# Draft
# Environmental Assessment
# and
# Finding of No Significant Impact
# for the
# Installation of a Debris-Containment Log Boom at Cochiti Lake, Sandoval County, New Mexico

Prepared by

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US Army Corps of Engineers®
Albuquerque District

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# Finding of No Significant Impact
# Installation of Log Boom at Cochiti Lake, Sandoval County, New Mexico

The U.S. Army Corps of Engineers, Albuquerque District (Corps), has installed a debris-containment log boom across the upper part of Cochiti Lake in Sandoval County, New Mexico. Following the 2011 Las Conchas Fire, large quantities of woody debris were washed into Cochiti Lake, necessitating a costly clean-up effort and closure of the lake to recreation. The log boom was installed to prevent further large woody debris from entering Cochiti Lake, endangering public safety and potentially damaging the dam's outlet works. Large quantities of woody debris resulting from the 2011 Las Conchas Fire still exist in several canyons that flow into the Rio Grande upstream of Cochiti Lake. These canyons within the burned area also have a potential to produce hazardous debris flows. The Corps determined that the log boom installation was necessary under its lake operations authority.

If the log boom were not installed (No Action Alternative), woody debris would create hazardous conditions again in Cochiti Lake and the lake would have to be closed for debris removal. This would not meet the project objectives of ensuring visitor safety, enabling recreational use to continue, and protecting the dam outlet works.

Alternative locations for the log boom were considered in consultation and coordination with the Pueblo de Cochiti, the local land owner. The final location was selected based on the absence of historic properties and/or culturally sensitive areas in the vicinity of proposed anchor locations.

This project is in compliance with the National Historic Preservation Act of 1966, as amended [16 U.S.C. 470 et seq]. Based on the fact that, in close consultation with the Pueblo de Cochiti, all historic properties would be avoided by the installation, operation and maintenance of the log boom, the Corps has determined that there would be "No Historic Properties Affected" by installing and maintaining the log boom. The SHPO concurred with the Corps' determination on October 11, 2011.

Alternatives considered for log boom operation included: keeping the boom closed at all times except when the trapped debris is being removed; or installing the floating part of the boom only, without the hanging chain link curtain.

Operation of the log boom would have a minor adverse impact on recreation when the boom is closed, impeding access to the lake by river runners floating down the Rio Grande through White Rock Canyon. However, small craft could be portaged around the western (right bank) end of the boom. Public information about the log boom would be provided via signage, Internet, news media, printed materials, and email.

The log boom project is located within waters of the United States but does not constitute fill. Therefore, the project is not regulated under Section 404 of the Clean Water Act and Section 404(b)(1) analysis is not required.

As required by the Endangered Species Act, the Corps has determined that the installation, operation and removal of the boom would have no effect on threatened or endangered species or designated or proposed critical habitat receiving protection under the Endangered Species Act.

The log boom installation did not involve construction. The boom was fabricated off-site and towed into place by boat. Therefore, installation of the log boom had no impacts on natural resources. The following elements have been analyzed and would not be significantly affected by the installation and planned operation of the log boom: air quality; land use; soils; climate and climate change; biological resources including vegetation, wildlife, and endangered and threatened species; noise levels; aesthetics; socioeconomic environment; hydrology and hydraulics; water quality; floodplains; waters of the United States including wetlands; prime farmland; and cultural resources.

The proposed action has been fully coordinated with Federal, Tribal, and local governments with jurisdiction over the ecological, cultural, and hydrological resources of the study area. Based upon these factors, the proposed action would not have a significant effect on the human environment. Therefore, an Environmental Impact Statement will not be prepared for the subject project.

_____ _____

Date

Jason D. Williams
Lieutenant Colonel, U.S. Army
District Commander

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# 1 INTRODUCTION

## 1.1 Background and Location

This Environmental Assessment (EA) addresses impacts associated with the placement of a debris-containment log boom barrier in the upper part of Cochiti Lake in Sandoval County, New Mexico. The Cochiti Dam and Lake Project is operated and managed by the Albuquerque District of the U.S. Army Corps of Engineers (Corps) on lands leased from the Pueblo de Cochiti (Pueblo).

Cochiti Dam spans the Rio Grande and Santa Fe Rivers northwest of Interstate 25 in Sandoval County between Bernalillo and Santa Fe, New Mexico, or about fifty miles upstream from Albuquerque. The dam can be accessed from New Mexico State Highways 16 and 22 via Interstate 25 (see Figure 1).

The Cochiti Dam Project was authorized for flood and sediment control in the Upper Rio Grande Basin by the Flood Control Act of 1960 (Public Law 86-645). In 1964, Congress authorized the establishment of a permanent pool of approximately 1,200 surface acres for recreation and the development of fish and wildlife resources using water from the San Juan-Chama Project. Construction of the dam was initiated in February 1965 and dam operations began in 1973.

Cochiti Lake is located within the boundaries of the Pueblo de Cochiti Reservation. In November 1965, the Pueblo granted a perpetual easement to the Corps for construction, operation, and maintenance of the Cochiti Dam and Lake Project on 4,069 acres of Pueblo lands. Flowage easements on an additional 9,621 acres of land were obtained for project purposes from other federal and state agencies (USACE 1996).

Cochiti is one of the four Corps dams for flood and sediment control in the Rio Grande watershed, operating in conjunction with Galisteo, Jemez Canyon and Abiquiu Dams. Operation of the dam is conducted in accordance with procedures defined in the Flood Control Act of 1960 and in coordination with the Rio Grande Compact.

The Las Conchas Fire during the summer of 2011 was the largest in recorded history for the state of New Mexico, burning 634 square kilometers (157,000 acres) in the Jemez Mountains. The fire burned through several canyons on the west side of the Rio Grande. These burned canyons are tributaries of the Rio Grande upstream of Cochiti Lake, and include Cochiti, Bland, Medio, Capulin, Alamo and Frijoles Canyons (Figure 2). Subsequent late-summer monsoon rain runoff washed large quantities of woody debris into Cochiti Lake. This debris covered about 80 acres of the lake's surface and threatened to damage the dam outlet works (see photos in Figure 3). The lake had to be closed to recreation to protect visitor safety. A large and costly debris clean-up operation had to be completed before the lake could be re-opened. Three debris-removal boats and their crews came from the Corps' San Francisco District and spent a month removing approximately 100 tons of large woody debris from the lake.

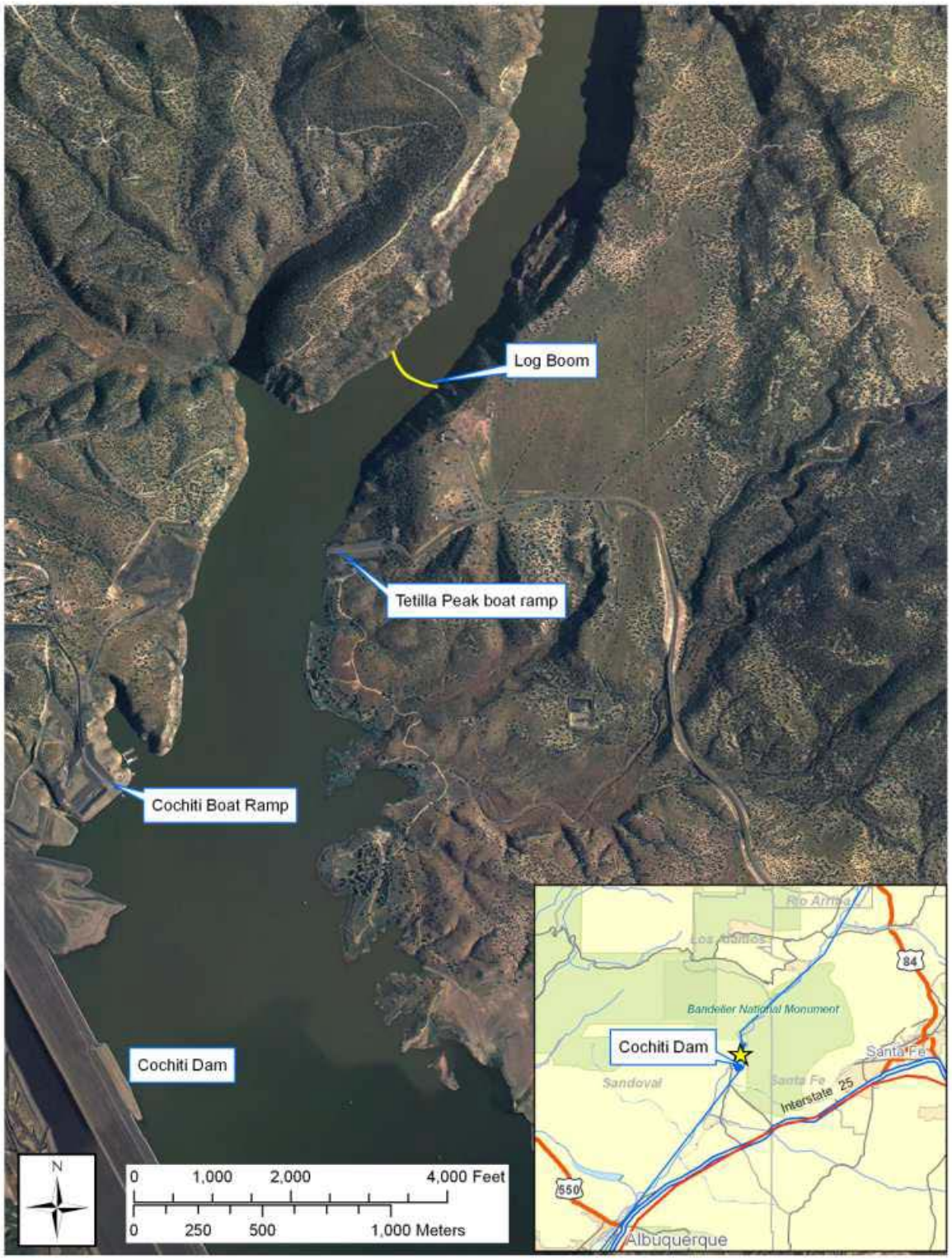



**Figure 1. Location of Log Boom in Cochiti Lake**

## 1.2 Purpose and Need

The Corps has installed a floating log boom barrier across the upstream end of Cochiti Lake, above the Tetilla Peak boat ramp. The log boom was installed to manage large debris entering Cochiti Lake. This debris, if present in the lake, would endanger public safety and dam safety, necessitating closure of the lake to recreation. The log boom installation is in response to the large quantities of fire debris that accumulated in Cochiti Lake in 2011. Large quantities of debris are still present in the watershed and are expected to present a hazard for 3-5 years. The log boom is designed to intercept floating and partially submerged debris being carried down the Rio Grande for subsequent removal. The purposes of this action are:

- To protect visitor safety.
- To maintain public access to lake recreation and prevent lake closures.
- To protect the dam outlet works from damaging debris.
- To prevent excessive debris reducing the storage capacity of the lake.

The potential for destructive debris flows is a serious concern in the canyons upstream from Cochiti Lake. A debris flow is a mixture of water and solids (sediment, stones, boulders, timber) which flows downhill in channels. Debris flows have a high destructive potential, comparable with rockfall, avalanche and flood water, threatening the safety and property of people downstream. Post-fire debris flows occurred in several canyons during the fall of 2011. Examples of destructive post-fire flash floods and debris flows that occurred in 2011 include Cochiti Canyon, where Dixon's apple orchard was destroyed, and Medio Canyon (Figure 4).

Debris is expected to be a concern for several years, until the watersheds become revegetated and stabilize. Following the Las Conchas Fire, woody debris from partially burned trees and vegetation has accumulated in canyons. Soils in the burned area lack vegetative cover that would help absorb rainfall, and soils in portions of the burned area have become water repellent and less able to absorb moisture. This causes an increase in runoff from even small rain events, scouring soil and carrying sediment, rocks, woody debris and other material downstream.

The U.S. Geological Survey (USGS) completed a debris study of the Las Conchas Fire area in December 2011 (Tillery et al., 2011). The study calculated debris volumes and the probabilities of hazardous debris flows in the smaller tributary watersheds in the burned area that flow into the canyons and from there into the Rio Grande. The calculated probability of a debris flow in response to a 10-year, 30-minute rainfall of 1.1 inch (28.0 millimeters) was greater than 80% in several watersheds that flow into Cochiti, Capulin, Frijoles, and other canyons, including Santa Clara, farther upstream.

The USGS study estimated that the volume of debris that could flow from individual tributary watersheds ranges from 400 $m^3$ (0.3 acre-foot) to greater than 72,000 $m^3$ (58.4 acre-feet). Watersheds with large estimated debris volumes include tributaries to Santa Clara Canyon, Bland, Cochiti, Capulin, Alamo, and Frijoles Canyons. Aggregating the estimated debris amounts from its tributary watersheds, Frijoles Canyon could produce at least 35,000 $m^3$ (28.4 acre-feet) of debris;

Capulin Canyon, at least 48,000 $m^3$ (38.9 acre-feet); and Cochiti and Bland Canyons combined, at least 140,000 $m^3$ (113.5 acre-feet). The volume of debris that could result from a significant area-wide rainstorm is staggering.

The USGS report produced Combined Relative Debris-Flow Hazard Rankings for watersheds in the burned area to illustrate those areas with the highest potential occurrence of debris flows of the largest volumes. The watersheds of Bland, Cochiti, Capulin, Alamo, and Frijoles Canyons showed high Combined Relative Debris-Flow Hazard Rankings. “Debris flows in Bland, Cochiti, and Alamo Canyons may create hazardous conditions in locations downstream along the valley floors and continuing towards their confluences with the Rio Grande. Such debris flows could potentially affect agricultural lands, water quality, infrastructure, property, and human life on lands of Cochiti Pueblo and Jemez Pueblo, and at Cochiti Lake.” (Tillery et al., 2011).

## 1.3 **Regulatory Compliance**

This Environmental Assessment (EA) was prepared by the Corps, Albuquerque District, in compliance with all applicable Federal Statutes, Regulations, and Executive Orders, including the following:

- National Historic Preservation Act (16 U.S.C. 470 *et seq*.)
- Archaeological Resources Protection Act (16 U.S.C. 470 *et seq*.)
- Clean Water Act (33 U.S.C. 1251 *et seq.*)
- Clean Air Act (42 U.S.C. 7401 *et seq.*)
- Endangered Species Act (16 U.S.C. 1531 *et seq*.)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations
- Occupational Safety and Health Act of 1970 (29 U.S.C. 651 *et seq*.)
- Executive Order 11988, Floodplain Management
- National Environmental Policy Act (42 U.S.C. 4321 *et seq*.)
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Part 1500 *et seq*.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq*.)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment
- Executive Order 11990, Protection of Wetlands
- U.S. Army Corps of Engineers' Procedures for Implementing NEPA (33 CFR Part 230; ER 200-2-2)
- Farmland Protection Policy Act (7 U.S.C. 4201 *et seq.*)
- Executive Order 13112, Invasive Species
- Federal Noxious Weed Act (7 U.S.C. 2814)
- Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*)
- Fish and Wildlife Coordination Act (48 Stat. 401; 16 USC 661 *et. seq.*)
- Section 438 of the Energy Independence and Security Act of 2007 (Public Law 110-140 Section 438, 121 Stat. 1492, 1620)
- Executive Order 13524, Federal Leadership in Environmental, Energy, and Economic Performance

This EA also reflects compliance with all applicable State and local regulations, statutes, policies, and standards for conserving the environment such as water and air quality, endangered plants and animals, and cultural resources.

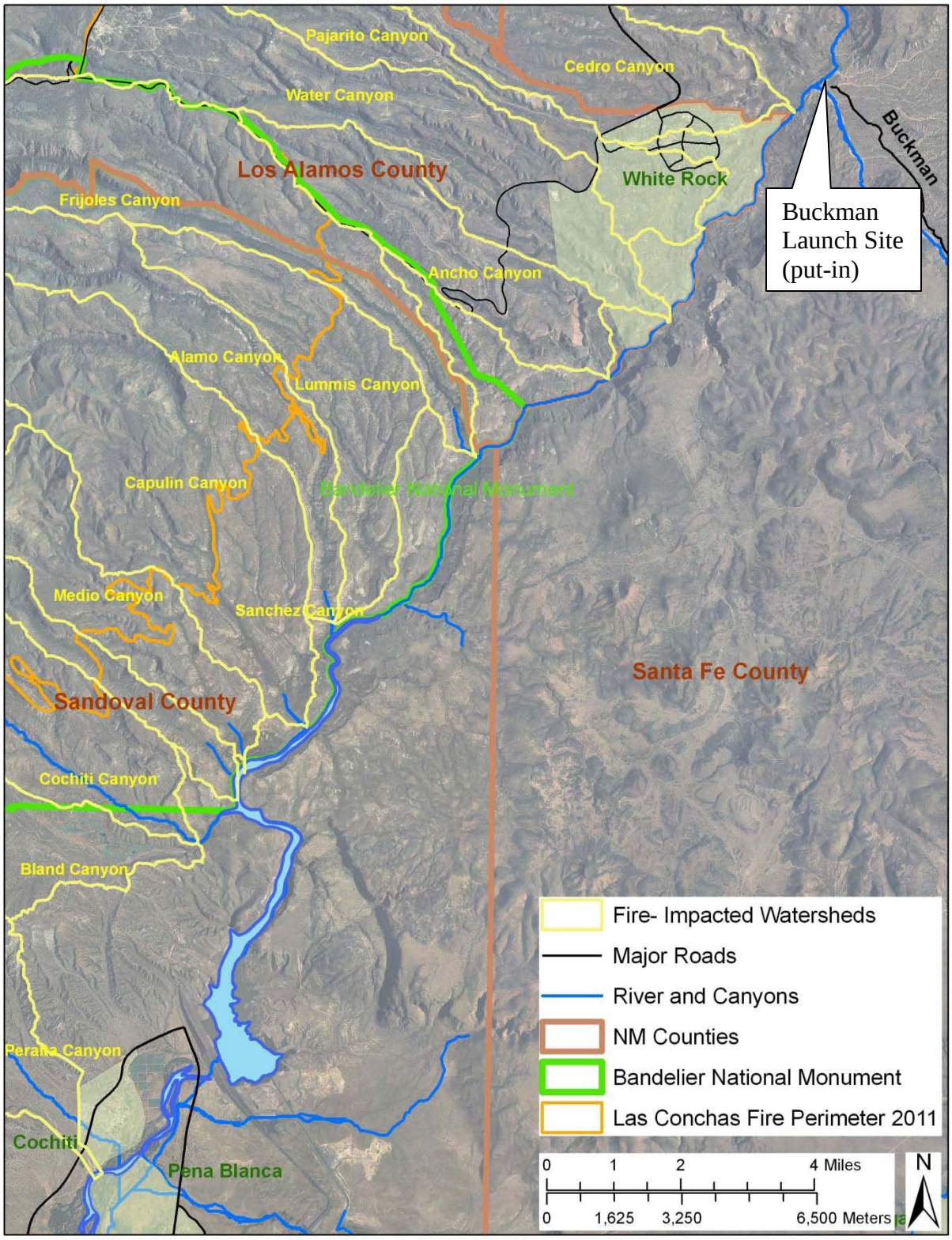



**Figure 2. Rio Grande Tributary Canyons Impacted by the Las Conchas Fire**

**Figure 3: Debris and Debris Removal at Cochiti Lake, August 2011**

a. Floating debris obstructing Tetilla Peak boat ramp

b. Towing debris to shore

c. Stacked debris awaiting removal

**Figure 3, cont. Debris and Debris Removal at Cochiti Lake, August 2011**

d. Cochiti Dam control tower. Outlet works below could be damaged if waterlogged debris enters.

**Figure 4: Post-fire flash flooding and debris flows, 2011**

a. Aftermath of flooding in Cochiti Canyon at Dixon's Apple Orchard

b. Debris Flow at the mouth of Medio Canyon, October 2011

# 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

## 2.1 Proposed Action

To prevent accumulation of post-wildfire debris in Cochiti Lake and to protect the dam's outlet works, the Corps has installed a floating log boom barrier near the mouth of White Rock Canyon, upstream of the Tetilla Peak boat ramp (location shown in Figure 1). Because of the ongoing threat of fire-related debris entering the lake, the log boom installation was considered an emergency action. The boom is designed to intercept debris coming down the Rio Grande before the debris would disperse throughout Cochiti Lake. Debris that accumulates at the boom would be removed periodically, as needed. The wood would be provided to the Pueblo de Cochiti for use as firewood by community members. Any garbage that is removed from the lake would be disposed of appropriately off-site along with the other garbage from the Cochiti Lake facilities.

The boom is constructed of 20-foot segments of 8" PVC pipe that are filled with flotation material and connected together with galvanized steel wire rope. It floats approximately 6" above the water line. Below the PVC pipe, sections of galvanized chain link are suspended to a depth of 3' to contain floating debris. The removable central segment of the boom curves downstream, forming a trap for debris, and would be detached and towed away to remove the debris. The boom is anchored with cable to the basalt cliffs on the left bank and boulders adjacent to the lake on the right bank. Anchor cables have been placed in low and high positions to accommodate changing water levels. Photos of the anchors are shown in Figure 5.

The Corps plans to leave the center section of the boom open to accommodate passage of boats when conditions permit. When the center of the boom is open, the resulting channel would be marked by standard navigation buoys for safety.

During periods of high runoff such as spring runoff and summer monsoon season, and at times when the lake level is rising and re-floating stranded debris, the boom would be closed. It is anticipated that it will be possible to pass light craft such as kayaks around the right side of the boom by lifting the boat over the anchor cable, which is close to the water level at the shore. It would also be possible to portage by scrambling 20 feet or so up the bank. Passage of larger boats such as rafts may be possible, if coordinated in advance with the Cochiti Lake Project Office (505-465-0307), depending on staff availability and the absence of potentially hazardous woody debris trapped behind the boom.

The Corps would take several measures to inform the public about the boom. Signs would be placed at the Cochiti and Tetilla Peak boat ramps informing boaters about the barrier. More complete information about the boom is available and would be kept updated on the Corps' Albuquerque District website [http://www.spa.usace.army.mil/] and the Cochiti Lake Facebook page [http://www.facebook.com/USACE.Cochiti.Lake ].

The log boom would be removed in 3-5 years as the volume of debris in the river decreases. This may be determined by the extent to which the burned area has been stabilized and re-vegetated, combined with the absence of large amounts of woody debris coming down the river during at least one monsoon season or other period of high flows.

## 2.2 The No Action Alternative

Under the No Action Alternative, there would be no log boom installation. Boats could continue to pass from the Rio Grande into Cochiti Lake and from the Cochiti and Tetilla Peak boat ramps into the upper lake. However, without the log boom it is likely that large volumes of woody debris would again enter Cochiti Lake. Debris would need to be removed by boat, similar to the removal operation in 2011. Under the No Action Alternative, the lake would likely need to be closed for visitor safety, protect visitor equipment from incidental damage, and to allow debris removal operations to proceed without hindrance. Damage to the dam outlet structure is more likely under the No Action Alternative.

## 2.3 Alternatives Considered but Not Analyzed

Alternatives that were considered included:

- Installing the log boom and keeping it closed at all times. This alternative was rejected because of significant adverse impacts to recreation, specifically boating.

- Installing the floating part of the boom only, without the hanging chain link. This alternative was rejected because it would not meet the objective of trapping partially submerged debris, and closure of the lake would still be likely.

- Alternative locations for the log boom were considered. A total of three possible locations were initially proposed, with two locations being ruled out based on the presence of historic properties and/or culturally sensitive areas in the vicinity of proposed anchor locations. The location that was selected falls within a gap between archaeological site clusters, and inspection of the area by Corps archaeologists confirmed that no cultural or historic resources are present. Subsequent consultation with the Pueblo de Cochiti confirmed that the area would be suitable for installing the log boom.

**Figure 5: Log Boom Construction**

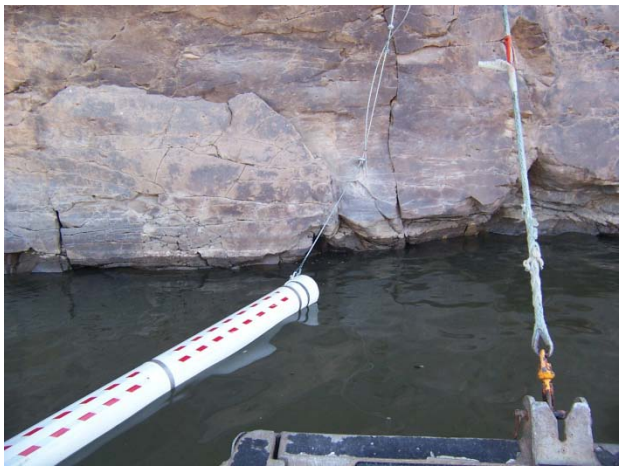
a. Section of boom

b: Connection between boom sections.

**Figure 6: Log Boom Installation**

a. Boom has been towed to site, ready to anchor to banks

b. Right (west) bank anchor



c. Left (east) bank anchor

# 3 EXISTING ENVIRONMENT AND FORESEEABLE EFFECTS

The following general summary of the physical environment of Cochiti Lake is sufficient for the purposes of analyzing the impacts of the log boom. Detailed information on the physical environment of Cochiti Lake can be found in the Corps' *Environmental Assessment for a Temporary Deviation in the Operation of Cochiti Lake and Jemez Canyon Dam* (USACE 2009) and in the Environmental Impact Statement for the closure of the Al Black recreation area (USACE 2004).

For purposes of this analysis, "short-term" effects are those that occurred during installation of the log boom and that would occur while it is in place. "Long-term" effects include any effects that would occur over more than 5 years or would continue after the log boom is removed.

## 3.1 Physical Environment, Geology, and Soils

Cochiti Lake is located at the downstream end of White Rock Canyon in the Rio Grande Rift Valley, through which the Rio Grande flows. The Rio Grande Rift Valley is filled with thousands of feet of alluvial sediments. Lining the valley both upstream and downstream from Cochiti Dam are volcanic deposits; the largest of the volcanoes is the Valles Caldera, which forms the Jemez Mountains. Downstream from Cochiti Dam, the Rio Grande valley is fairly broad with extensive floodplains and a reduced gradient.

Soil material in the bed of the Rio Grande and Cochiti Lake is alluvial in origin. The deepest area of sediment deposition (approximately 80 feet) is near the southern end of White Rock Canyon. Sediment accumulation within the main body of Cochiti Lake averages several feet. Ildefonso soil, which is a very stony loam, is the principal soil series on the slopes of White Rock Canyon. This well-drained soil is derived principally from basalt. Runoff from this soil is rapid and the hazard of water erosion is moderate (USDA-NRCS 2012).

The log boom floating on the lake surface would have no direct or indirect adverse effect on soils or geology at Cochiti Lake or the surrounding area. The No Action Alternative would similarly have no effect.

## 3.2 Climate and Climate Change

The climate of north-central New Mexico can be generally characterized as semi-arid continental, with mild summer and cold winter temperatures. The average precipitation for the Cochiti Lake area is approximately 10 inches per year, and about 70 percent of this moisture falls in June, July, and August. The Jemez Mountains at the headwaters of the tributary canyons on the west side of the Rio Grande receive significantly more precipitation: approximately 17 inches per year for the Jemez River basin (USACE 2009). Summer moisture is carried into the state by southerly and southeasterly air circulation from the Gulf of Mexico and is usually released in brief, often intense thunderstorms. Winter moisture is carried into the state by eastward-moving storms from the Pacific Ocean and is often blocked from reaching the project area by the Jemez

Mountains and other mountain ranges to the north and west. Snowfall (averaging 7.4 inches annually) that does reach the project area is generally of short duration.

Temperatures in the area are influenced both by elevation (approximately 5,200 to 5,400 feet above sea level) and the highly variable topography. Cold air draining from the Jemez Mountains is often directed through White Rock Canyon during the colder months, resulting in somewhat lower temperatures during the winter than might be expected at this elevation. The mean annual temperature is close to 50 degrees F, and usually only about 11 days per year reach 90 degrees F. Most days in November through March have freezing temperatures, but only rarely during winter does the temperature fall to zero degrees F.

Winds in the area are predominantly from the west-southwest during the spring (when strongest) and shift to the north-northwest during the rest of the year. Average wind speeds are approximately 12 miles per hour, increasing to 25 miles per hour or greater about 5 percent of the time. Annual sunshine is nearly 75 percent of the total possible and is important during the summertime in the generation of localized winds and storm systems in the project area.

Climate change refers to any significant change in measures of climate such as temperature, precipitation, or wind patterns lasting for an extended period such as decades or longer. Climate change may result from: natural factors; natural processes within the climate system; and human activities that change the atmosphere's composition through burning fossil fuels or changes in the land surface such as deforestation, urbanization and desertification (US EPA 2009).

Average air and sea-surface temperatures worldwide are predicted to increase beyond the current range of natural variability as human activities have, in the period since the onset of the Industrial Revolution, caused an accumulation of greenhouse gases (e.g. carbon dioxide) in the global atmosphere (US EPA 2009). As a result of climate change, summer air temperatures in the southwestern United States are predicted to rise considerably from 2011 through 2039, average annual precipitation is expected to decrease, and mountain snowpacks are predicted to decrease significantly.

The log boom is designed to rise and fall with changing lake levels and would not be affected by hydrologic changes induced by climate change. No new source of carbon dioxide emissions is associated with the log boom project. Neither the log boom nor the No Action Alternative would have an effect on climate or climate change.

## 3.3 Water Resources

### 3.3.1 Hydrology and Water Quality

The Rio Grande watershed upstream from Cochiti Dam drains an area of more than 11,000 square miles in northern New Mexico and southern Colorado. The drainage basin lies between the Continental Divide and the crest of the Sangre de Cristo Mountains and includes several tributary streams, including the Rio Chama, Santa Fe River, Rio Hondo, Red River, and Rio Pueblo de Taos. Snowmelt runoff from high elevations is the most significant contributor to stream flows in the basin.

Prior to the construction of Cochiti Dam and other upstream dams, flood flows of 10,000 to 20,000 cubic feet per second (cfs) were periodically recorded in White Rock Canyon and downstream reaches. Present-day discharges in the Rio Grande downstream from Cochiti Dam range from a typical minimum winter flow of about 300 cfs, to spring runoff peaks that, through regulation, do not exceed 7,000 cfs at the Albuquerque gauge. This is the current safe channel capacity water control criterion that is defined in the Cochiti Lake Water Control Manual (USACE 1996). The elevation of Cochiti Lake during the spring runoff period has reached or exceeded an elevation of 5,348 feet during 14 of the past 33 years (1975-2007). Except for exceptionally long storage periods in 1985 through 1987, this elevation has been inundated for periods of approximately 2 to 60 days between late April and the end of June. The most recent flood control storage occurred in 2005 when the lake reached an elevation of about 5,364 feet.

The New Mexico Water Quality Control Commission (2000) has designated uses and standards for streams in New Mexico (by stream segment). Designated uses of the main stem of the Rio Grande above Cochiti Dam (Cochiti Reservoir to San Ildefonso segment) are irrigation (fully supported), livestock watering (fully supported), marginal coldwater aquatic life (not supported), primary contact (not assessed), warm-water aquatic life (not supported), and wildlife habitat (fully supported) (NMED SWQB 2010). The probable causes of impairment are listed as PCBs in fish tissue and turbidity.

Surveys conducted by the New Mexico Environment Department Surface Water Quality Bureau (NMED SWQB) in 2001 reported that three canyons in the Los Alamos area were considered impaired due to selenium, and Pajarito Canyon was also impaired due to mercury. Selenium levels may have been elevated due to the effects of the Cerro Grande fire (NMED SWQB 2004).

Placement and operation of the log boom would not affect water quality. The source of turbidity, metals and other potential contaminants is upstream of the log boom. Sediment carried by water of the Rio Grande drops out as the river flows into Cochiti Lake upstream of the log boom, forming a delta that can be seen from aerial images (Figure 7). The log boom was placed downstream from the delta so it would neither affect, nor be affected by river-borne sediment deposition. Therefore, neither the log boom nor the No Action Alternative would affect hydrology or water quality.

**Figure 7: Lower White Rock Canyon and Upper Cochiti Lake, Showing Delta Formed by River Sediment Deposition and Development of Riparian Corridor**

## 3.4 Floodplains and Wetlands

The log boom is placed at the lower end of White Rock Canyon. The floodplain of the Rio Grande is narrow at the site, constrained by cliffs on the east side and steep slopes on the west side. This would not change with placement and operation of the log boom.

The Cochiti Lake delta has approximately 243 acres of wetlands and riparian habitat in White Rock Canyon, upstream from the log boom location. The native riparian vegetation around the shallow backwaters upstream of Cochiti Lake may develop into suitable Southwestern Willow Flycatcher (flycatcher) habitat (USACE 2009). The log boom has no potential to affect this wetland and riparian vegetation, nor would it affect the processes creating backwater wetland habitat at the mouths of tributary canyons. Therefore, there would be no effect to floodplains or wetlands due to the placement and operation of the log boom or to the No Action Alternative.

## 3.5 Air Quality, Noise, and Aesthetics

Air quality in the Cochiti Lake area is generally good. This part of Sandoval County is in attainment of air quality standards (USEPA 2012). The nearest air quality monitoring station is in Bernalillo (New Mexico Environment Department Air Quality Bureau, 2012). The placement and operation of the log boom and the No Action Alternative do not involve construction or any new emission sources. There would be no change in vehicle use or other sources of dust or particulates. The log boom and the No Action Alternative would have no effect on air quality.

Noise is generally minimal in the undeveloped setting of Cochiti Lake. There would be no new sources of noise and no change to noise levels from the log boom or the No Action Alternative.

There may be a minor visual aesthetic impact from the log boom. The boom constitutes an artificial barrier placed across the lake in contrast with the otherwise natural setting, and floating debris is expected to be trapped in the area. However, the No Action Alternative would also change the aesthetics of the lake, as without the log boom floating debris would cover a substantial part of the lake. Both the No Action Alternative and the proposed action would have minor adverse effects to visual aesthetics. These effects are short-term and would disappear when the log boom is removed.

## 3.6 Vegetation Communities

The Cochiti Dam project area is located within the Great Basin Conifer Woodland and the Plains and Great Basin Grassland biotic communities as defined by Brown (1982). These biotic communities characterize the vegetation outside of the Rio Grande floodplain. Uplands adjacent to the Rio Grande and Cochiti Lake are vegetated by one-seed (*Juniperus monosperma*) and Rocky Mountain juniper (*J. scopulorum*), piñon pine (*Pinus edulis*), Apache plume (*Fallugia paradoxa*), rabbit brush (*Chrysothamnus depressus*), skunkbush (*Rhus trilobata* var. *trilobata*), four-wing saltbush (*Atriplex canescens*), snakeweed (*Gutierrezia glutinosa*), prickly pear and cholla (*Opuntia* spp.), and a variety of forbs and grasses including grama grasses (*Bouteloua* spp.), dropseeds (*Sporobolus* spp.), and ring muhly (*Muhlenbergia torreyi*).

Since the completion of Cochiti Dam in 1974, wetland vegetation has been developing in the lake's delta in White Rock Canyon, upstream of the log boom location. When evaluated in 2009, approximately 243 acres of wetlands occurred within the reach entailing the permanent pool (USACE 2009). Vegetation adjacent to the permanent pool within White Rock Canyon consists of emergent and shrub wetland types. Emergent wetlands are dominated by cattail (*Typha latifolia*), barnyard grass (*Echinochla crus-galli*), salt grass (*Distichlis spicata*), and inland rush (*Juncus interior*). Shrub stands are dominated by Goodding's willow (*Salix gooddingii*) and coyote willow (*Salix exigua*) ranging from less than 5-feet to about 15-feet tall. The placement of the log boom involved simply installing an anchor bolt to rock on the bank and cliff adjacent to the lake. Therefore, the log boom would not affect vegetation communities.

## 3.7 Noxious Weeds and Invasive Species

Riparian areas in White Rock Canyon have populations of invasive species including saltcedar (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*). The log boom and the No Action Alternative would have no effect on invasive species.

## 3.8 Wildlife

A list of the wildlife and fish species that are known or expected to occur at Cochiti Lake can be found in the Corps' *Environmental Assessment for a Temporary Deviation in the Operation of Cochiti Lake and Jemez Canyon Dam* (USACE 2009). Mammals include several bat species, desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus),* beaver (*Castor canadensis*), several species of mice and other small rodents, coyote (*Canis latrans*), raccoon (*Procyon lotor*), bobcat (*Felis rufus*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), mule deer (*Ococoileus hemionus*), and elk (*Cervus canadensis*) .

Common breeding bird species in the area include Canada Goose (*Branta canadensis*), Mallard (*Anas platyrhynchos*), Turkey Vulture (*Cathartes aura*), Red-Tailed Hawk (*Buteo jamaicensis*), Swainson's Hawk (*B. swainsoni*), American Kestrel (*Falco sparverius*), Killdeer (*Charadrius vociferous*), Mourning Dove (*Zenaida macroura*), Greater Roadrunner (*Geococcyx californianus*), Western Screech-Owl (*Megascops kennicottii*), Great Horned Owl (*Bubo virginianus*), Belted Kingfisher (*Megaceryle alcyon*), Northern Flicker (*Colaptes auratus*), Western Kingbird (*Tyrannus verticalis*), Cliff Swallow (*Hirundo pyrrhonota*), Western Scrub Jay (*Aphelocoma californica*), Black-billed Magpie (*Pica hudsonia*), Common Raven (*Corvus corax*), American Crow (*C. brachyrhynchos*), Black-capped Chickadee (*Poecile atricapillus*), Canyon Wren (*Catherpes mexicanus*), American Robin (*Turdus migratorius*), Mountain Bluebird (*Sialia currucoides*), Western Meadowlark (*Sturnella neglecta*), Brownheaded Cowbird (*Molothrus ater*), and Spotted Towhee (*Pipilo maculatus*).

Amphibians and reptiles known to occur in or near the project area include tiger salamander (*Ambystoma tigrinum*), plains spadefoot (*Spea bombifrons*), Woodhouse toad (*Bufo woodhousii*), northern leopard frog (*Rana pipiens*), bullfrog (*R. catesbeiana*), painted turtle (*Chrysemys picta*), spiny softshell turtle (*Apalone spiniferus*), lesser earless lizard (*Holbrookia maculata*), eastern fence lizard (*Sceloporus undulatus*), plateau whiptail (*Aspidoscelis velox*), checkered whiptail (*A. tesselata*), western hognose snake (*Heterodon nasicus),* coachwhip (*Masticophis flagellum*),

glossy snake (*Arizona elegans*), New Mexico gartersnake (*Thamnophis sirtalis*), western hognose snake (*Heterodon nascius*), and western diamondback rattlesnake (*Crotalus atrox*).

Cochiti Lake is primarily a warm-water fishery consisting of northern pike (*Esox lucius*), walleye (*Sander vitreus*), black bullhead (*Ameiurus melas*), channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), white bass (*Morone chrysops*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), green sunfish (*Lepomis cyanellus*), bluegill (*L. macrochirus*), white crappie (*Pomoxis annularis*), and black crappie (*P. nigromaculatus*). The New Mexico Department of Game and Fish occasionally performs supplemental stocking of walleye, largemouth bass, and channel catfish in the lake.

There would be no effects to wildlife from the installation and operation of the log boom. The chain link hanging from the boom may affect the movement of fish, but they would be able to swim beneath the boom and chain link, or smaller fishes may swim through it. Similarly, there would be no effect to wildlife from the No Action Alternative.

## 3.9 Special Status Species

Three agencies have a primary responsibility for the conservation of animal and plant species in New Mexico: the U.S. Fish and Wildlife Service (Service), under the authority of the Endangered Species Act of 1973 (as amended); the New Mexico Department of Game and Fish, under the authority of the Wildlife Conservation Act of 1974; and the New Mexico Energy, Mineral and Natural Resources Department, under authority of the New Mexico Endangered Plant Species Act and Rule No. NMFRCD 91-1. State of New Mexico regulations do not apply to Pueblo and tribal lands. Each agency maintains a list of animal and or plant species that have been classified or are candidates for classification as endangered or threatened based on present status and potential threat to future survival and recruitment. Of these species, only those with potential to occur in the project area are discussed below. Additional information regarding federally-listed species is presented in the Corps' 2011 Biological Assessment (USACE, 2011).

### 3.9.1 Southwestern Willow Flycatcher

The action area is within the current range of the Southwestern Willow Flycatcher (*Empidonax traillii extimus*). The Service listed the flycatcher as endangered in February 1995 (USFWS 1995). The flycatcher also is classified as endangered by the State of New Mexico (NMDGF 1988). A recovery plan for the flycatcher (USFWS 2002) has been completed. In New Mexico, flycatchers are known to breed in the Rio Grande, Zuni, San Francisco, and Gila River drainages. Critical habitat does not occur at Cochiti Lake.

The flycatcher is an obligate riparian species and nests in thickets associated with streams and wetlands where dense growth of willow, boxelder, Russian olive, saltcedar, or other shrubs are present. Nests are frequently associated with an overstory of scattered cottonwood. Throughout the flycatcher's range, these riparian habitats are now rare, widely separated, and occur in small and/or linear patches. Flycatchers nest in stands with a densely vegetated understory approximately 10 to 23 feet or more in height. Surface water or saturated soil is usually present beneath or adjacent to occupied thickets. Southwestern Willow Flycatchers arrive in New

Mexico in late May and early June. Breeding activity begins immediately and young may fledge as soon as late June.

As previously described, approximately 167 acres of shrub wetlands consisting primarily of Goodding's and coyote willow occur upstream from Cochiti Dam along the Rio Grande within White Rock Canyon. This area is likely to be suitable breeding habitat for the flycatcher. Any of these willow stands could be used by flycatchers during migration.

The U.S. Bureau of Reclamation (Reclamation) performed protocol surveys along the Rio Grande between the confluence of Frijoles Canyon and the Pueblo de Cochiti in 2008 and 2009 (Moore and Ahlers 2009; Reclamation 2010, 2011). In each year, several migrant flycatchers were encountered in May and June, and an unpaired male was present for a portion of the survey season. In 2011, Reclamation surveyed the area during two protocol periods, but had to abandon the remaining surveys due to dangerous conditions ensuing from the Las Conchas Fire (V. Ryan, Reclamation, *pers. comm.* to W. DeRagon, USACE, June 2011). During their June 13, 2011, survey, Reclamation documented a pair plus a single male flycatcher near the confluence of Medio Canyon. The Corps assumes that the Southwestern Willow Flycatcher now resides within the flood pool of the Cochiti Dam and Lake Project.

The log boom is not located within riparian vegetation: it is approximately 3 river miles from the confluence of Medio Canyon, and 1.4 miles from the nearest stand of developed riparian vegetation. Installation, operation and removal of the boom would have no effect on flycatcher habitat. Therefore, it is the Corps' determination that the proposed action would not affect the Southwestern Willow Flycatcher within White Rock Canyon or the Cochiti Lake reservoir pool.

## 3.10 **Cultural Resources**

This project is in compliance with the National Historic Preservation Act of 1966, as amended [16 U.S.C. 470 et seq]. A review of Corps records and the New Mexico Cultural Resources Information System (NMCRIS) database by a Corps archaeologist on August 30, 2011 showed that the entire project area falls within the original 1970's University of New Mexico Office of Contract Archeology (OCA) permanent and flood pool surveys of the Cochiti Lake Project (Biella and Chapman 1977). The OCA survey recorded a number of sites in the project area, and potential anchor locations were proposed in areas outside the boundaries of archaeological sites. Because the site boundaries obtained from the NMCRIS database are more than thirty years old and are questionable in terms of accuracy, site visits were undertaken by the Corps on September 2 and 20, 2011, and by the Pueblo de Cochiti (Pueblo) on September 12, 2011, in order to determine a location that would avoid cultural resources.

A total of three possible locations were initially proposed, and subsequent to field visits by the Corps and by the Pueblo, one location was selected as the preferred alternative because it provided a good anchor point and avoided cultural resources. Consistent with the Department of Defense's American Indian and Alaska Native Policy of 1998, and pursuant to 36 CFR 800.2(c)(2)(i), tribal consultation on this project was conducted with the Pueblo de Cochiti. The project is located entirely on Pueblo de Cochiti lands. Consultation was conducted by phone, email and formal letter, and coordinated through the Director of the Pueblo de Cochiti Department of Natural Resources and Conservation. The consultation process is documented in

a formal consultation letter sent to the Pueblo on September 23, 2011 and in a consultation letter to the New Mexico State Historic Preservation Officer (SHPO) (Appendix A).

Based on the fact that, in close consultation with the Pueblo de Cochiti, all historic properties will be avoided by the installation, operation and maintenance of the log boom, the Corps has determined that there will be "No Historic Properties Affected" by installing and maintaining the log boom. The SHPO concurred with the Corps' determination of effect on October 11, 2011 (Appendix A, HPD Consultation No. 93065). Pursuant to 36 C.F.R. 800.13, should previously unknown artifacts, features or historic properties be encountered during operation of the log boom, a determination of significance would be made, and the Corps would conduct further consultation with the SHPO and the Pueblo de Cochiti to determine the best course of action.

## 3.11 **Socioeconomic Considerations, Land Use and Recreation**

### 3.11.1 **Socioeconomics**

Cochiti Lake is in Sandoval County. The county is generally rural in character. The town of Cochiti Lake is located near the lake on Pueblo land, and the community of Peña Blanca is located about five miles downstream (south) of the lake. The Town of Bernalillo (the county seat) (population 8,320 in 2010) and City of Rio Rancho (population 87,521 in 2010) are the major population centers in Sandoval County. Both communities are considered "bedroom communities" of the Albuquerque metropolitan area. The total population of Sandoval County in 2010 was 131,561 (U.S. Census Bureau 2012). Demographic information on Sandoval County is discussed more thoroughly in the Corps' Environmental Assessment for the Cochiti Deviation (USACE 2009).

People visiting Cochiti Lake and White Rock Canyon may come from Sandoval County or the adjacent counties and cities of Los Alamos and Santa Fe; the Albuquerque metropolitan area, or other areas of the state and beyond. Both lake and river recreation contribute to the economy of these counties, where river outfitters base their operations. The Town of Cochiti Lake and the Pueblo de Cochiti currently derive only minor economic benefits from lake recreation through purchases at the Pueblo's convenience store. Under the No Action Alternative, lake recreation would likely be curtailed, resulting in minor short-term economic losses. The log boom would maintain the economic benefits of recreation by helping keeping the lake open and unimpeded by debris. On the other hand, the log boom would have a short-term, adverse effect on the businesses of commercial river outfitters who run trips through White Rock Canyon.

Woody debris removed from the lake would be provided to the Pueblo de Cochiti for members to use as firewood. Many tribal members use firewood to heat their homes. This economic benefit would be available to the Pueblo either with or without the log boom, but having the boom in place would make removal of the wood form the lake easier.

### 3.11.2 **Land Use**

Lands surrounding Cochiti Lake on Pueblo de Cochiti land are devoted to residential and agricultural (cropland, irrigated and non-irrigated livestock pasture) uses. The Tetilla Peak and Cochiti Recreation Areas are within the Pueblo land easement devoted to floodwater and

sediment control for the Cochiti Dam Project. The Corps/Pueblo easement area also contains much of the 1,200-acre permanent pool for recreation and fish and wildlife enhancement. The Pueblo de Cochiti reserved the right to use all associated lands for any purposes not inconsistent with those expressly granted to the Federal Government for the facility. Lands to the west of the dam at the Town of Cochiti Lake are leased from the Pueblo by private entities and are mainly for residential and recreational uses. Properties at the town of Peña Blanca adjacent to Pueblo de Cochiti and Santo Domingo Pueblo lands are privately owned and, in general, are dedicated to residential and agricultural uses.

North of the Pueblo de Cochiti in White Rock Canyon, the permanent pool and Rio Grande channel are bordered by Santa Fe National Forest on the east, with Bandelier National Monument and Los Alamos National Laboratory property on the west. The U.S. Forest Service, National Park Service, and Department of Energy, are responsible for the management of their respective lands within the Corps' easement for all purpose other than flood control.

There are no prime farmlands within the flood pool easements of the Cochiti Dam and Lake Project.

### 3.11.3 **Recreation**

Public recreation facilities have been developed at two primary areas at Cochiti Lake: the Cochiti (west shore) and Tetilla Peak (east shore) Recreation Areas. Recreation activities include camping; picnicking; warm-water fishing; sailing and boating (at "no wake" speeds); sail-boarding; swimming; sightseeing; and wildlife viewing. The highest visitation at the lake occurs during the months of April through September. Overall, there is sustained public use of the area throughout the year.

Public access to Santa Fe National Forest land in White Rock Canyon is very limited and no recreational facilities currently exist within this reach. Within Bandelier National Monument, visitors can enjoy hiking, sightseeing, and wildlife viewing within Frijoles Canyon to its confluence with the Rio Grande. Monument lands downstream from Frijoles Canyon comprise a designated wilderness area and public access for backpacking and hiking is relatively low, in accordance with National Park Service policy.

The U.S. Forest Service (USFS) has proposed to conduct habitat restoration and construct recreation enhancements in the Buckman corridor area along the Rio Grande (SWCA, 2011). Recreation enhancements that are proposed for the area near the Rio Grande include trail improvements within the restored riparian area, shade structures along the improved trail, designated river access locations for rafters or fishermen, a parking area, and two vault toilets.

The USFS has estimated that approximately 19 vehicles per weekday visit the Buckman area, with 50% doing so for recreational purposes. On the weekends, approximately 50 vehicles visit the Buckman area, 95% of which do so for recreational purposes (SWCA 2011). Currently, there are no developed recreation sites within the project area. Following the proposed recreation enhancements, recreational use of the Buckman area is expected to increase slightly but non-significantly.

Boating accounts for approximately 20% of visits to Cochiti Lake (USACE 2009). The number of boaters running the river through White Rock Canyon is unknown. Most river runners launch at the end of Buckman Road on property of the USDA Forest Service in Santa Fe County. The Forest Service does not require river runners to obtain permits, except for commercial outfitters.

The Corps proposes to operate the log boom to accommodate recreation without compromising safety. The Tetilla Peak and Cochiti boat ramps are the only public take-out points downstream of Buckman. The boom would be closed during periods when high runoff is expected, such as spring runoff and summer monsoon season. This would prevent most large debris from entering the lake and allow the lake to be kept open. When the boom is closed, river recreation may not be possible for all types of craft. It is anticipated that it will be possible to pass light craft such as kayaks around the right side of the boom by lifting the boat over the anchor cable, which is close to the water level at the shore. It would also be possible to portage by scrambling 20 feet or so up the bank. Passage of larger boats such as rafts may be possible, if coordinated in advance with the Cochiti Lake Project Office (505-465-0307), depending on staff availability and absence of hazardous debris trapped behind the boom.

The log boom would benefit lake recreation by preventing debris accumulation in the lake, enabling the Corps to keep the lake open for recreation. The boom would have a minor adverse impact on river recreation because at certain times, such as when high runoff is expected, raft travel down the Rio Grande into Cochiti Lake would be impeded. These effects would be short-term, ending when the log boom is removed in 3-5 years.

## 3.12 **Environmental Justice**

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994) was designed to focus the attention of federal agencies on the human health and environmental conditions of minority and low-income communities. It requires federal agencies to adopt strategies to address environmental justice concerns within the context of agency operations and proposed actions. The 1995 EPA guidance document, *Environmental Justice Strategy: Executive Order 12898*, defines the approaches by which the EPA will ensure that disproportionately high environmental and/or socioeconomic effects on minority and low-income communities are identified and addressed. Further, it establishes agency wide goals for all Native Americans with regard to Environmental Justice issues and concerns.

The installation and proposed operation of the log boom would affect all lake and river recreational users equally. Neither the log boom nor the No Action Alternative would have a disproportionate effect on minority and low-income communities. The Pueblo de Cochiti members, like any other users, would be able to pass boats through the area when the boom is open. The Corps anticipates a potentially greater need for coordination with the Pueblo when the log boom is closed. By enabling the Corps to keep Cochiti Lake open to recreational visitors, there would be a minor beneficial effect on the Pueblo de Cochiti, a Native American community. Under the No Action Alternative, there would be fewer visitors to the lake and a possible adverse effect on the Pueblo. Under either alternative, the Pueblo and its members would be given the wood that is removed from the lake, which replaces fuel previously harvested in portions of the reservation that fall within the Las Conchas Fire burn area.

## 3.13 **Indian Trust Assets**

Indian Trust Assets (ITAs) are legal interests in assets held in trust by the United States for Indian tribes or individuals. Examples of ITAs include land, minerals, hunting and fishing rights, water rights, titles and money. The Indian Trust Responsibility requires that all Federal agencies take all actions reasonably necessary to protect such trust assets. The Department of Defense's American Indian and Alaska Native Policy, signed by Secretary of Defense William S. Cohen on October 20, 1998, and DOI's Secretarial Order 3175 require that the Corps consult with tribes and assess the impacts of its projects on ITAs.

The principal ITAs under consideration for this action are Cochiti Pueblo lands within the flood control pool for Cochiti Lake. The Corps has consulted with the Pueblo as described above in Section 3.10, Cultural Resources. There would be no effect on Indian Trust Assets by the proposed action or the No Action Alternative.

## 3.14 **Human Health and Safety**

Debris flows have a potentially serious impact on human health and safety. Ensuring the safety of visitors to Cochiti Lake by preventing debris build-up in the lake is a primary purpose of the log boom. The log boom would benefit recreation and safety, whereas the No Action Alternative would result in potentially hazardous debris being present in Cochiti Lake.

The Corps is taking all precautions for safe operation of the log boom. As described above, the Corps would take several measures to inform the public about the boom and ensure its safe operation. Lighted navigation buoys would guide boats through the channel created when the center section of the boom is open. Signs would be placed at the Cochiti and Tetilla Peak boat ramps informing boaters about the barrier. More complete information about the boom is available and will be updated on the Web at the Corps' Albuquerque District home page <http://www.spa.usace.army.mil/> and the Cochiti Lake Facebook page <http://www.facebook.com/USACE.Cochiti.Lake>.

## 3.15 **Hazardous, Toxic, and Radioactive Waste (HTRW)**

There are no hazardous, toxic, or radioactive waste impacts from this project. No hazardous materials were used in the construction of this log boom and none will be used in its operation and maintenance. Almost all debris washed downstream in this area during and after the Los Conchas Fire has been woody debris. Any trash or other man-made debris that is removed from the boom or the lake would be disposed of properly in an off-site facility. Cochiti Lake Project staff would set aside any questionable items and would consult the Corps' Environmental Engineering HTRW experts for appropriate disposal.

## 3.16 **Cumulative Impacts**

NEPA defines cumulative effects as "…the impact on the environment which results from the incremental impact of the action when added to other, past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

The proposed action lies within a rural area in Sandoval County (Figure 1). The log boom would not significantly impact the current conditions of the local environment and would benefit lake recreation and human safety. For these reasons, the proposed project when combined with past, present, or future activities in the Cochiti Lake and White Rock Canyon area would not significantly add to or raise local cumulative adverse environmental impacts to a level of significance.

# 4 CONCLUSIONS AND SUMMARY

This Environmental Assessment addresses the potential effects of the placement of a debris-containment log boom in upper Cochiti Lake. The log boom is needed to prevent large debris from entering Cochiti Lake, endangering public safety and dam safety, and necessitating closure of the lake to recreation. The log boom presents an obstruction between the Rio Grande upstream and Cochiti Lake, and when the boom is closed it would impede river recreation from Buckman to Cochiti Lake. Communication with the public would occur through several channels to ensure that river users are aware of the boom.

**Table 1. Summary of Effects of Proposed Action and No Action Alternative**

| Resource | Proposed Action | | No Action Alternative | |
|---|---|---|---|---|
| | **Short-term effect** | **Long-term effect** | **Short-term effect** | **Long-term effect** |
| Physiography, Geology, and Soils | No effect | No effect | No effect | No effect |
| Climate and Climate Change | No effect | No effect | No effect | No effect |
| Water Resources | No effect | No effect | Adverse effect to lake | No effect |
| Floodplains and Wetlands | No effect | No effect | No effect | No effect |
| Air Quality, Noise, and Aesthetics | Minor adverse effect | No effect | Minor adverse effect | No effect |
| Vegetation Communities | No effect | No effect | No effect | No effect |
| Noxious Weeds and Invasive Species | No effect | No effect | No effect | No effect |
| Wildlife | No effect | No effect | No effect | No effect |
| Special Status Species | No effect | No effect | No effect | No effect |
| Cultural Resources | No effect | No effect | No effect | No effect |
| Socioeconomic Considerations and Land Use | Minor adverse effect to river outfitters | No effect | Minor adverse effect | No effect |
| Recreation | Beneficial for lake users; minor adverse effect for river runners | No effect | No effect for river runners; adverse effect for lake users | No effect |
| Environmental Justice | No effect | No effect | No effect | No effect |
| Indian Trust Assets | No effect | No effect | No effect | |
| Human Health and Safety | Beneficial effect | No effect | Adverse effect | No effect |
| Hazardous, Toxic, and Radioactive Waste | No effect | No effect | No effect | No effect |

# 5 PREPARATION, CONSULTATION AND COORDINATION

## 5.1 Preparation

This Environmental Assessment was prepared by the U.S. Army Corps of Engineers, Albuquerque District. Personnel primarily responsible for preparation include:

- Dana M. Price, Botanist
- Jeremy Decker. Archaeologist
- Mark Rosacker, Lead Ranger, Cochiti Lake
- Leverett Bogle, Project Manager

## 5.2 Quality Control

This EA has been reviewed for quality control purposes. Reviewers include:

- Julie A. Alcon, Chief, Environmental Resources Section
- Rebecca L. Miner, Operations Project Manager, Cochiti Lake
- Michael D. Porter, Biologist
- Jonathan Van Hoose, Archaeologist
- Ariane Pinson, Technical Writer/Editor

## 5.3 Consultation and Coordination

Agencies and entities that were consulted in preparation of this Environmental Assessment include:

- Mr. Miles Standish, USDA Forest Service, Espanola Ranger District
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- Kokopelli Rafting
- Kirtland AFB Outdoor Recreation Program
- Adobe Whitewater Club

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**Libraries and public locations for DEA to be available:**

Santa Fe Public Library
145 Washington Street
Santa Fe, NM 87501

Albuquerque Main Library
501 Copper NW
Albuquerque, NM 87102

Bernalillo Roosevelt Public Library
134 Calle Malinche / P.O. Box 638
Bernalillo, NM 87004

Corrales Community Library
84 West La Entrada
Corrales, NM 87048

Los Alamos Mesa Public Library
2400 Central Ave.
Los Alamos, NM 87544

Espanola Public Library
313 North Paseo de Oñate
Espanola, NM 87532

Sweetkind Public Library
6515A Hoochaneetsa Blvd
Cochiti Lake, NM 87083

# 6 REFERENCES

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