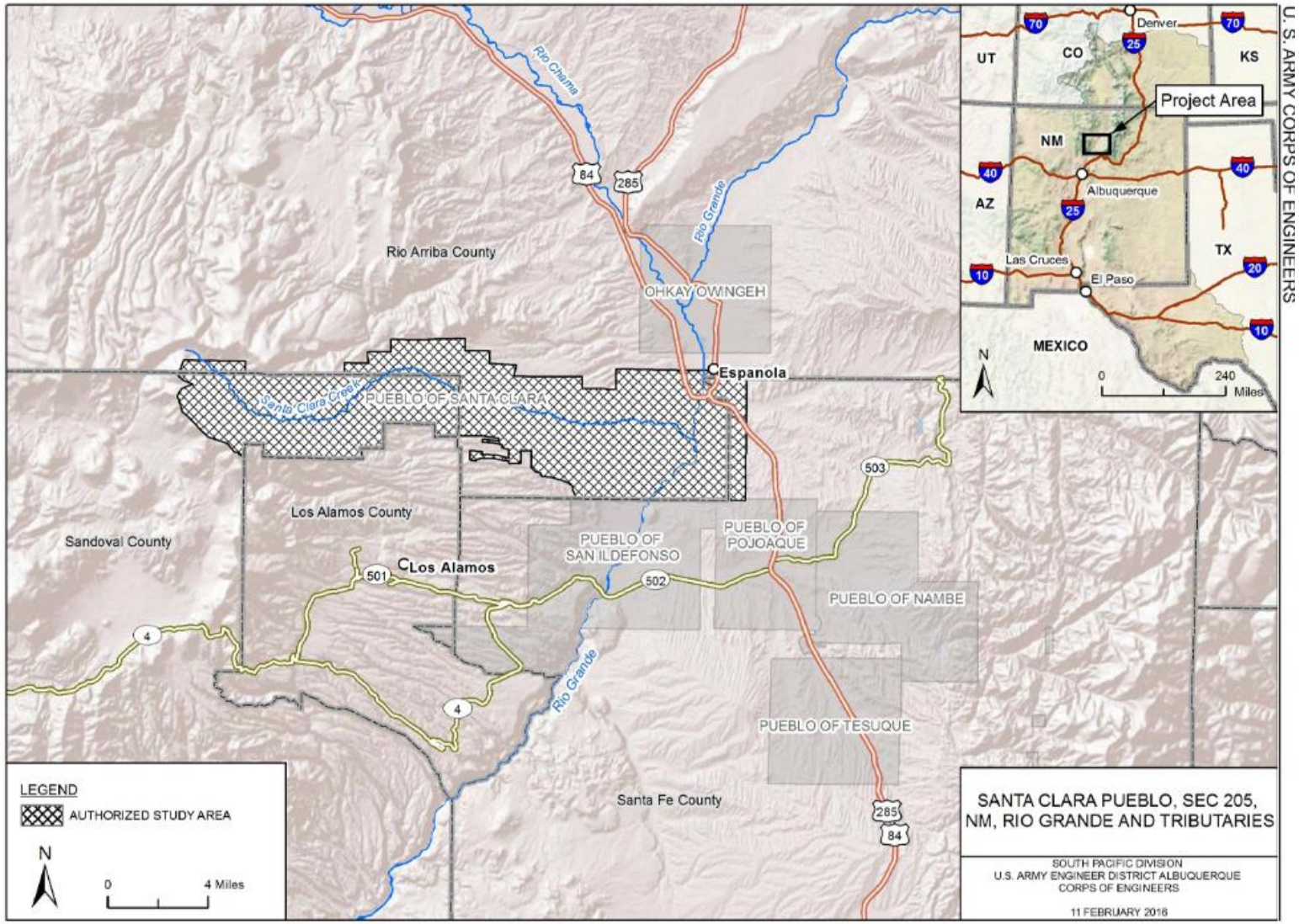
# 319 NPS Work Building BMP Structures to Address Impacts from the 2011 Las Conchas Fire and Flooding

## *An Enduring Partnership with EPA: Fire, Water, and Earth on Santa Clara Pueblo*

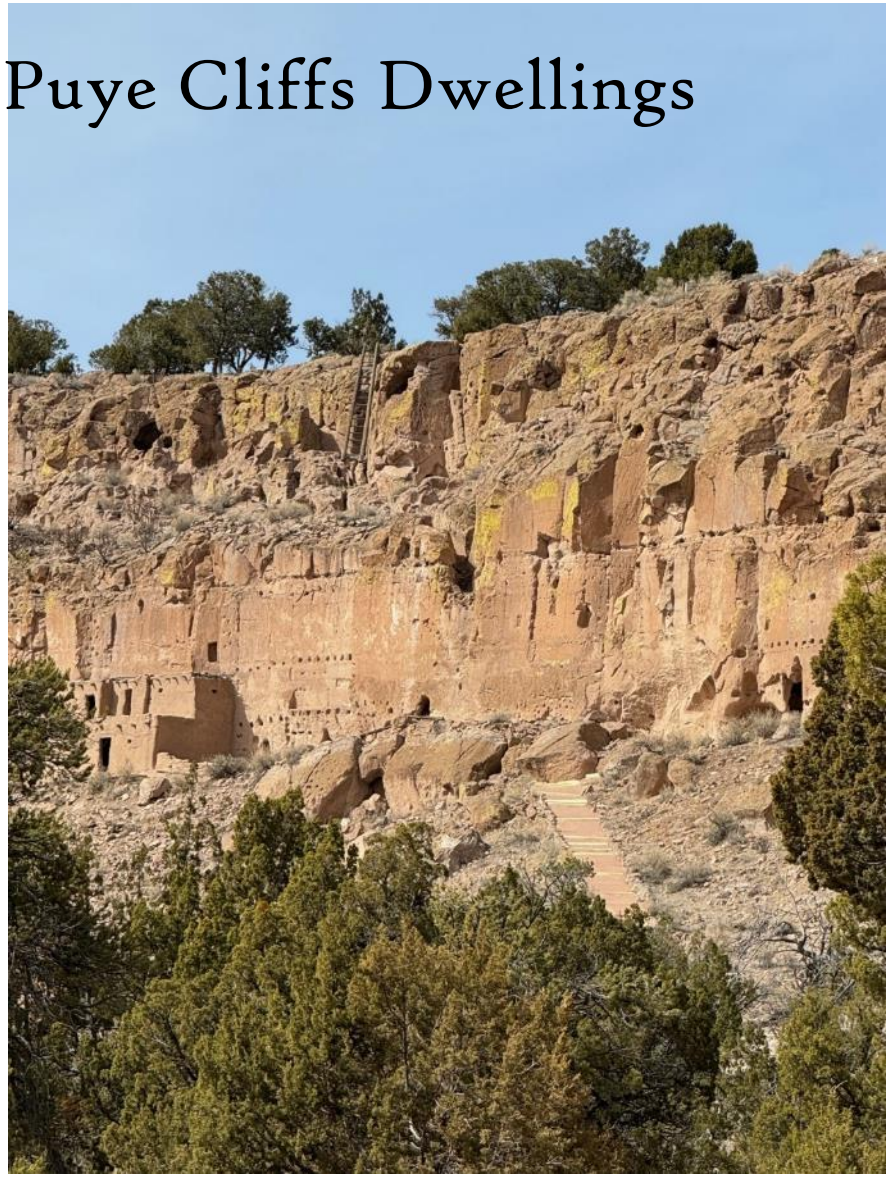
**Southwest Tribal Clean Water Act Training**
**National Association of Wetland Managers**
Pueblo of Isleta, NM
March 5, 2024

# Overview: Santa Clara Pueblo

- Federally recognized Native American Tribe
- Located on the Rio Grande in Northern New Mexico
- Population: 1,500
- Area: 90 square miles



Santa Clara Canyon, Pajarito Plateau and Puye Cliffs Dwellings



# Contact

1540 Coronado Expedition

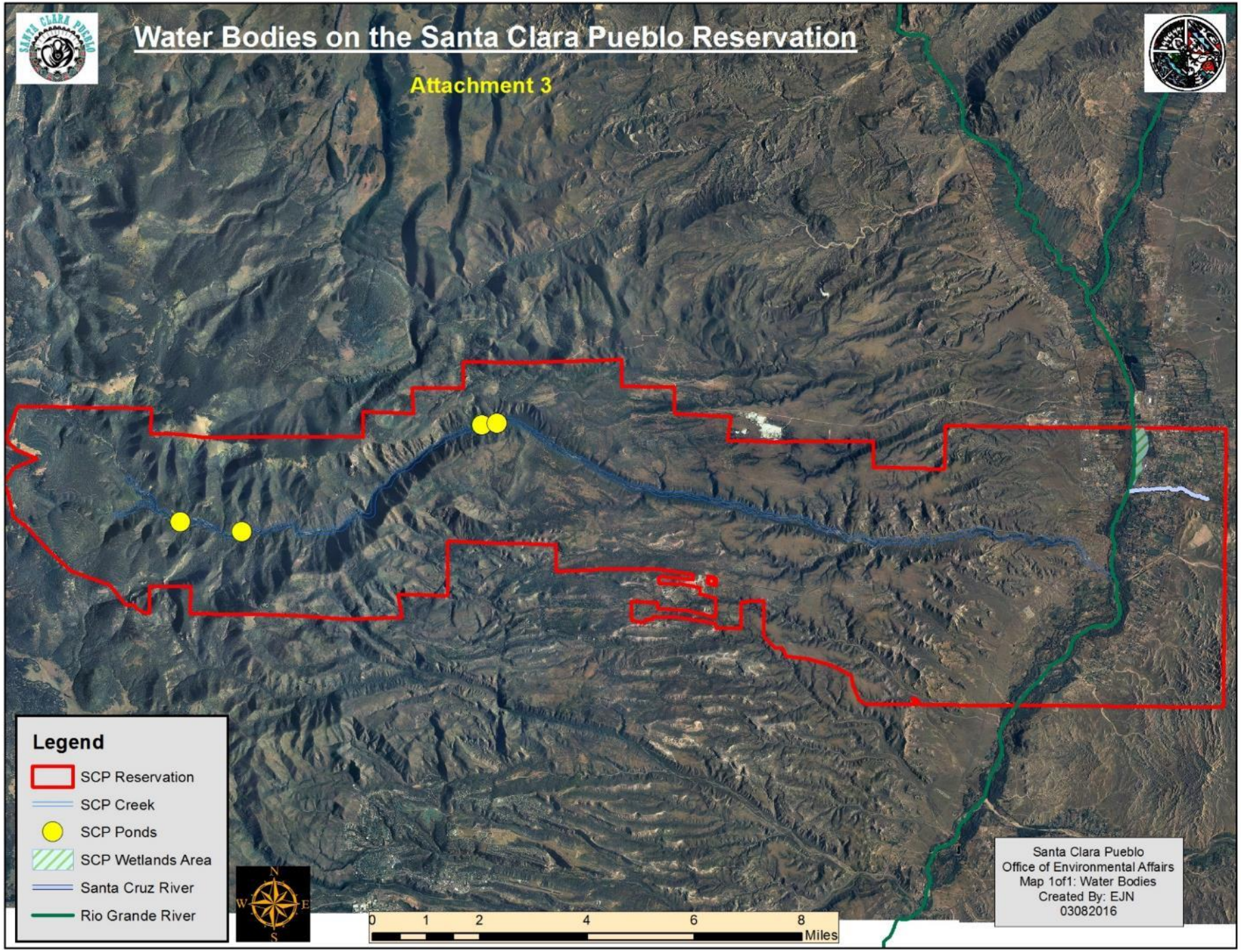
1598 Onate Expedition – Established Spanish government capitol at San Juan Pueblo at
La Villa de San Gabriel.

1680 The Pueblo Revolt

1692 Spanish Reconquista – Diego De Vargas

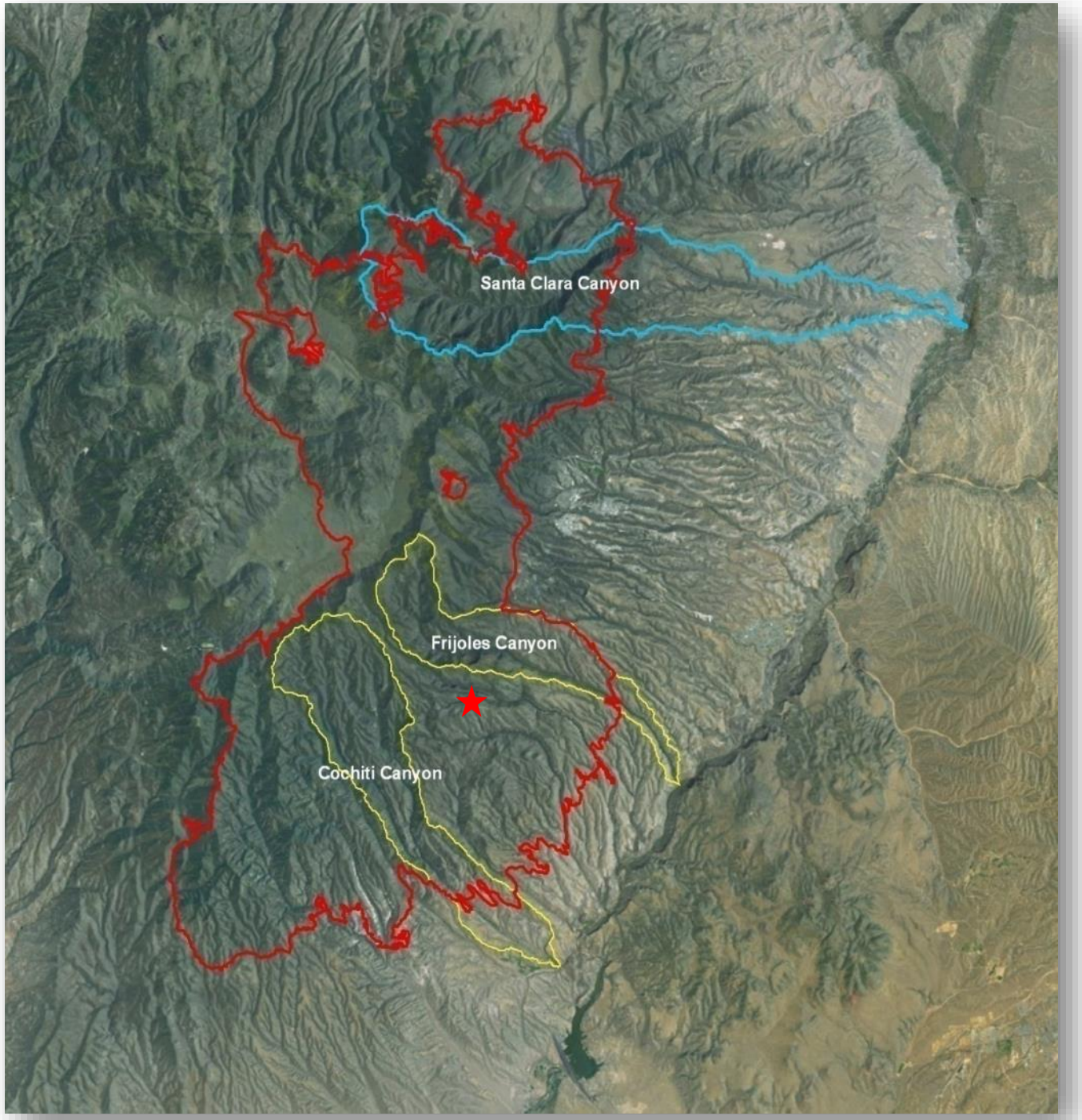
1821 Mexican Independence

1846 Treaty of Guadalupe Hildago


Water Bodies on the Santa Clara Pueblo Reservation
Attachment 3
Legend
SCP Reservation
SCP Creek
SCP Ponds
SCP Wetlands Area
Santa Cruz River
Rio Grande River
N
W
E
S
0 1 2 4 6 8
Miles
Santa Clara Pueblo
Office of Environmental Affairs
Map 1of1: Water Bodies
Created By: EJN
03082016

# Fire Impacts on the Santa Clara Creek Watershed

- 1998 Oso Complex Fire 1,500 acres burned
- 2000 Cero Grande Fire 6,200 acres burned
- 2011 Las Conchas Fire 14,700 acres burned




# Las Conchas Fire

Started: June 26, 2011
Entered Watershed: June 29, 2011
100% Contained: August 3, 2011

Total Burn Area: 156,600 ac.

First Day: 40,000 ac.
First 2 Days: 60,000 ac.
Burn Rate (peak est.): ~1ac./second

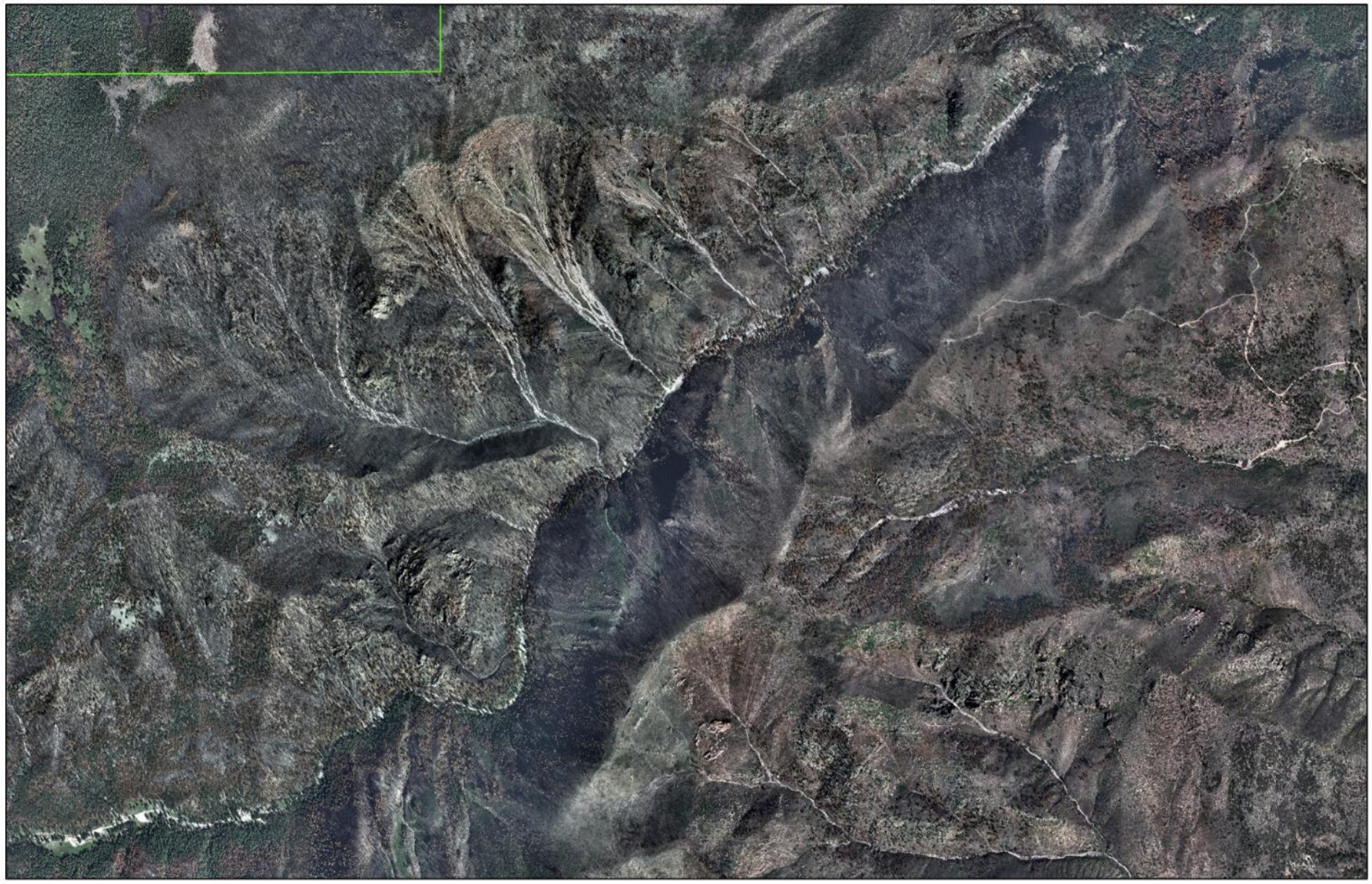
**Santa Clara Canyon**
Watershed Area: 31,400 ac.
Burn Area: 17,400 ac.
**~55% of Entire Watershed**

SANTA CLARA CANYON 2009 NAIP IMAGERY

N
W E
S

0 0.25 0.5 Miles

1:11,193



N
W E
S

0 0.125 0.25 Miles

Santa Clara Canyon Post Las Conchas Fire Oct. 2011

# 2011 IMAGERY


Enjoy
Coke
06/16/2011 18:32

# EPA NPS Section 319 Competitive Projects Resulting from the Request for Proposals

GOAL: Improve Water Quality of the Santa Clara Creek by completing Nonpoint Source Pollution projects in the Upper Watershed of the Santa Clara Canyon

BMP Project Outcomes: Installation of Log Mattresses, Log and Rock Dams, Zuni Bowls, Log Drops, Diversions, Flow Splitters, Induced Meanders, Vegetation Planting, Water Harvesting, etc.

# NPS BEST MANAGEMENT PRACTICE STRUCTURES APPLIED in SANTA CLARA CANYON WATERSHED

ROCK DAM

ROCK BAFFLE

LOG MATTRESS

RUNDOWN

FLOW SPLITTER

ZUNI BOWL – Head Cut Mitigation

A large log drop that is reinforced with rock to aggrade an incised channel

A well-constructed sediment catchment in Santa Clara Canyon

A rock baffle induces a stream meander and adds sinuosity to Santa Clara Creek

a rock dam helps slow the water down and capture sediment loads improving non-point source pollution

Another sediment catchment in a drainage to the creek

large rundown comprised of logs, rocks and branches placed in severely impacted erosion channel

A nicely built and located rock dam helps aggrade the stream bed and supplement local willows with water. A baffle in the background adds sinuosity and modifies flow.

Observations has shown that baffles and rock dams are by far the most beneficial structures on the creek, both with short- and long-term results and considering their very low rate of failure. Other structures on the creek, especially those made from wood and those that require more complex construction (such as Zuni Bowls), have a much higher rate of failure, and often take more time to construct.

Rock dams are used for the primary purpose of channel aggradation and used when a channel is incised and disconnected from its floodplain.

Baffles are used to restore sinuosity and used when the creek has access to its floodplain. Prior to the fire and flooding events, a stream survey was completed of Santa Clara Creek in 2005 (Zeedyk) that shows that sinuosity was near and often above 20% for the upper creek. After the fire and floods, it is observed that sinuosity has been reduced to around 6% in most places.

In 2022 NPS 319 work resulted in completion of 414 structures in 8 tributaries (including 164 built within Santa Clara Creek), floodplain expansion and access on a three-acre project site.

7,837 NPS 319 BMP structures completed between 2014 and 2022 in 64 drainages and stream reaches across over 16,200 acres of sub-watersheds and 39 miles of tributaries and stream

Future Steps:
- Continue monthly monitoring of creek to determine if the work is effective and generate data
- Inspect and review past projects to see which structures and locations best captured sediments and generated plan growth
- Apply for future EPA NPS competitive funding as it becomes available.
- Maintenance of 319 NPS BMP structures (IF ALLOWED).

*Thanks to our contractor Sustainable Ecosystems, SCP Rights Protection Office, SCP Forestry Department and US EPA for helping improve water quality in Santa Clara Pueblo*