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# Inyo National Forest and Bureau of Land Management Ridgecrest Field Office

## Cottonwood Creek Wild and Scenic River Comprehensive River Management Plan



**Forest Service**  
**Bureau of Land Management**

**Inyo National Forest**  
**Ridgecrest Field Office**  
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**Pacific Southwest Region**  
**California Desert District**



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# Background

This comprehensive river management plan (CRMP) establishes programmatic management direction for Cottonwood Creek (“river”), a Wild and Scenic River (WSR) administered jointly by the US Forest Service (Forest Service) and Bureau of Land Management (BLM). Within the area of Forest Service jurisdiction, the river runs through the White Mountain Ranger District of the Inyo National Forest (the Forest). Within the area of BLM jurisdiction, the river runs through the Ridgecrest Field Office management area. This CRMP has been developed to implement the direction of the Wild and Scenic Rivers Act of 1968 (Public Law 90-542) (Act) as amended in the 2009 Omnibus Public Land Management Act (2009 Omnibus Act). The 2009 Omnibus Act added 21.5 miles of Cottonwood Creek to the National Wild and Scenic Rivers System. The Wild and Scenic Rivers Act established a system for preserving outstanding free-flowing rivers. Section 1(b) of the Act directs that:

*“...certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreations, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.”*

## Role of a CRMP

The Act requires the agency responsible for administration of designated rivers to develop a CRMP that provides for the protection and enhancement of the river’s water quality, free-flowing condition and “outstandingly remarkable values,” collectively referred to as “river values,” for the benefit and enjoyment of present and future generations. The Forest Service, under the direction of the Secretary of Agriculture, and the BLM, under the direction of the Secretary of Interior, are the agencies responsible for the administration of Cottonwood Creek.

The purpose of this CRMP for the Cottonwood Creek WSR is to protect and enhance river values by providing desired conditions, management direction, and monitoring plans that will be applied to the designated river corridor. The CRMP also addresses resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of the Act.

This CRMP does not withdraw or invalidate valid existing rights within the corridor. Existing land uses in the Cottonwood Creek WSR corridor are discussed in the “Land Uses and Access in River Corridors” section below. With respect to locatable, leasable, and salable minerals, WSR segments classified as scenic or recreational are not withdrawn under the Act from mining or mineral leasing laws. Per the National Wild and Scenic Rivers System website (2022):

*“Existing valid claims or leases within the river boundary remain in effect, and activities may be allowed subject to regulations that minimize surface disturbance, water sedimentation, pollution, and visual impairment. Reasonable access to mining claims and mineral leases will be permitted...For river segments classified as wild, no new mining claims or mineral leases can be granted; however, existing valid claims or leases within the river boundary remain in effect, and activities may be*

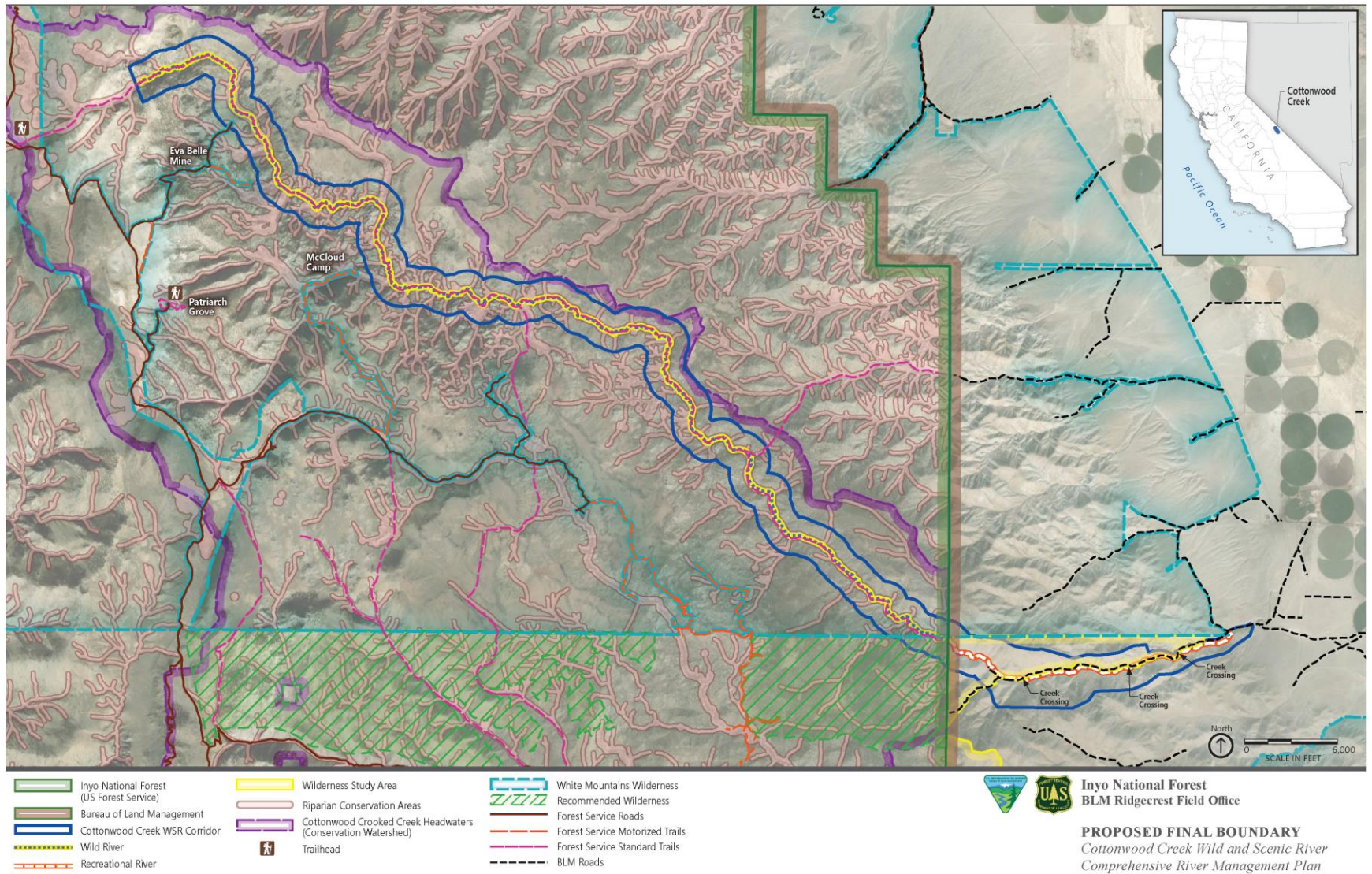
*allowed subject to regulations that minimize surface disturbance, water sedimentation, pollution and visual impairment.”*

Cottonwood Creek and its boundaries are shown in Figure 1, below. The river’s outstandingly remarkable values include the following (organized by administering agency), which are further discussed in the Baseline Conditions section.

- Forest Service
  - Scenery
  - Wildlife
  - Fisheries
  - Historic, Prehistoric, and Cultural Resources
  - Botany
- BLM
  - Scenery
  - Wildlife
  - Recreation
  - Botany

As established in the 2009 Omnibus Act, the Forest Service administers a 17.4-mile wild segment of Cottonwood Creek. BLM administers a 4.1-mile recreational segment of the river (Public Law 111-11 2009). Further discussion of the river’s classifications is detailed in the “Wild and Scenic River Corridor Classification” section, below.

This management plan will guide all development, management, and restoration activities in the wild and scenic river corridor.



**Figure 1. Final Boundary**  
 Cottonwood Creek  
 Comprehensive River Management Plan

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## River Corridor Locations and Boundaries

Cottonwood Creek originates in ancient bristlecone forests and is the longest perennial stream east of the White Mountains. The majority of Cottonwood Creek lies in Mono County, California, but also flows through neighboring Inyo County to the south. Cottonwood Creek flows through the Inyo National Forest and onto BLM land. As described on the National Wild and Scenic Rivers System website (2020):

*“The creek flows eastward from the 14,000-foot crest of the White Mountains and steeply descends through groves of aspen, eventually flowing into a sagebrush desert. Numerous springs feed the creek as it meanders through large meadows in the upper reaches. Stands of aspen and bristlecone pine can be found in the higher elevations, while lower elevations are marked with stands of pinyon and juniper trees.”*

The proposed final boundary for the 17.1-mile FS segment is the same as the interim boundary: a quarter-mile distance on each side of the river. For the BLM 4.1-mile segment, the final boundary is a modified boundary that reflects protection of the scenic viewshed. This boundary varies in width but comprises 320 acres per river mile, as mandated by the Act. The boundary is shown in Figure 1.

## Wild and Scenic River Corridor Classifications

The Act states rivers should be classified, designated, and administered as wild, scenic, or recreational. The three classes (wild, scenic, or recreational) represent a development scale and serve as a framework for future management; they are not synonymous with the river’s outstandingly remarkable values. Designating river segments in classifications neither prohibits development nor gives the federal government control over private property. According to the 2009 Omnibus Act, wild rivers are “those rivers or sections of river that are free of impoundments and generally inaccessible except by trail, with watershed or shorelines essentially primitive and water unpolluted.” Scenic rivers are “those rivers or sections of rivers that are free of impoundments, with shorelines or watershed still largely primitive and shorelines largely undeveloped, but accessible in places by road.” Recreational rivers are “those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.”

Cottonwood Creek was classified as a combination of wild and recreational segments, based on eligibility reports from the Forest Service and BLM. A 1991 Forest Service eligibility study initially recommended an eligible scenic segment from the headwaters to the Forest boundary. However, the 2009 Omnibus Act created the White Mountains Wilderness which resulted in the Forest Service segment of Cottonwood Creek being designated instead as wild. BLM’s 2002 eligibility report recommended the recreational classification for its segment of the river, which was later designated by Congress in the 2009 Omnibus Act. Classification of each segment of river is described below. Once designated in the 2009 Omnibus Act, segment classifications cannot be changed. The purpose of this CRMP planning process is not intended to modify classifications, but to provide programmatic management direction for the WSR as it was originally designated. Relatedly, although the 2019 Forest Plan identifies some Cottonwood Creek tributaries as eligible for inclusion, these eligible river segments are not covered by this CRMP. A total of 21.5 miles of Cottonwood Creek are designated as a wild or recreational river (see Figure 1). The wild portion is a 17.4-mile segment (administered by the Forest Service) from its headwaters at the spring in sec. 27, T 4 S., R. 34 E., to the Inyo National Forest Boundary at the east section line of sec. 3,

T. 6 S., R. 36 E (US Congress 2009). The recreational segment is 4.1 miles (administered by BLM) and extends from the Inyo National Forest boundary to the northern boundary of sec. 5, T.4 S., R. 36 E.

## Regional River Setting

### Forest Service segment

The Forest has diverse ecosystems including portions of the Great Basin, Mojave Desert, and Sierra Nevada Bioregions. Elevations range from 3,800 feet in Owens Valley to 14,495 feet at the peak of Mount Whitney, the highest point in the contiguous United States. Geographically, the Forest is split in two by Owens Valley and Long Valley caldera. Toward the east, the Glass and White-Inyo Mountain Ranges fall within the Great Basin and Intermountain Desert Bioregions. The changing elevation across the Forest, combined with the variability in aspect and slope, variety of geology and soils, and amount and timing of precipitation creates high diversity in ecosystems inhabited by at least 1,300 plant species, and approximately 300 terrestrial wildlife species. Key tributaries to this segment include Poison Creek and South Fork Cottonwood Creek. The Forest's contribution to social and economic sustainability depends on resilient ecosystems, with terrestrial and aquatic biodiversity (USDA Forest Service 2019c).

Previous restoration work in the river corridor was completed prior to Cottonwood Creek's 2009 designation. Restoration work included stabilizing the system trail where it crosses ephemeral streams, and stabilizing headcuts and downcutting in grazed areas (1990s).

### BLM segment

Cottonwood Creek is the longest perennial stream on the east side of the White Mountains. The headwaters originate at over 11,000 feet in the Inyo National Forest and flow for 17.4 miles before entering BLM lands. The designated 4.1 miles on BLM land runs from the Forest boundary to the mouth of Cottonwood Canyon.

The segment of Cottonwood Creek managed by BLM is within Inyo County at the far northern edge of the California Desert Conservation Area (CDCA). The nearest rural communities are Big Pine, California, approximately 25 miles to the southwest, and Bishop, California, 30 miles to the west (BLM 2002).

## Planning Context: Laws, Regulations, Directives, and the Forest Plan

The Forest's and BLM's responsibilities and requirement to comply with other federal laws remains unchanged by direction in this plan. Management direction in the 2019 Land Management Plan (LMP)—including Forest-wide standards and guidelines for various resources, such as wilderness areas—still applies to lands within the WSR corridors. Where the WSR corridors overlap with wilderness, the most restrictive policies apply. Management direction in the 2009 *Final Environmental Impact Statement Record of Decision for the Inyo National Forest Motorized Travel Management* also applies to lands within the Forest Service's segment of the WSR corridor.

Similarly, management direction in BLM’s CDCA Plan as amended, including the Northern and Eastern Mojave Desert Management Plan (NEMO) amendment and the 2016 Desert Renewable Energy Conservation Plan (DRECP) Land Use Plan Amendment apply to the BLM land within the river corridor.

## **Wild and Scenic Rivers Act**

The Wild and Scenic Rivers Act of 1968 preserves selected rivers and their immediate environments in free-flowing conditions to protect them for the benefit and enjoyment of present and future generations. These rivers may possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or similar values. The Act states rivers should be classified, designated, and administered as wild, scenic, or recreational. The Act also requires the administering agency to establish a detailed river corridor boundary of an average of not more than 320 acres per river mile and to prepare a CRMP for those areas.

Section 7 of the Wild and Scenic Rivers Act directs federal agencies to protect the free-flowing condition and other values of wild and scenic rivers. A Section 7 determination is required for any water resources project proposed within or below, above, or on a stream tributary to Cottonwood Creek WSR. The Section 7 analysis will determine whether a proposed water resources project within bed or banks of the WSR would have a “direct and adverse” effect, or whether a proposed water resource project below, above, or on a stream tributary would “invade” the WSR or “unreasonably diminish” its river values. More guidance on the Section 7 process can be found in the IWSRCC technical report Wild & Scenic Rivers Act: Section 7 (IWSRCC 2004).

## **2009 Omnibus Public Land Management Act (Public Law 111-11)**

Section 1805 of the 2009 Omnibus Public Lands Management Act added two segments of Cottonwood Creek to the National Wild and Scenic Rivers System through amendment to the Wild and Scenic Rivers Act. The 17.4-mile segment of Cottonwood Creek is administered by the Secretary of Agriculture, and the 4.1-mile segment is administered by the Secretary of the Interior.

## **Forest Plan**

The 2019 LMP for the Inyo National Forest is the guiding direction for the Forest and became effective on November 24, 2019. It replaces the 1988 Land Management Plan and its amendments. The 2019 LMP includes desired conditions and management direction for the three (either in whole or in part) designated wild and scenic rivers on the Forest.

Within the 2019 LMP, management direction was specifically developed to preserve the free-flowing condition and water quality and to protect the ORVs for which Cottonwood Creek was congressionally designated. Management activities that are inconsistent with these objectives will not be permitted.

## **Forest Service Manual – Comprehensive River Management Plan**

Forest Service Manual 2350 provides additional information on the requirements for completing a CRMP. Additional guidance on the suggested contents of a CRMP is found in the *Wild and Scenic River Management Responsibilities*, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council (IWSRCC 2002). The suggested contents include a description of the river setting and resource

values, planning context, coordination with others, management direction, management actions, and monitoring strategies.

## **Northern and Eastern Mojave Desert Management Plan**

The 2002 NEMO plan updated BLM’s 1980 California Desert Conservation Area Plan in the northeastern part of the CDCA. NEMO provides a comprehensive framework for the recovery of certain species in the planning area, as well as a landscape basis for resource management. This plan also provides criteria for defining BLM’s ORVs for this CRMP effort.

## **Desert Renewable Energy and Conservation Plan**

The 2016 DRECP plan updated the CDCA plan and is a collaborative, landscape-scale planning effort covering 22.5 million acres in seven California counties—Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego. The DRECP has two primary goals: one is to streamline the process for development of utility-scale renewable energy generation and transmission in Southern California consistent with federal and state renewable energy targets and policies. The other is to provide for the conservation and management of special-status species and desert vegetation communities, as well as other physical, cultural, scenic, and social resources within the DRECP Planning Area.

## **Federal Land Policy and Management Act**

The Federal Land Policy and Management Act outlines the process for reviewing lands for wilderness values and directs BLM to “carry out a wilderness review of the public lands.” As of 2018, BLM managed 517 wilderness study areas (WSAs); activities on these lands are strictly limited, “so as not to impair their suitability for potential wilderness management” (BLM 2016).

## **Federal Reserved Water Rights**

Cottonwood Creek WSR is protected by a federal reserved water right that was created when Congress designated the river. The federal reserved water right only protects the portion of Cottonwood Creek in the WSR corridor and does not extend to downstream locations. The federal reserved water right protects the flows necessary to support the ORVs, which include wildlife and riparian vegetation.

The federal reserved water right is a non-consumptive instream flow water right, so any water protected by the federal right is available for other uses once the creek leaves the WSR-designated portion of the river. Given that the federal reserved water right is non-consumptive and limited to the designated stream corridor, exercising and protecting this right will not affect existing water uses located downstream. BLM will coordinate any water developments for cattle or recreation with the downstream users.

## **Migratory Bird Treaty Act and other Migratory Bird Protections**

The Migratory Bird Treaty Act (MBTA) prohibits the take of protected migratory bird species without prior authorization by the U.S. Fish and Wildlife Service (USFWS no date). Other legal protections for migratory birds include Executive Order (EO) 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds” and the Memorandum of Understanding (MOU) between BLM and the U.S. Fish and Wildlife Service to promote migratory bird conservation. Specific to this CRMP and accompanying National Environmental Policy Act (NEPA) process, EO 13186 requires that FS and BLM evaluate the effects of their actions and agency plans on migratory birds, with emphasis on species of concern. BLM is

also required to abide by the terms of its MOU with USFWS which stipulates that it will protect, restore, and conserve migratory bird habitat (per EO 13186) and address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans for BLM lands, consistent with the Federal Land Policy and Management Act, Endangered Species Act, and other applicable law.

## Land Uses and Access in River Corridors

### **Cottonwood Creek (Forest Service segment)**

Land use in the Forest Service-managed segment of the corridor consists of a non-motorized trail and remote, dispersed camping. This segment lies completely within the White Mountains Wilderness area where use and development are highly restricted. Public access is via rough four-wheel drive roads. The remoteness and difficult road access limits vehicle camping in the area and results in very low use overall. A trail connecting the wild segment of the river to the recreational segment on BLM land exists but is difficult to locate and is rarely maintained, thus receiving minimal use.

There are no special use authorizations in this segment of the WSR corridor.

The Forest Service segment is part of the Cottonwood grazing allotment which has been vacant since 2000. This CRMP does not include the potential for removing livestock from grazing allotments and does not preclude the reintroduction of livestock onto this allotment. Any proposal for future restocking would need to be analyzed under a separate effort and would need to be consistent with Act requirements, including the protection of ORVs identified in this CRMP.

### **Cottonwood Creek (BLM segment)**

BLM's segment of Cottonwood Creek is popular for dispersed camping. Given its remote location, this segment is valued for its hidden nature and solitude; it is enjoyed by dispersed campers seeking an escape (BLM 2021a). Modification has occurred at the far eastern boundary of this segment, where Cottonwood Creek has been diverted for agricultural uses (BLM 2002). Approximately 50% of the proposed River Management Boundary encompasses the Wilderness Study Area (WSA). The WSA is generally north of the river, but it encompasses both sides of the river on its west end for about the last quarter mile (Figure 1).

One valid existing right, right-of-way CARI-007090, for an irrigation ditch has been approved since 1966 and is still authorized. One power site reservation, created by Executive Order on October 18, 1912, reserved an area for a potential future power site near BLM's boundary with the Inyo National Forest. No proposals for a power site have been received by the BLM. Special uses in the corridor include the Oasis grazing allotment that is located partially within the WSR corridor and to the south, near the border with Forest Service land. The allotment contains over 15,000 acres of public land managed by BLM. The lessee owns 160 acres of the approximate 240 acres of unfenced land in the allotment (BLM 2021b). The allotment's western boundary is not fenced and includes the Piper and Sugar Loaf Mountains. The northern and eastern boundaries of the allotment are fenced, with the southern boundary mostly unfenced due to topography that restricts cattle to the allotment (BLM 2021b).

There are no current mining claims in BLM's segment of the WSR corridor and any new requests in this area would be reviewed on a case-by-case basis.

## Baseline Conditions

Management emphasis in the designated wild and scenic river corridor is to protect and preserve the free-flowing conditions, water quality, and ORVs. The Act specifies that designated rivers, and the outstandingly remarkable values they possess, will be “protected for the benefit and enjoyment of the present and future generations.”

## Free-Flowing Condition and Water Quality

### Cottonwood Creek (Forest Service segment)

Free-flowing conditions range from an estimated mean annual flow of 9 cubic feet per second (cfs) at the downstream terminus to annual flows of 1 cfs and less in the upper tributaries. Baseflow in North and South Forks of Cottonwood Creek is derived from discrete springs and from diffuse seepage. Perennial flow on both forks begins below distinct springs, with the channel upstream intermittent or ephemeral. Peak runoff is generated from the watershed above the springs through the melting of large snowpack or from convective cloudbursts. The extreme variations in baseflow suggest that baseflow is controlled by factors other than drainage area; groundwater interactions are of significant importance to the baseflow hydrology. As seen in Figure 2, below, 2016 flow estimates in the North Fork of Cottonwood Creek were considerably less than previous years. During normal years (e.g., 1974), summer flows averaged 1 cfs. In historical drought years, such as 1991, summer flows averaged over 0.1 cfs, and in 2016, summer flows averaged 0.06 cfs.

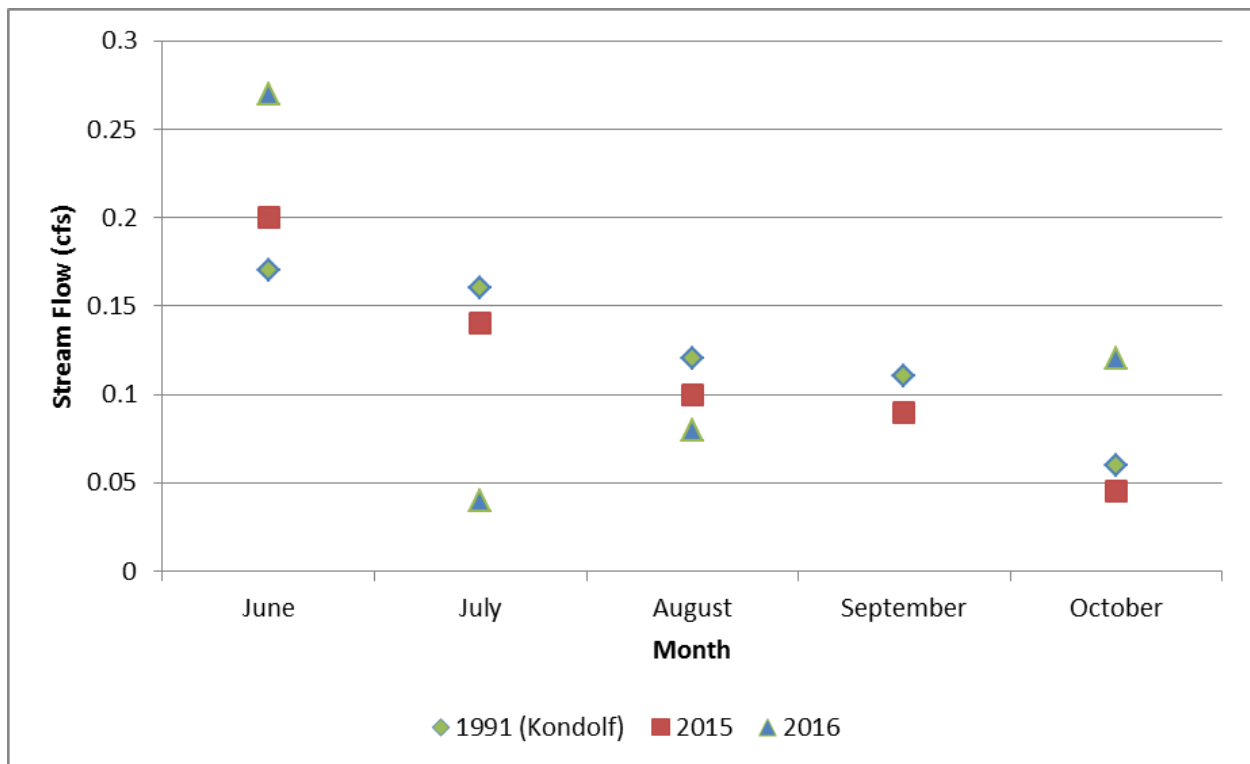


Figure 2. Comparison of 1991, 2015, and 2016 Drought Stream Flows at Granite Meadow, in North Fork Cottonwood Creek (California Department of Fish and Wildlife 2016)

Likely, groundwater emerging in the headwater springs of South Fork is recharged by infiltrating snowmelt on an extensive area of Reed Dolomite near the range crest. The occurrence of the springs is at the contact between the Reed Dolomite and the Cottonwood Pluton. Water chemistry data suggest that Reed Dolomite is the source of ground water discharge. The south fork gains flow from Poison Creek and from diffuse seepage, amounting to a 35% gain in the summer of 1990 between headwater springs and the confluence. In the summer of 1991, the north fork flow increased by an order of magnitude from headwater springs to the confluence. The locations of the North Fork Springs reflect no lithologic or structural controls. The incised valley of the North Fork constitutes the lowest point on the landscape, springs located along its base may serve as general drains for the fractured pluton. Regarding the in-stream flow of the river, it appears that the South Fork has a “constant” groundwater discharge. Between 1990 and 1992 (the sixth year of a drought) there was a decrease in baseflow of about 15% from “normal” baseflow. The discharge in the North Fork at Granite Meadow declined substantially from 1974 to 1990, dropping to about 10% of normal. This is vastly different than the South Fork.

Water quality data from the North Fork of Cottonwood Creek indicate an elevated pH of 8.0-8.5 (due to the underlying Precambrian and Cambrian carbonate bedrock in the surrounding watershed). This elevated pH may result in additional physiological stress on resident trout. Table 1 below outlines selected water quality constituents monitored (all concentration is in parts per million [PPM]).

**Table 1. Monitored Water Quality Constituents**

<b>Constituent</b>	<b>South Fork Cottonwood Creek below springs</b>	<b>North Fork Cottonwood Creek Granite Meadow</b>
Ca	26	33
Mg	15.9	15
Na	1.48	5.7
SO <sub>4</sub>	2.7	3.3
Cl	0.5	0.7
pH	8.05	8.19

Sources: Marchand 1974

Chemistry of the North Fork waters suggest an origin in the Reed Dolomite modified through the Cottonwood Pluton (a body of intrusive rock). Water chemistry data from the South Fork suggest that the Reed Dolomite is the source of groundwater discharge. There are currently few threats to water quality in the Forest Service section of Cottonwood Creek, due to the very low level of human use, almost no development, and Wilderness status. There is one designated road within the corridor that may contribute sediment to the creek during rainfall, and a few small unauthorized routes that could carry sediment into the river. There is some dispersed camping in the corridor, so there is a very minor threat from human waste.

### **Cottonwood Creek (BLM Segment)**

Free-flowing conditions have an estimated mean annual flow of 9 cfs, with flows greatly reduced in the summer. Studies in 1973 by Wong and in 1974 by Diana (Diana and Lane 1978) determined that the summer stream discharge ranges from just 0.6 to 1.8 cfs, with daily maximum water temperatures ranging from 12 to 15.8 degrees Celsius (53.6 to 60.4 degrees Fahrenheit). Despite the abundance of spring-fed

water sources, diurnal water temperatures varied as much as 10.5 degrees Celsius (18.9 degrees Fahrenheit).

The relatively stable, spring-fed flows, together with a low frequency of flooding, are believed to be responsible for the high number of fine sediments within the channel. Mean stream width is 2.3 meters (7.5 feet) with a 1:1 ratio of pools and riffles. Pool depths range between 0.3 and 2.0 meters (1 and 7 feet). There are no impoundments, dams, or bank improvements within this segment that would impede free-flowing condition. Occasionally, users form temporary and primitive road crossings for vehicles, in essence creating low-level dams that manage and affect water depths at the crossing and immediately upstream. This type of structure could impede flow.

## Outstandingly Remarkable Values

The Act requires that each river possess one or more ORVs to qualify for designation. In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. While the spectrum of resources that may be considered is broad, all values should be directly river related. To be considered river related, a value should be located in the river or its immediate environment (generally within a quarter mile on either side), contribute substantially to the functioning of the river ecosystem, owe its existence to the presence of the river, or some combination of these things. The Forest Service and BLM regions of comparison are defined geographically in the Resource Assessment, included in this document as Appendix B. In 1991, the Forest Service initiated an eligibility study of all rivers on the Forest. This eligibility assessment was revisited during the Land Management Planning revision process and considered which resources within the Cottonwood Creek designated corridor qualified as ORVs. A Resource Assessment for the corridor was then completed in November 2019 to support development of this CRMP. The River Management Society (RMS) held a workshop on the Forest from November 4-8, 2019, for the purpose of developing CRMPs for Cottonwood Creek and Owens River Headwaters WSRs on the Inyo National Forest. During that workshop, the resource experts on the CRMP team, along with representatives from the Forest Service, BLM, and RMS, reviewed each ORV for the river. During this time, the Forest Service decided to refine the Ecology ORV to Botany because it is a more specific ORV which allows staff to better measure effects on this resource. All other ORVs were retained by the team with no further revisions.

The identified ORVs for each agency's segment of the river are identified below in Table 2 and further described in the following section. Certain values did not qualify as ORVs because they did not meet the required criteria. See Appendix B for additional detail about ORV findings and rationales, as well as the criteria used to define each ORV.



**Table 2. Outstandingly Remarkable Values for Cottonwood Creek**

ORV Name	Cottonwood Creek (Forest Service)	Cottonwood Creek (BLM)
Scenery	X	X
Wildlife	X	X
Fisheries	X	—
Historic, Prehistoric, and Cultural Resources	X	—
Recreation	—	X
Geologic/Hydrologic	—	—
Other	X (Botany)	X (Botany)

## Cottonwood Creek (Forest Service Segment)

### Scenery

Cottonwood Creek is within the White Mountains Wilderness, a spectacular and unique desert mountain range with 14,000-foot peaks and ancient bristlecone pine (USDA Forest Service 2019a). The river segment between the headwaters and the confluences of the North and South Forks of Cottonwood Creek includes diverse foreground and background views including high meadows, granite outcrops, bristlecone pine forest, aspen stands, sections of narrow canyon, and rugged uplands with mountain and low sagebrush habitats. The river itself is usually only visible when standing next to it, due to the narrow channel and tall meadow grasses that border the creek. This segment of the river is no longer accessible by authorized four-wheel drive roads, though one road enters the corridor and two others travel within 1/3 mile of the river.

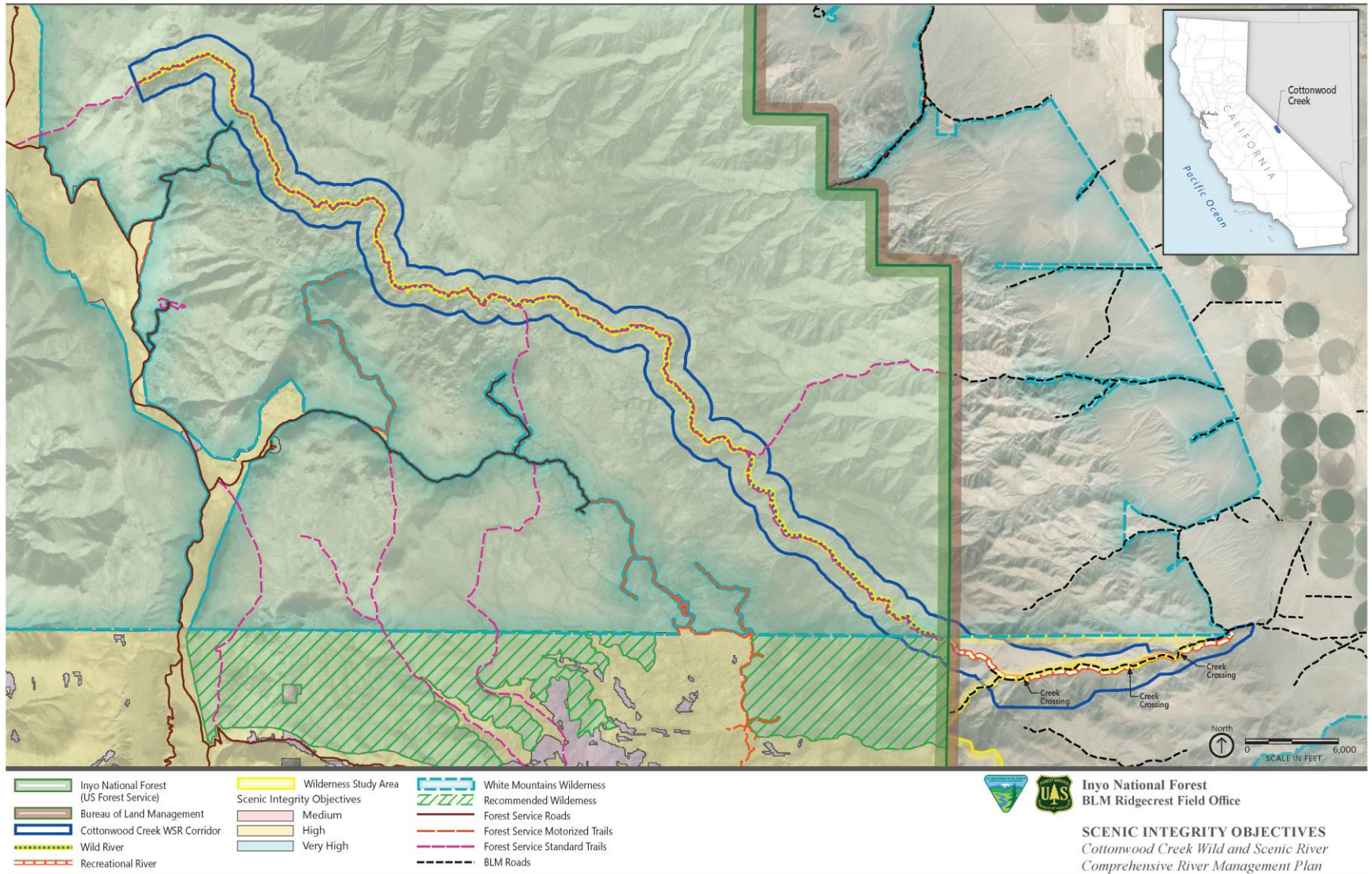
Outstanding features include a bristlecone pine forest, interspersed areas of rocky outcrops, narrow canyon, meadow, sagebrush, and aspen groves. The approach to the headwaters area provides a distant overview of the corridor before dropping into Cottonwood Basin for a closer view.

The diverse components of the landscape provide a wealth of color and patterns in the foreground, middle ground, and background. Summer and fall are particularly distinct due to extensive wildflower blooms, aspen groves, and golden meadows contrasted with pine forest on hillsides and ridges. The area is snow covered in winter and not accessible by road all year.

The background viewshed appears unmodified except for native surface access roads. The foreground includes a variety of old fencing, small signs, short native surface roads, and grazing exclosures. The Cottonwood grazing allotment has been vacant since 2000 and the grazing structures have not been maintained. Unnecessary structures may be removed. The Scenic Integrity Objective (SIO) along this portion of the WSR is Very High. Scenic integrity objectives define the minimum level to which landscapes are to be managed from an aesthetics standpoint (USDA Forest Service 2005). Specifically, a “Very High” SIO generally provides for ecological changes only and refers to landscapes where the valued (desired) landscape character is intact with only minute, if any, deviations. The landscape is unaltered (USDA Forest Service 2005). In combination with BLM’s segment of Cottonwood Creek, this river forms the only WSR in the Great Basin Geographic Province protected entirely from the headwaters to its terminus (BLM 2002). See Figure 3 for a map of SIOs in the project area.



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**Figure 3. Scenic Integrity Objectives**

Cottonwood Creek  
Comprehensive River Management Plan

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## Wildlife

The corridor contains occupied habitat for the bi-state distinct population segment (DPS) of sage grouse, a Species of Conservation Concern (SCC) for the Forest. In 2022, its status changed to proposed as threatened under the Endangered Species Act. The White Mountain Population Management Unit (PMU) sage grouse occur year-round within the WSR corridor at the highest known elevation (2,875 meters) and breed and rear young in the sagebrush scrub habitat located in the vicinity of Tres Plumas. This area includes two known leks, or breeding territories. There are also multiple northern goshawk nesting and foraging territories within the river corridor. The WSR corridor also hosts a diverse community of bird species. A survey conducted in 2010 by Point Blue Conservation Science identified 26 bird species along a transect near Cottonwood Creek. The dominant species included dusky flycatcher, house wren, and song sparrow (Point Blue Conservation Science 2021). A summer herd of mule deer and herds of Nelson desert bighorn sheep, a SCC, occupy the WSR corridor. Willow shrub communities within the riparian zone may provide habitat for migratory bird species including SCC willow flycatcher (includes Sierra Nevada Mountain Willow Flycatcher and Great Basin Willow Flycatcher), but no known breeding habitats. Numerous spring systems may provide habitat for aquatic springsnails and create fens with wet organic layers. SCC Wong's springsnail and Owens Valley springsnail are present in this area, although they have not been found in the WSR corridor. Additional surveys for these species and monitoring for aquatic springsnail species are recommended.

The least Bell's vireo was added to the State of California's list of endangered species in 1980. It was also listed as federally endangered by the US Fish and Wildlife Service (USFWS) on May 2, 1986, due to a significant range-wide decline in population related to extensive habitat loss and degradation associated with urban development, exotic plant invasion, and expansion of agricultural practices into riparian zones. Brood parasitism by the brown-headed cowbird was also identified as an issue.

The least Bell's vireo is endemic to southern California and northern Baja California, and historically extended as far east as the Owens Valley and Death Valley. There have only been two known sightings in the Owens Basin since the turn of the twentieth century: these migrating birds were seen near Big Pine in 1976 and 1980. The *Owens Basin Wetland and Aquatic Species Recovery Plan for Inyo and Mono Counties*, as signed by Region 1 of the USFWS in 1998, states that Owens Basin habitats are comparatively small and there is little potential of the region to support a large population of vireos. It also notes that this species "was not a historical resident of higher Owens basin elevations" and elevational limits recorded for this species ranged from -175 feet in Death Valley to 4,100 feet in Owens Valley. A review of literature and surveys of bird distribution in the Inyo and White Mountains completed by Hall et. al. did not identify any Bell's vireo species. Since riparian habitat adjacent to the Owens Valley within the Forest boundary near Big Pine (where migrating birds were observed) occurs above 4,500 feet, and riparian habitat on Forest administered lands do not exhibit similar habitat characteristics as that in the Owens Valley, it is unlikely that suitable habitat exists on the Forest.

## Fish

Paiute cutthroat trout were introduced to Cottonwood Creek in 1946 by a transplant from the Silver King Creek Basin (USDA Forest Service 2019b). Progeny of that transplant survive in the creek today and have formed a self-sustaining population, one of five in existence (USFWS 2004). The population is found upstream of the confluence with Tres Plumas Creek where a natural barrier prevents non-native trout from migrating upstream. Paiute cutthroat trout were one of the first animals in the United States to

be listed as federally endangered under the Endangered Species Act (ESA) in 1967. The species status was downgraded to threatened in 1973. Pools are important rearing habitat for juveniles and act as refuge areas during winter (Raleigh et al. 1984, Swales et al. 1986, and Berg 1994 cited in USFWS 2004). The species is considered an out-of-basin refuge population (USDA Forest Service 2019b), and it will be managed to repopulate the Silver King Basin when conditions for the fish are sufficient for supporting the trout's recovery (USFWS 2004). Key recovery actions planned for the species include removing nonnative trout from historic Paiute cutthroat trout habitat; reintroducing Paiute cutthroat trout into renovated stream reaches in historic habitat; and protecting and enhancing all occupied Paiute cutthroat trout habitat (USFWS 2004). In addition, extensive past restoration work has occurred to stabilize stream channels, banks, contributing draws, etc.

## Historic, Prehistoric, and Cultural Resources

### Historic

Cottonwood Creek appears on land survey maps as early as 1879. Ethnographic literature for this region indicates a long history of use by the Paiute of Owens Valley and Fish Lake Valley (Steward 1933), which continues to the present day. A horse corral recorded at the top of the river in the White Mountains is associated with the White Mountain wild horse herd and notable Paiute known as "Grey-Haired Johnny." The wild horse herd was documented in this area as early as the 1870s and is thought to have originated with the establishment of early ranches in the area. Grey-Haired Johnny was a prominent horse doctor who was skilled in the use of herbal medicines. In the early 1900s, Grey-Haired Johnny would travel to Southern California horse racing tracks where he was in high demand to treat injured racehorses with his special herbal remedies. In return for his treatment, Grey-Haired Johnny was given thoroughbred stallions that he would take back to the herd in the White Mountains (USDA Forest Service, no date).

Cottonwood Creek has a long history of grazing and mining, evidenced by numerous related features. A notable extant mining feature is the standing cabin at Eva Belle Mine, which was a prosperous gold mine that was also a source of silver, copper, lead, and zinc. The site was historically associated with the Mono Lake Mining District prior to its incorporation into the Inyo National Forest. The mine was owned by the Minerals Management Company of Dyer, Nevada, and produced in 1929 (Wilkerson 2014). A former log cabin associated with the mining company remains at the site. Smaller-scale resources associated with grazing and mining include rock-lined dugout features, fences and corral features, and arborglyphs in aspen groves along the river corridor. These resources are significant at the local level. Due to the remote location of many of these resources their historic integrity has been retained. These historic-era ethnographic features and mining sites may be eligible for listing in the National Register of Historic Places (the National Register).

### Prehistoric/Cultural

Cottonwood Creek and Canyon (known as *tō'sa kwā' si wū'ha* to the Paiute) was a prehistoric through historic period Paiute/Shoshone trail corridor connecting the high elevation resources of the White Mountains to the lower elevation resources of Fish Lake Valley (Steward 1933). Cultural resource sites along the river corridor represent temporary seasonal habitation locales, selected for their proximity to water, plant, and animal products. The ethnographic literature indicates that a pine nut camp (known as *sāi' kwidupi* to the Paiute) (Steward 1933) was also located at the river. Sites located along the river corridor consist of lithic scatters with milling features, house rings, rock shelters, and rock art panels. Twelve prehistoric sites have been documented in the corridor to date. Tribal consultation may provide insight regarding ongoing use of the river corridor for harvesting traditional products. Wilderness

designation and the remote location of Cottonwood Creek have protected these cultural resources from vandalism, and they retain their historic integrity. Though no formal evaluations have been conducted, the sites along the stream have the potential for significant subsurface deposits, making them eligible for listing in the National Register for their ability to increase understanding of prehistoric land use in this riverine environment. Rock art sites are eligible for listing in the National Register as works created by a master, though the creator is unknown.

## Botany

Known occurrences of Forest Service sensitive/SCC plants associated with Cottonwood Creek include trianglelobe moonwort, scalloped moonwort, western singlespike sedge, valley sedge, Hall's hawkbeard, male fern, Poison Canyon stickseed, blue nodding locoweed, Rolland's bulrush, and Dedecker's clover. Additional SCC species overlapping the corridor include White Mountain horkelia; however, this is an upland species and is not directly associated with the river. Bristlecone pine also occurs within the WSR corridor, and the Congressionally designated Ancient Bristlecone Pine Forest is adjacent to the river. There are a high number and density of rare plant species present, and there is high potential for additional, unknown occurrences of SCC plant species within the river corridor. Cottonwood Creek is spring fed at its upper reaches and is the longest perennial stream in the White Mountains. It supports a lush riparian community contrasting greatly with the nearby upland communities. Riparian habitats include wet and moist meadows, aspen forests, willow shrub communities, and cottonwood forests at the lowest elevations. Unglaciaded meadows, a special habitat type in the Inyo National Forest Terrestrial Ecological Unit Inventory dataset, are present in the upper reaches of the river corridor.

Extensive past restoration work has occurred to stabilize stream channels, banks, contributing draws, etc. Some common dandelion has been noted in upper stream segments, and there are more nuisance and low-priority invasive species along the river corridor. No high priority/noxious weeds are currently known in this WSR. However, the noxious weed species broadleaf pepperweed, hairy whitetop, and tamarisk infest numerous other perennial streams in the White Mountains (primarily at lower elevations). Additional surveys for these species and potential ongoing monitoring for invasive species are recommended. There is no known cultural or historic use of plant species or habitat on this river. While the river is small in size, it is one of the few unique riparian areas in an otherwise harsh desert mountain landscape.

## Cottonwood Creek (BLM segment)

### Scenery

The BLM Cottonwood Creek segment has been inventoried as having a Class "A" (Excellent) scenic quality rating, per BLM Visual Resource Management guidelines. The lush riparian plant community along the river bottom contrasts dramatically with the surrounding stark and primitive White Mountain Wilderness Study Area. Where the BLM and FS river boundaries meet, the WSA is located both to the north and south of the river corridor. As the river travels farther east, the WSA exists only to the north of the river. In combination with the Forest Service's segment of Cottonwood Creek, this river forms the only WSR in the Great Basin Geographic Province protected entirely from the headwaters to its terminus (BLM 2002).

### Wildlife

Wildlife along the BLM portion of Cottonwood Creek is supported by a unique plant assemblage along the WSR corridor and includes a variety of animal species. Specifically, there are a number of special status and/or sensitive bird species such as yellow warbler, yellow-breasted chat, prairie falcon, sharp-



shinned hawk, and Cooper's hawk. Willow shrub communities along the WSR corridor provide potentially suitable habitat for the southwestern willow flycatcher, a federally endangered species. This WSR segment of Cottonwood Creek supports over 70 species of birds (BLM 2002).

The BLM segment of Cottonwood Creek is also an important habitat for the spotted bat, which is a federal and California state special concern species. Ecological data used to inform this rationale were collected from contracted bird and vegetation surveys conducted between the early 2000s-2012.

## Recreation

The presence of a perennial stream of this size in such an arid region offers visitors a unique and outstanding semi-primitive water-based recreation opportunity. Activities along this recreational segment include trout fishing, hiking, bird watching, primitive camping, four-wheel drive exploration, upland game bird and mule deer hunting, photography, mountain biking, and equestrian uses (BLM 2002). Equestrian use in this area includes working ranch hands on horseback managing grazing allotments and pack stock packing. Opportunities for the combination of identified recreation activities do not exist in the surrounding region, or when they do exist, do not encompass the full list of activities together in one place. Easy river access by passenger car from a paved highway with campsites large enough for camper trailers is rare in the region of comparison. Cottonwood Creek affords additional opportunities for visitors using camp trailers or passenger cars to engage in the identified recreation activities. As the primitive road along the creek goes north, its roughness increases, generally reducing the number of visitors and transitioning the nature of visitation from front country, easy access users to back-country, more primitive users. Topography limits the viewshed to Cottonwood Creek valley, except in a few areas where topography allows viewing of the distant Fish Lake Valley. This gives the area a mountainous feel which is very different than the Mojave Desert visitors crossed to reach Cottonwood Creek. A difficult to find trail connecting the recreational section of the WSR on BLM-managed lands to the Forest's wild section offers a primitive recreation opportunity. Hikers follow the creek from north to south, or the reverse, thereby adding to hiking and primitive camping experiences.

## Botany

Cottonwood Creek supports a willow/cottonwood riparian woodland, which is considered an Unusual Plant Assemblage in the California Desert Conservation Area Plan (BLM 2002). This regionally uncommon plant community is primarily comprised of Fremont cottonwood, water birch, various willow species, and important forage species such as elderberry and coast live oak. Vegetation diversity in these areas promotes high densities of growth and provides important ecosystem functions. The physical cover within the dense undergrowth provides habitat for aquatic, semiaquatic and terrestrial species. On the drier slopes adjacent to Cottonwood Creek, big sagebrush, an important forage species for many of California's native fauna, is well-established. Collectively, this community forms a structurally diverse riparian area that is a valuable migratory stop-over and breeding habitat for a variety of neotropical bird species. The riparian area is also refugia for numerous resident wildlife species that are dependent on consistent water access and shelter from the surrounding arid landscape. Furthermore, the existing shrub and tree canopy helps minimize evaporation and, consequently, sustains the consistent water flow that is vital to many ecological functions within the stream corridor. Recognition of the botanical component of the lower section of the WSR is therefore warranted in order to effectively manage for the diverse ecological and hydrological functions the river currently supports.

The plant communities outside of Cottonwood Creek’s riparian area also contribute to its ecological value and its aesthetic beauty. Flowing down the slope of the Sierra Nevada Mountains between 6,600 feet and 5,400 feet of elevation, the surrounding vegetation community transitions from pinyon woodland at the upper reaches of the segment to desert scrub at the lowest elevations. As their name suggests, pinyon woodlands are dominated by pinyon pine which is often the sole canopy species in pinyon woodlands. The other major components of the canopy structure in pinyon woodlands are Utah juniper and/or California juniper. Canopy densities in pinyon woodlands ranges from sparse to moderately dense, and mature canopy height usually ranges from 10-20 feet tall. Understory species composition and density are often highly variable and include species of ragweed and low-growing oaks. At the lowest portions of the segment, desert scrub communities become prevalent. Characterized by low growing vegetation (often less than 6.5 feet tall) with a dominance of creosotebush as well as cacti and other xerophiles, desert scrub is visibly and functionally distinct from pinyon woodlands. Creosotebush is of particular significance in these habitats largely due to its importance as a nectar source for pollinators and its history as a medicinal herb used to treat pain and illness in many Native American communities. Overall species diversity in desert scrub communities is low due to the relative sparseness of vegetation on the landscape, but many drought-adapted species grow at low densities within these communities. The presence of multiple community types with varying habitat structures throughout the Cottonwood Creek WSR corridor contributes to its outstandingly remarkable botanical value.

## **Visitor Use Management and Capacity**

(The information below is excerpted from Appendix A, *User Capacity Analysis for Cottonwood Creek and Owens River Headwaters Wild and Scenic River Corridors*. Additional detail on the framework, concepts, and approach used to develop the capacity analysis can be found in Appendix A.)

### **Wild Segment**

#### **Recreation Use Setting**

The wild segment of Cottonwood Creek is located entirely within Inyo National Forest. The only notable public access within the Cottonwood Creek wild segment is from a few rough roads requiring high-clearance four-wheel-drive vehicles. Recreation activities along this segment of Cottonwood Creek include trout fishing in specified portions of the stream, hiking, primitive camping, and upland game bird and mule deer hunting. There are six primitive campsites at the ends of road spurs documented by a USFS site visit during spring 2021. The remoteness and difficult road access limits vehicle camping in the area and results in very low use overall. A trail connecting the wild segment of the WSR to the recreational segment on BLM land exists but is difficult to locate, is not maintained east of McCloud Camp, and is rarely maintained in other areas, and therefore receives very minimal use. There are no other developed recreation facilities in the wild segment of Cottonwood Creek.

#### **River Values Potentially Affected by Visitor Use**

The purpose of this section is to identify and discuss the effects or potential effects of recreation use on river values in the river segment. The effects of recreation use considered in Appendix A are not only with respect to the amounts of recreation use, but also other characteristics of use (e.g., visitor behavior, dispersed versus concentrated use, etc.). The assessments of the effects of recreation use on river values in

this section are general in nature and relationships between recreation use and impacts are better understood for some river values than others.

The wild segment of Cottonwood Creek possesses outstandingly remarkable scenery, wildlife, fisheries, historic/pre-historic, and botany values. As noted, natural resource conditions are generally not directly related to recreation use levels but can be impacted by recreation use depending on a number of situational factors (e.g., visitor behavior, terrain, weather). As such, the botany, wildlife ORVs and water quality of the creek could be sensitive to recreation-related impacts and these should be addressed by managing the characteristics of visitor use (e.g., concentrating use on established trail treads, road surfaces, and campsites, promoting low-impact use behaviors). In addition, the botany ORV and water quality would potentially be adversely impacted if the physical footprint of primitive campsites were expanded to accommodate higher levels of recreation use.

The amount of recreation use in the area could impact the quality of visitors' experiences and their recreation behavior, which may indirectly impact the ORVs in this segment. For example, high levels of recreation use might force visitors to have to share campsites with other groups or increase the number of encounters with other groups while hiking or hunting. These impacts to the recreation experience could cause indirect impacts to the botany and wildlife ORVs and/or to water quality, for example, if visitors create new informal campsites or travel off trail at increasing rates to avoid crowding. The scenic values of the river segment are unlikely to be impacted by recreation use levels given the limited extent and dispersed nature of recreation facilities and activities. Given the dispersed and remote location of historic/pre-historic resources, recreation use is unlikely to impact the historic/pre-historic values. Fisheries are an ORV due to the presence of a refuge population of the threatened Paiute cutthroat trout in a portion of the creek which is protected from recreational fishing. Therefore, the fisheries value is not directly impacted by recreational fishing, but could be affected due to the indirect impacts to water quality from recreation use.

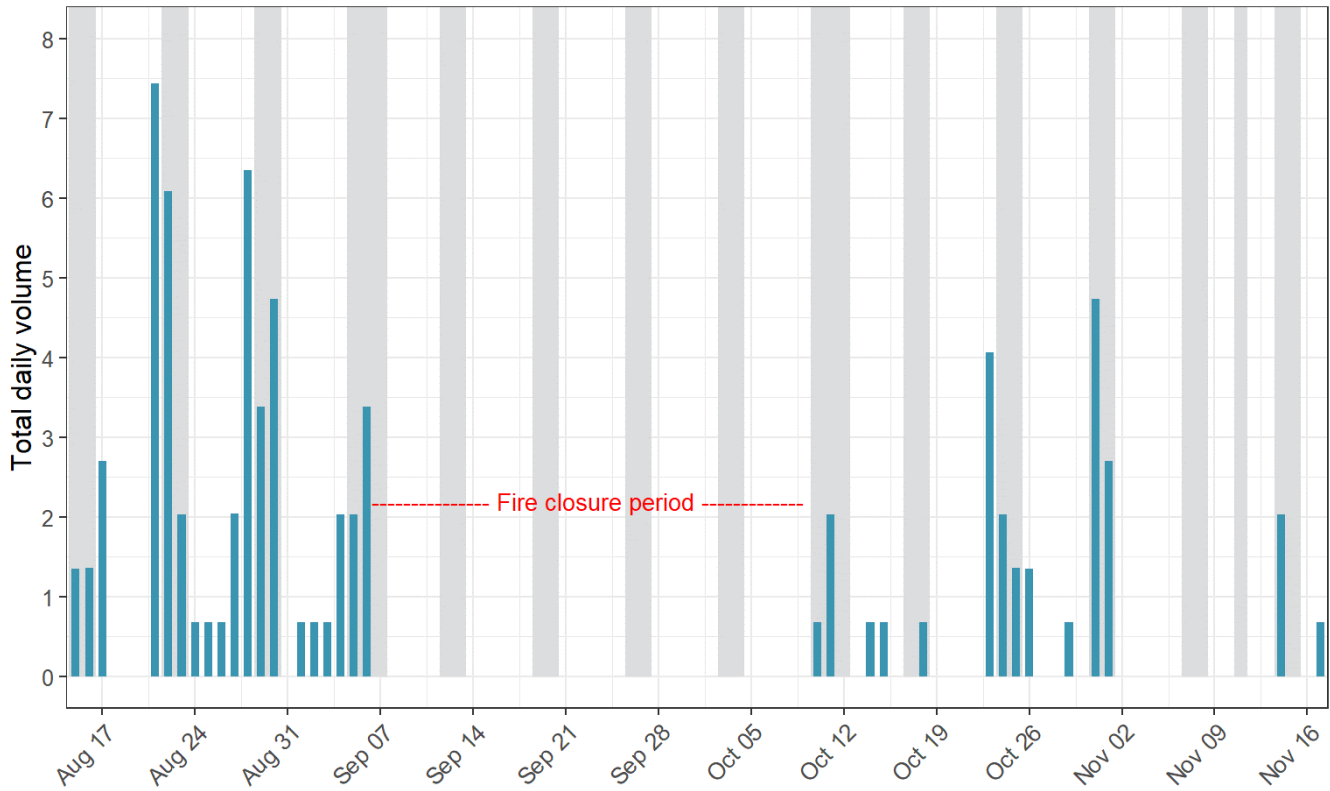
## **Current Recreation Use**

The following subsection reports an estimate of current daily use in the Cottonwood Creek wild segment based on daily visitor volume data collected for a total of 94 days on the Cottonwood Creek Trail between August and November 2020 as part of the CRMP effort. A nearby fire closed the portion of the Forest where Cottonwood Creek resides, from September 7 through October 9, 2020. Data from the fire closure period were excluded from the statistical summaries in Table 3 and Figure 5. Table 3 presents the mean and maximum current daily visitor volume on the Cottonwood Creek Trail. Figure 4 reports current total daily visitor use volume by date, while Figure 5 presents the distribution of current total daily visitor use volume on the Cottonwood Creek Trail during the CRMP data collection period. Daily and average intergroup encounter rates per hour are presented in Figure 6 for each of twelve sample days between August and November 2020. These summaries of estimated current daily use were intended to provide a basis for comparison to the estimate of user capacity for the river segment, and the management triggers and associated adaptive management strategies. However, it became evident from the data reported in this section that trail use is very low, generally dispersed, and often off-trail (e.g., for hunting) and that dispersed camping is more of a limiting factor for user capacity in the river segment.

**Table 3. Cottonwood Creek wild segment mean and maximum current daily use on the Cottonwood Creek Trail (August-November 2020)<sup>1</sup>**

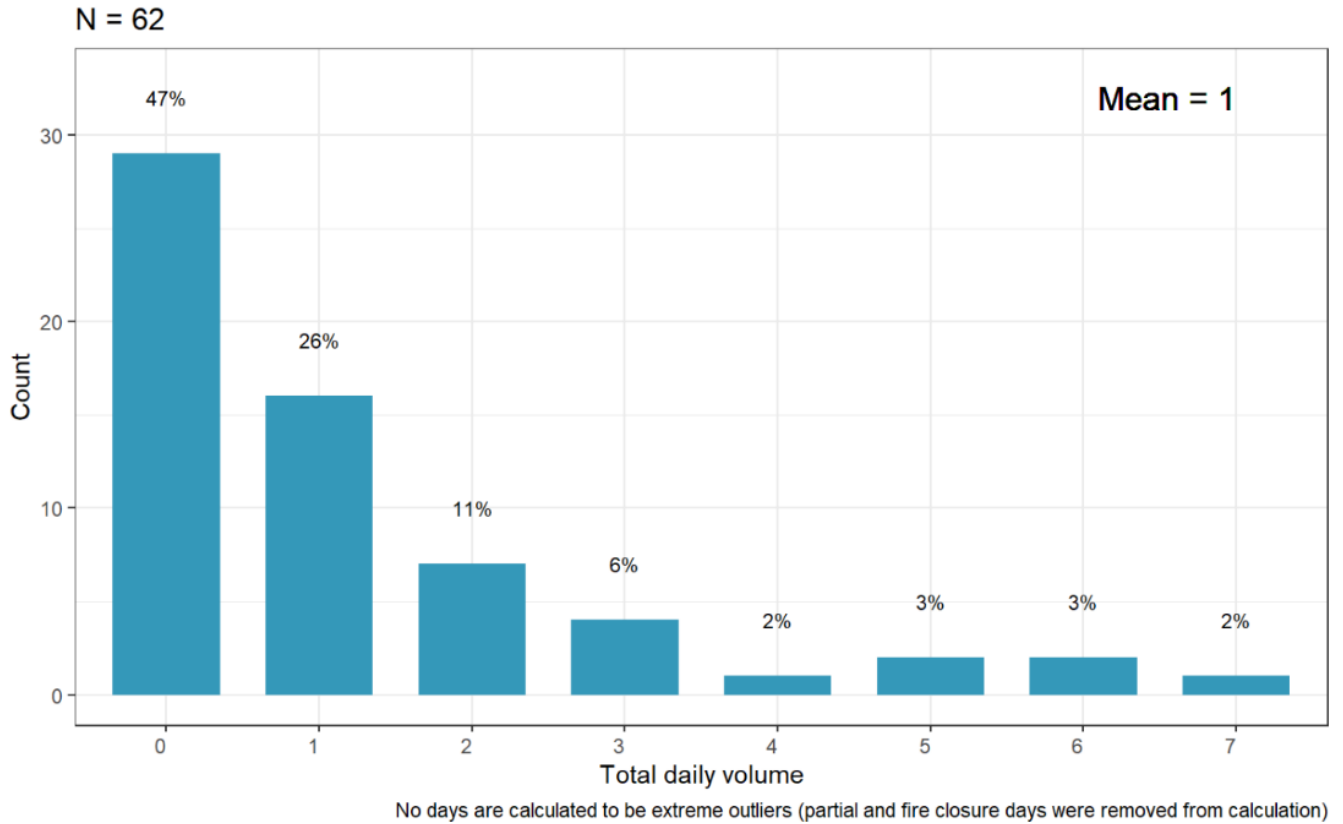
	Unit	Mean	Minimum	Maximum
Cottonwood Creek Trail counter	Total daily volume	1	0	7

Note: no days are calculated to be extreme outliers (partial days were removed from calculations)



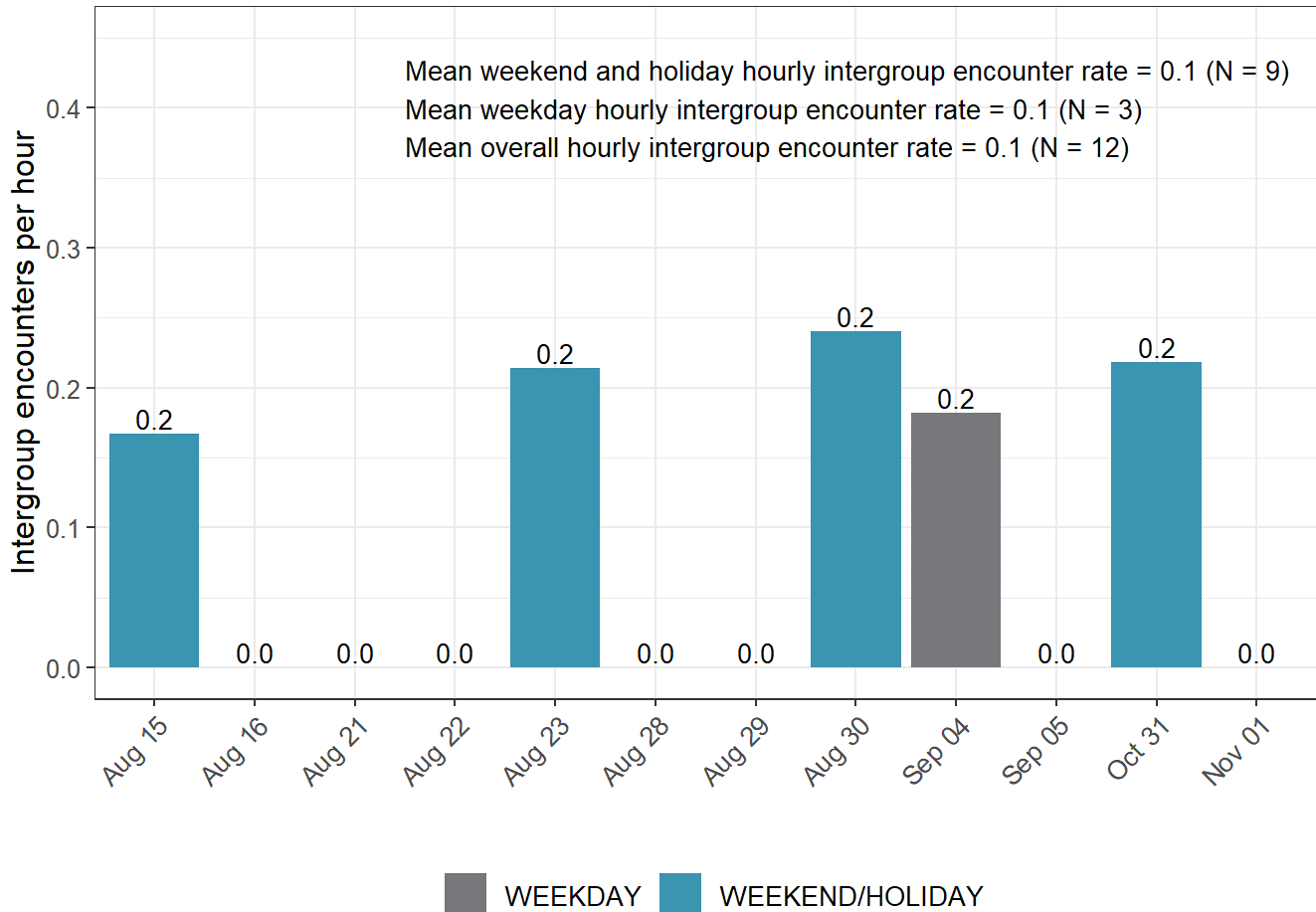
**Figure 4. Cottonwood Creek Trail daily visitor use volume**  
(gray shading indicates weekends/holidays)

<sup>1</sup> Data during the fire closure period (September 7 – October 9, 2020) were excluded from this summary.



**Figure 5. Cottonwood Creek Trail distribution of daily visitor use volume<sup>2</sup>**

<sup>2</sup> Data during the fire closure period (September 7 – October 9, 2020) were excluded from this summary.



**Figure 6. Cottonwood Creek Trail group encounters per hour by sampling date and day of week category<sup>3</sup>**

## User Capacity Estimate

As noted, any expansion of the physical footprint of primitive campsites in this area to accommodate higher levels of recreation use would potentially adversely impact the botany, wildlife, fisheries ORVs and water quality of the creek. As a result, the numeric user capacity was estimated as the maximum number of visitors that can be accommodated in the wild segment of Cottonwood Creek per day without the number of camping groups exceeding the physical capacity of the primitive campsites<sup>4</sup>.

The estimated numeric daily user capacity for the Cottonwood Creek wild segment is calculated by multiplying the number of dispersed campsites by the number of visitors per campsite. It was assumed that up to two vehicles can be accommodated at each campsite and USDA Forest Service National Visitor Use Monitoring Program (USFS NVUM) data were used as the basis for the average vehicle occupancy of 2.5 visitors. There are a total six primitive campsites available in the analysis area, resulting in an

<sup>3</sup> Fridays were classified as weekdays.

<sup>4</sup> User capacities based on the physical capacities of recreation facilities, such as dispersed campsites, have precedent in the Snake River Headwaters CRMP (USDA Forest Service 2014).

estimate of a maximum of 30 visitors per day that can be accommodated in the wild river segment of Cottonwood Creek without adversely impacting river values or water quality.

**Total daily user capacity estimate: 6 sites x (2 vehicles per site x 2.5 occupancy) = 30 visitors per day**

## Recreational Segment

### Recreation Use Setting

The recreational segment of Cottonwood Creek is located entirely on land managed by the California Desert District of the BLM. The only notable public access within the Cottonwood Creek recreational segment occurs along the paved road that accesses dispersed campsites and day use parking areas. Recreation activities along this segment of Cottonwood Creek include trout fishing, hiking, bird watching, primitive camping, four-wheel drive exploration, upland game bird and mule deer hunting, photography, mountain biking, and equestrian use. The road along the creek transitions from front country to backcountry and primitive uses to the north. A trail connecting the recreational segment of the WSR to the wild segment on National Forest land is difficult to locate. This trail does potentially offer a primitive recreation opportunity for hikers to follow the creek from north to south, or the reverse, thereby adding hiking and primitive camping experiences.

### River Values Potentially Affected by Visitor Use

The purpose of this section is to identify and discuss the effects or potential effects of recreation use on river values in the river segment. The effects of recreation use considered in this assessment are not only with respect to the amounts of recreation use, but also other characteristics of use (e.g., visitor behavior, dispersed versus concentrated use, etc.). The assessments of the effects of recreation use on river values in this section are general in nature and relationships between recreation use and impacts are better understood for some river values than others.

The recreational segment of Cottonwood Creek possesses outstandingly remarkable values for scenery, wildlife, botany, and recreation. As noted, natural resource conditions are generally not directly related to recreation use levels but can be impacted by recreation use depending on a number of situational factors (e.g., visitor behavior, terrain, weather). As such, the botany and wildlife ORVs and water quality of the creek could be sensitive to recreation-related impacts and these should be addressed by managing the characteristics of visitor use (e.g., concentrating use on established trail treads, road surfaces, and campsites, promoting low-impact use behaviors). In addition, the botany ORV and water quality would potentially be adversely impacted if the physical footprint of the dispersed campsites and/or day use area parking were expanded to accommodate higher levels of recreation use.

The amount of recreation use in the area could impact the quality of visitors' experiences and degrade the recreation ORV. For example, high levels of recreation use might force visitors to have to share campsites with other groups or make it difficult for day use visitors to find a place to park. These impacts to the recreation ORV could cause indirect impacts to the botany and wildlife ORVs and/or to water quality, for example, if visitors create new informal campsites or park in previously undisturbed areas. The scenic values of the river segment are unlikely to be impacted by recreation use levels given the limited extent and dispersed nature of recreation facilities and activities.

## Current Recreation Use

Counts of daily vehicle use on the access road and of campground occupancy in the dispersed campsites in the recreational segment of Cottonwood Creek were conducted on a total of 94 days and 13 days respectively, between August and November 2020. Table 4 presents the mean and maximum current daily vehicle use and campsite occupancy. Vehicle use was counted at two locations; the “lower traffic counter” had more activity than the “upper traffic counter” (see Figure 7). Figure 8 reports current daily vehicle use through the data collection period (daily vehicle use is defined as the daily number of vehicles counted traveling in the inbound direction). Figure 9 presents current daily campsite occupancy during the data collection period. These summaries of estimated current daily use provide a basis for comparison to the estimates of user capacity presented below, and the management triggers and associated actions outlined in the next subsection. The results suggest that current overnight and day use in this area is very low.

**Table 4. Cottonwood Creek recreational segment mean, minimum, and maximum current daily use on the road and at dispersed campsites (August-November 2020)**

Source	Unit	Mean	Minimum	Maximum
Vehicle traffic counter (lower)	Inbound vehicles per day	5	0	22
Vehicle traffic counter (upper)	Inbound vehicles per day	1	0	8
Campsite occupancy counts	Number of sites occupied per day	2	0	4



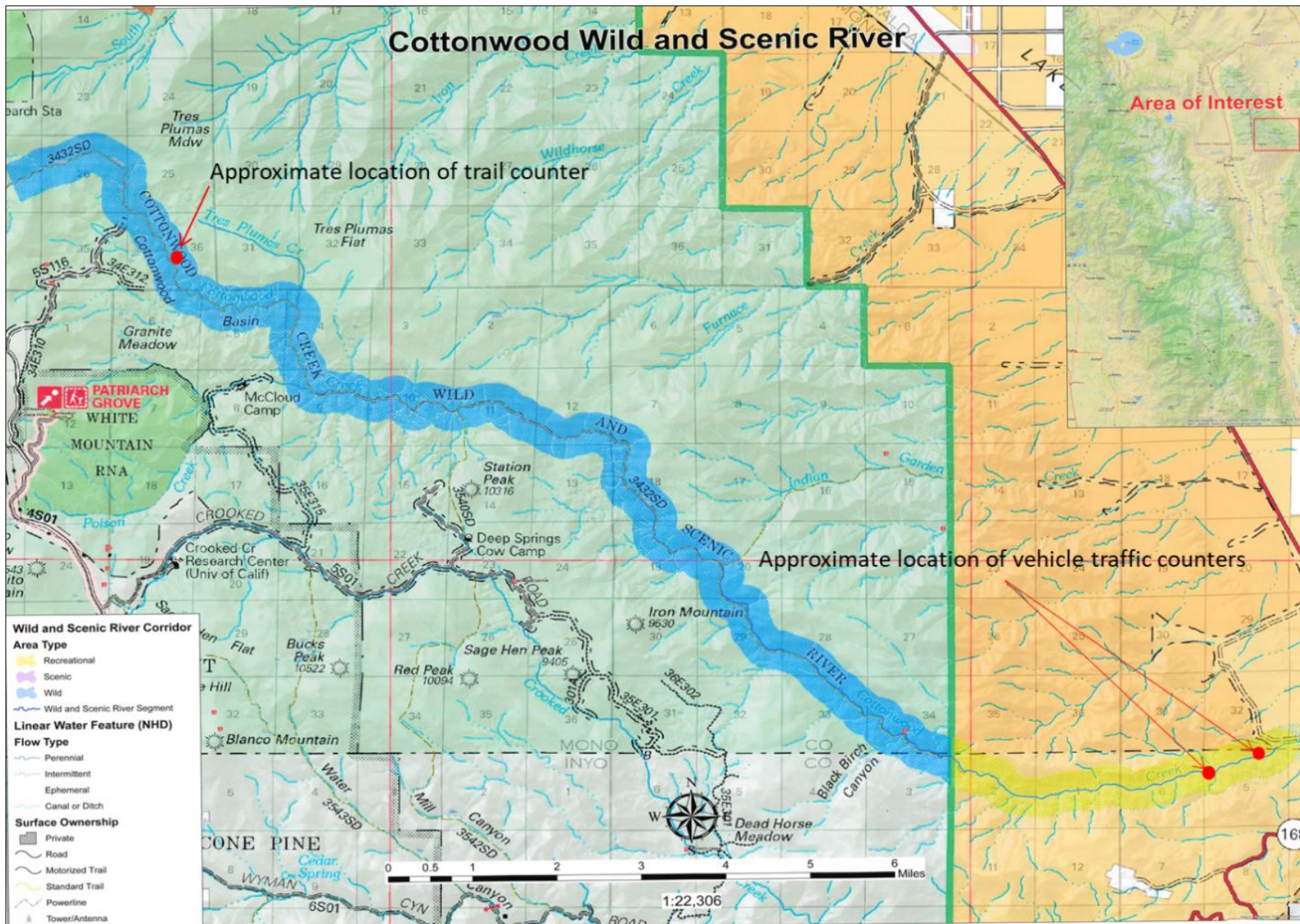
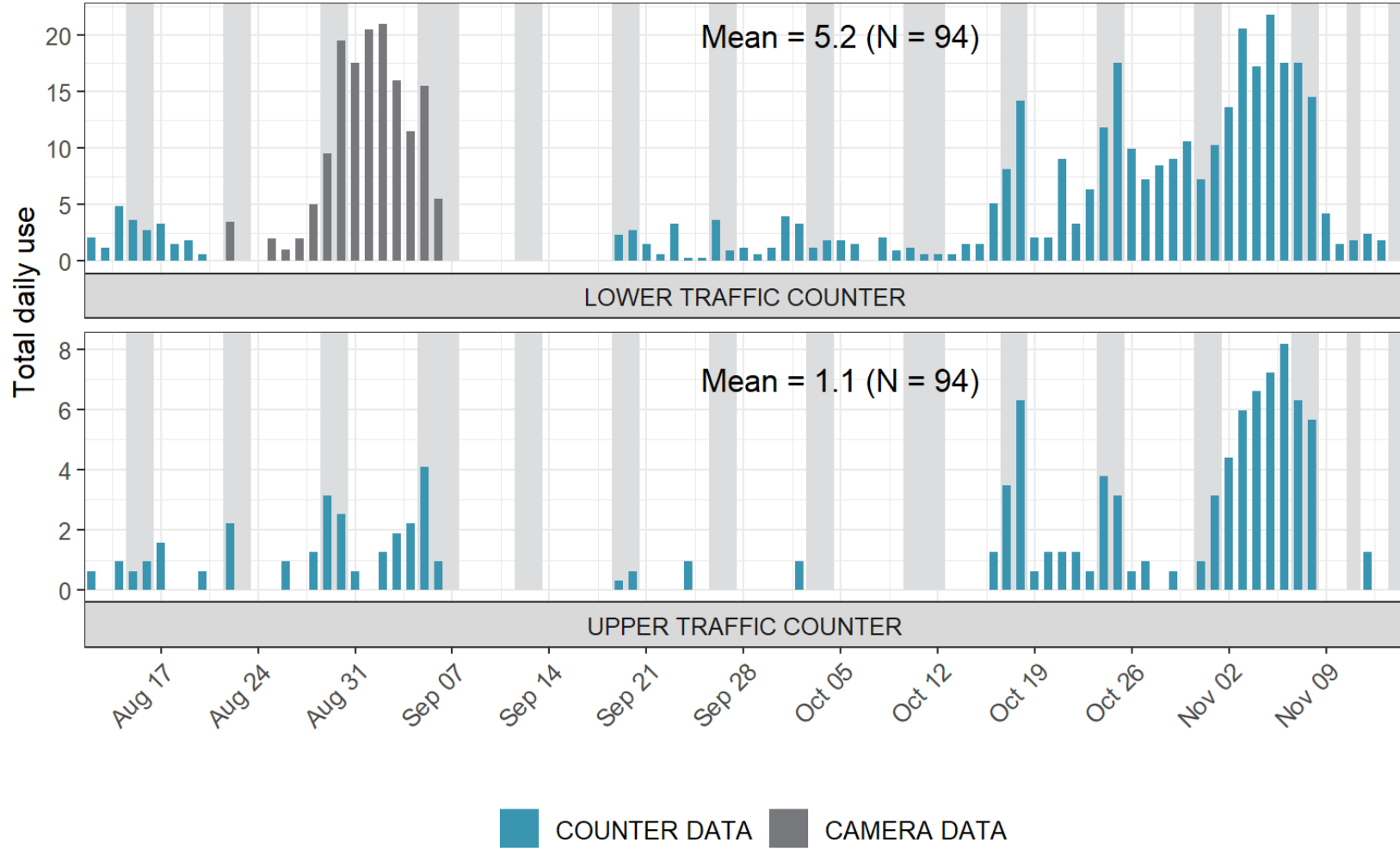
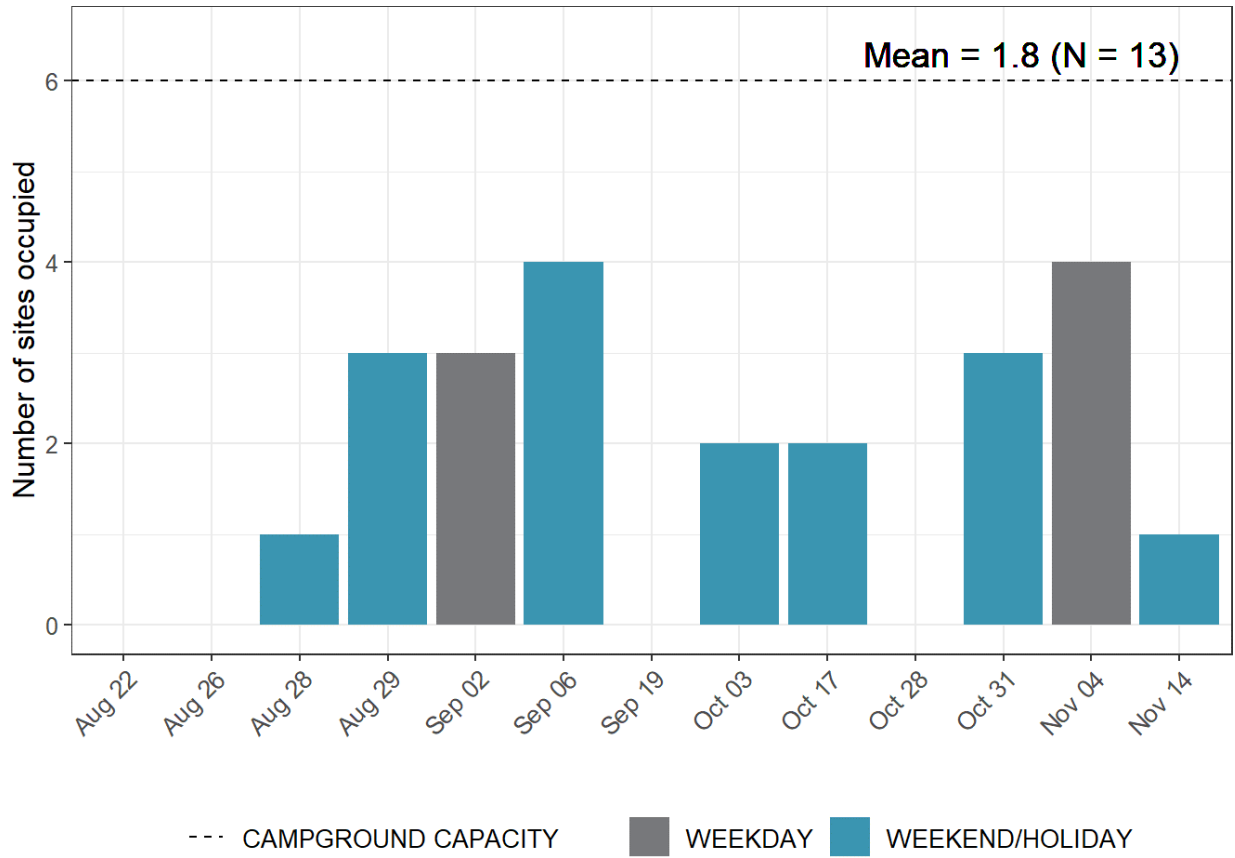


Figure 7. Cottonwood Creek Wild and Scenic River Corridor



**Figure 8. Cottonwood Creek recreational segment daily vehicle use<sup>5</sup>**

<sup>5</sup> Due to a malfunction in the lower vehicle traffic counter, no data were collected by that counter from midnight August 21 through noon on September 19, 2020. Data from a co-located trail camera were used to replace the missing data. There are no missing data during the dates reported, dates without a bar had zero counts.



**Figure 9. Cottonwood Creek recreational segment daily campsite occupancy<sup>6</sup>**

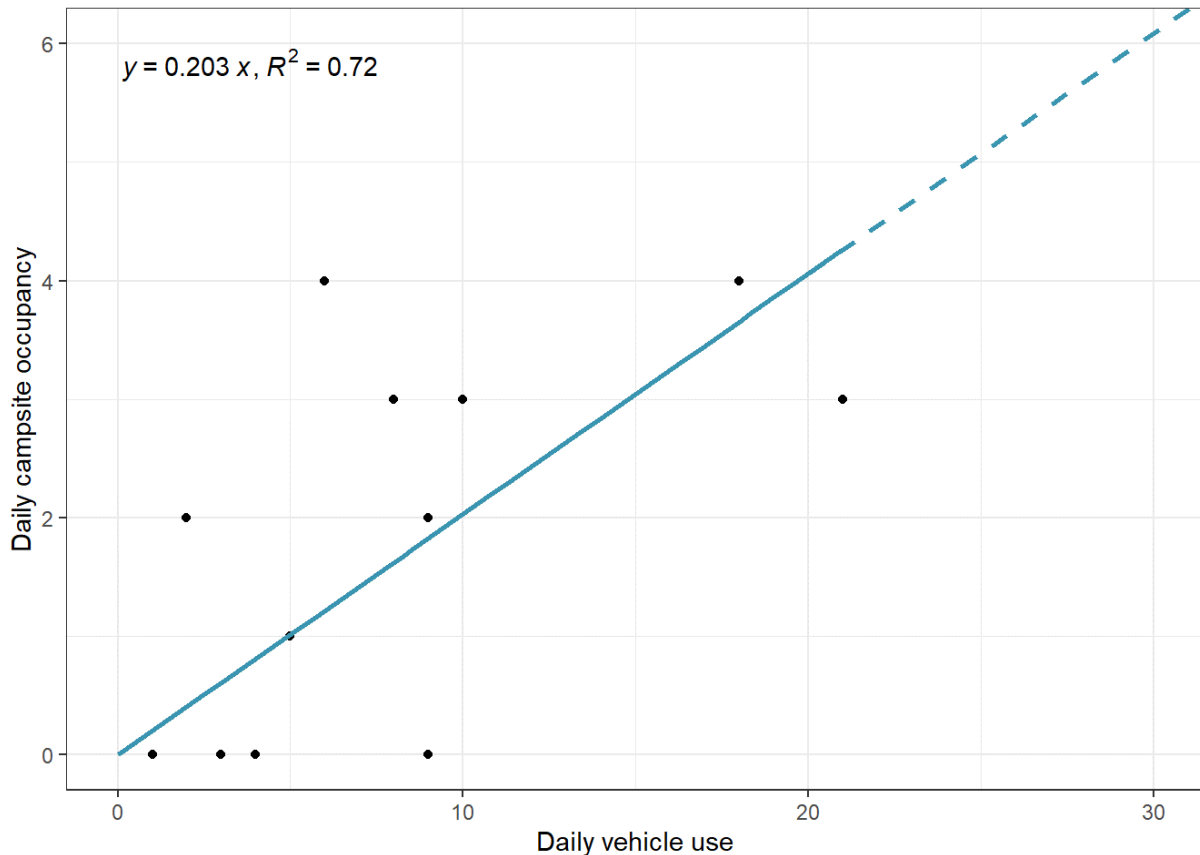
### User Capacity Estimate

The only notable public access within the Cottonwood Creek recreational segment occurs along the paved road that accesses dispersed campsites and day use parking areas. As noted, any expansion of the physical footprint of dispersed campsites or day use parking in this area to accommodate higher levels of recreation use would potentially adversely impact the recreation and botany ORVs and water quality of the creek. Therefore, the limiting factors for recreation use in the recreational segment of Cottonwood Creek are the physical design capacities of the dispersed campsites and day use parking area. The capacity of the dispersed campsites was determined to be a greater limiting factor than the day use parking area, based on data collected for this project. As a result, the numeric user capacity for the recreation segment of Cottonwood Creek was estimated as the maximum number of visitors that can be accommodated in the area per day without the number of camping groups exceeding the physical capacity of the dispersed campsites.<sup>7</sup>

<sup>6</sup> Fridays were classified as weekend days. There are no missing data during the dates reported, dates without a bar had zero counts.

<sup>7</sup> User capacities based on the physical capacities of recreation facilities, such as dispersed campsites, have precedent in the Snake River Headwaters CRMP (USDA Forest Service 2014).

The vehicle traffic and campground occupancy data collected for this study were used to estimate the relationship between daily vehicle use on the road and the number of dispersed campsites occupied per day (Figure 10). The results of this analysis suggest that, on average, when there is a daily total of 30 or fewer vehicles traveling inbound on the road at the lower traffic counter location, the number of camping groups does not exceed the number of dispersed campsites. On average, when there is a daily total of more than 30 vehicles traveling inbound on the road, the number of camping groups is estimated to be greater than the number of dispersed campsites. This suggests the daily capacity for the recreational segment of Cottonwood Creek is a total of 30 inbound vehicles per day.



**Figure 10. Cottonwood Creek recreational segment user capacity scatterplot and regression equation: daily vehicle use and daily campsite occupancy**  
(note, dashed line indicates extrapolation beyond the observed campsite occupancy data values)

The daily capacity of 30 inbound vehicles per day was multiplied by the average vehicle occupancy of 2.5 visitors, as estimated by the USFS NVUM. This translates to a numeric user capacity estimate of 75 visitors per day that can be accommodated in the recreation segment of Cottonwood Creek without adversely impacting river values or water quality (Table 5).

**Table 5. Cottonwood Creek recreational segment estimated numeric user capacity**

	Daily Capacity
Visitors per day	75
Vehicles per day	30

# Management Direction

Management direction contained in this plan is designed to meet requirements of the Act as well as Forest Service and BLM requirements, in order to provide a long-term management strategy for protecting and enhancing the river segment's free-flowing condition, water quality, and ORVs. Management direction in this section consists of desired conditions and management actions and standards, some of which are drawn from the Forest Service's 2019 LMP. Those that are derived from the 2019 LMP include the document section reference in parentheses following the standard, guidelines, or action. Management direction from both agencies prioritizes protecting and enhancing WSR values during the planning and implementation of resource management activities in the river corridor. Some specific management actions were developed through the interdisciplinary team's (IDT) internal planning and discussions, and further informed by civic engagement.

As noted above, this CRMP establishes programmatic management direction. Site-specific NEPA analysis will be done for actions proposed on Forest Service or BLM lands in the WSR corridor. All proposed projects would be checked for consistency with the CRMP during the site-specific analysis.

## Desired Conditions

Desired conditions for the WSR describe the resource conditions, visitor experiences and opportunities, and facilities and services that the agency should strive to achieve and maintain within the designated river corridor. The desired conditions present a broad vision of the desired state for resources in the river corridor. Actions that lead toward the desired conditions over the long term would be considered consistent with this plan. Actions that lead the corridor away from desired conditions over the long term would be considered inconsistent with this plan.

### Forest Service segment

- The designated river has excellent water quality that supports diverse ecological communities. The river segment exists in a free-flowing condition with a range of flows that provide optimum conditions for wildlife, natural processes, and channel integrity.
- Conservation watersheds provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of species of conservation concern and the recovery of threatened, endangered, proposed, or candidate species (MA-CW-DC-01 in LMP).
- Conservation watersheds exhibit long-term (multiple planning cycles) high watershed integrity and have aquatic, riparian, and terrestrial ecosystems resilient to stochastic disturbance events such as wildfires, floods, and landslides (MA-CW-DC-02 in LMP).
- The drainage connections between floodplains, wetlands, upland slopes, headwaters, and tributaries are intact and provide for breeding, dispersal, overwintering, and feeding habitats for at-risk species. These areas provide refugia if other areas of the watershed are disturbed by events such as floods, landslides, and fires (MA-CW-DC-03 in LMP).
- Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that: contribute to the survival, recovery, and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for species of conservation concern (including minimal

impacts from diseases); and sustain both common and uncommon native species (SPEC-FW-DC-2 in LMP).

- Within conservation watersheds, restoration projects and actions are given a high priority for implementation and monitoring (MA-CW-Potential Management Approach).
- Consider Watershed Condition Framework indicators when developing restoration activities within conservation watersheds (MA-CW-Potential Management Approach).
- The free-flowing condition, water quality, and specific ORVs of designated WSRs are protected or enhanced from current condition. Any development is consistent with the river's classification, and management is consistent with a current CRMP (DA-WSR-DC-01 in LMP). Flow levels below 1 cfs would be unfavorable, as these are considered drought conditions. Develop strategies to manage and adapt hydrology in response to potential climate change impacts.
- Public recreation and resource uses are provided that do not adversely impact or degrade the values for which the river was designated (DA-WSR-DC-02 in LMP).
- Cultural resources (buildings, sites, districts, structures, and objects) having scientific, cultural, or social values are preserved and protected for their cultural importance. Site integrity and stability are protected and maintained on sites that are susceptible to imminent risks or threats, or where values are rare or unique. Priority heritage assets are stable, and their significant values protected; vandalism, looting, theft, and human-caused damage to heritage resources are rare. Site significance and integrity are maintained through conservation and preservation efforts (CULT-FW-DC-01 in LMP).
- Cultural resources, traditional cultural properties, and sacred sites are protected through project design and consultation with Indian Tribes, Tribal cultural leaders, and consulting parties (CULT-FW-DC-02 in LMP).
- The Inyo staff coordinates with Tribes in managing traditional cultural properties, resources, and sacred sites where historic preservation laws alone may not adequately protect the resources or values (TRIB-FW-DC-02 in LMP).
- Tribes have access to areas that provide them an opportunity to practice traditional, cultural, and religious lifeways, such as plant gathering, fishing, hunting, and ceremonial activities that are essential to maintaining their cultural identity and the continuity of their culture (TRIB-FW-DC-03 in LMP).

## **BLM segment**

- Conditions are managed to maintain sufficient water quantity to enhance and protect the purposes of the ORVs. Develop strategies to manage and adapt hydrology in response to potential climate change impacts.
- Conditions are managed to maintain stable banks and prevent runoff into the creek; water quality is maintained for the purpose of protecting and enhancing fish and ecological conditions.
- Conditions are managed to protect or enhance outstanding scenery within the river corridor relating to upland and riparian vegetation, tree galleries, scenic vistas, and recreational activities.
- Conditions are managed to support a healthy and diverse Willow-Cottonwood Riparian Community and stream corridor that maintains proper functioning condition. This vegetation community forms a structurally diverse riparian area that is a valuable migratory stop-over and breeding habitat for a variety of neotropical bird species and is refugia for numerous resident

wildlife species that are dependent on consistent water access and shelter from the surrounding arid landscape.

- Conditions are managed to maintain or enhance riparian plant communities, and upland and riparian vegetation along the creek over the lifetime of the plan.
- Conditions are managed to maintain visitor experiences related to designated route use, including route character and desired destinations; visitor crowding; area interpretation; and environmental ethics.

## Management Standards and Actions

### Forest Service segment

The management standards below prioritize protecting and enhancing WSR values during the planning and implementation of resource management activities in the river corridors. These standards and actions are derived from the 2019 LMP, IDT planning and discussions, and public comments. They are intended to preserve the designated rivers' free-flowing condition and protect and enhance their ORVs and water quality. In addition, with the following management activities, the Forest intends to meet its obligations to protect the Paiute cutthroat trout and meet their obligations as provided in the *Revised Recovery Plan for the Paiute Cutthroat Trout* (USFWS 2004).

A standard is a mandatory constraint on project and activity decision making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.

### Standards

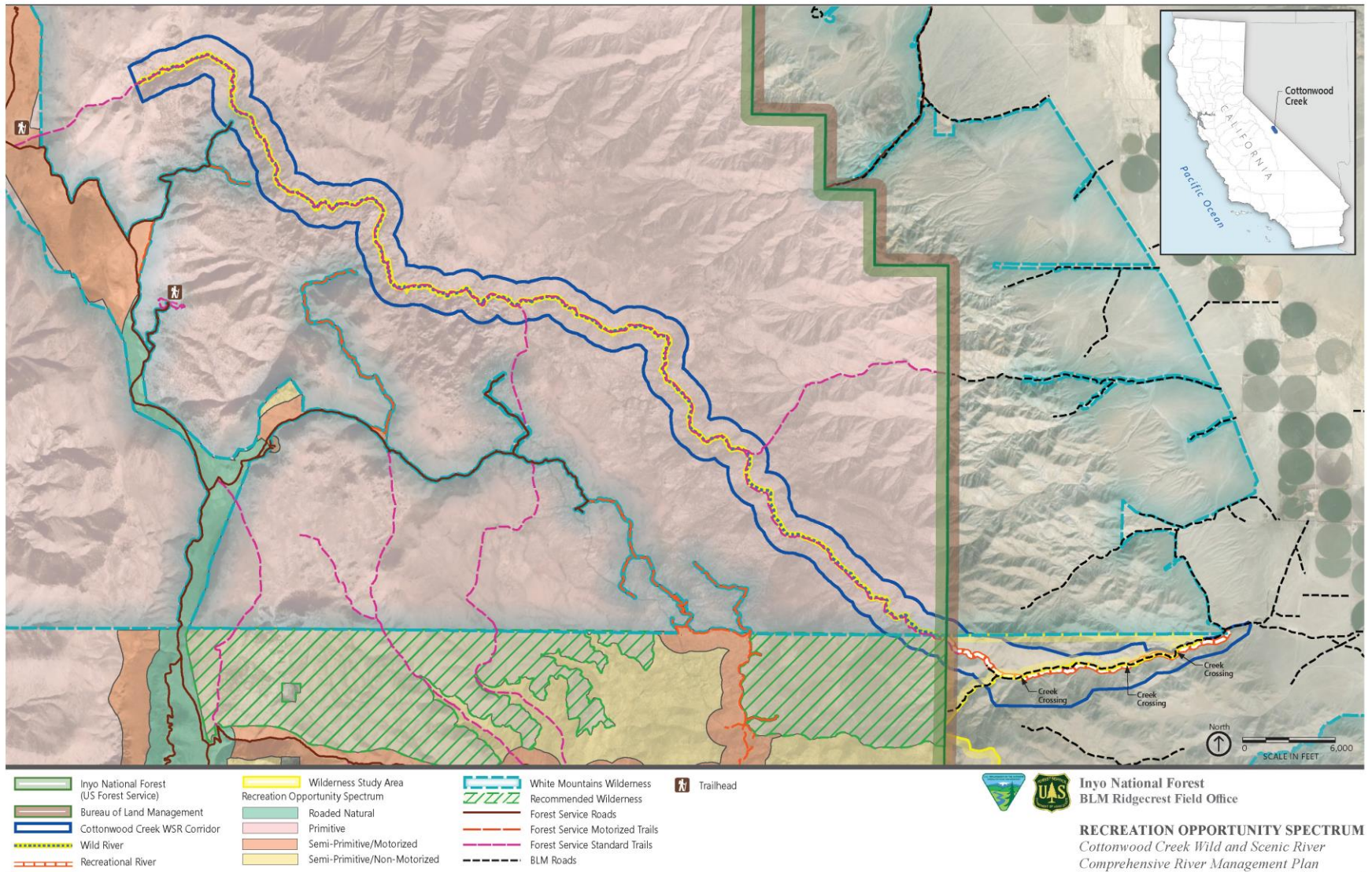
- Road and motorized trail access to rivers must be consistent with river classification, travel management direction, and the recreation opportunity spectrum (ROS) classification (DA-WSR-STD-01). (See Figure 11 for map of ROS classes.)
- Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species (SPEC-FW-STD-01).
- Within the wild segment, structural improvements will be limited to existing structures (DA-WSR-STD-03).
- Utility rights-of-way will not be authorized within wild segments (DA-WSR-STD-05).
- Uses of facilities in existence at the date of designation that do not conform to the river's classification may be allowed so long as the river's free-flowing condition, water quality, and ORVs are protected (DA-WSR-STD-06).
- If new recreation facilities are needed, they must be consistent with river classification, ROS classification, and SIOs, and located to protect ORVs (DA-WSR-STD-07).
- Follow thresholds and capacity guidelines from the User Capacity Analysis to ensure recreation activities do not negatively affect river values.
- Use hydrology best management practices to mitigate campsite and dispersed camping impacts to water quality.
- Include historic property protection provisions in contracts and special use permits (CULT-FW-STD-01).

## Management Actions

- Implement road closure and restoration where road 5S116 enters White Mountains Wilderness and the Cottonwood Creek WSR corridor. This road segment was closed upon wilderness designation.
- Maintain the segment of the Cottonwood Creek trail upstream from the confluence with the South Fork of Cottonwood Creek as staffing allows.
- Further study water quality impacts, and if dispersed campsites are adversely affecting water quality, ensure that the adverse impacts are stopped or mitigated to the greatest extent practicable. For example, the dispersed campsites can be reduced in size, moved away from water, hardened to reduce erosion, or closed and restored to natural conditions.
- Livestock grazing within the Cottonwood Allotment would be administered according to Core Best Management Practices (BMPs) specified in USDA Technical Guide FS-990a, National Best Management Practices for Water Quality Management on National Forest System Lands. Monitoring plans, grazing terms and management actions will be developed using these BMPs. This may include specifying management requirements in the Allotment Management Plan to avoid adverse impacts to water quality, incorporating monitoring data to adapt grazing management practices in the Annual Operating Instructions, and designing structural and nonstructural range improvements to achieve desired conditions for water quality. Specific management actions may include creating off-stream water developments, herding, or salting to reduce livestock presence in the stream. Monitoring will be based on standards and guidelines set in the planning process when analyzing the allotment for grazing.



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**Figure 11. Recreation Opportunity Spectrum**

Cottonwood Creek  
Comprehensive River Management Plan

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## BLM segment

### Management Actions

- Maintain and improve riparian vegetation, including the diversity of native plants and tree galleries, through active restoration, elimination of invasive species, and the prevention of cutting standing trees, including dead ones.
- Limit the collection of firewood to dead and downed wood and consider restricting collection when the quantity of dead and downed wood cannot be sustained; alternatively, encourage campers to buy wood locally.
- Campfires would be allowed in pre-existing established fire rings within the main camping areas before the first creek crossing. Fires would be allowed in dispersed sites beyond the first creek crossing when using a fire pan and all ashes would have to be removed by the visitor who created the fire. Ground fires would be prohibited. BLM would require monitoring of these fire rings to ensure the number does not expand above an acceptable level.
- Provide a Proper Functioning Condition Assessment to help establish the existing conditions and prioritize management, monitoring, and restoration activities.
- Improve streambank stabilization using natural channel design techniques (specifically, adjacent to campsites and at stream crossings).
- Perform projects that employ natural channel design techniques to enhance the stream bed, banks, or immediate riparian area (e.g., beaver dam analogs, shallow floodplain wetlands, etc.), improving sediment retention leading to recruitment of wetland and riparian vegetation.
- Protect or enhance water quality conditions in order to sustain a healthy and representative aquatic ecosystem. Specifically, consider management actions that maintain healthy aquatic vertebrate and invertebrate populations and communities. Monitor campsites, vehicle crossings and cattle use.
- Authorize barricades such as natural barriers and then, if necessary, fences, when necessary to prevent trampling of riparian vegetation and destabilization of creek banks.
- Allow grazing only to a level at which ORVs and water quality can be protected and/or enhanced. Take swift action to enforce the terms and conditions of the grazing permit including steps to halt and reverse the adverse effects to water quality and the ORVs.
- Annually monitor and maintain the existing grazing enclosure fencing. Require permittee maintenance of this fence in working condition as a condition of the grazing permit renewal authorization.
- Maintain designated routes to allow for continued use while protecting ORVs. Consider closure or development of designated routes on a case-by-case basis.
- Define Route Management Objectives for each designated route segment in the River Management Corridor.
- Make corrections or adjustments to the designated route system using the guidance provided in NEMO.
- Avoid exceedance of the capacity limit for the area when issuing Special Recreation Permits.
- Authorize projects requiring water in a manner consistent with maintaining a sufficient quantity of water to support the natural riparian vegetation community and other ORVs. Projects could include, but are not limited to, water diversions for cattle grazing, wildlife, and irrigation.
- Study the water quantity for the purposes of quantifying the needed amount to maintain the river and its ORVs.
- Make application through the appropriate channel to achieve an in-stream flow water right.

- Establish permanent flow gauges to annually monitor flow.

## Potential Future Management Actions

This CRMP establishes programmatic management direction and therefore, site-specific projects are not included as part of this plan. However, the Forest and BLM may consider more site-specific projects in the WSR corridor in the future, for which separate NEPA analysis would be conducted. As noted above, all proposed projects would be checked for consistency with the CRMP during the site-specific analysis.

### Forest Service segment

- Maintain and/or improve fish barrier at Tres Plumas confluence to protect Paiute Cutthroat trout population.

### BLM segment

- Complete projects to protect or enhance riparian vegetation and prevent bank erosion such as, but not limited to, stream restoration efforts (i.e., willow plantings and appropriate erosion control methods) and improving creek crossings (both vehicular and pedestrian) by bridging or armoring (e.g., rip rap, gravel, bridges) while ensuring these are minimized to the maximum extent practicable, do not impede free-flow, do not create bed or bank instability upstream or downstream and prevent an increase in turbidity.
- Conduct road maintenance on the single lane dirt road in the river corridor (4.7 miles) in order to continue providing existing vehicle and hiking access (consistent with the recreation ORV) and in a way that is consistent with protecting and enhancing water quality.
- Raise stream bed to its previous configuration and reconnect to and restore floodplains to support riparian vegetation in a changing climate.
- Reconfigure campsites to move fire pits away from the creek which includes placement of 1,000+ pound boulders for use as primitive fire pits/cooking areas.
- Install a single or double panel information kiosk at the beginning of the river corridor.
- Interpret a homestead site along the creek, which might include a sign along the road.
- Maintain and/or improve grazing fences and gates to keep cows away from the banks of the creek (locations and length unknown, but potentially up to 9.5 miles in length).
- Explore vegetation management projects to increase the diversity and quantity of trees along the creek which could include planting of willow seedlings along creek banks after addressing issues such as invasive weeds.
- Consider stream projects that improve fishing such as adding rock or woody debris to parts of the creek to improve insect production and fish populations, without altering or impairing the stream hydraulics.
- Consider human health and safety improvements such as, but not limited to, a toilet system (composting or other).
- To reduce erosion and concentrated flow entering the creek, limit times (seasons or weather events) when vehicular traffic can enter the canyon to reduce erosion at stream crossings and on unimproved roads or trails; provide gate for permittees to use.

- Manage recreation activities causing exceedance of the capacity limit, degradation of resources, and safety. Potential actions include (in order of priority; actions are from least difficult and restrictive to most difficult and restrictive):
  - ❑ Implement a signage and information program to improve environmental ethics.
  - ❑ Harden campsites to prevent expansion.
  - ❑ Identify fire safe areas for fire pits that protect vegetation and water quality and limit campfires to established fire pits specifically before the first creek crossing.
  - ❑ Establish new safer, sustainable campsites, sanitation, and parking areas outside the riparian corridor.
  - ❑ Implement supplementary rules to protect and enhance resources and experiences.
  - ❑ Enact a permit system to address overuse of the area when monitoring indicates the need.

# Monitoring Plan

The CRMP monitoring plan is intended to track river corridor impacts from various kinds of land uses, including recreation, and to maintain the river corridor’s desired conditions. Monitoring these items will provide managers with key thresholds for when changes to management must be considered in order to protect the corridor’s ORVs, free flow, and water quality, and to manage use within capacity.

The following table lists the location, issue being addressed, and brief description of CRMP monitoring items. Monitoring design considers past, current, and anticipated future funding levels, along with staffing level and other White Mountain Ranger District and Ridgecrest Field Office priorities. The monitoring actions selected are those that address areas of highest concern.

**Table 6. Possible Monitoring Items and their Locations in the Wild and Scenic River Corridors**

Location (FS segment, BLM segment, or both)	Potential Issue / ORV Addressed	Monitoring Action
FS	Water quality	Continue documenting water quality metrics at existing monitoring locations and consolidate data in a database to include a collection of point-in-time data from field observations of fish, land use, color, smell, water alkalinity or lab sample. The California Environmental Data Exchange Network is a source for past water quality sampling data. Refer to the CA Water Board’s Lahontan Basin Plan for water quality metrics
FS	Historic/pre-historic value impacts	Continue monitoring known heritage sites for damage or vandalism.
BLM	Water quality	Monitor grazing use for water quality impacts. Water quality may be monitored by collecting water samples both where the WSR enters BLM land and where it leaves BLM lands. BLM could then list all of the BLM lands in that area which could help determine how uses on BLM lands contribute to water quality readings.  Maintain water quality to state and federal standards.
BLM	Historic and cultural sites	Monitor prehistoric, historic, and cultural sites annually for damages or vandalism, to determine whether recreation or other activities are causing harm.
BLM	Free flow	Annually monitor gauges to track flow levels.
BLM	Botany impacts from recreation	Annually monitor sensitive plant species to determine whether recreation or other activities are causing harm.

Location (FS segment, BLM segment, or both)	Potential Issue / ORV Addressed	Monitoring Action
BLM	Grazing impacts	Annually monitor and maintain the existing grazing enclosure fencing. Consider requiring permittee maintenance of this fence in working condition as a condition of the grazing permit renewal authorization.
BLM	Campground impacts	Monitor fire rings to ensure the number does not exceed an acceptable level.
Both	Scenic impacts	Begin monitoring scenic integrity upon use changes such as grazing, mining, or other development.
Both	Free flow	Establish a practice of annual observations, at a minimum, to note water elevations/depth at certain locations that can be easily replicated upon subsequent visits. These locations could be surveyed so that water depth could be used to calculate flow and to establish a basic database to determine adequate flow when compared to fish or other species survivability.
Both	Wildlife impacts from visitor use	Continue surveys for/documentation of SCC wildlife species within the WSR corridor.
Both	Botany impacts from visitor use	Continue surveys for/documentation of SCC and invasive plant species within the WSR corridor.

Table 7, below, lists triggers and associated management actions for various recreational sites along the river corridor, as well as the rationale for each action. These management triggers apply to both the wild and the recreational segments of the corridor. Monitoring of campsite occupancy should occur every three years, unless a trigger is reached, and action is taken to increase the monitoring frequency. The triggers allow all dispersed campsites to be occupied for a limited percentage of time before prompting adaptive management actions to protect river values and water quality (information in Table 7 is taken from Appendix A; see Appendix A for additional detail).



**Table 7. Cottonwood Creek Triggers and Management Actions**

<b>Management trigger</b>	<b>Adaptive management action</b>	<b>Rationale for adaptive management action</b>
<p>Trigger 1: All dispersed campsites are occupied on 50% or more of monitoring days for one year.</p>	<p>Monitor occupancy annually for the next two years.</p> <p>Educate visitors about low impact camping practices and inform them of alternate recreation opportunities.</p>	<p>To ensure that river values are protected, managers would immediately address early indications of unanticipated increases in campsite occupancy. More frequent monitoring will allow managers to identify changes in use levels and take appropriate actions.</p> <p>Management actions such as education and outreach to visitors would help to maintain the level of use within the current footprint by providing visitors with information about where it is appropriate to camp and how they can help protect river values.</p>
<p>Trigger 2: All dispersed campsites are occupied on 50% or more of monitoring days for two years.</p>	<p>Monitor occupancy annually for the next two years.</p> <p>Use site management techniques to clearly define campsite boundaries and prevent campsite expansion.</p> <p>Use information, signage, and enforcement to keep visitors from camping outside of designated campsites.</p> <p>Actively rehabilitate and close areas where signs of new dispersed campsites start to form.</p> <p>Make necessary changes to campsite access, such as instituting a mandatory reservation system to make sure campground occupancy does not exceed capacity.</p>	<p>Management actions such as enforcing camping only in sanctioned dispersed campsites would help to maintain the level of use within existing infrastructure by preventing new dispersed campsites from forming.</p> <p>Rehabilitation in areas where signs of new dispersed campsites begin to form will discourage formalization of those new campsites and prevent increases in dispersed campsite footprint.</p> <p>As use increases, a reservation system would control the level of use and discourage visitors from camping in new informal sites.</p>

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# **Appendix A: User Capacity Analysis for Cottonwood Creek Wild and Scenic River Corridor**



# **Comprehensive River Management Planning for Inyo National Forest**

## **User Capacity Analysis for Cottonwood Creek Wild and Scenic River Corridor**

**Draft Final**

**Submitted to:**

**VHB  
351 McLaws Circle, Suite 3  
Williamsburg, VA 23185**

**Prepared by:**

**Otak, Inc.  
Willows Road NE, Suite 200  
Redmond, WA 98052**

**April 16, 2021**

**Otak Project No. 33370B**





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## ACRONYMS

BLM	Bureau of Land Management
CRMP	Comprehensive River Management Plan
IDT	Interdisciplinary Team
IVUMC	Interagency Visitor Use Management Council
IWSRCC	Interagency Wild and Scenic Rivers Coordinating Council
OHV	Off-Highway Vehicles
ORV	Outstandingly Remarkable Value
USFS	United States Forest Service
USFS NVUM	USDA Forest Service National Visitor Use Monitoring Program
WSR	Wild and Scenic River

# Introduction

The US Forest Service (USFS) and the Bureau of Land Management (BLM) are working with VHB to develop a comprehensive river management plan (CRMP) for a river corridor in the Inyo National Forest (“the Forest”) that was recently designated under the Wild and Scenic Rivers Act. The river for which the CRMP is being developed is Cottonwood Creek Wild and Scenic River (WSR). Otak, Inc., working as a subcontractor to VHB, completed data collection and analysis to help USFS and BLM establish current recreation use conditions, estimate user capacities, and specify management triggers and adaptive management strategies required for this plan.

The purpose of this report is to present the framework and methods we used and the results to help USFS and BLM establish current recreation use conditions and estimate numeric user capacities for Cottonwood Creek. In the remainder of this introduction section, we describe the geographic setting of the river corridor, provide information about the regulatory requirements for our work, and explain the concept of and established framework we applied to help USFS and BLM estimate numeric user capacities for the river corridor.

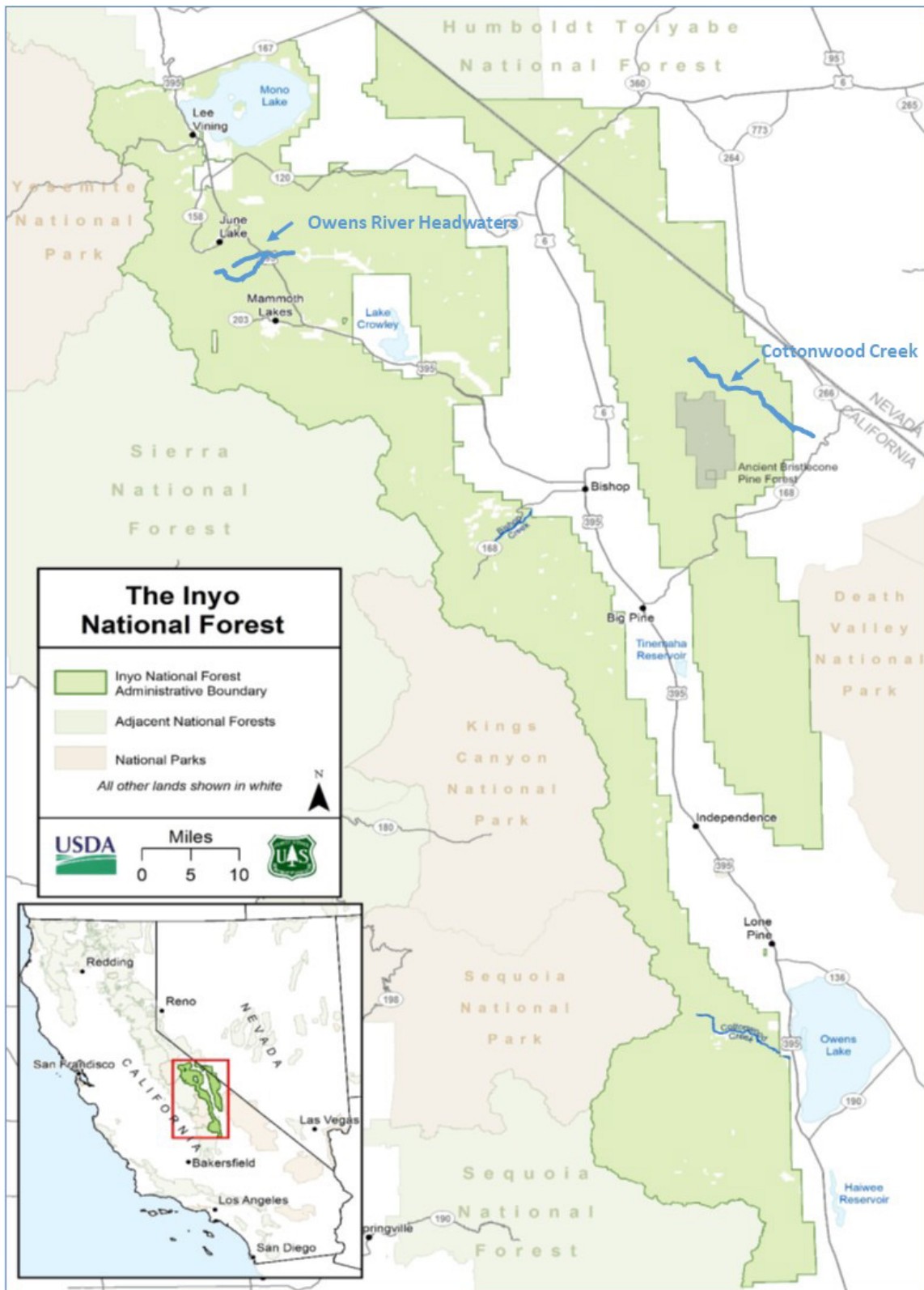
Following the introduction, we provide an overview of the river corridor, information about river values potentially affected by visitor use, and a description of and rationale for our approach and methods to help USFS and BLM establish current recreation use conditions and estimate user capacities. We then present results of our analysis, including statistical summaries of current recreation use conditions, estimates of numeric user capacities, and corresponding management triggers, monitoring, and adaptive management actions.

## Background

### Geographic Setting

The Inyo National Forest is located in parts of the eastern Sierra Nevada of California and the White Mountains of California and Nevada, and spans portions of Fresno, Inyo, Madera, Mono, and Tulare Counties of eastern California, and Esmeralda and Mineral Counties of western Nevada. The Forest encompasses approximately two million acres and was established in 1907 for the purpose of protecting lands needed to build the Los Angeles Aqueduct. The headwaters and tributaries into Mono Lake, the Owens River, and Owens Lake are important for the supply of water to the City of Los Angeles.

Congress designated three wild and scenic rivers that are either in whole or in part on the Forest. One of those rivers, Cottonwood Creek WSR, is the subject of this report. Figure 1 shows Cottonwood Creek, as well as another WSR in the area, Owens River Headwaters, in the context of the Forest. Cottonwood Creek is located in the northeast portion of the Forest in the White Mountain District and in the California Desert District of the BLM.



**Figure 1. Inyo National Forest map**  
*(base map from the 2019 Land Management Plan for the Inyo National Forest, p. 2)*

## Regulatory Requirements

The Wild and Scenic Rivers Act (“the Act”) was signed into law in 1968 (Wild and Scenic Rivers Act, Public Law 90-542). The Act protects the free-flowing waters of many of the nation’s most spectacular rivers and safeguards the special character of these rivers, while also recognizing the potential for appropriate use and development. The Act strives to balance river development with permanent protection for the country’s most outstanding free-flowing rivers.

The Act requires the identification of user capacities and the development of management strategies to manage use within those capacities (IVUMC 2016a). The Wild and Scenic Rivers Act, Section 3(d)(1) states:

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*“...the Federal agency charged with the administration of each component of the National Wild and Scenic Rivers System shall prepare a comprehensive management plan for such river segment to provide for the protection of the river values. The plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act.”*

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Section 3(d)(1) of the Act requires that river managers address user capacities in CRMPs even when use levels are low and do not currently threaten river values or the established desired conditions for those values.

The Act does not define user capacities or prescribe a particular approach to address user capacities in CRMPs. However, more recent federal court rulings have directed that agencies must specify *numeric* user capacities to define the maximum number of people that can be accommodated in a designated river area without adversely impacting river values (IVUMC 2016b).

## User Capacity Framework, Concepts, and Approach

### Framework

Decisions about user capacities for Wild and Scenic Rivers can be challenging. Relationships between the types and amounts of recreation use in a river corridor and impacts to river resources and values are complex. For example, relatively high levels of recreation use can be sustained without resource impacts, in some cases, where use is concentrated on trail treads, forest roads, campsites, and other “hardened surfaces.” At the same time, impacts to resources can occur at even very low levels of visitor use, depending on weather, terrain, visitor behavior, and other factors not directly related to the types or amounts of recreation use.

The Interagency Wild and Scenic Rivers Coordinating Council (IWSRCC) developed guidance and a framework to help address user capacities for Wild and Scenic Rivers (IWSRCC 2018). The IWSRCC framework is adapted specifically to the context of Wild and Scenic Rivers from the Interagency Visitor Use Management Council’s Framework (IVUMF) for managing visitor use and addressing user capacity on federally managed lands and waters. The IVUMF has been developed and adopted together by all of the primary federal land management agencies as the “gold standard” for addressing user capacities. The IWSRCC framework specifies the following set of nine steps to provide a legally defensible, systematic, and transparent process for determining numeric user capacities according to the legal requirements of the Wild and Scenic Rivers Act:

## ***Step 1. Describe the baseline and current conditions and uses for the WSR***

- Identify baseline conditions. Baseline conditions are the conditions which were present at the time of river designation.
- Describe the current amounts and types of use and the current management direction.

## ***Step 2. Identify desired conditions for river values and classifications***

- Integrate visitor use, other public use, and administrative uses into desired conditions.
- Take into account the WSR classification as wild, scenic, or recreational.
- Divide the WSR into relevant analysis areas.
- Identify the need for action by comparing existing and desired conditions.

## ***Step 3. Identify the kinds of use that the WSR corridor can accommodate***

- Tie the kinds of public uses to the facilities that support those uses.

## ***Step 4. Identify measurable indicators for desired conditions***

- Indicators are specific resource or social attributes that can be measured to track changes in conditions associated with human use.

## ***Step 5. Establish thresholds for each indicator***

- Thresholds are the highest levels of indicators that prevent degradation of a river's baseline condition.

## ***Step 6. Identify triggers that elicit management response***

- A trigger is the predetermined point at which changes in an indicator require a management response to ensure that the threshold for that condition is not crossed.
- Where appropriate, more than one trigger may be set to identify levels where action is needed to prevent further decline or to reverse decline.

## ***Step 7. Identify management actions to take when triggers are reached***

- Tie management actions to triggers that prevent degradation of river values.
- Identify and decide upon those capacity-related actions ripe for decision.

## ***Step 8. Determine the WSR corridor's user capacity***

- Identify a measurable amount of use each analysis area can receive without crossing thresholds.
- Establish user capacities that reflect an appropriate quantity of use.
- Support user capacity decisions with information that meets NEPA and agency requirements.

## ***Step 9. Establish a monitoring and adaptive management approach***

- Monitoring of indicators is critical to help determine whether management actions are:
  1. Implemented as designed.
  2. Effective in preventing degradation and protecting and enhancing river values.
  3. Based on valid assumptions about user behaviors, relationship of use to river values, and changes in social perception about crowding.
- New information may require a CRMP amendment or capacity adjustment.
- An adaptive management strategy can be a critical tool which allows managers to use new information to shape future management approaches.



- The types of new information that may lead to a capacity adjustment include the following:
  1. Results of monitoring.
  2. Identification of more appropriate indicators and thresholds.
  3. Clarification of the relationship between the level of use and condition of river values.
  4. Changes in visitor use patterns that could affect river values.
  5. Changes in original assumptions, such as management actions to be taken.
  6. Identification of a new ORV or new information about an existing ORV.

## Key Concepts

There are several key concepts incorporated in the ISWRCC framework for addressing user capacity in Wild and Scenic Rivers that warrant further description. Each of these key concepts is described in this section.

**Desired conditions** provide an important part of the foundation for addressing user capacities. Desired conditions are narrative statements that describe the quality, character, and conditions of river values and visitor experiences to be protected by the CRMP, while allowing for uses that are consistent with the Act. It is the responsibility and privilege of the managing agency (i.e., USFS or BLM for this project) to specify desired conditions for river values and visitor experiences.

**Indicators** are measurable proxies for desired river resource and visitor experience conditions that can be monitored to track changes in river values associated with recreation use. For example, the number of encounters with other groups per hour while hiking is an indicator related to the quality and character of visitors' experiences. Good indicators are those that can be easily and reliably measured, are related to and representative of desired conditions, and are responsive to visitor use management actions. For the purposes of managing use according to numeric user capacities, indicators must also be directly related to the amounts and types of recreation use.

Social indicators (e.g., hiking encounters, number of people at one time at boat ramps, etc.) tend to be directly related to changes in the types and amounts of recreation use and provide a reliable basis for managing recreation use according to numeric user capacities. In contrast, natural resource-related indicators generally do not have direct and reliably quantifiable relationships to recreation use levels except in extreme low use situations (e.g., trail-less/cross country zones, foot trails with less than 50 to 250 hikers *per year*). Nonetheless, resource-related indicators should be monitored, and adaptive resource management actions should be taken to protect ORVs from impacts. Managing the characteristics of visitor use (e.g., to concentrate use on established trail tread, road surfaces, and other established recreation resources and facilities, to promote low-impact use behaviors and patterns, etc.) is the most effective method for limiting or reducing impacts to natural resource-related indicators.

**Thresholds** are the minimally acceptable conditions of indicators to prevent degradation of river values. Thresholds should be precise, time-bounded, and outcomes of recreation use rather than types or amounts of recreation use themselves. Like thresholds, **triggers** are quantifiable conditions of indicators; they represent points at which adaptive management actions are needed to ensure the conditions of indicators do not cross thresholds. In other words, triggers are designed to support proactive visitor use management to protect river values from adverse impact, while allowing for recreation use that is consistent with the requirements of the Act.

Within the ISWRCC framework, **numeric user capacities** are estimated based on quantifiable relationships between the types and amounts of recreation use and the conditions of use-related indicators ("user capacity indicators"). The best available data are used to estimate the maximum amount of recreation use that can be accommodated without crossing thresholds for user capacity indicators. For example, trail counter data could be

correlated with observations from encounter patrols to estimate the maximum number of people who can hike in a river corridor without crossing a threshold for the number of encounters hikers have with other groups per hour or day.

A systematic **monitoring** program provides the structure to measure indicators and assess their conditions in relation to triggers and thresholds on a recurring basis. Monitoring results provide the basis to determine if actions are needed to **adapt management** of recreation use to protect river values from adverse impacts.

### Overall Approach

The framework and concepts described above were operationalized and applied to the specific context of Cottonwood Creek WSR beginning at a week-long CRMP workshop held on site with forest managers and contractors. As part of the workshop, a map-based recreation use and user capacity work session was conducted. The Interdisciplinary Team (IDT) identified and mapped all types and locations of currently established uses and discussed and documented that there were generally no reasonably foreseeable new types of uses expected to occur in the future. Possible limiting factors were identified, as were the ORVs that may potentially be impacted by visitor use. Desired conditions, WSR classifications, and potential analysis areas were discussed and documented.

Draft user capacity methods were developed to specify estimated numeric user capacities for analysis areas within the river corridor. The method for the river corridor specified the: 1) analysis area; 2) type(s) of use; 3) indicators directly related to types and amounts of use; 4) basis for specifying thresholds; and 5) mathematical or statistical methods used to calculate the numeric capacities. The IDT conducted a series of conference calls to refine the user capacity approach for the river corridor before finalization. Triggers for the user capacity indicators and adaptive management strategies were identified based on a review of literature and other recent CRMPs.

## Visitor Use and User Capacities

This section presents the methods and results to establish current recreation use conditions, user capacities, and management triggers and adaptive management strategies for Cottonwood Creek WSR. This section contains information about:

- River classifications and recreation use settings;
- River values potentially affected by recreation use;
- Methods and results to estimate current recreation use and numeric user capacities; and
- Indicators, triggers, thresholds, and adaptive management strategies.

## Cottonwood Creek

Cottonwood Creek is located in Inyo County, California, seventeen miles northeast of the City of Bishop. The headwaters are located in the White Mountains Wilderness at an elevation of 11,200 feet. Cottonwood Creek flows into Fish Valley Lake. The Cottonwood Creek WSR is a total of 21.5 miles in length and is divided into two segments, a 17.4-mile wild segment and a 4.1-mile recreational segment. Each segment is described below and shown in Figure 2.

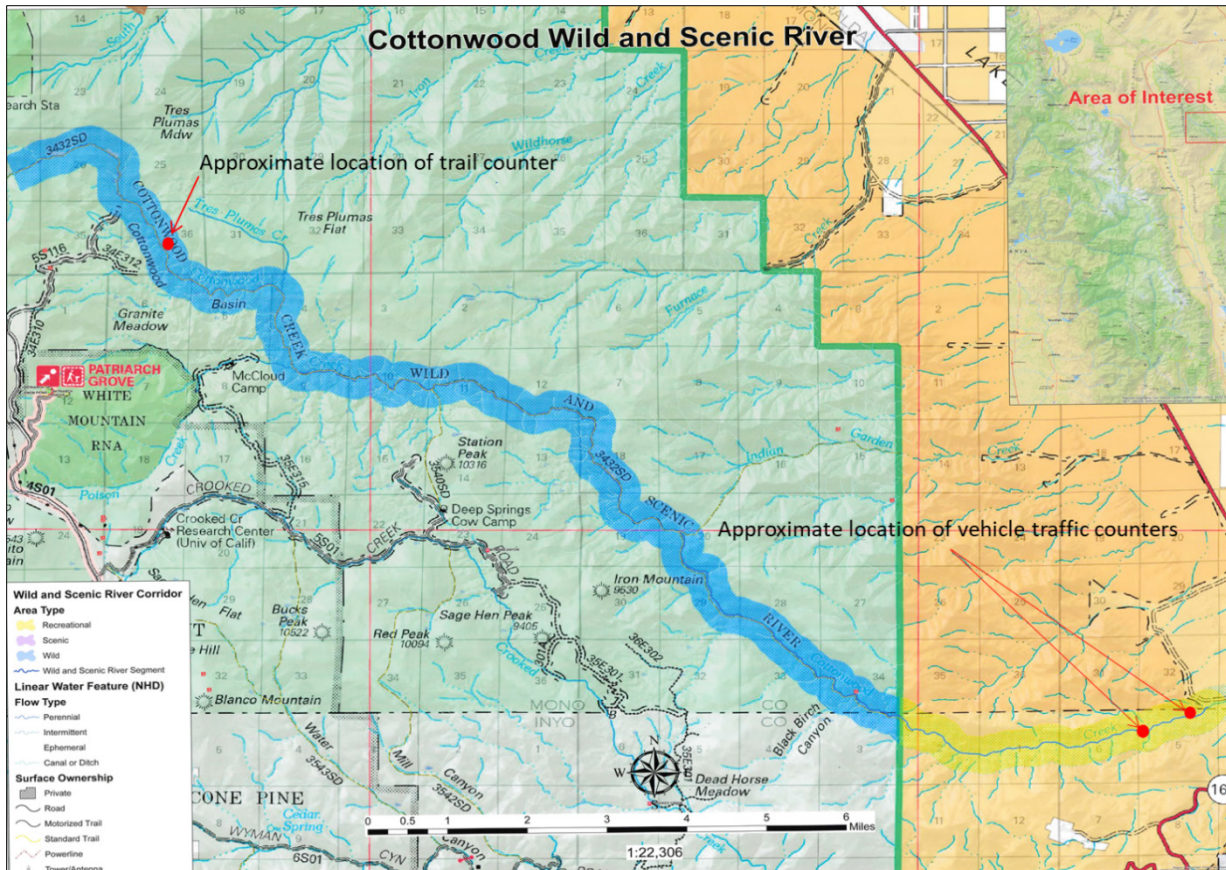


Figure 2. Cottonwood Creek Wild and Scenic River Corridor

## Recreational Segment

### Recreation Use Setting

The recreational segment of Cottonwood Creek is located entirely on land managed by the California Desert District of the BLM. The only notable public access within the Cottonwood Creek recreational segment occurs along the paved road that accesses dispersed campsites and day use parking areas. Recreation activities along this segment of Cottonwood Creek include trout fishing, hiking, bird watching, primitive camping, four-wheel drive exploration, upland game bird and mule deer hunting, photography, mountain biking, and equestrian use. The road along the creek transitions from front country to backcountry and primitive uses to the north. A trail connecting the recreational segment of the WSR to the wild segment on National Forest land is difficult to locate. This trail does potentially offer a primitive recreation opportunity for hikers to follow the creek from north to south, or the reverse, thereby adding hiking and primitive camping experiences.

## Visitor Use and User Capacities (continued)

### *River Values Potentially Affected by Visitor Use*

The recreational segment of Cottonwood Creek possesses outstandingly remarkable values for scenery, wildlife, botany, and recreation. As noted, natural resource conditions are generally not directly related to recreation use levels but can be impacted by recreation use depending on a number of situational factors (e.g., visitor behavior, terrain, weather). As such, the botany and wildlife ORVs and water quality of the creek could be sensitive to recreation-related impacts and these should be addressed by managing the characteristics of visitor use (e.g., concentrating use on established trail treads, road surfaces, and campsites, promoting low-impact use behaviors). In addition, the botany ORV and water quality would potentially be adversely impacted if the physical footprint of the dispersed campsites and/or day use area parking were expanded to accommodate higher levels of recreation use.

The amount of recreation use in the area could impact the quality of visitors' experiences and degrade the recreation ORV. For example, high levels of recreation use might force visitors to have to share campsites with other groups or make it difficult for day use visitors to find a place to park. These impacts to the recreation ORV could cause indirect impacts to the botany and wildlife ORVs and/or to water quality, for example, if visitors create new informal campsites or park in undesignated areas. The scenic values of the river segment are unlikely to be impacted by recreation use levels given the limited extent and dispersed nature of recreation facilities and activities.

### *Current Recreation Use*

Counts of daily vehicle use on the access road and of campground occupancy in the dispersed campsites in the recreational segment of Cottonwood Creek were conducted on a total of 94 days and 13 days respectively, between August and November 2020. Table 1 presents the mean and maximum current daily vehicle use and campsite occupancy. Vehicle use was counted at two locations; the "lower traffic counter" had more activity than the "upper traffic counter" (see Figure 2). Figure 3 reports current daily vehicle use through the data collection period (daily vehicle use is defined as the daily number of vehicles counted traveling in the inbound direction). Figure 4 presents current daily campsite occupancy during the data collection period. These summaries of estimated current daily use provide a basis for comparison to the estimates of user capacity presented below, and the management triggers and associated actions outlined in the next subsection. The results suggest that current overnight and day use in this area is very low.

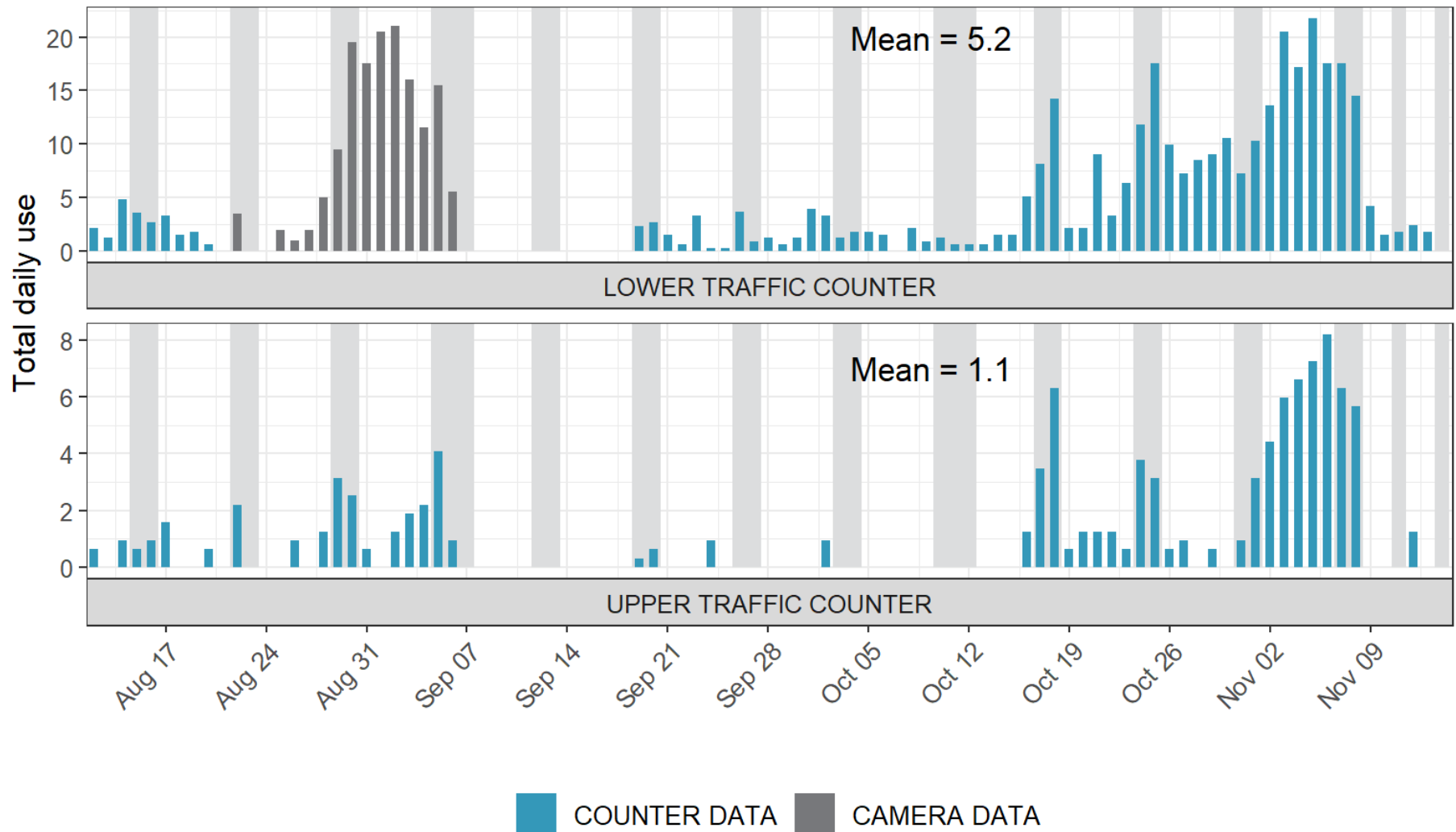
## Visitor Use and User Capacities (continued)

**Table 1. Cottonwood Creek recreational segment mean, minimum, and maximum current daily use on the road and at dispersed campsites (August-November 2020)**

Source	Unit	Mean	Minimum	Maximum
Vehicle traffic counter (lower)	Inbound vehicles per day	5	0	22
Vehicle traffic counter (upper)	Inbound vehicles per day	1	0	8
Campsite occupancy counts	Number of sites occupied per day	2	0	4

**Visitor Use and User Capacities**  
(continued)

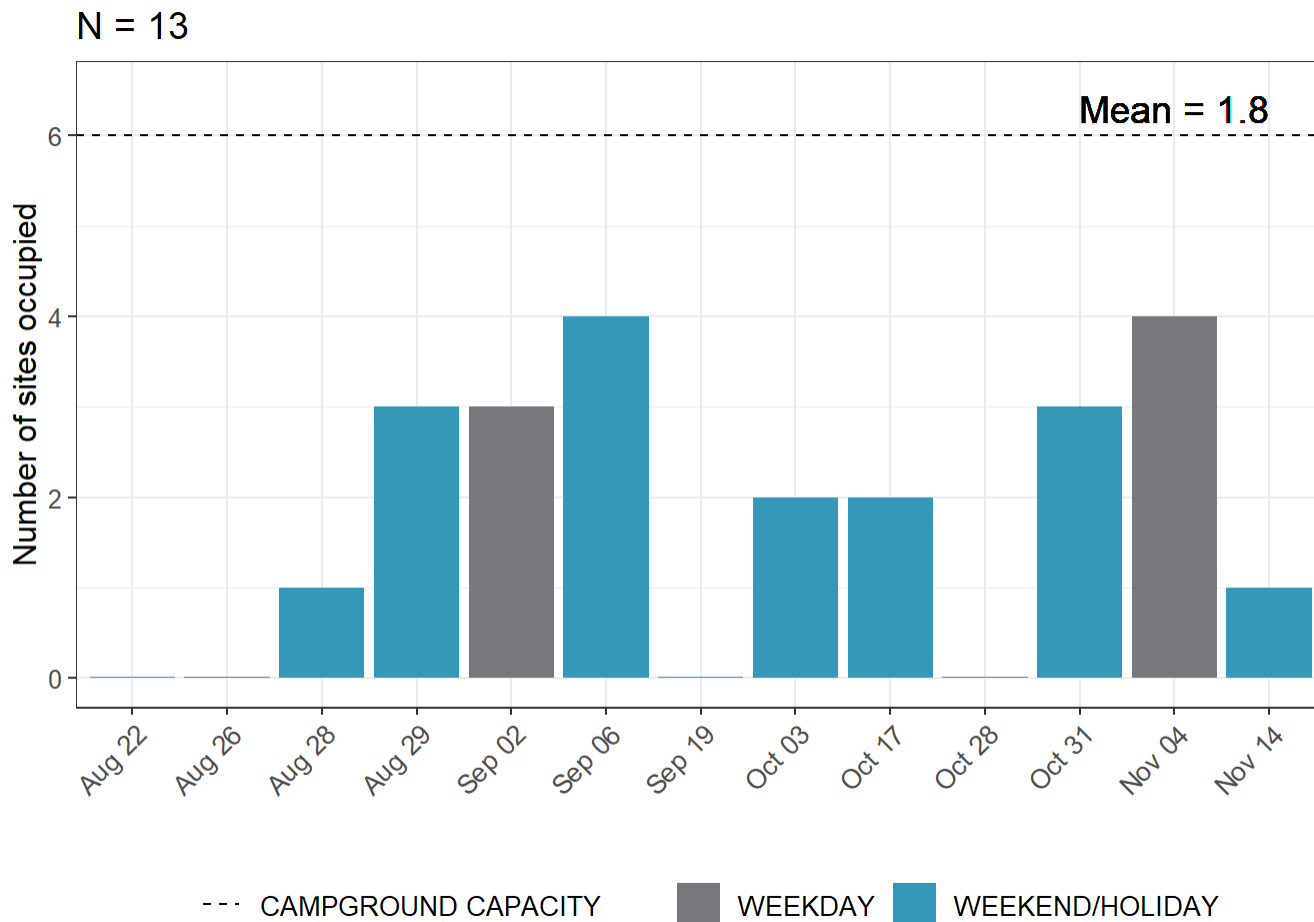
N = 94



**Figure 3. Cottonwood Creek recreational segment daily vehicle use<sup>1</sup>**

<sup>1</sup> Due to a malfunction in the lower vehicle traffic counter, no data were collected by that counter from midnight August 21 through noon on September 19, 2020. Data from the trail camera were used to replace the missing data.

## Visitor Use and User Capacities (continued)



**Figure 4. Cottonwood Creek recreational segment daily campsite occupancy<sup>2</sup>**

### User Capacity Estimate

The only notable public access within the Cottonwood Creek recreational segment occurs along the paved road that accesses dispersed campsites and day use parking areas. As noted, any expansion of the physical footprint of dispersed campsites or day use parking in this area to accommodate higher levels of recreation use would potentially adversely impact the recreation and botany ORVs and water quality of the creek. Therefore, the limiting factors for recreation use in the recreational segment of Cottonwood Creek are the physical design capacities of the dispersed campsites and day use parking area. The capacity of the dispersed campsites was determined to be a greater limiting factor than the day use parking area, based on data collected for this project. As a result, the numeric user capacity for the recreation segment of Cottonwood Creek was estimated as the maximum number of visitors that can be accommodated in the area per day without the number of camping groups exceeding the physical design capacity of the dispersed campsites<sup>3</sup>.

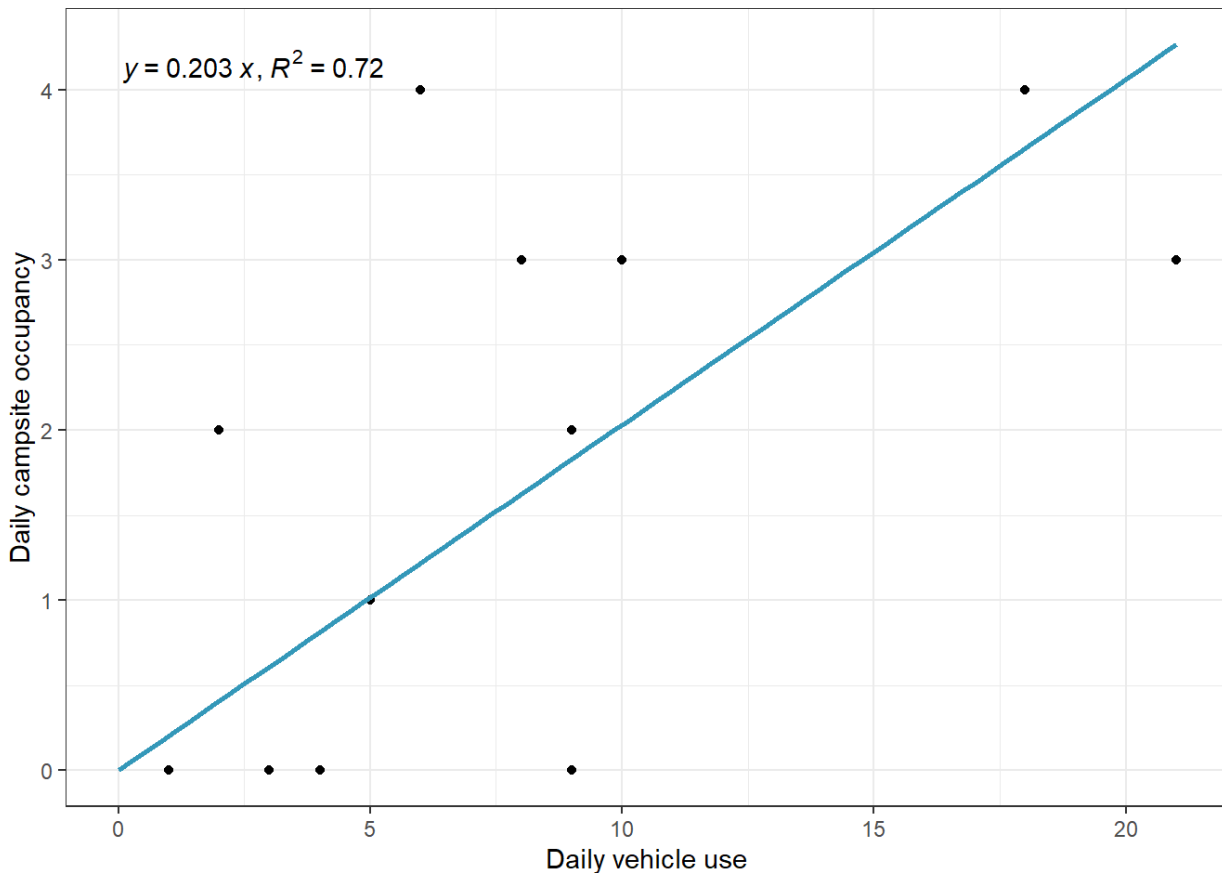
<sup>2</sup> Fridays were classified as weekend days.

<sup>3</sup> User capacities based on the physical capacities of recreation facilities, such as dispersed campsites, have precedent in the Snake River Headwaters CRMP (USDA Forest Service 2014).



## Visitor Use and User Capacities (continued)

The vehicle traffic and campground occupancy data collected for this study were used to estimate the relationship between daily vehicle use on the road and the number of dispersed campsites occupied per day (Figure 5). The results of this analysis suggest that, on average, when there is a daily total of 30 or fewer vehicles traveling inbound on the road at the lower traffic counter location, the number of camping groups does not exceed the number of dispersed campsites. On average, when there is a daily total of more than 30 vehicles traveling inbound on the road, the number of camping groups is estimated to be greater than the number of dispersed campsites. This suggests the daily capacity for the recreational segment of Cottonwood Creek is a total of 30 inbound vehicles per day.



**Figure 5. Cottonwood Creek recreational segment user capacity scatterplot and regression equation: daily vehicle use and daily campsite occupancy**

The daily capacity of 30 inbound vehicles per day was multiplied by the average vehicle occupancy of 2.5 visitors, as estimated by the USDA Forest Service National Visitor Use Monitoring Program (USFS NVUM). This translates to a numeric user capacity estimate of 75 visitors per day that can be accommodated in the recreation segment of Cottonwood Creek without adversely impacting river values or water quality (Table 2).

**Table 2. Cottonwood Creek recreational segment estimated numeric user capacity**

	Daily Capacity
Visitors per day	75
Vehicles per day	30

## Visitor Use and User Capacities (continued)

### Monitoring, Triggers, and Management Actions

Table 3 lists potential management triggers and adaptive management actions that should be taken if triggers are reached. Monitoring of campsite occupancy should occur every three years, unless a trigger is reached and action is taken to increase the monitoring frequency. The triggers allow all dispersed campsites to be occupied for a limited percentage of time before prompting adaptive management actions to protect river values and water quality.

**Table 3. Cottonwood Creek recreational segment triggers and management actions**

Management trigger	Adaptive management action	Rationale for adaptive management action
<p><b>Trigger 1:</b> All dispersed campsites are occupied on 50% or more of monitoring days for one year.</p>	<p>Monitor occupancy annually for the next two years.</p> <p>Educate visitors about low impact camping practices and inform them of alternate recreation opportunities.</p>	<p>To ensure that river values are protected, managers would immediately address early indications of unanticipated increases in campsite occupancy. More frequent monitoring will allow managers to identify changes in use levels and take appropriate actions.</p> <p>Management actions such as education and outreach to visitors would help to maintain the level of use within the current footprint by providing visitors with information about where it is appropriate to camp and how they can help protect river values.</p>
<p><b>Trigger 2:</b> All dispersed campsites are occupied on 50% or more of monitoring days for two years.</p>	<p>Monitor occupancy annually for the next two years.</p> <p>Use site management techniques to clearly define campsites boundaries and prevent campsite expansion.</p> <p>Use information, signage, and enforcement to keep visitors from camping outside of designated campsites.</p> <p>Actively rehabilitate and close areas where signs of new dispersed campsites start to form.</p> <p>Make necessary changes to campground access, such as instituting a mandatory reservation system to make sure campground occupancy does not exceed capacity.</p>	<p>Management actions such as enforcing camping only in sanctioned dispersed campsites would help to maintain the level of use within existing infrastructure by preventing new dispersed campsites from forming.</p> <p>Rehabilitation in areas where signs of new dispersed campsites begin to form will discourage formalization of those new campsites and prevent increases in dispersed campsite footprint.</p> <p>As use increases, a reservation system would control the level of use and discourage visitors from camping in new informal sites.</p>

## **Wild Segment**

### **Recreation Use Setting**

The wild segment of Cottonwood Creek is located entirely within Inyo National Forest. The only notable public access within the Cottonwood Creek wild segment is from a few rough roads requiring high-clearance four-wheel-drive vehicles. Recreation activities along this segment of Cottonwood Creek include trout fishing in specified portions of the stream, hiking, primitive camping, upland game bird and mule deer hunting. There are four primitive campsites at the ends of road spurs. The remoteness and difficult road access limits vehicle camping in the area and results in very low use overall. A trail connecting the wild segment of the WSR to the recreational segment on BLM land exists but is difficult to locate, is not maintained east of McCloud Camp, and is rarely maintained in other areas, and therefore receives very minimal use. There are no other developed recreation facilities in the wild segment of Cottonwood Creek.

### **River Values Potentially Affected by Visitor Use**

The wild segment of Cottonwood Creek possesses outstandingly remarkable scenery, wildlife, fisheries, historic/pre-historic, and botany values. As noted, natural resource conditions are generally not directly related to recreation use levels but can be impacted by recreation use depending on a number of situational factors (e.g., visitor behavior, terrain, weather). As such, the botany, wildlife ORVs and water quality of the creek could be sensitive to recreation-related impacts and these should be addressed by managing the characteristics of visitor use (e.g., concentrating use on established trail treads, road surfaces, and campsites, promoting low-impact use behaviors). In addition, the botany ORV and water quality would potentially be adversely impacted if the physical footprint of primitive campsites were expanded to accommodate higher levels of recreation use.

The amount of recreation use in the area could impact the quality of visitors' experiences and their recreation behavior, which may indirectly impact the ORVs in this segment. For example, high levels of recreation use might force visitors to have to share campsites with other groups or increase the number of encounters with other groups while hiking or hunting. These impacts to the recreation experience could cause indirect impacts to the botany and wildlife ORVs and/or to water quality, for example, if visitors create new informal campsites or travel off trail at increasing rates to avoid crowding. The scenic values of the river segment are unlikely to be impacted by recreation use levels given the limited extent and dispersed nature of recreation facilities and activities. Given the dispersed and remote location of historic/pre-historic resources, recreation use is unlikely to impact the historic/pre-historic values. Fisheries are an ORV due to the presence of a refuge population of the threatened Paiute cutthroat trout in a portion of the creek which is protected from recreational fishing. Therefore, the fisheries value is not directly impacted by recreational fishing. However, the fisheries value may be indirectly impacted due to the indirect impacts to water quality from recreation use.

### **Current Recreation Use**

The following subsection reports an estimate of current daily use in the Cottonwood Creek wild segment based on daily visitor volume data collected for a total of 94 days on the Cottonwood Creek Trail between August and November 2020 as part of the CRMP. A nearby fire closed the portion of the Forest where Cottonwood Creek resides, from September 7 through October 9, 2020. Data from the fire closure period were excluded from the statistical summaries in Table 4 and Figure 7. Table 4 presents the mean and maximum current daily visitor volume on the Cottonwood Creek Trail. Figure 6 reports current total daily visitor use volume by date, while Figure 7 presents the distribution of current total daily visitor use volume on the Cottonwood Creek Trail during the CRMP data collection period. Daily and average intergroup encounter rates per hour are presented in Figure 8 for each of twelve sample days between August and November 2020. These summaries of estimated current daily use provide a basis for comparison to the estimate of user capacity presented below, and the

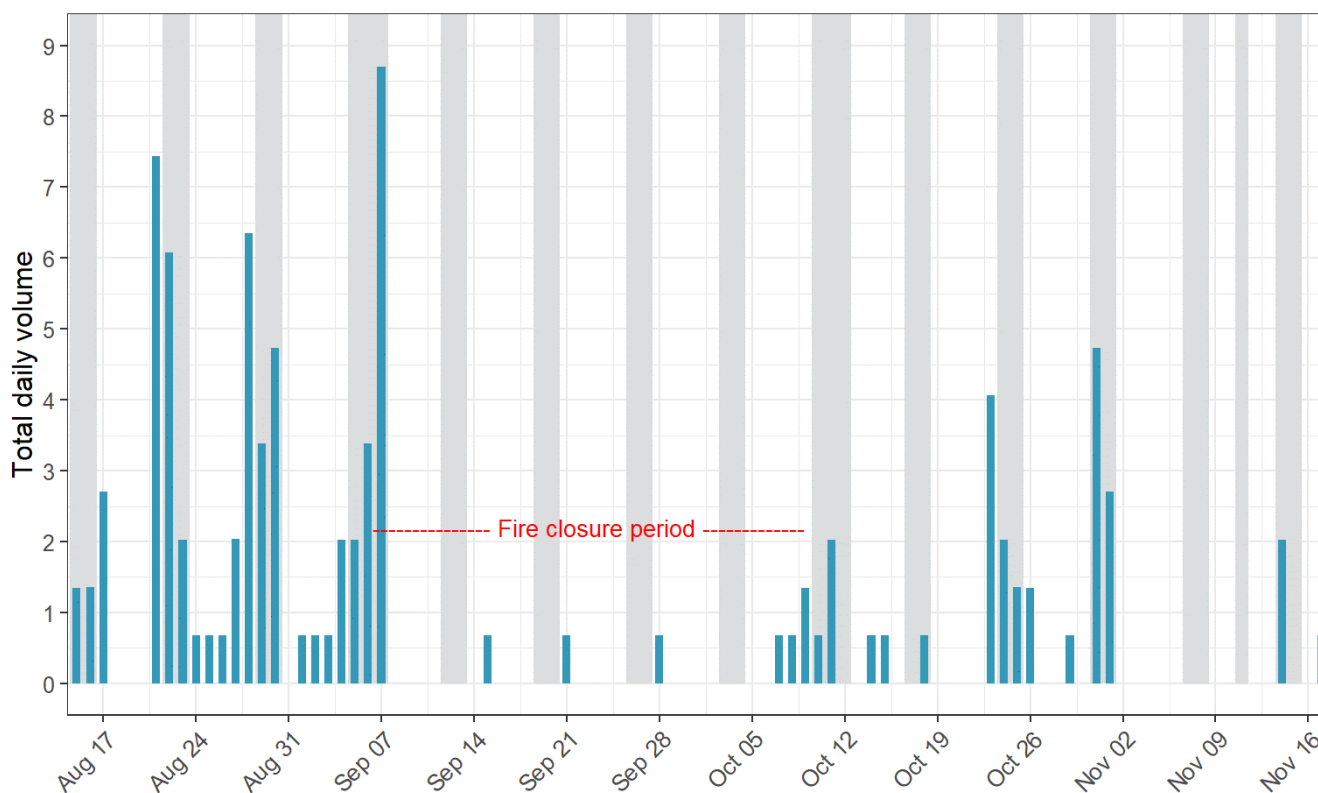
## Visitor Use and User Capacities (continued)

management triggers and associated actions outlined in the next subsection. These results suggest that use in this area is very low.

**Table 4. Cottonwood Creek wild segment mean and maximum current daily use on the Cottonwood Creek Trail (August-November 2020)<sup>4</sup>**

	Unit	Mean	Minimum	Maximum
Cottonwood Creek Trail counter	Total daily volume	1	0	7

*Note: no days are calculated to be extreme outliers (partial days were removed from calculations)*

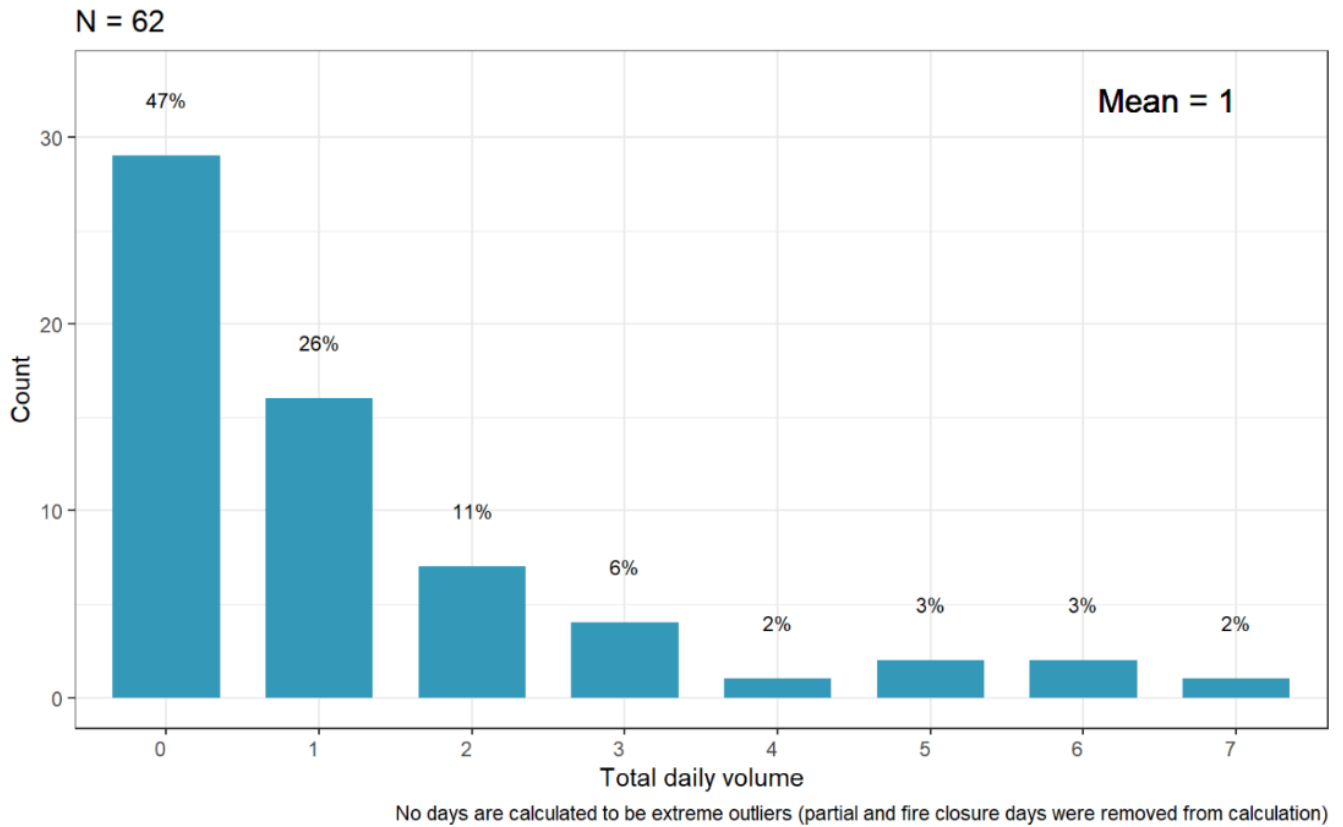


**Figure 6. Cottonwood Creek Trail daily visitor use volume<sup>5</sup>  
(gray shading indicates weekends/holidays)**

<sup>4</sup> Data during the fire closure period (September 7 – October 9, 2020) were excluded from this summary.

<sup>5</sup> The fire closure period began on September 7, 2020. The spike in total daily volume on this day should not be attributed to actual visitor use.

## Visitor Use and User Capacities (continued)

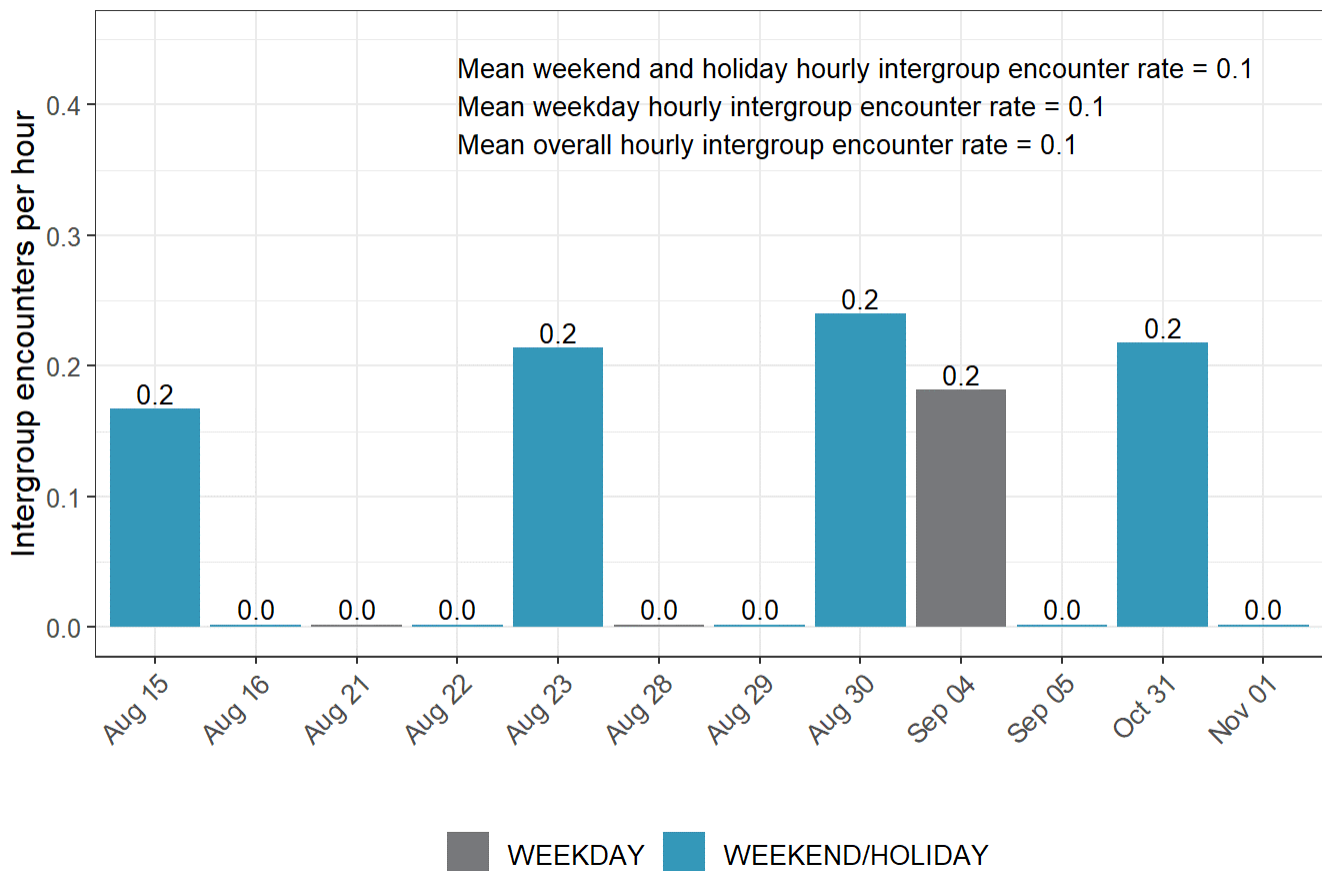


**Figure 7. Cottonwood Creek Trail distribution of daily visitor use volume<sup>6</sup>**

<sup>6</sup> Data during the fire closure period (September 7 – October 9, 2020) were excluded from this summary.

## Visitor Use and User Capacities (continued)

N = 12



**Figure 8. Cottonwood Creek Trail group encounters per hour by sampling date and day of week category<sup>7</sup>**

### User Capacity Estimate

The only notable public access within the Cottonwood Creek wild segment occurs along a few rough roads that access primitive campsites just outside the river corridor. As noted, any expansion of the physical footprint of primitive campsites in this area to accommodate higher levels of recreation use would potentially adversely impact the botany, wildlife, fisheries ORVs and water quality of the creek. Therefore, the limiting factor for recreational use in the wild segment of Cottonwood Creek is the physical design capacity of the primitive campsites. As a result, the numeric user capacity was estimated as the maximum number of visitors that can be accommodated in the wild segment of Cottonwood Creek per day without the number of camping groups exceeding the physical design capacity of the primitive campsites<sup>8</sup>.

The estimated numeric daily user capacity for the Cottonwood Creek wild segment is calculated by multiplying the number of dispersed campsites by the number of visitors per campsite. It was assumed that up to two vehicles can be accommodated at each campsite and NVUM data were used as the basis for the average vehicle

<sup>7</sup> Fridays were classified as weekdays.

<sup>8</sup> User capacities based on the physical capacities of recreation facilities, such as dispersed campsites, have precedent in the Snake River Headwaters CRMP (USDA Forest Service 2014).

## Visitor Use and User Capacities (continued)

occupancy of 2.5 visitors. There are a total four primitive campsites available in the analysis area, resulting in an estimate of a maximum of 20 visitors per day that can be accommodated in the wild river segment of Cottonwood Creek without adversely impacting river values or water quality.

**Total daily user capacity estimate: 4 sites x (2 vehicles per site x 2.5 occupancy) = 20 visitors per day**

### *Monitoring, Triggers, and Management Actions*

Table 5 lists potential management triggers and adaptive management actions that should be taken if triggers are reached. Monitoring of campsite occupancy should occur every three years, unless a trigger is reached and action is taken to increase the monitoring frequency. The triggers allow all dispersed campsites to be occupied for a limited percentage of time before prompting adaptive management actions to protect river values and water quality.

**Table 5. Cottonwood Creek wild segment triggers and management actions**

Management trigger	Adaptive management action	Rationale for adaptive management action
<p><b>Trigger 1:</b> All dispersed campsites are occupied on 50% or more of monitoring days for one year.</p>	<p>Monitor occupancy annually for the next two years.</p> <p>Educate visitors about low impact camping practices and inform them of alternate recreation opportunities.</p>	<p>To ensure that river values are protected, managers would immediately address early indications of unanticipated increases in campsite occupancy. More frequent monitoring will allow managers to identify changes in use levels and take appropriate actions.</p> <p>Management actions such as education and outreach to visitors would help to maintain the level of use within the current footprint by providing visitors with information about where it is appropriate to camp and how they can help protect river values.</p>
<p><b>Trigger 2:</b> All dispersed campsites are occupied on 50% or more of monitoring days for two years.</p>	<p>Monitor occupancy annually for the next two years.</p> <p>Use site management techniques to clearly define campsites boundaries and prevent campsite expansion.</p> <p>Use information, signage, and enforcement to keep visitors from camping outside of designated campsites.</p> <p>Actively rehabilitate and close areas where signs of new dispersed campsites start to form.</p> <p>Make necessary changes to campsite access, such as instituting a mandatory reservation system to make sure campground occupancy does not exceed capacity.</p>	<p>Management actions such as enforcing camping only in sanctioned dispersed campsites would help to maintain the level of use within existing infrastructure by preventing new dispersed campsites from forming.</p> <p>Rehabilitation in areas where signs of new dispersed campsites begin to form will discourage formalization of those new campsites and prevent increases in dispersed campsite footprint.</p> <p>As use increases, a reservation system would control the level of use and discourage visitors from camping in new informal sites.</p>

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# **Appendix B: Resource Assessment for Cottonwood Creek Wild and Scenic River Corridor**

# Cottonwood Creek Resource Assessment

## Introduction

Wild and scenic river (WSR) planning for Cottonwood Creek began for the Forest Service during the development of the Inyo National Forest's (the Forest) Land Management Plan. An interdisciplinary team from the Forest Service and the Bureau of Land Management (BLM) Ridgecrest Field Office then further discussed river resources and values in November 2019 during an internal workshop that was held at the Inyo National Forest Supervisor's office to support development of a comprehensive river management plan (CRMP) for the river. The purpose of the evaluation was to identify river-related outstandingly remarkable values (ORVs), which help guide the focus of the CRMP. Forest Service criteria for outstandingly remarkable values are pulled from Appendix C ("Wild and Scenic Rivers Evaluation for the Inyo National Forest") of the *Inyo National Forest 2019 Land Management Plan EIS*. BLM criteria are found in BLM Manual 6400 and the Eligibility Report is in the *Northern and Eastern Mojave (NEMO) Final EIS/RMP (2002), Appendix O*.

## Resource Assessment

The resource assessment is important to guide the preparation of CRMPs for the Cottonwood Creek WSR, to protect river values. The assessment must take into consideration all features which are directly river-related, and it helps provide a holistic approach to investigating the relationship of river features. Features existing along a river's tributaries may also contribute to the ORVs of the river system. There are three components to the resource assessment process: 1) identifying potential ORVs, 2) determining ORV status based on the river-related values which contribute to the river's overall character, and 3) confirming ORVs set forth for the river in the legislative history of its designation.

## River Segment Classification

Different segments of Cottonwood Creek are classified as either wild, scenic, or recreational, based on the degree of access and amount of development along the river area (Public Law 90-542). The primary criteria for the three classifications are outlined below:

- **Wild River Areas:** Those rivers, or sections of rivers, that are free from impoundments, generally inaccessible except by trail (no roads), with watersheds or shorelines essentially primitive, and having unpolluted waters.
- **Scenic River Areas:** Those rivers, or sections of rivers, that are free from impoundments, having shorelines or watersheds largely primitive and undeveloped, but accessible in places by roads (i.e., roads may cross but generally do not run parallel to or in close proximity to the river). These rivers or segments of rivers are usually more developed than wild and less developed than recreational. This classification does not, however, imply that scenery is an ORV.

- **Recreational River Areas:** Those rivers or sections of rivers that are readily accessible by road or railroad, may have had some development of the shoreline, and may have had some impoundment or diversion in the past. This classification does not, however, imply that recreation is an ORV.

## Region of Comparison Used for the Eligibility Assessment

The Forest Service used the following regions of comparison for each value reviewed in the inventory of ORVs evaluated for eligibility (USDA Forest Service 2019c):

- Scenery – Scenery values were evaluated across the southeastern subregions of the assessment area identified in the Bioregional Assessment Report. This area includes the southern Sierra Nevada and small portions of the Great Basin located in western Nevada.
- Recreation – Recreation values were evaluated across the southeastern subregions of the assessment area identified in the Bioregional Assessment Report. This area includes the southern Sierra Nevada and Great Basin and Desert areas of eastern California, approximately from the Bodie Hills in the north, to Owens Lake in the southeast, and including portions of the Sierra and Sequoia National Forests.
- Geology – Geology values were evaluated across the Central and Southern Sierra Nevada (Lake Tahoe to the Sequoia National Forest), the Western Great Basin (Nevada), and northern Mojave Desert.
- Fish and Wildlife – Fish and wildlife values, population, and habitat were evaluated as follows:
  - Across the species range for Sierra Nevada yellow-legged frog (*Rana sierrae*), northern distinct population segment of mountain yellow-legged frog (*Rana muscosa*), Yosemite toad (*Bufo canorus*), Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), Paiute cutthroat trout (*Oncorhynchus clarki seleniris*), golden trout (*Oncorhynchus aguabonita*), willow flycatcher (*Empidonax traillii*), and Panamint alligator lizard (*Elgaria panamintina*).
  - Across the species range within the Forest for Owens tui chub (*Siphateles bicolor snyderi*).
  - Across the Forest for Owens Valley springsnail (*Pyrgulopsis owensensis*) and Wong's springsnail (*Pyrgulopsis wongi*).
- Prehistory – Prehistory values were evaluated across the Forest.
- History – History values were evaluated across the Forest.
- Other (Botanical) – Other (botanical) values were evaluated across the Central and Southern Sierra Nevada (Lake Tahoe to the Sequoia National Forest), the Western Great Basin (Nevada), and northern Mojave Desert.

The BLM used the criteria provided by *BLM Handbook 6400* to examine a resource for ORVs, including the following values: scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values (e.g., ecological, biological, botanical, paleontological, hydrological, traditional cultural uses, water quality, and scientific values). The Handbook defines an ORV, in general, as a resource which is considered more than simply ordinary, in the context of the local region of comparison. As defined, the BLM delineated the ORV region of comparison for Cottonwood Creek as the following: the northern

Mojave Desert, including the low, arid/semi-arid mountains and basins east of the Sierra Nevada mountain range, and extending into the Basin and Range desert of Nevada.

ORV evaluation is further described in the section below.

## Outstandingly Remarkable Values

The term “outstandingly remarkable value” has never been precisely defined, but criteria have been described in “The Wild and Scenic River Study Process,” which is a technical report of the Interagency Wild and Scenic Rivers Coordinating Council and Forest Service Handbook 1909.12 (82.73a) (USDA Forest Service 2015). This resource assessment is based on the professional judgment of the interdisciplinary team and documents objective, scientific analysis based on reviews of available literature, consultation with experts, and field work.

ORVs are commonly such things as scenery, recreation, geology, fisheries, wildlife, prehistory, history, or botany. To be considered river related, a value should be located in the river or its immediate environment (generally within one-quarter mile on either side), contribute substantially to the functioning of the river ecosystem, owe its existence to the presence of the river, or some combination of these things.

The following ORVs were identified for Cottonwood Creek:

ORV Name	Cottonwood Creek (Forest Service)	Cottonwood Creek (BLM)
Scenery	X	X
Wildlife	X	X
Fisheries	X	-
Historic and Prehistoric/Cultural	X	-
Other	X (Botany)	X (Botany)
Recreation	-	X
Geologic/Hydrologic	-	-

The process for determining ORVs on the river is further described below.

The Forest Service and BLM identified the following criteria for determining if any river-related values were outstandingly remarkable:

- **Scenery**
  - *Forest Service Criteria:* The landscape element forms of landform, vegetation, water, color, and related factors result in notable or exemplary visual features, attractions, or both. When analyzing scenic values, additional factors, such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed, may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment (USDA Forest Service 2015).

- In applying these scenery criteria, unique scenery considered as an outstandingly remarkable value included scenery with views of unique geologic formations; unique vistas; or unique landscapes with combinations of alpine lakes, high peaks, and water features such as waterfalls (USDA Forest Service 2019c).
    - *BLM Criteria:* The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attractions. The BLM Visual Resource Inventory Handbook, H-8410-1, may be used in assessing visual quality and in evaluating the extent of development upon scenic values. The rating area must be scenic quality “A” as defined in the BLM Visual Resource Inventory Handbook. When analyzing scenic values, additional factors, such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed, may be considered. Scenery and visual attractions may be highly diverse along the majority of the river or river segment (BLM 2012).
- **Recreation**
  - *Forest Service Criteria:* Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout the region or are unique or rare within the region. Visitors are willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, fishing, hunting, and boating. Interpretive opportunities may be exceptional and attract, or have the potential to attract, visitors from outside the region. The river may provide, or have the potential to provide, settings for national or regional usage or competitive events (USDA Forest Service 2015).
    - In applying recreation criteria, unique recreation considered as an ORV included recreation experiences such as unique fishing opportunities (for example, fishing for golden trout or Blue Ribbon fishery areas); areas that offered unique scenery which enhanced the recreation experience (for example, unique formations or vistas); or where a combination of multiple recreational experiences occur, such as hiking, backpacking, wildlife viewing, photography, and fishing (USDA Forest Service 2019c).
  - *BLM Criteria:* Recreational opportunities within the subject river corridor are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. River-related opportunities include, but are not limited to, sightseeing, interpretation, wildlife observation, camping, photography, hiking, fishing, hunting, and boating. Such a recreational opportunity may be an outstandingly remarkable value without the underlying recreational resource being an outstandingly remarkable value (e.g., fishing may be an ORV without the fish species being an ORV). The river may provide settings for national or regional usage or competitive events (BLM 2012).
- **Geology**

- *Forest Service Criteria:* The river or the area within the river corridor contains one or more examples of a geologic feature, process, or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a “textbook” example, or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic structures).
    - In applying these criteria for geology, unique geologic features considered as an ORV included lava formations, rare mineral deposits, hot springs, or unique rock formations (USDA Forest Service 2019c).
  - *BLM Criteria:* The river area contains one or more examples of a geologic feature, process, or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a “textbook” example, and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic features) (BLM 2012).
- **Hydrology/Hydrogeology**
    - *Forest Service Criteria:* The river has a unique flow regime, or exceptional water quality or water chemistry, compared to the region of comparison. The feature may be an unusual water source, either in volume or in the way it relates to the area’s geology, or it may possess unique water chemistry related to underlying rock types.
      - In applying these criteria for hydrology, unique features considered as ORVs included high volume springs, springs with unique water chemistry, unique regimes, critical hydrological related values, and exceptionally good water quality (USDA Forest Service 2015).
  - **Fish**
    - *Forest Service Criteria:* Fisheries values should be judged on the relative merits of fish populations, habitat, or a combination of these river-related conditions (USDA Forest Service 2019c).
      - Populations: The river is nationally or regionally an important producer of resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or federal or state listed (or candidate) threatened or endangered species or Species of Conservation Concern (SCC). Diversity of species is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (USDA Forest Service 2019c).
      - Habitat: The river provides exceptionally high-quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or federal or state listed (or candidate) threatened or endangered species or SCCs. Diversity of habitats is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (USDA Forest Service 2019c).

- In applying these criteria, these features were identified as an ORV if the area represented important habitat for breeding or are occupied at critical life stages, such as breeding; or the area offers exceptional habitat or diverse habitat for the species (USDA Forest Service 2019c).
- *BLM Criteria:* Fish values include either indigenous fish populations or habitat or a combination of these river-related conditions (BLM 2012).
  - Populations: The river is a nationally or regionally important producer of indigenous resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or federal or state listed or candidate, threatened, endangered, or BLM Sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (BLM 2012).
  - Habitat: The river provides exceptionally high-quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or federal or state listed or candidate, threatened, endangered, or BLM Sensitive species. Diversity of habitat is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (BLM 2012).
- **Wildlife**
  - *Forest Service Criteria:* Wildlife values should be judged on the relative merits of either terrestrial or aquatic wildlife populations, habitat, or a combination of these things (USDA Forest Service 2015).
    - Populations: The river, or area within the river corridor, contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique, and/or populations of federal or state listed (or candidate) threatened or endangered species or SCCs. Diversity of species is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (USDA Forest Service 2019c).
    - Habitat: The river, or area within the river corridor, provides exceptionally high-quality habitat for wildlife of national or regional significance, and/or may provide unique habitat or a critical link in habitat conditions for federal or state listed (or candidate) threatened or endangered species or SCCs. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (USDA Forest Service 2019c).
    - In applying these criteria, these features were identified as an ORV if the area represented important habitat for breeding or are occupied at critical life stages,



such as breeding; or the area offers exceptional habitat or diverse habitat for the species.

- *BLM Criteria:* Wildlife values include either terrestrial or aquatic wildlife populations or habitat or a combination of these conditions (BLM 2012).
  - Populations: The river, or area within the river corridor, contains nationally or regionally important populations of indigenous wildlife species dependent on the river environment. Of particular significance are species considered to be unique to the area and/or populations of federal or state listed (or candidate) threatened, endangered, or BLM Sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (BLM 2012).
  - Habitat: The river, or area within the river corridor, provides exceptionally high-quality habitat for wildlife of national or regional significance and/or may provide unique habitat or a critical link in habitat conditions for federal or state listed (or candidate) threatened, endangered, or BLM Sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitat is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable” (BLM 2012).

- **Prehistoric, Historic, and Cultural Resources**

- *Forest Service Criteria:* The river, or area within the river corridor, contains important evidence of historic or prehistoric occupation or use by humans. Sites may have national or regional importance for interpreting history or prehistory (USDA Forest Service 2015).
  - Historic: The river or area within the river corridor contains one or more sites or features associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region. Many such sites are listed in the National Register of Historic Places (the National Register), which is administered by the National Park Service. A historic site or feature is 50 years old or older in most cases (see notes below regarding National Register sites) (USDA Forest Service 2019c).
  - Prehistoric/Cultural: The river, or area within the river corridor, contains a site(s) where there is evidence of occupation or use by Native Americans. Sites must have unique or rare characteristics or exceptional human-interest value(s). Sites may have national or regional importance for interpreting prehistory, may be rare and represent an area where a culture or cultural period was first identified and described, may have been used concurrently by two or more cultural groups, and/or may have been used by cultural groups for rare sacred purposes. Many such sites are listed in the National Register (see notes below regarding National Register sites) (USDA Forest Service 2019c).

- **Notes about sites listed in the National Register of Historic Places:** The Inyo National Forest heritage database was used to identify documented historic and prehistoric sites within one-quarter mile of each analyzed stream segment as river related values. Because there presently are no National Register listed cultural properties on the Forest, the National Register had limited use in identifying ORVs. In absence of identified National Register sites, the following factors were considered to determine if documented sites (if present) might qualify as outstanding and remarkable values:
  - **Does an important interrelationship exist between documented cultural sites and the river?** In the case of prehistoric sites, or when insufficient information was available, this relationship was presumed to exist.
  - **Is unique or rare significance of all or any of the documented cultural sites established through National Register of Historic Places evaluation, associative history, site density, or other means?** The significance of some sites has been established through a consensus determination with the California State Historic Preservation Office as qualifying National Register eligible properties and, in a few cases, draft National Register nomination forms substantiating site significance have been compiled. Other sites, while not formally evaluated against National Register criteria, occur in such great densities, or are associated with such well-established themes of significance that outstanding and remarkable values were assumed. These themes of significance were defined in “Appendix C: Wild and Scenic Rivers Evaluation” of the *Inyo National Forest Final Environmental Impact Statement Revision of the Inyo National Forest Land Management Plans – Vol. 2* and include the following: nationally important high elevation prehistoric habitation sites in the White Mountains, regionally significant prehistoric obsidian sources, regionally important development of the Los Angeles Aqueduct in Owens Valley, and regionally significant historic hydroelectric development
  
- The same process was used in the reconsideration of past evaluations as well as for all new evaluations. It is important to note that while known themes of history and prehistory exist throughout the Forest, not all cultural properties have been discovered and documented. For the purposes of the analysis, the ability to recognize prehistory or history values was presumed to rely upon the confirmed presence of associated cultural sites. If the heritage database contained no record of documented prehistoric and/or historic cultural sites within one-quarter mile of a stream reach, then no corresponding river-related value (potential ORV) was identified. If prehistoric and/or historic sites were known, the above criteria were used to determine if available site information warranted identification of an ORV.

- *BLM Criteria:*
  - Historical: The river, or area within the river corridor, has scientific value or contains a rare or outstanding example of a district, site, building, or structure that is associated with an event, person, or distinctive style. Likely candidates include sites that are eligible for the National Register of Historic Places at the national level or have been designated a National Historic Landmark by the Secretary of the Interior (BLM 2012).
  - Cultural: The river, or area within the river corridor, contains rare or outstanding examples of historic or prehistoric locations of human activity, occupation, or use, including locations of traditional cultural or religious importance to specified social and/or cultural groups. Likely candidates might include a unique plant procurement site of contemporary significance (BLM 2012).
- **Botany**
  - *Forest Service Criteria:* ORVs were determined for this resource based on the unique combination or numerous botanical values associated with the river segments (USDA Forest Service 2019c).
  - *BLM Criteria:* The area within the river corridor contains riparian communities that are ranked critically imperiled by state-based natural heritage programs. Alternatively, the river contains exemplary examples, in terms of health, resilience, species diversity, and age diversity, of more common riparian communities. The river corridor may also contain exemplary and rare types of ecological refugia (palm oases) or vegetation habitats (hanging gardens or rare soil types) that support river-related species. The river may also contain river-related plant species that are listed as threatened or endangered by the US Fish and Wildlife Service (USFWS) or the State of California, or are included on the BLM Sensitive species list (BLM 2012).

River-related values must be rated for level of significance. Levels include:

- Outstandingly remarkable — Unique, rare, or exemplary feature that is significant at a comparative regional or national scale.
- Significant (not outstandingly remarkable) — Values which still contribute substantially to the river’s character. These values may still need varying levels of protection and consideration during river planning process.
- Insufficient information — If the level of existing data is insufficient to make a determination of significance, then it must be identified what is needed to get sufficient data. The value needs to be protected as outstandingly remarkable until more information is gathered.

No river-related values studied in this assessment were deemed to be significant or with insufficient information. Values were deemed as either outstandingly remarkable or were dismissed from consideration.

## River Descriptions

Cottonwood Creek is split between Forest Service and BLM jurisdiction. A total of 17.4 miles resides on Forest Service land and is designated as a wild segment. BLM administers a 4.1-mile recreational segment of the river (US Congress 2009).

## Findings and Discussion of Values

Discussion of the values, criteria, findings, and rationales for conclusions specific to Cottonwood Creek WSR are detailed below.

Because Cottonwood Creek lies partially on both Forest Service and BLM land, the ORVs are different on each portion, as detailed below.

### Cottonwood Creek

#### 1. Scenery

##### Forest Service Segment

###### *Finding*

The river corridor possesses outstandingly remarkable scenic values.

###### *Discussion of Values – Rationale for Conclusion*

Cottonwood Creek is within the White Mountains Wilderness, a spectacular and unique desert mountain range with 14,000-foot peaks and ancient bristlecone pine (*Pinus aristata*; USDA Forest Service 2019a). The river segment between the headwaters and the confluences of the North and South Forks of Cottonwood Creek includes diverse foreground and background views including high meadows, granite outcrops, bristlecone pine forest, aspen stands, sections of narrow canyon, and rugged uplands with mountain and low sagebrush habitats. The river itself is typically only visible when standing next to it, due to the narrow channel and tall meadow grasses that border the creek. This segment of the river is no longer accessible by road or maintained trail.

Outstanding features include bristlecone pine forest, interspersed areas of rocky outcrops, narrow canyon, meadow, sagebrush, and aspen groves. The approach to the headwaters area provides a distant overview of the corridor before dropping into Cottonwood Basin for a closer view.

The diverse components of the landscape provide a wealth of color and patterns in the foreground, middle ground, and background. Summer and fall are particularly distinct due to extensive wildflower blooms, aspen groves, and golden meadows contrasted with pine forest on hillsides and ridges. The area is snow covered in winter and not accessible by road.

The background viewshed appears unmodified except for access roads. The foreground includes a variety of old fencing, small signs, short native surface roads, and grazing exclosures. The Cottonwood grazing allotment has been vacant since 2000 and the grazing structures have not been maintained. Unnecessary structures may be removed. Scenic Integrity Objective (SIO) is Very High. The SIOs are objectives that define the minimum level to which landscapes are to be managed from an aesthetics standpoint (USDA Forest Service 2005). Specifically, a “Very High” SIO generally provides for ecological changes only and

refers to landscapes where the valued (desired) landscape character is intact with only minute, if any, deviations. The landscape is unaltered (USDA Forest Service 2005). In combination with BLM's segment of Cottonwood Creek, this river forms the only WSR in the Great Basin Geographic Province protected entirely from the headwaters to its terminus (BLM 2002).

## **BLM Segment**

### *Finding*

Scenic values along the BLM portion of Cottonwood Creek are determined to be outstandingly remarkable.

### *Discussion of Values – Rationale for Conclusion*

The BLM Cottonwood Creek segment has been inventoried as having a Class "A" (Excellent) scenic quality rating, per BLM Visual Resource Management guidelines. The lush riparian plant community along the river bottom contrasts dramatically with the surrounding stark and primitive White Mountain Wilderness Study Area (WSA). Where the BLM and Forest Service river boundaries meet, the WSA is located both to the north and south of the river corridor. As the river travels farther east, the WSA exists only to the north of the river. In combination with the Forest Service's segment of Cottonwood Creek, this river forms the only WSR in the Great Basin Geographic Province protected entirely from the headwaters to its terminus (BLM 2002).

## **2. Recreation**

### **Forest Service Segment**

#### *Finding*

The river corridor possesses no outstandingly remarkable recreation values.

#### *Discussion of Values – Rationale for Conclusion*

The Forest Service-managed wild segment of Cottonwood Creek is open and accessible from May or June to October or November, depending on snow cover. The upper segment is only accessible by a few rough roads requiring high-clearance four-wheel-drive (4WD). Typically, summer and fall are the seasons of use for any recreational activities. Recreation in the wild segment of Cottonwood Creek includes hunting and fishing. Hunting is popular due to the remote and open terrain in the upper reaches of the river. The area is within a trophy X9 C hunt zone, which is an area that tends to attract paying tourists interested in hunting game with "exceptional" physical traits (Jeke et al. 2019). Species include mule deer (*Odocoileus hemionus*), desert bighorn sheep (*Ovis canadensis nelsoni*), and upland game species. Hunt zone regulations define trophy characteristics for deer hunting in a particular area (CDFW 2017). For all X and C zones, deer with trophy characteristics have "four or more points on either antler (excluding eye guards) or with an outside antler spread of at least 22 inches" (CDFW 2017).

There are a few primitive campsites at road ends and along the South Fork Road. The remoteness and difficult road access limits vehicle camping in the area. There is a rarely maintained Forest Service system trail along a portion of the North Fork. The trail provides day hiking opportunities for people visiting the area. The river is quite narrow, with thick vegetation on the banks in most areas. Some pools are large enough for wading, though not for swimming. The wild segment appears to be very lightly used for recreation. The system trail along the North Fork has faded away in many locations. There is a high potential for solitude in the area.

The 4WD road to McCloud Camp does appear in a common off-highway vehicle (OHV) guidebook to the Eastern Sierra. The area provides a high-quality experience for those people seeking a remote and beautiful area in which to hunt, fish, hike, or camp. However, options for hiking on trails or using established campsites are very limited. Access requires a high-clearance 4WD. There are a few rugged 4WD roads that access the upper wild segment corridor. There are no other recreational facilities. The faint Forest Service system trail is the only formal recreational site or facility in the wild segment. The Ancient Bristlecone Pine Forest is adjacent to the river and is popular for sightseeing and education, but the river itself is remote, difficult to access, and does not stand out as a recreational destination in comparison to other areas of the White Mountains or the eastern Sierra Nevada.

## **BLM Segment**

### *Finding*

The river corridor possesses outstandingly remarkable recreation values.

### *Discussion of Values – Rationale for Conclusion*

The presence of a perennial stream of this size in such an arid region offers visitors a unique and outstanding semi-primitive water-based recreation opportunity. Activities along this recreational segment include trout fishing, hiking, bird watching, primitive camping, 4WD exploration, upland game bird and mule deer hunting, photography, mountain biking, and equestrian uses (BLM 2002). Opportunities for the combination of identified recreation activities do not exist in the surrounding region, or when they do exist, do not encompass the full list of activities together in one place. Easy river access by passenger car from a paved highway with campsites large enough for camper trailers is rare in the region of comparison. Cottonwood Creek affords additional opportunities for visitors using camp trailers or passenger cars to engage in the identified recreation activities. As the primitive road along the creek goes north, its roughness increases, generally reducing the number of visitors and transitioning the nature of visitation from front country, easy access users to back-country, more primitive users. Topography limits the viewshed to Cottonwood Creek Valley, except in a few areas where topography allows viewing of the distant Fish Lake Valley. This gives the area a mountainous feel that is very different than the Mojave Desert visitors cross to reach Cottonwood Creek. A trail connecting the recreational section of the WSR on BLM-managed lands to the Forest's wild section remains difficult to find yet offers a primitive recreation opportunity. Hikers follow the creek from north to south, or the reverse, thereby adding to hiking and primitive camping experiences.

## **3. Geology**

### **Forest Service Segment**

#### *Finding*

The river corridor possesses no outstandingly remarkable geology or hydrology values.

#### *Discussion of Values – Rationale for Conclusion*

The geology surrounding Cottonwood Creek contains the same rock formations as the surrounding region. Bedrock within the Cottonwood Creek and Basin area mainly consists of Mesozoic granitic rocks of the Sierra Nevada batholith and overlying Tertiary rocks, chiefly of volcanoclastic origin and quaternary alluvium. Other portions within the Cottonwood area contain younger and older alluvial fan deposits, glacial and talus deposits, fluvial deposits and olivine basalt flows (Hollett et. al. 1991).

The geology types are generally sedimentary, volcanic, and plutonic rocks from the Mesozoic, Paleozoic, and late Cenozoic eras within the Cottonwood Creek area. The Sierra Nevada Mountain Range and the Owens Valley were formed by basin and range tectonics and were transformed by glacial processes (Hollett et. al. 1991). Landforms located within the area associated with these processes include debris slides, debris flows, and rock falls. Elevations in the Cottonwood area rise to the White Mountain Peak at 14,252 feet, the third highest summit in California.

## **BLM Segment**

### *Finding*

The BLM portion of the river does not possess any outstandingly remarkable geologic or hydrologic values.

### *Discussion of Values – Rationale for Conclusion*

The geology surrounding Cottonwood Creek contains the same rock formations as the surrounding region. There are no regionally significant rock formations that would warrant an ORV.

## **4. Fish**

### **Forest Service Segment**

#### *Finding*

This river corridor possesses outstandingly remarkable fish values.

#### *Discussion of Values – Rationale for Conclusion*

Paiute cutthroat trout (*Oncorhynchus clarki seleniris*) were introduced to Cottonwood Creek in 1946 by a transplant from the Silver King Creek Basin (USDA Forest Service 2019b). Progeny of that transplant survive in the creek today and have formed a self-sustaining population, one of five in existence (USFWS 2004). The population is found upstream of the confluence with Tres Plumas Creek, where a natural barrier prevents non-native trout from migrating upstream. Paiute cutthroat trout were one of the first animals in the United States to be listed as federally endangered under the Endangered Species Act (ESA) in 1967. The species status was downgraded to threatened in 1973. Pools are important rearing habitat for juveniles and act as refuge areas during winter (Raleigh et al. 1984, Swales et al. 1986, and Berg 1994 cited in USFWS 2004). The species is considered an out-of-basin refuge population (USDA Forest Service 2019b), and it will be managed to repopulate the Silver King Basin when conditions for the fish are sufficient for supporting the trout's recovery (USFWS 2004). Key recovery actions planned for the species include removing nonnative trout from historic Paiute cutthroat trout habitat; reintroducing Paiute cutthroat trout into renovated stream reaches in historic habitat; and protecting and enhancing all occupied Paiute cutthroat trout habitat (USFWS 2004). In addition, extensive past restoration work has occurred to stabilize stream channels, banks, contributing draws, etc.

## **BLM Segment**

### *Finding*

The BLM portion of the river does not possess any outstandingly remarkable fish values.

### *Discussion of Values – Rationale for Conclusion*

While non-native brown trout (*Salmo trutta*) inhabit the creek, they are not an uncommon species, nor are they protected by law. The fish gain importance from a recreational perspective due to their angling sport value. For this reason, fish values in the river are not deemed to be outstandingly remarkable.

## 5. Wildlife

### **Forest Service Segment**

#### *Finding*

The river corridor possesses outstandingly remarkable wildlife values.

### *Discussion of Values – Rationale for Conclusion*

The corridor contains occupied habitat for the bi-state distinct population segment of greater sage-grouse (*Centrocercus urophasianus*), an SCC for the Forest. The White Mountain Population Management Unit (PMU) sage-grouse occur year-round within the WSR corridor at the highest known elevation (2,875 meters) and breed and rear young in the sagebrush scrub habitat located in the vicinity of Tres Plumas. This area includes two known leks, or breeding territories. There are also multiple northern goshawk (*Accipiter gentilis*) foraging and nesting territories within the river corridor. The WSR corridor also hosts a diverse community of bird species. A survey conducted in 2010 by Point Blue Conservation Science identified 26 bird species along a transect near Cottonwood Creek. The dominant species included dusky flycatcher (*Empidonax oberholseri*), house wren (*Troglodytes aedon*), and song sparrow (*Melospiza melodia*; Point Blue Conservation Science 2021). A summer herd of mule deer and herds of Nelson desert bighorn sheep, an SCC, occupy the WSR corridor. Willow shrub communities within the riparian zone may provide habitat for migratory bird species, such as the SCC willow flycatcher, including the Sierra Nevada Mountain willow flycatcher and the Great Basin willow flycatcher (*Empidonax traillii adastus*), but no known breeding habitats. Numerous spring systems may provide habitat for aquatic springsnails and create fens with wet organic layers. SCC Wong's springsnail and Owens Valley springsnail are present in this area. Additional surveys for these species and monitoring for aquatic springsnail species are recommended.

### **BLM Segment**

#### *Finding*

The river corridor possesses outstandingly remarkable wildlife values.

### *Discussion of Values – Rationale for Conclusion*

Wildlife along the BLM portion of Cottonwood Creek is supported by the unique plant assemblage along the WSR corridor and includes a variety of animal species. Specifically, there are a number of special status and/or sensitive bird species, such as yellow warbler (*Dendroica petechia*), yellow-breasted chat (*Icteria virens*), prairie falcon (*Falco mexicanus*), sharp-shinned hawk (*Accipiter striatus*), and Cooper's hawk (*Accipiter cooperii*). Willow shrub communities along the WSR corridor provide potentially suitable habitat for the southwestern willow flycatcher, a federally endangered species. This segment of Cottonwood Creek supports over 70 species of birds (BLM 2002).

The BLM segment of Cottonwood Creek is also an important habitat for the spotted bat (), which is a federal and California State Species of Special Concern. Paiute cutthroat trout, a federally threatened



species, inhabit the North Fork of Cottonwood Creek in the Forest. Ecological data used to inform this rationale were collected from contracted bird and vegetation surveys conducted between the early 2000s-2012.

## 6. Historic, Prehistoric, and Cultural Resources

### Forest Service Segment

#### *Finding*

The river corridor possesses outstandingly remarkable prehistoric and historic values.

#### *Discussion of Values – Rationale for Conclusion*

#### Historic:

Cottonwood Creek appears on land survey maps as early as 1879. Ethnographic literature for this region indicates a long history of use by the Paiute of Owens Valley and Fish Lake Valley, which continues to the present day (Steward 1933). A horse corral recorded at the top of the river in the White Mountains is associated with the White Mountain wild horse herd and notable Paiute known as “Grey-Haired Johnny.” The wild horse herd was documented in this area as early as the 1870s and is thought to have originated with the establishment of early ranches in the area. Grey-Haired Johnny was a prominent horse doctor who was skilled in the use of herbal medicines. In the early 1900s, Grey-Haired Johnny often traveled to Southern California horse racing tracks where he was in high demand to treat injured racehorses with his special herbal remedies. In return for his treatment, Grey-Haired Johnny was given thoroughbred stallions that he would take back to the herd in the White Mountains (USDA Forest Service no date).

Cottonwood Creek has a long history of grazing and mining, evidenced by numerous related features. A notable extant mining feature is the standing cabin at Eva Belle Mine, which was a prosperous gold mine that was also a source of silver, copper, lead, and zinc. The site was historically associated with the Mono Lake Mining District prior to its incorporation into the Inyo National Forest. The mine was owned by the Minerals Management Company of Dyer, Nevada, and produced in 1929 (Wilkerson 2014). A former log cabin associated with the mining company remains at the site. Smaller-scale resources associated with grazing and mining include rock-lined dugout features, fences and corral features, and arborglyphs in aspen groves along the river corridor. These resources are significant at the local level. Due to the remote location of many of these resources their historic integrity has been retained. These historic-era ethnographic features and mining sites may be eligible for listing in the National Register of Historic Places (the National Register).

#### Prehistoric/Cultural:

Cottonwood Creek and Canyon (tō’sa kwā’ si wü’ha) was a prehistoric through historic period Paiute/Shoshone trail corridor connecting the high elevation resources of the White Mountains to the lower elevation resources of Fish Lake Valley (Steward 1933). Cultural resource sites along the river corridor represent temporary seasonal habitation locales, selected for their proximity to water, plant, and animal products. The ethnographic literature indicates that a pine nut camp (săi’ kwidupi) was also located at the river. Sites located along the river corridor are lithic scatters with milling features, house rings, rock shelters, and rock art panels. Twelve prehistoric sites have been documented in the corridor to date. Tribal consultation may provide insight regarding on-going use of the Cottonwood Creek corridor for resource procurement. Wilderness designation and the remote location of Cottonwood Creek have

protected resources from vandalism. Though no formal evaluations have been conducted, the sites along the stream have the potential for significant subsurface deposits, making them eligible for listing in the National Register for their ability to increase understanding of prehistoric land use in this riverine environment. Rock art sites are eligible for listing in the National Register as works created by a master, although the creator is unknown.

## **BLM Segment**

### *Finding*

The BLM portion of the river does not possess any outstandingly remarkable historic or cultural values.

### *Discussion of Values – Rationale for Conclusion*

Historic and prehistoric sites and values exist along the river corridor; however, they are not significantly different or better than those of similar type found within the region. For this reason, historic and cultural values are not outstandingly remarkable.

## **7. Botany**

### **Forest Service Segment**

### *Finding*

The river corridor possesses outstandingly remarkable botanical values.

### *Discussion of Values – Rationale for Conclusion*

Known occurrences of Forest Service Sensitive and SCC plants associated with Cottonwood Creek include trianglelobe moonwort (*Botrychium ascendens*), scalloped moonwort (*Botrychium crenulatum*), western single-spike sedge (*Carex scirpoidea* ssp. *pseudoscirpoidea*), valley sedge (*Carex vallicola*), Hall's hawkbeard (*Crepis runcinata* ssp. *hallii*), male-fern (*Dryopteris filix-mas*), Poison Canyon stickseed (*Hackelia brevicula*), blue nodding locoweed (*Oxytropis deflexa*), Rolland's bulrush (*Trichophorum pumilum*), and Dedecker's clover (*Trifolium dedeckeriae*). Additional SCC plants overlapping the corridor include White Mountain horkelia (*Horkelia hispidula*); however, this is an upland species and is not directly associated with the river. Bristlecone pine also occurs within the WSR corridor, and the congressionally-designated Ancient Bristlecone Pine Forest is adjacent to the river. There are a high number and density of rare plant species present, and there is high potential for additional, unknown occurrences of SCC plants within the river corridor. Cottonwood Creek is spring fed at its upper reaches and is the longest perennial stream in the White Mountains. It supports a lush riparian community contrasting greatly with the nearby upland communities. Riparian habitats include wet and moist meadows, aspen forests, willow shrub communities, and cottonwood forests at the lowest elevations. Unglaciated meadows, a special habitat type in the Inyo National Forest Terrestrial Ecological Unit Inventory dataset, are present in the upper reaches of the river corridor.

Extensive past restoration work has occurred to stabilize stream channels, banks, contributing draws, etc. Some common dandelion (*Taraxacum officinalis*) has been noted in upper stream segments, and there are more nuisance and low-priority invasive species along the river corridor. No high-priority/noxious weeds are currently known in this WSR. However, the noxious weed species broadleaf pepperweed (*Lepidium latifolium*), hairy whitetop (*Lepidium appelianum* Al-Shehbaz), and tamarisk (*Tamarix ramosissima*) infest numerous other perennial streams in the White Mountains, primarily at lower elevations. Additional surveys for these species and potential ongoing monitoring for invasive species are recommended. There

is no known cultural or historic use of plant species or habitat on this river. While the river is small in size, it is one of the few unique riparian areas in an otherwise harsh desert mountain landscape.

## **BLM Segment**

### *Finding*

The river corridor possesses outstandingly remarkable botanical values.

### *Discussion of Values – Rationale for Conclusion*

Cottonwood Creek supports a willow/cottonwood Riparian Woodland, which is considered an Unusual Plant Assemblage in the California Desert Conservation Area Plan (BLM 2002). This regionally uncommon plant community is primarily comprised of Fremont cottonwood (*Populus fremontii*), water birch (*Betula occidentalis*), various willows species (*Salix* spp.), and big sagebrush (*Artemisia tridentata*). Collectively, this community forms a structurally diverse riparian area that is a valuable migratory stop-over and breeding habitat for a variety of neotropical bird species. Similarly, the riparian area provides refugia for numerous resident wildlife species that are dependent on consistent water access and shelter from the surrounding arid landscape. Further, the existing shrub and tree canopy help minimize evaporation and consequently sustains the consistent water flow that is vital to many ecological functions within the stream corridor. Therefore, recognition of the botanical component of the lower section of the WSR is warranted in order to effectively manage for the diverse ecological and hydrological functions the river currently supports.

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