract; acquisition of permits; and design approvals from local, state, and federal agencies.

To minimize impacts to breeding birds, construction would typically begin after nesting (August 1), but could begin sooner if pre-August bird surveys determine that nesting birds are not, and will not be, present in the construction areas, and thus would not be impacted by construction. Due to the extent of in-channel construction at the Bucktail site, contractors are expected to move into the site and to initiate pre-construction surveys for breeding birds and construction staking as early as June. Construction may begin after approvals are received (e.g., 404 Permit) where breeding bird surveys indicate that no impacts to birds will occur. Surface disturbance activities may be limited during the late spring (May and June), depending on the flow release schedule established for the particular water year. Although the majority of excavation and grading activities would typically occur between July 15 and November 1, excavation may continue later as long as surface water runoff does not increase the mainstem Trinity River turbidity by > 20 percent (Trinity River summer turbidity is typically very low; < 2 nephelometric turbidity units [NTUs]). Revegetation work (e.g., planting of willow pole cuttings and/or container plants, and seeding with native grasses) would generally take place in the wet season (fall/winter) following work or a year after construction.

2.5 Alternatives Considered but Eliminated from Further Evaluation

Within the general confines of the defined activity areas and ESL, the designers continue to use models to inform themselves as to the potential effects that changes in constructed topography (how the features are built – using various grades, side slope angles, and elevation on the ground) might have on how constructed features function under various flow conditions. The designers have been evaluating how these relatively minor changes in design affect modeled water depths, velocities, and sheer stresses under post construction conditions and how these results might affect long-term maintenance/evolution of features. Results of modeling are being used to select optimal configurations for maximum aquatic habitat quality for juvenile salmonids (e.g., depth, velocity, and substrate) in as-built conditions and as conditions evolve (e.g., erode, aggrade, or vegetate) under envisioned ROD flow conditions. In addition to the alternatives described above, the following alternative was also considered but dismissed for the reasons presented.

2.5.1 2013 Design Alternative

The original 2013 Bucktail and Lower Junction City EA/IS contained a different alternative than presented in Section 2.42. At that time, commenters objected to the split flow channel (at IC-5) and mechanical re-routing of the river at IC-3. They stated that creation of the side channel would reduce the depth of water over gravel bars, particularly at winter base flows of 300 cfs, and that this would affect fishermen who have to drag boats over gravel bars at low flows, therefore potentially impacting salmon redds contained in the gravel bars. They also objected to the reduction in public access to the Trinity River. They stated that public access would be temporarily affected during the construction period as well as being reduced in the long term because of the proposal to replace the existing public access boat launching area upstream of Bucktail Bridge to an area downstream of the bridge on BLM managed lands, resulting in a net loss of public access. Therefore, design revisions were made based on program partner and public comments received during the CEQA/NEPA process.

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