

## **EXECUTIVE SUMMARY**

In September 2014 Siskiyou Research Group (SRG) conducted an aquatic habitat inventory and an aquatic biota survey of Taylor Creek to partially satisfy the Rogue River – Siskiyou National Forest’s (RR-SNF) aquatic resource inventory goals and to provide baseline data. SRG followed methods described in the Forest Service Region 6 (Pacific Northwest Region) Stream Inventory Handbook (2014). The survey began at Taylor Creek’s confluence with Baldface Creek (42° 02’ 58.44”N, 123° 54’ 55.62”W, NAD 83) and extended upstream 3.47 miles. The aquatic biota surveys were performed to determine fish species presence, distribution, and relative abundance.

The survey of Taylor Creek was conducted in one reach based on the similarity of canyon morphology, stream gradient, channel substrate, and flow. The very upper portion of the survey was characteristically different but was too short in length to justify a reach break.

The geomorphology of Taylor Creek was characterized by a moderately sloped V-shaped peridotite colluvial canyon that contained a mild to moderate gradient 11-foot wide stream. Long rapids and riffles and short shallow mid-channel scour pools best describe the most common aquatic habitats. Cobble and gravel were estimated to be the most common channel substrate. Gravel was found in small pockets of deposition in low gradient sections. Bedrock was common in lower Reach 1. Stream bank erosion and inner canyon instability were present in the form of cutbanks and moderately sized landslides (Photo 24). Stream gradient averaged 6%. Large woody material (LWM) was moderately abundant (50 pieces/mile) but not distributed equally throughout the survey. The greater concentration of instream wood was located in upper Reach 1.

Aquatic biota surveys were conducted with a mask and snorkel and focused on the identification, distribution, and abundance of salmonids. SRG identified a moderately sized population of steelhead/rainbow trout in the 0 – 100 mm and 100 mm – 200 mm size classes. Fish density was calculated to be 0.099 fish/yd<sup>2</sup>. No physical barriers to fish passage were identified except for perhaps the steep boulder rapid that must be negotiated to enter Taylor Creek from Baldface Creek (Photo 1). Fish distribution extended deep into the Taylor Creek drainage as a result of a mild to moderate stream gradient, a lack of physical barriers, and sufficient cool water produced in the upper watershed areas. Other aquatic animals included foothill yellow-legged frogs (*Rana boylei*), aquatic garter snakes (*Thamnophis atratus*), Pacific giant salamanders (*Dicamptodon tenebrosus*), and aquatic macroinvertebrates.

The riparian habitat and adjacent forest in the lower and middle sections were of peridotite-influenced vegetation and consisted mostly of small tree class Port-Orford-cedar (*Chamaecyparis lawsoniana*), lodgepole pine (*Pinus contorta*), western white pine (*Pinus monticola*), Douglas-fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), Jeffery pine (*Pinus jeffreyi*), knobcone pine (*Pinus attenuate*) and associated shrubs such as coffeeberry (*Rhamnus californica*), willow (*Salix spp*), manzanita (*Arctostaphylos spp*), western azalea (*Rhododendron occidentale*), Pacific madrone (*Arbutus menziesii*), and Pacific yew (*Taxus brevifolia*). Vegetation structure and growth were stunted and sparse as a result of the serpentine-type geology. Further, throughout the lower and middle sections the canyon vegetation was regenerating from the 2002 Biscuit Fire (Photo 25). As a result, stream shading and canopy cover were poor and recruitment of instream LWM was moderate to low because of the small diameter riparian trees that were common. Conversely, the lower and middle sections did exhibit areas that were not severely burned and contained green vegetation including a narrow inner riparian overstory of live large Port-Orford-cedars (Photos 15, 16) that provided shade and potential recruitment of instream LWM. The upper portion of Taylor Creek contained a lush green forest of large and mature Port-Orford-cedar and Douglas-fir (Photos 29-31) as a result of a change in soil type (from peridotite derived soils of the lower and middle sections to diorite derived soils of the upper section). The mature

mixed conifer forest provided deep shade and large amounts of LWM. Stream temperatures were considerably lower in this section compared to the sparse and open canopy areas of the peridotite canyon. Worth mentioning were the numerous *Darlingtonia* (*Darlingtonia californica*) fens located in the inner canyon and riparian zone along Taylor Creek (Photos 4, 21). These unique habitats were a source of cool water and diverse vegetation in the Taylor Creek drainage.

## INTRODUCTION

Taylor Creek, a second order tributary to Baldface Creek, flows north in the coastal Siskiyou Mountains for approximately 3.7 miles before joining Baldface Creek approximately 4.5 miles upstream of Baldface Creek's confluence with the North Fork Smith River. Taylor Creek drains an area of approximately 1,870 acres and is part of the Baldface Creek subwatershed of the North Fork Smith River watershed. Elevations in the Taylor Creek drainage range from approximately 1,637 feet at the survey start point to 3,280 feet. Nearly the entire drainage is located in the rain dominated elevation belt and receives annual precipitation amounts that can exceed 95 inches with most of this moisture coming during the winter months. Temperate, moisture-laden storms from the Pacific Ocean often deliver rain in relatively short but intense events.

Landscape features of the Taylor Creek drainage include:

- Typical peridotite geology of the Josephine Ultramafic sheet characterized by soil deficient in calcium and high in heavy metals.
- Possible deposits of nickel, chromium, and other heavy metals and commercial interest to extract.
- Located on National Forest land that provides habitat and connectivity for plants and animals that is adjacent to both a National Recreation Area and a Wilderness Area.
- Riparian vegetation and adjacent forest burned in the 2002 Biscuit Fire.
- Several large fens featuring *Darlingtonia californica* and other fen-associated plants endemic to peridotite geology provide high plant diversity and cool water to Taylor Creek.
- Perennial stream flow, a low to moderate gradient channel, and no physical barriers provides for the distribution of fish deep into the drainage.
- Upper section of Taylor Creek contains an area that was not burned in 2002 and is of a soil type not derived from peridotite rock, providing a

lush mature riparian forest with a high percent of canopy closure (that lowers stream temperatures) and a high recruitment potential for instream LWM.

- A small number of adult winter steelhead likely use the low gradient sections of Taylor Creek for spawning.

The Taylor Creek drainage, and larger Baldface Creek subwatershed, are located on land managed by the Wild Rivers Ranger District of the Rogue River-Siskiyou National Forest (RR-SNF). These systems are part of the North Fork Smith River watershed, which has been designated a Tier 1 key watershed and is currently managed as a late successional reserve as defined in the 1994 Northwest Forest Plan. Further, the designation of a Tier 1 key watershed means management priority will be given for the protection and propagation of at risk anadromous fish populations (ROD, USDA Forest Service, 1994).

In September 2014 approximately 3.47 miles of Taylor Creek were surveyed for type of aquatic habitats, composition of channel substrates, amount and distribution of stream bank erosion, amount and distribution of large woody material (LWM), presence of invasive species, and composition of riparian habitat using a protocol described in the 2014 Forest Service Region 6 Stream Inventory Handbook. Additionally, we conducted fish surveys with mask and snorkel to assess species composition, abundance, and distribution.

The survey of Taylor Creek was conducted in one reach. Right and left stream bank designations were of the perspective of looking downstream. All aquatic habitats were measured for length, width, and depth. **Table 1** summarizes information collected during the survey of Taylor Creek. An explanation of codes used in this report is found in **Appendix A**. A survey map showing the location of survey start and end points, reach breaks, SOs, tributaries, and photographic points are found in **Appendix B**. Thirty-two photographs were taken and described in a photographic log depicting representative/typical habitats, unusual or permanent features, landmarks, wood complexes, riparian forests, and reach start and end habitats. Photographs and the photographic log are found in **Appendix F**.

**Table 1. Summary of Taylor Creek Attributes. 2014 Stream Survey.**

<b>Stream Order</b>	2	<b># Special Case Units</b>	0
<b>Rosgen Channel Type</b>	B3	<b>Bank Instability (% reach length)</b>	3.7
<b>Valley Segment Type</b>	Colluvial Canyon	<b>Dominant / Subdominant Substrate</b>	Cobble / Gravel
<b>Valley Form</b>	Moderate V-shaped	<b>D<sub>50</sub> - 1 (mm)</b>	89
<b>Valley Width Estimate (ft)</b>	100	<b>D<sub>84</sub> - 1 (mm)</b>	510
<b>Measured Length (miles)</b>	3.47	<b>D<sub>50</sub> - 2 (mm)</b>	59
<b>Mapped Gradient (%)</b>	6.38	<b>D<sub>84</sub> - 2 (mm)</b>	293
<b>Measured Sinuosity</b>	1.00	<b>Dominant / Subdominant Riparian Veg. Class</b>	Small tree / Shrub
<b>Entrenchment Ratio</b>	1.55	<b>Overstory / Understory Riparian Species</b>	CT,CD,CL,CX HW,HM,CY
<b>Bankfull Width:Depth</b>	22.17	<b>SWM / Mile</b>	43
<b>Average Bankfull Width (ft)</b>	18	<b>MWM / Mile</b>	6
<b>Ave. Bankfull Depth (ft)</b>	0.8	<b>LWM / Mile</b>	0.6
<b>Ave. Floodprone Width (ft)</b>	27	<b>Hi / Lo H<sub>2</sub>O Temp. (°C)</b>	17 / 13
<b>Ave. Floodprone Depth (ft)</b>	3.2	<b>Dominant Cover Type for Fish</b>	Substrate, LWM
<b>Ave. FW Width (ft)</b>	11	<b>Fish Species Observed</b>	ONMY
<b>Ave. FW Depth (ft)</b>	0.6	<b>Salmonid Density (fish/yd<sup>2</sup>)</b>	0.099
<b>% SW Units</b>	14		
<b>SW<sub>(area)</sub>:FW<sub>(area)</sub></b>	0.16		
<b>SW Units / Mile</b>	21		
<b>Ave. Residual SW Depth (ft)</b>	1.7		

## GEOLOGY / GEOMORPHOLOGY

The Taylor Creek drainage is located in the geologically complex Klamath Mountains Physiographic Province. The bulk of the watershed is comprised of ultramafic rock consisting of serpentinite and various peridotites including harzburgite (saxonite), dunite, and pyroxentite (Ramp and Peterson, 1977). The ultramafic rock found in the Baldface watershed and the Taylor Creek drainage is part of a larger ultramafic sheet that extends south into Del Norte County, California and east into Josephine County, Oregon. This body of rock is referred to as the Josephine Ultramafic Sheet and is believed to be the largest and most complete exposure of this type on a continental land mass (Orr, et. al. 1992). Located in the upper portion of the drainage was a pocket of post-amalgamation Jurassic – Diorite. This change in geologic parent rock explains the change in vegetation pattern from sparse and stunted vegetation (of ultramafic geology) to lush green mature forest vegetation (diorite geology), it might also help explain the burn pattern of the 2002 Biscuit Fire and why fire was considerably less severe to absent in the upper portion of the drainage.

The Taylor Creek drainage contained moderately sloped to steeply sloped mountainous terrain, broad plateaus formed by low angle ultramafic thrust plates, large inner canyon landslides, and incised V-shaped tributary canyons. In general, Taylor Creek flows through a peridotite colluvial canyon containing small bedrock outcrops. Overall stream gradient is moderate, channel width averaged 11 feet, and aquatic habitats were shallow. Valley bottom width estimates ranged from 75 feet to 150 feet.

### **RIPARIAN HABITAT**

The riparian habitat, as defined by the 2014 Forest Service Region 6 Stream Inventory Handbook, consists of an area extending 100 linear feet out from each stream bank. This survey divided the riparian habitat into an inner zone (0-25 feet) and an outer zone (25-100 feet). We reported the average vegetative condition regarding dominant species and size class in the overstory and understory at each snorkeled unit to help characterize the riparian forest. We also noted the general condition of riparian habitat throughout each reach with qualitative observations. The reach summaries contain descriptions of the riparian habitat for that reach.

### **AQUATIC HABITAT**

The most common aquatic habitats in Taylor Creek were long shallow riffles and rapids and small shallow mid-channel scour pools. Other aquatic habitats included a small number of plunge pools and side channels. Side channel habitat did not provide an appreciable amount of unique off-channel habitat. Cobble was the most common substrate estimated in both slow and fast water units. Gravel was subdominant and small pockets of suitable spawning gravel were noted in the low gradient sections along the habitat margins and in some pool tails (Photo 10).

Large woody material was found in moderately abundant amounts but was not equally distributed through Reach 1. The small diameter and sparse riparian vegetation in many areas did not provide for instream LWM, whereas some areas of the riparian forest did contain small stands of overstory trees large enough to contribute to instream LWM. Further, the upper portion of Reach 1 found on the diorite Pluton supported a mature

Port-Orford-cedar and Douglas-fir riparian forest that provided a large amount of instream LWM (Photo 30). Overall LWM was tallied to be 50 pieces/mile. Much of this wood was found as individual pieces, although several small wood jams were also noted (Photo 12).

## **FISHERIES**

Fish surveys were conducted by direct observation using a mask and snorkel to determine fish species presence, abundance, and distribution. Our survey results showed a moderate population of steelhead/rainbow trout in the 0 – 100 mm and 100 mm – 200 mm size range. No fish passage barriers were identified in the survey of Taylor Creek and fish distribution extended deep into the drainage. It appeared to be an increasing stream gradient and decreasing stream flow in the very upper section of the drainage that limited distribution. The short sections of low gradient channel with areas of deposition provided spawning habitat for the probable small number of adult winter steelhead using Taylor Creek for spawning. In addition to native trout we found yellow-legged frogs and aquatic garter snakes to be common in the lower and middle sections and Pacific giant salamanders were observed in the upper section.

## **REACH SUMMARY**

### **REACH 1**

Reach 1 began at the confluence with Baldface Creek (042° 02' 58.44"N, 123° 54' 55.62"W – NAD 83) and ended 3.47 miles upstream (042° 01' 03.35"N, 123° 53' 47.22"W). The reach and survey were ended at this location due to an absence of fish and an increasing stream gradient and decreasing stream flow.

### **GEOMORPHOLOGY / HYDROLOGY**

Reach 1 was located in a moderately to steeply sloped V-shaped peridotite colluvial canyon. Mapped channel sinuosity was very low (1.00) and average mapped channel gradient was 6.38%. Two stream gradient measurements taken at Wolman pebble count sites with an Abney hand level were 11% and 4%. The peridotite colluvial canyon exhibited areas of erosion in the form of cutbanks and moderately large inner canyon

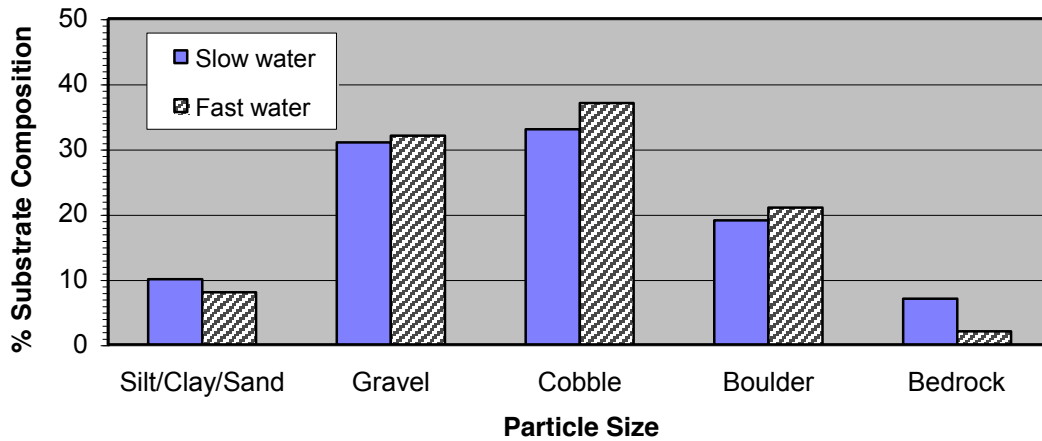
landslides. We observed thirteen aquatic habitats that contained eroding stream banks that totaled 671 linear feet, or 3.7% of the total reach length. Average mapped valley width was estimated to be 100 feet and field estimates ranged between 75 feet and 150 feet. Due to the remote location of Taylor Creek we were not able to measure discharge with the standard Price pygmy velocity meter and top set rod, but rather had to estimate stream flow at approximately  $0.5 \text{ ft}^3/\text{sec}$  ( $\pm 0.25 \text{ ft}^3/\text{sec}$ ) at the time of the survey.

Channel substrate composition estimates were made at every pool and riffle in order to describe the streambed for those habitat types. These estimates were then averaged (but not corrected for habitat length) for the reach. The result depicts a cobble-dominated channel for both pools and rapids. Gravel was subdominant substrate size and boulder was common (**Figure 1**). Two Wolman pebble counts conducted in Reach 1 indicated a median channel substrate size ( $D_{50}$ ) of 89 mm (small cobble) and 59 mm (very coarse gravel). Wolman pebble count graphs for Taylor Creek are found in **Appendix D**.

In an effort to describe channel morphology five cross section measurements were conducted in Reach 1. These results were averaged to describe an entrenched to moderately entrenched channel (entrenchment ratio of 1.55, range 1.15-2.07) with a bankfull width-to-depth ratio of 22.17 (**Appendix C**). Based on an average of hydrological data, substrate size estimates, stream gradient, photographs, and Wolman pebble counts, Reach 1 was classified as a B3 Rosgen stream type (Rosgen 1996).



**Figure 1. Average Substrate Composition  
Taylor Creek Reach 1**



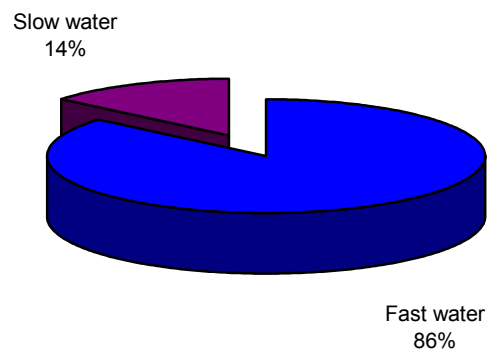
### **RIPARIAN HABITAT**

As previously mentioned, the riparian vegetation and vegetation on the adjacent slopes was influenced by ultramafic geology and was regenerating in many areas from the 2002 Biscuit Fire. As a result, the riparian vegetation consisted mostly of an overstory in the inner and outer zone of small tree class Port-Orford-cedar, lodgepole pine, Douglas-fir, western white pine, knobcone pine, and madrone. The understory was typically shrub class vegetation associated with ultramafic geology such as coffeeberry, western azalea, and manzanita. This vegetation was found in the lower and middle sections of the survey and provided a low percent of canopy cover and shade and a low potential for the recruitment of LWM. Conversely, there were pockets in the middle section that contained a narrow band of large live Port-Orford-cedars in the inner riparian zone that provided shade and a higher LWM recruitment potential. Further, the geology changed in the upper section and supported a mature mixed conifer (Port-Orford-cedar and Douglas-fir) forest that provided a high percent of canopy cover and a high recruitment potential of LWM (Photo 30). Worth mentioning were the numerous *Darlingtonia* (Photos 4, 7, 11, 21) fens observed in peridotite canyon of the lower and middle section of Taylor Creek.

## AQUATIC HABITAT

The aquatic habitats of Reach 1 consisted mostly of shallow rapid and riffles and shallow scour pools. Also identified were three small plunge pools and two short side channels located in lower Reach 1. In general, fast water comprised 86% of the total habitat area and slow water comprised 14% of the total habitat area (**Figure 2**). Specifically, fast water consisted of 82% rapids and 4% low gradient riffles. Slow water consisted of 13% mid channel scour pools and 1% plunge pools (**Figure 3**).

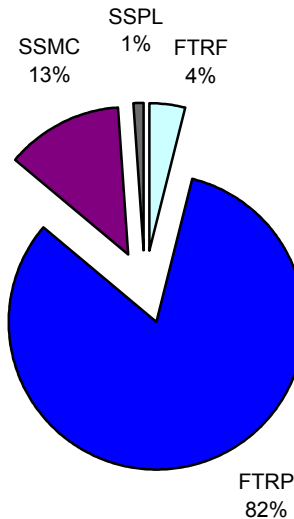
**Figure 2. Habitat Composition  
Taylor Creek Reach 1**



Seventy-two pools were identified in Reach 1 for a pool frequency of 21 pools/mile. Three pools exceeded three feet in depth (residual depth) for a deep pool frequency of 0.9 pools/mile. Average residual maximum pool depth for Reach 1 was 1.7 feet and the deepest pool was 3.5 feet (residual depth at SO 105, SSPL 52). Average pool tail crest was 0.3 feet. The longest pool was 62 feet (SO 111, SSMC 55), average pool length was 29 feet, and average pool width was 12 feet. Total pool area in Reach 1 was approximately 24,979 ft<sup>2</sup>. Pool habitat in Taylor Creek was small in area and shallow. Cover for fish was provided by overhanging streambanks, channel substrate, overhanging vegetation, and instream LWM. Seventy-one fast water units were identified in Reach 1. Average fast water depth was 0.6 feet, average fast water maximum depth was 1.6 feet, and average fast water width was 11 feet. The longest fast water unit was 1,161 feet (SO 137, FTRP 65) and average fast water length was 229 feet. Total fast water area in Reach 1 was approximately 151,760 ft<sup>2</sup>. Fast water habitat was shallow and long and provided

pocket pool habitat, pockets of deposition and spawning habitat, and cover for fish in boulder substrate and instream LWM.

**Figure 3. Taylor Creek Channel Unit Composition  
Reach 1**



We counted a total of 173 pieces of LWM (size classes combined) for a reach frequency of 50 pieces/mile. Specifically, we counted 150 pieces of small class LWM (43 pieces/mile), 21 pieces of medium class LWM (6 pieces/mile), and 2 pieces of large class LWM (1 piece/mile). Wood was found in Reach 1 as scattered pieces and some pieces tied up in small wood complexes. A large percentage of the total wood was found in the upper section of Reach 1 where the riparian forest was of a mature seral stage. Snags created by the 2002 Biscuit Fire were beginning to contribute to instream LWM in the lower and middle sections.

**Figure 4. Large Woody Material  
Taylor Creek**



## FISHERIES

Fish identification and enumeration were obtained from direct observation using a mask and snorkel. Sampling frequency, based on a random start, was every fifth slow water unit and every tenth fast water unit. We calculated moderate fish densities based on snorkel counts. Fourteen slow water units and six fast water units were snorkeled in Reach 1 sampling area of 4,765 ft<sup>2</sup> and 6,839 ft<sup>2</sup>, respectively. We identified steelhead/rainbow trout. In the fourteen snorkeled slow water habitats we counted 61 size-class 1 (0-100 mm), 27 size-class 2 (100 mm – 200 mm), and 2 size class  $\geq 3$  (> 200 mm) steelhead/rainbow trout for a combined density of 0.170 fish/yd<sup>2</sup>. In the six snorkeled fast water habitats we counted 32 size-class 1 and 5 size-class 2 for a density of 0.049 fish/yd<sup>2</sup>. Combined (pools and riffles) salmonid density for Reach 1 was 0.099 fish/yd<sup>2</sup>. No physical barrier to fish passage was observed in the survey of Taylor Creek and fish distribution extended deep into this drainage. Small numbers of steelhead likely use Taylor Creek for spawning and rearing, although the entrance jump from Baldface Creek into Taylor Creek was steep and rocky at low stream flows. **Table 2** summarizes the results of the snorkel survey data for species, habitat type, and size class. **Appendix C** contains habitat dimensions and fish counts in a calculation table used to derive fish densities and **Appendix E** contains completed field forms (raw data) of aquatic biota surveys. Stream temperatures taken at every measured unit in Reach 1 ranged from 11°C (upper Reach 1) to 17°C (lower and middle Reach 1).

**Table 2. Summary of Fish Species, Age Class, and Density by Habitat Type Taylor Creek 2014 Stream Survey Snorkel Results**

Reach #	Habitat Type	% Area Sampled	Species Code	Tally by Size Class			Total Salmonids			Salmonid Density (fish/yd <sup>2</sup> )								
				1	2	≥3	SW	FW	Sum	SW	FW	ONMY	ONCL	ONKI	ONTS	1	≥2	Total
1	SW	19	ONMY	61	27	2												
	FW	4.5	ONMY	32	5	0												
Salmonid Size Class Totals				93	32	2	90	37	127	0.170	0.049	0.099	0.000	0.000	0.000	0.072	0.026	0.099

Size Class Definition: 1 = 0 to 100mm, 2 = 100mm to 200mm, ≥3 = >200mm

**TRIBUTARIES**

Six tributaries were identified during the survey of Taylor Creek (see survey maps for locations) that contributed 1% or greater of the volume of Taylor Creek at the tributary confluence point. Only one tributary (Tributary 4) was identified as fish-bearing.

Tributary stream temperatures ranged from 11°C to 17°C. **Table 3** provides a summary of the information collected at the mouth of each tributary.

**Table 3. Summary of Tributary information, Taylor Creek 2014**

Tributary Number	Reach #	Est. Flow Contrib.	Fish Bearing?	Temp (°C)	Time	Gradient at Mouth	Enters From	Tributary Name
1	1	7%	No	17	1355	30%	Left	None
2	1	5%	No	15	1418	36%	Right	None
3	1	1%	No	17	1438	20%	Right	None
4	1	40%	Yes	14	1616	10%	Left	None
5	1	25%	No	11	1735	15%	Left	None
6	1	8%	No	11	1749	24%	Left	None

**SUMMARY**

Taylor Creek is a small perennial tributary to Baldface Creek located in a moderately sloped V-shaped colluvial canyon dominated by ultramafic geology. Vegetation is relatively sparse and stunted due to the elemental composition of the soil. Stream shading and contributions of instream LWM were low in this area and stream temperatures were relatively warm. The 2002 Biscuit Fire burned hot through the middle section, including in the riparian zone (Photos 22-25). By contrast, the upper section of Taylor Creek was characterized by plutonic diorite geology and an unburned mature mixed conifer riparian forest. Stream temperatures were lower in this section due to the high percent of canopy cover. Several *Darlingtonia* fens were found in the lower and middle sections that provided subsurface flow to Taylor Creek and increased biological diversity provided by the specialized plants and animals endemic to fens.

Taylor Creek offers aquatic habitat to a moderately sized population of rainbow trout. It is also probable a small number of adult steelhead use the low gradient sections containing pockets of suitable habitat for spawning. The aquatic environment of Taylor Creek also provided habitat for aquatic garter snakes, foothill yellow-legged frogs, Pacific giant salamanders, and aquatic macroinvertebrates.

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