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Final Report for Salt River Watershed Level I Study

(Contract No. 029CM0091017)

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APRIL 7, 2026

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Disclaimer:

It is important to note that all project recommendations presented in this report are conceptual only and are intended to provide sufficient information to initiate projects, assess design/site constraints, understand costs, and apply for funding through various funding mechanisms; implementation may require further engineering analysis and design. Also, there are no requirements that these projects be ultimately implemented; participation is totally voluntary. Furthermore, the Star Valley Conservation District (SVCD) has no obligation to participate as a sponsor of projects for potential funding. The SVCD board will decide on a case-by-case basis whether to sponsor a project.

**SALT RIVER WATERSHED LEVEL I STUDY
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ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
AIS	Aquatic Invasive Species
ARPA	Archeological Resource Protection Act
BLM	Bureau of Land Management (U.S. Department of the Interior)
BMPs	Best Management Practices
BOR	U.S. Bureau of Reclamation (Department of the Interior)
BTNF	Bridger-Teton National Forest
CCVAs	Climate Change Vulnerability Assessments
CFS	Cubic Feet per Second
CIR	Crop Irrigation Requirements
CSP	Conservation Stewardship Program
CTNF	Caribou-Targhee National Forest
CU	Consumptive Use
EA	Environmental Assessment
ECHO	Enforcement and Compliance History Online
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
ESA	Endangered Species Act
ET	Evapotranspiration
EWP	Emergency Watershed Protection
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act
FSA	Farm Service Agency
GAP	Gap Analysis Project
GIS	Geographical Information System
GPM	Gallons per Minute
HUC	Hydrologic Unit Code
IDFG	Idaho Department of Fish and Game
LANDFIRE	Landscape Fire and Resource Management Planning Tools
LCWP	Lincoln County Weed and Pest
LDRs	Land Development Regulations
MRLC	Multi-resolution Land Characteristics Consortium
NFWF	National Fish and Wildlife Foundation
NGOs	Non-Governmental Organizations
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NOAA	National Oceanic and Atmospheric Association
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service (U.S. Department of Agriculture)
NWI	National Wetlands Inventory
NWIS	National Water Information System
NWP	Nationwide Permit
NWS	National Weather Service

OSLI	Wyoming Office of State Lands and Investments
PCN	Pre-Construction Notification
POD	Point of Diversion
POU	Point of Use
RAWS	Remote Automated Weather Stations
RCPP	Regional Conservation Partnership Program
ROWs	Right-of-ways
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SRWG	Salt River Watershed Group
SNOTEL	Snow Telemetry
SSRBP	Snake/Salt River Basin Plan
SVCD	Star Valley Conservation District
SWAP	State Wildlife Action Plan
SWE	Snow Water Equivalent
SWPP	Small Water Project Program
TMDLs	Total Maximum Daily Loads
TNC	The Nature Conservancy
TU	Trout Unlimited
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA-RD	U.S. Department of Agriculture Rural Development
USFS	U.S. Forest Service (U.S. Department of Agriculture)
USFWS	U.S. Fish and Wildlife Service (U.S. Department of the Interior)
USGS	U.S. Geological Survey (U.S. Department of the Interior)
WBC-OOR	Wyoming Business Council – Office of Outdoor Recreation
WDA	Wyoming Department of Agriculture
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department
WHMA	Wildlife Habitat Management Area
WLCI	Wyoming Landscape Conservation Initiative
WRDS	Water Resources Data System
WSFD	Wyoming State Forestry Department
WSGS	Wyoming State Geological Survey
WWCS	Wyoming Wetlands Conservation Strategy
WWDC	Wyoming Water Development Commission
WWDO	Wyoming Water Development Office
WWNRT	Wyoming Wildlife Natural Resource Trust
WYDOT	Wyoming Department of Transportation
WYGISC	Wyoming Geographic Information Science Center
WYNDD	Wyoming Natural Diversity Database
WYPDES	Wyoming Pollution Discharge Elimination System

1 INTRODUCTION AND OVERVIEW

1.1 Introduction

In 2023, the Star Valley Conservation District (SVCD) requested funding from the Wyoming Water Development Commission (WWDC) for the completion of a watershed management plan for the Wyoming portion of the Salt River Watershed. The funding request was intended to complete a comprehensive watershed inventory that identified land-use and water-resource issues, and to develop a plan to address them. In April 2024, the WWDC entered into a contract, following a standardized selection process, with Y2 Consultants, LLC (Y2) and its subcontractors, Sunrise Engineering, LLC (Sunrise) and Engineering Associates (EA), to complete the Level I Watershed Study.

1.2 Project Overview

The Salt River Watershed Study is an inventory of resources within the watershed, an assessment of watershed function, and an identification of opportunities for improvement. This watershed study aims to evaluate the existing conditions of the Salt River Watershed and develop a Watershed Management and Rehabilitation Plan to improve or maintain watershed function and systems through collaboration with SVCD (the study's local sponsor), landowners, stakeholders, and the interested public.

Additionally, this plan identifies projects eligible for WWDC funding through the Small Water Project Program and identifies other funding sources to which improvement projects may be eligible. In generating this report, data and recommendations were gathered from previous studies conducted within the Salt River Watershed to identify data gaps. A tabulation of prior studies within the Salt River Watershed is discussed in more detail in Section 2: Background Information Review and is presented in Table 2-2.

1.2.1 Study Area

The study area is located in western Wyoming, primarily in Lincoln County (Figure 1-1). The watershed includes approximately 220 stream miles, including the mainstem of the Salt River (80 miles) and its major tributaries. Tributaries from the mountains of Wyoming and Idaho include Jackknife Creek, Tincup Creek, Strawberry Creek, Willow Creek, Stump Creek, Swift Creek, Dry Creek, Cottonwood Creek, Spring Creek, Crow Creek, and numerous spring creeks which originate in the valley bottom. Reservoirs within the watershed include Strawberry Creek Reservoir and Upper and Lower Swift Creek Reservoirs. Elevation within the watershed ranges from 5,600 feet above mean sea level to over 10,800 feet in the Salt River Range.

The landscape is a mixture of mountain forests, agricultural valley bottomlands, ranchland and hayland, rangelands, and small rural communities. There are four incorporated towns located within the watershed: Afton, Alpine, Star Valley Ranch, and Thayne. Unincorporated towns within the watershed include: Smoot, Fairview, Grover, Auburn, Turnerville, Bedford, Etna, Osmond, and Freedom.

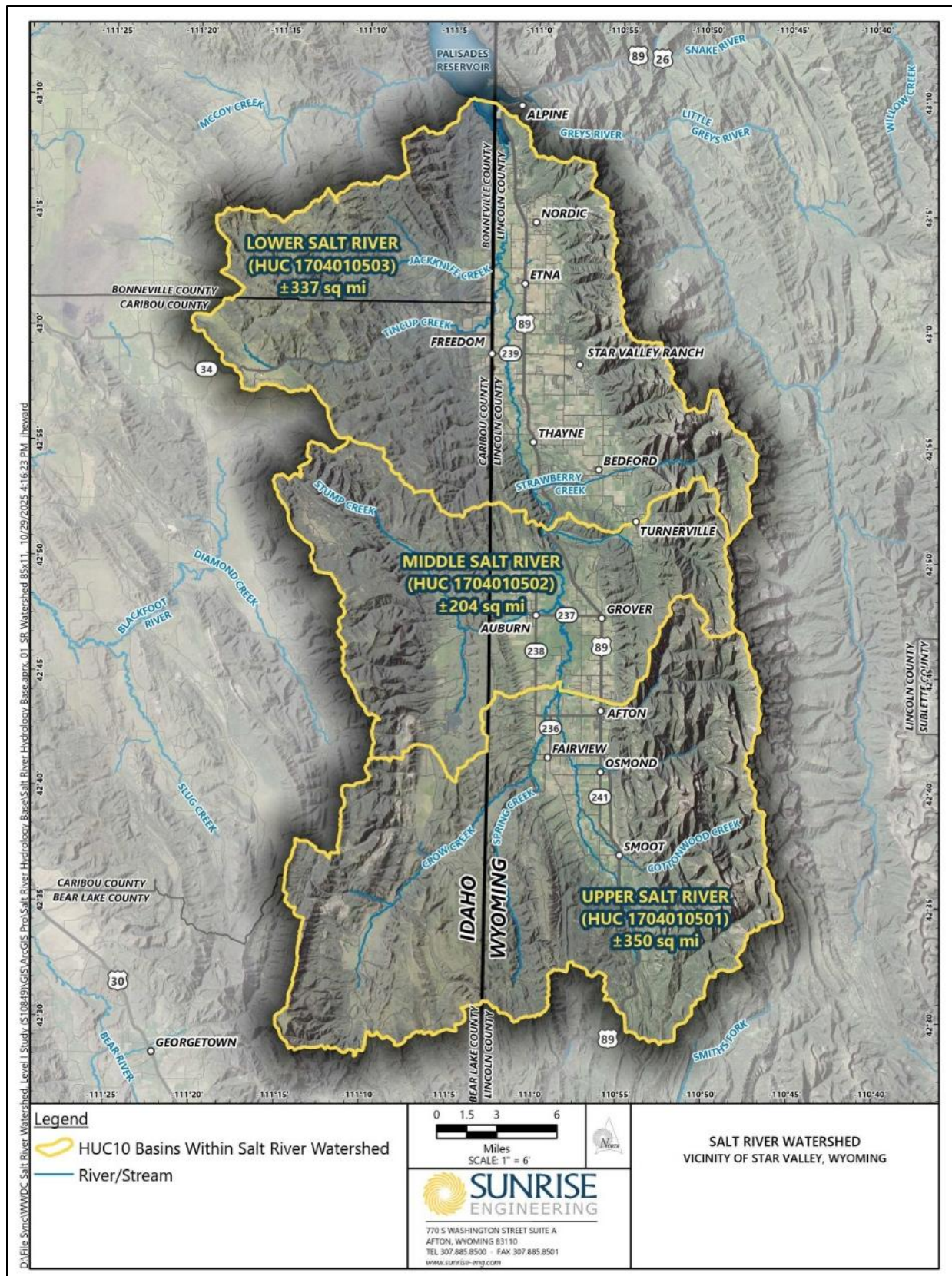


Figure 1-1. Salt River Watershed project study area (only in Wyoming).

1.2.2 What is a Watershed Study?

The Operating Criteria of the Wyoming Water Development Program (Wyoming Water Development Office, 2015) describes Level I watershed studies as:

These studies provide a detailed evaluation of an individual watershed. The studies may identify water development and system rehabilitation projects as well as address erosion control, flood control, or other non-water development-related environmental issues. Watershed improvement studies are integral to the Small Water Project Program, which has its own specific criteria. The studies may identify projects that may be eligible for the New Development, Rehabilitation, or Dam and Reservoir Programs.

1.2.3 The Small Water Project Program (SWPP)

One of the purposes of this Level I watershed study is to provide a basis for the WWDC to make future decisions regarding state funding for water development projects. Potential projects identified in this study may be eligible for funding through the WWDC's Small Water Project Program (SWPP). According to the operating criteria of the SWPP:

The purpose of the Small Water Project Program (SWPP) is to participate with land management agencies and sponsoring entities in providing incentives for improving watershed condition and function. Projects eligible for SWPP grant funding assistance include the construction or rehabilitation of small reservoirs, wells, pipelines and conveyance facilities, springs, solar platforms, irrigation works, windmills and wetland developments. Projects should improve watershed condition and function and provide benefits for wildlife, livestock, and the environment. Projects may provide improved water quality, riparian habitat, habitat for fish and wildlife and address environmental concerns by providing water supplies to support plant and animal species or serve to improve natural resource conditions.

Applicants can receive up to \$35,000 toward the cost of constructing eligible projects. Individuals apply for funding through the SVCD or another public entity that serves as the applicant's sponsor.

Application deadlines are November 15th of each year. In addition, projects that have completed the permitting requirements, certified designs, agency notifications, land procurement, and finalized other financial agreements ("shovel-ready" projects) may be considered a funding priority at the discretion of the WWDC.

1.3 Project Purpose and Objectives

The purpose of this Level I watershed study was to combine available data and information with the study-generated inventory data to develop a comprehensive watershed management and rehabilitation plan that outlines proposed and potential water development opportunities. To accomplish this, the following were completed:

- Facilitate public participation through public meetings, open houses, SVCD contacts, and advertisements.

- Conduct an evaluation and description of the Salt River Watershed, including its physical, biological, and anthropogenic resources.
- Conduct a geomorphic assessment of primary channels within the watershed and identify potential mitigation measures to improve impaired channel reaches.
- Develop a watershed management plan that identifies water resource-related issues within the watershed and proposes practical economic solutions.
- Identify permits, easements, and clearances necessary for plan implementation.
- Develop cost estimates for improvements.
- Complete an economic analysis and evaluate alternative sources of funding.
- Provide a proposed scope enhancement for the Star Valley Conservation District GIS Platform.
- Provide recommendations to help implement the watershed projects moving forward.

The study culminates with the Watershed Management and Rehabilitation Plan. The goals and objectives of the sponsor and WWDC are to develop a plan that is not only technically sound but also practical and economically feasible. The Watershed Management and Rehabilitation Plan also includes creating a database to facilitate planning and the evaluation/implementation of watershed improvements.

As part of this Level I study, efforts were made to meet with as many landowners and stakeholders as possible and help define their individual water projects. These projects are then outlined as components of the Watershed Management and Rehabilitation Plan.

1.4 Report Layout and Utilization

The following description lays out each section with a brief explanation:

- **Section 2 – Review of Existing Information:** This section describes the data collection and management methods used in the project, along with an overview of the project GIS and the Digital Library submitted along with this report.
- **Section 3 – Watershed Description and Inventory:** This section provides a characterization of the study area and its resources. This section discusses the management implications of various watershed attributes and their potential impacts on watershed improvement recommendations. Source references for data utilized are provided so that the SVCD and WWDC can easily update information as needed in the future.
- **Section 4 – Surface Hydrology:** This section provides a summary of existing hydrology data, mean annual discharge estimates for each sub-watershed, peak flow estimates, flooding information pertinent to the study area, and a description of surface water availability and shortages.
- **Section 5 – Watershed Management and Rehabilitation Plan:** This section describes the individual projects that comprise the plan.
- **Section 6 – Scope Enhancement – SVCD GIS Platform:** This section describes a scope enhancement to assist SVCD in developing a GIS platform to support future watershed project planning, development, and implementation.

- **Section 7 – Cost Estimates:** This section provides a summary of the cost estimates associated with each watershed project analyzed in the Watershed Management and Rehabilitation Plan. Detailed cost estimates for each project are included on the project worksheets in Appendix D: Project Descriptions and Cost Estimates.
- **Section 8 – Economic Analysis:** This section summarizes numerous funding programs provided by local, state, and federal entities, as well as private organizations. This information can be used to determine funding strategies, including partnering with multiple funding sources.
- **Section 9 – Permits:** This section provides information on the permitting process. Most projects will require a permit.
- **Section 10 – Conclusions and Recommendations:** This section provides concise, feasible recommendations for further action by the WWDC and SVCD.

1.5 Project Public Meetings and Participation

1.5.1 Public Meetings and Workshops

An essential piece of the Salt River Watershed Study was the public outreach and involvement. Meetings were organized and conducted by Y2 and included presentations by Y2 staff, the Wyoming Water Development Office (WWDO), SVCD, and Trout Unlimited (TU).

Three public meetings were held during the study period. The first meeting was held in Afton at the Town of Afton Civic Center; the second, in Etna at the Star Valley Community Center; and the third, in Afton again at the Town of Afton Civic Center. Dates of the meetings were:

- June 11, 2024 – Project Scoping Meeting (Afton)
- June 12, 2024 – Project Scoping Meeting (Etna)
- November 13, 2024 – Project Workshop/Open House (Afton)

A report presentation to the public was given on:

- February 2, 2026 – Final Draft Report Presentation (Afton)

Meetings were advertised in the local newspaper (SVI News), on flyers in populated areas throughout the watershed, by phone, on SVCD-provided known email lists, on social media, and on the project website. The project workshop/open house meeting included a live radio interview to promote the meeting and describe the purpose of the Salt River Watershed Study.

Project scoping meetings included a PowerPoint presentation by Y2 outlining the Salt River Watershed Study objectives, a description of the different levels of studies supported by WWDC, a brief overview of the Small Water Project Program, and the proposed strategy to carry out the tasks outlined in the WWDC scope of services. In addition to the project team members, Mabel Jones (WWDO Project Manager), Kay Lynn Nield (SVCD/sponsor), and Tanner Belknap (Trout Unlimited) also participated in the presentation

and in the Q&A portion of the meeting. Most of the Q&A portion of the discussions with stakeholders focused on project applicability, costs, and permitting.

The project workshop/open house was held later in the fall to update stakeholders on the plan's progress and explore additional potential projects to include in the plan. Along with a project update presented via PowerPoint, the Small Water Project Program lead, Jodie Jackson, presented virtually and answered questions about projects and their eligibility for SWPP. This workshop/open house had a great turnout with over thirty (30) landowners in the room. Mabel Jones (WWDO Project Manager) attended the meeting virtually, and Kay Lynn Nield (SVCD) and Tanner Belknap (Trout Unlimited) were there in person to answer questions and discuss potential project ideas based on their extensive experience in the watershed.

The report presentation provided an overview of the report's findings, described the potential projects recommended in the report, and offered the public an opportunity to comment on the report prior to its finalization. Comments received at the public meeting were only clarification or next-step questions.

Information from the public meetings, including the presentations and transcripts, can be found in Appendix A: Public Meeting Materials. Information from the report presentation can be found in Appendix E: Report Presentation.

1.5.2 Project Meetings and Coordination

Monthly project meetings were held between Y2, SVCD, and the WWDO Project Manager, Mabel Jones, to discuss project updates, progress, and other housekeeping items. A detailed agenda and meeting minutes were provided for each meeting. Additionally, Y2 met at least monthly with their subconsultants, Sunrise and EA, to discuss project updates, progress, timelines, and address next steps.

Meetings were also held with the Wyoming Resources Data Systems (WRDS) to review and discuss the project's spatial data and the development of the spatial geodatabase. A data request was submitted to WRDS for data related to existing studies in the watershed. Data permissions were obtained from respective entities prior to WRDS releasing the data.

Y2 also coordinated with the Wyoming Game and Fish Department (WGFD) to discuss watershed conditions affecting fisheries and to review potential projects WGFD would like to explore.

1.5.3 Field Tours and Site Visits

Y2 participated in two field tours hosted by Trout Unlimited within the study timeframe to engage with projects already underway in the watershed, understand the resource conditions and issues, and discuss potential future projects with Trout Unlimited and other stakeholders participating in the tour.

Individual meetings with landowners and leaseholders were scheduled at their properties. Team members would review the potential project with the landowner and discuss related land and water resource concerns. During the site visits, initial planning and conceptual project designs were discussed.

2 BACKGROUND INFORMATION REVIEW

2.1 Collection of Existing Information

A large amount of information and data was available from existing sources when this project kicked off. To collect and incorporate as much of this information as possible, the following sources were either contacted directly, or information and documents were procured via websites, libraries, or personal contacts. Table 2-1 lists the published reports and studies relevant to the Salt River Watershed with different agencies. A further description of these studies, along with additional existing information, is available in the project's digital library.

Table 2-1. Published reports and studies relevant to the Salt River Watershed and the associated agency.

U.S. Department of the Interior/Bureau of Land Management (BLM)
A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas TR 1731-16
Record of Decision and Approved Kemmerer Resource Management Plan (2010)
Record of Decision for the Greater Sage-Grouse Supplemental Environmental Impact Statement (2021)
U.S. Department of Agriculture/Natural Resource Conservation Service (NRCS)
Wyoming Agricultural Management Assistance - Fiscal Year 2025
U.S. Department of Agriculture/Forest Service: Bridger Teton National Forest (USFS)
2021 Biennial Monitoring Report for the Bridger-Teton National Forest
Bridger-Teton National Forest Draft Assessment (2025)
Bridger-Teton National Forest Fire Management Plan (2015)
Bridger-Teton National Forest Land and Resource Management Plan (2015)
Greater Sage Grouse Record of Decision for Northwest Colorado and Wyoming
Study of Preferences and Values on the Bridger Teton National Forest
Wyoming Water Development Commission (WWDC)
Alpine Master Plan Level II Update (209)
Alpine Spring Irrigation Supply Projection (2001)
Bedford Water Supply Level I Master Plan (2019)
Cottonwood Irrigation District Master Plan (2017)
Cottonwood Lake Enlargement Level II Final Report (2009)
Cottonwood Lake Level II Phase II Final Report (2010)
Current Wyoming Water Development Commission Reservoir Projects (2019)
Dry Creek Irrigation District Infrastructure Master Plan Level II (2016)
Happy Valley Water Supply Level II Study (2021)
Nordic Ranches Water Master Plan Level I (2022)
Salt River Feasibility of Providing Instream Flow Segment No. 1 (1994)
Siting, Construction, and Testing of the Town of Afton's New Municipal East Alley Well (2006)
Snake/Salt River Basin Plan Report (2003)
Snake/Salt River Basin Plan Summary of Interstate Compacts and Court Decrees (2002): Technical Memorandum
Snake/Salt River Basin Plan Update (2012)
Snake/Salt River Basin Plan Update- Groundwater Study (2014)

Snake/Salt River Basin: Wyoming State Wildlife Action Plan Aquatic Basins Report (2017)
Star Valley Ranch Groundwater Level II Study (2009)
Star Valley Ranch Master Plan (2008)
Star Valley Regional Master Plan (2009)
Star Valley Regional Master Plan- Town of Afton Water System Investigation and Evaluation
State of Wyoming Irrigation System Survey Report (2021)
Thayne Storage Level II Study (2012)
West Afton/Nield String Master Plan (2023)
Wyoming Irrigation Systems Report (2021)
Wyoming Public Water System Survey (2022)
Wyoming State Water Plan (2007)
Wyoming Department of Environmental Quality (WDEQ)
Salt River Watershed, Wyoming E. coli Implementation Plan (2015)
Selenium Concentrations in Crow Creek, Snake River Basin, 2008-2012
Use Support Decision Fact Sheet - Crow Creek WYSR170401050102_01 (2014)
Use Support Decision Fact Sheet - Salt River WYSR170401050309_01 (2007)
Use Support Decision Fact Sheet - Stump Creek WYSR170401050203_01 (2007)
Water Quality Assessment and E. coli TMDLs - Salt River Watershed, Wyoming (2015)
Wyoming's 2020 Integrated 305b and 303d Report (2020)
Wyoming's 2022/2024 Integrated 305b and 303d Report (2025)
Wyoming Game and Fish Department (WGFD)
2021 Strategic Plan - Invasive Annual Grass Implementation Plan
Salt River Wetland Complex Regional Wetland Conservation Plan
Statewide Habitat Plan Annual Report (2024)
Wyoming Aquatic Invasive Species Management Plan (2010)
Wyoming Elk Feedgrounds Management Plan (2024)
Wyoming Game and Fish Department Statewide Habitat Plan (2025)
Wyoming State Wildlife Action Plan (2017)
Wyoming State Engineer's Office (WSEO)
Incidental Impoundments 2004 Memorandum by the Wyoming State Engineer's Office

2.2 Previous WWDC Investigations in Watershed

A large proportion of the background information review for this study drew on the wealth of information available at the WRDS Library Archives. Many Level I and Level II planning studies have been completed for the municipalities and irrigation districts within the Salt River Watershed over the last 25 years. A review of this information provided a comprehensive view of the areas within the watershed that need further research or updated data gathering. These reports also served as a starting point for assessing the watershed's current status, cataloging existing infrastructure, and identifying potential improvement projects. The tabulation of the WWDC studies completed within the Salt River Watershed is presented in Table 2-2 and the locations of the studies are shown in Figure 2-1. The planning study reports are available on request from WRDS.

Table 2-2. Past WWDC studies conducted within the Salt River Watershed.

Project ID	Study Type	Study Name	Year	Area
1	Irrigation	West Afton/Nield String Master Plan	2023	Afton
2	Irrigation	Alpine Spring Irrigation Supply Projection	2001	Alpine
3	Irrigation	Stewart Creek Irrigation Pipeline Level II Study	1993	Stewart Creek, North of Etna
4	Drinking Water	Afton Municipal Water Supply Level II Study	1990	Afton
5	Drinking Water	Afton Water Supply Project Level II Final Report	1999	Afton
6	Drinking Water	Alpine Junction Water Level I Final Report	1995	Alpine
7	Drinking Water	Bedford Water Supply Level I Master Plan	2019	Bedford
8	Irrigation	Cottonwood Irrigation District Master Plan	2017	Star Valley
9	Irrigation	Dry Creek Irrigation District Infrastructure Master Plan Level II	2016	Afton
10	Storage	Etna Diversion Dam Project Level II Study	1990	Etna
11	Well Options	Freedom Construction and Testing Report, Freedom No. 2 Test Well	1993	Freedom, No. 2 Well
12	Drinking Water	Happy Valley Water Supply Level II Study	2021	Osmond
13	Drinking Water	Nordic Ranches Water Master Plan Level I	2022	Nordic Ranches
14	River Basin Plan / Water Use	Snake/Salt River Basin Plan	2003	Snake/Salt River Basin
15	River Basin Plan / Water Use	Snake/Salt River Basin Plan Update	2012	Snake/Salt River Basin
16	River Basin Plan / Groundwater	Snake/Salt River Basin Plan Update-Groundwater Study	2014	Snake/Salt River Basin
17	Instream Flow	Report on the Feasibility of Providing Instream Flow Segment in Salt River Instream Flow Segment No. 1	1994	Salt River
17	River Basin Plan / Groundwater	Star Valley Ranch Groundwater Level II Study	2009	Star Valley Ranch
18	Drinking Water	Star Valley Ranch Master Plan	2008	Star Valley Ranch
19	Drinking Water	Star Valley Regional Master Plan	2009	Star Valley Region
20	Irrigation	Strawberry Canal Rehabilitation Project Level II Feasibility Study	1997	Strawberry Canal near Thayne
21	Drinking Water	Thayne Area Water Supply Level II Study-Turnerville Water Supply	1998	Turnerville

Project ID	Study Type	Study Name	Year	Area
22	Drinking Water	Thayne Area Water Supply Level II Study	1997	Thayne
23	Storage	Thayne Storage Level II Study	2012	Thayne
24	Drinking Water	Thayne Area Water Supply Level I	1995	Thayne
25	Drinking Water	Star Valley Regional Master Plan- Town of Afton Water System Investigation and Evaluation	2009	Thayne
26	Drinking Water	Star Valley Municipal Water Supply Level II- Freedom Water Supply System	1991	Freedom
27	Drinking Water	Star Valley Municipal Water Supply Level II- Fairview Water Supply System	1991	Fairview
28	Drinking Water	Star Valley Municipal Water Supply Level II- Smoot Water Supply System	1991	Smoot
29	Drinking Water	Star Valley Municipal Water Supply Level II- Osmond Water Supply System	1991	Osmond
30	Drinking Water	Star Valley Municipal Water Supply Level II- Grover Water Supply System	1991	Grover
31	Drinking Water	Star Valley Municipal Water Supply Level II- Etna Water Supply System	1991	Etna
32	Drinking Water	Star Valley Municipal Water Supply Level I Study	1989	Star Valley
33	Water Supply and Management	Star Valley Level II- Freedom Water and Sewer District Water Supply System	1992	Freedom
34	Water Supply and Management	Star Valley Level II- Etna Water and Sewer District Water Supply System	1993	Etna
35	Groundwater	Star Valley Groundwater Alternatives Investigation	1990	Star Valley
36	Groundwater	Star Valley Groundwater Alternatives Investigation- Smoot Wyoming	1991	Smoot
37	Groundwater	Star Valley Groundwater Alternatives Investigation- Grover Wyoming	1991	Grover
38	Groundwater	Star Valley Groundwater Alternatives Investigation- Freedom Wyoming	1991	Freedom
39	Groundwater	Star Valley Groundwater Alternatives Investigation- Fairview Wyoming	1991	Fairview
40	Drinking Water	Bedford Water Supply Study Level II	1987	Bedford
41	Drinking Water	Bedford Water Supply Study Level I	1986	Bedford

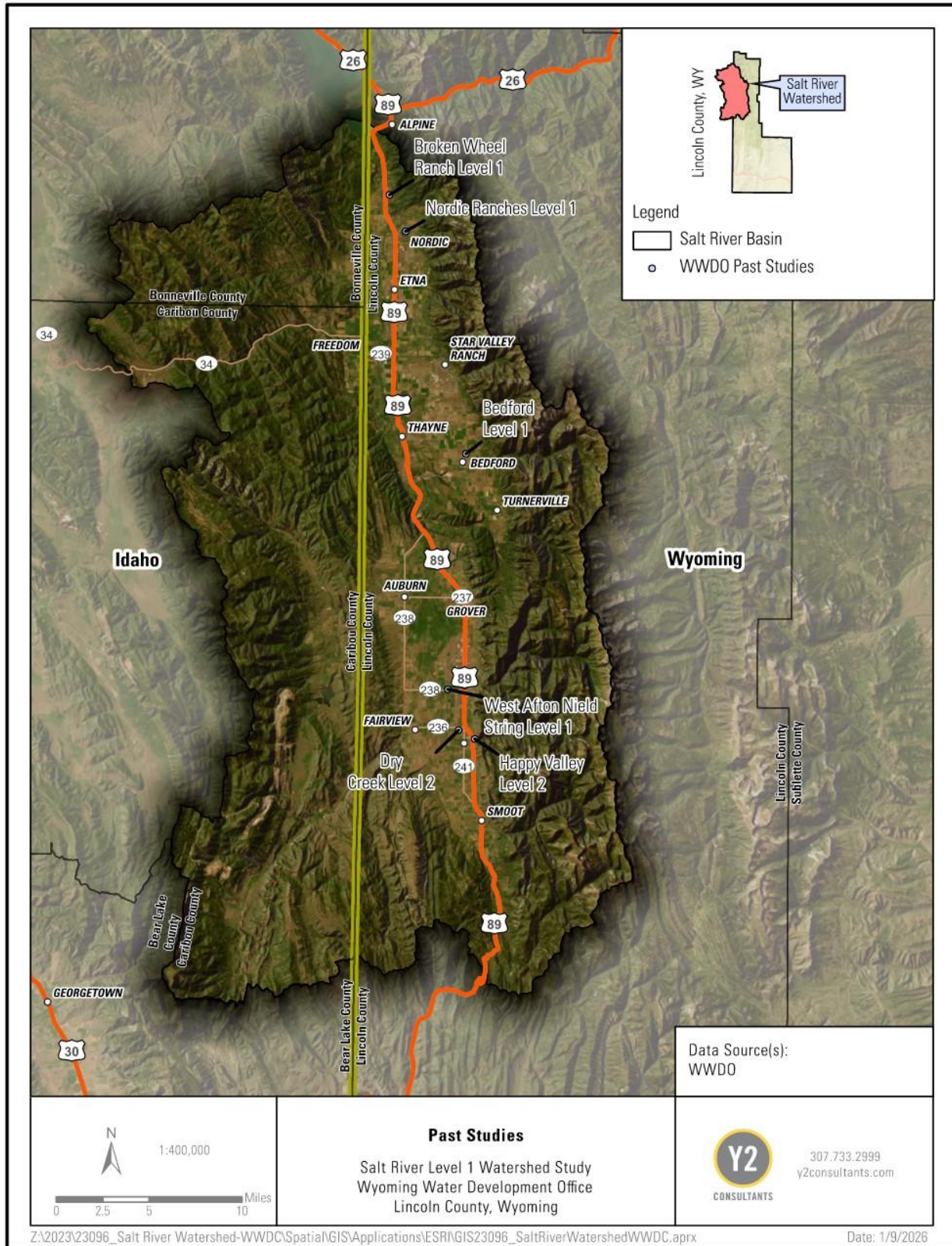


Figure 2-1. Past WWDC studies conducted in the Salt River Watershed.

2.3 Geographic Information System

2.3.1 Overview

A Geographic Information System (GIS) is a robust mapping and analysis tool that allows users to view and compare spatial data across many topics. It works by “stacking” multiple map layers, or themes, each containing data (attributes) related to that topic. For example, a map layer showing headgates can also include information about current condition, water rights, owner, etc.

Available GIS data relevant to the Salt River Watershed were collected from various sources and used to develop a description of the watershed. The data included in the GIS deliverable was generated through analysis and watershed plan development. This data represents “new” or “value-added” information that does not currently exist in any other database or from any other sources. “New” data could include: Rosgen stream classification results, identification of upland water sources, WWDC potential project locations, etc. “Value-added” data are datasets that already exist but have been modified or have attributes added as a result of the analysis in this study.

The delivered GIS geodatabase was built using a template geodatabase obtained from the WWDO. The geodatabase adheres to the GIS standards detailed in the Wyoming Water Development Office GIS Standards V. 4.0, issued July 2024.

Note: Data presented in the project GIS are subject to change over time, and databases are continually updated. It is encouraged that the user obtain the most up-to-date information for future projects.

2.3.2 Information Used

Examples of spatial information that was referenced and used throughout the development of the study include land cover, land ownership/management and parcel boundaries, zoning district boundaries, municipality boundaries, irrigation district boundaries, conservation easements, watershed HUC boundaries, hydrology, National Wetlands Inventory (NWI), FEMA flood zones, oil and gas leases, federal land permit boundaries, aerial imagery, grazing allotments, wildlife habitat ranges, wildlife migration routes, and other related data. Several water data resources used in this study are also geospatially referenced, including water quality and impaired areas, water gauge stations, and water supply source and storage locations. Below is a list of sources used to obtain geo-referenced data for this study. The data available in the WWDC studies is listed in the section above.

- Lincoln County Map Server
 - <https://maps.lcwy.org/webmaps/LinCoParcels/>
- USDA – U.S. Forest Service
- USDA – Natural Resources Conservation Service
- USDI – Bureau of Land Management
- Wyoming Geospatial Hub (WYGISC)
 - <https://geospatialhub.org/>
- Wyoming Association of Conservation Districts (SuiteWater)
 - <https://suitewater.wygisc.org/>
- USGS – National Cover Lands Database
- USGS – Gap Analysis

- USGS – LANDFIRE
- USFWS – National Wetland Inventory
- WRDS – previous WWDC studies in watershed databases (data permissions were given prior to data being shared to consultant team)
- Wyoming State Engineer’s Office – ePermit
- Wyoming Game and Fish Department
- Wyoming State Geological Survey
- USGS – StreamStats
- USGS – National Hydrography Dataset

2.4 Digital Library

The Digital Library is a collection of documents, plans, maps, figures, spreadsheets, and other materials pertaining to the project. The Digital Library consists of a spreadsheet listing available documents and their links.

3 INVENTORY AND DESCRIPTIONS

The Salt River Watershed spans 890 square miles of Lincoln County, Wyoming. The Salt River Watershed study area is approximately 14.5 miles across and 45 miles north to south and is bounded west by the Idaho/Wyoming state border and east by the Salt River mountain range. The watershed extends from where the Snake River joins the Palisades Reservoir to the north, and approximately 8 miles south of Smoot, Wyoming.

The following section will describe the existing conditions and resources within the Salt River Watershed across physical, biological, and anthropogenic systems. Refer to Figure 3-1 for an illustration of the Salt River Watershed and the defined study area.

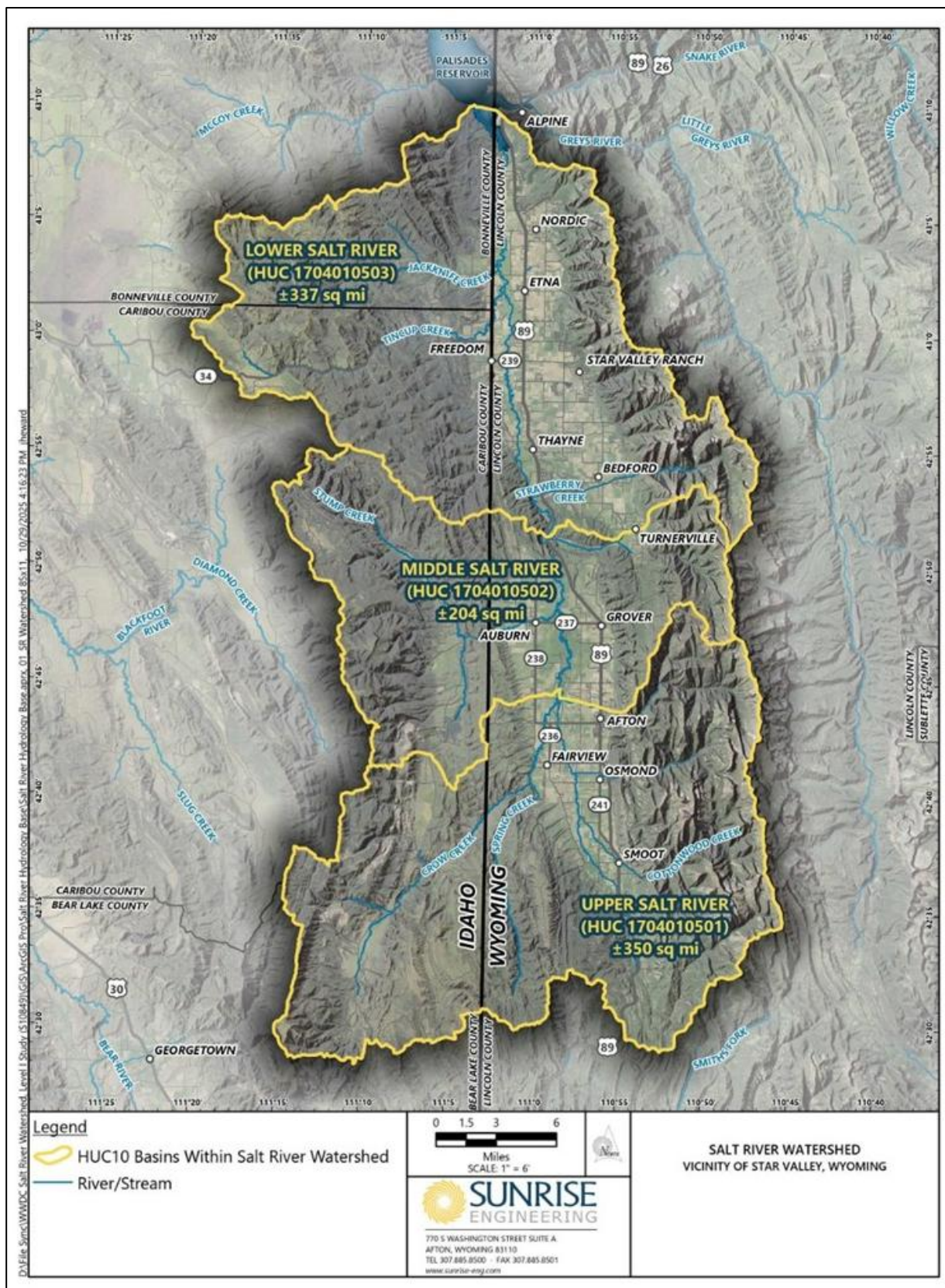


Figure 3-1. Salt River Watershed study area (only within Wyoming).

3.1 Physical Systems

3.1.1 Climate

The Salt River Watershed exhibits a semi-arid continental climate, characterized by low annual precipitation and pronounced seasonal variability in temperature and precipitation. This climate is influenced by the watershed's elevation gradient, which ranges from approximately 5,600 to over 10,800 feet, and its topography (U.S. Geological Survey, n.d.-b). The watershed receives most of its annual precipitation between October and May, primarily as snow during the winter months. These year-to-year snowpack conditions affect the watershed's hydrology throughout the growing season and into the subsequent fall.

Climate is highly variable, and future data and climate patterns may deviate from historical and running averages. These changes in temperature, precipitation, and evapotranspiration can affect the watershed's hydrology. While these potential impacts cannot be predicted within the scope of this document, the EPA's Climate Change Adaptation Resource Center (ARC-X) maintains a library of resources that may be helpful for guidance for land managers' decision-making and for conducting climate change vulnerability assessments (CCVAs). (Environmental Protection Agency, 2015)

3.1.1.1 Climate Stations

Twenty-two (22) climate stations were identified within or adjacent to the Salt River Watershed. The Afton (480027) COOP station and the Salt River Summit, Cottonwood Creek, and Willow Creek SNOTEL stations were used to assess precipitation and temperature for the watershed. These were the only four stations that have maintained a consistent record of precipitation and temperature data for 30-plus years. These stations, situated within Star Valley and the Salt River Range, collect daily precipitation, air temperature observations, and snowfall records (National Centers for Environmental Information, n.d.; Western Regional Climate Center, n.d.). There are many other stations with shorter data records or that are currently inactive and therefore considered historical.

The nearest permanent active Remote Automated Weather Stations (RAWS) are the Hoback RAWS (HOBW4) to the north and the Snider Basin RAWS (BPYW4) southeast of Big Piney, both of which report hourly meteorological parameters, including solar radiation, wind, relative humidity, temperature, and precipitation. The portable, B-T Portable #3, station is located within the watershed (National Interagency Fire Center, 04/042025). Although located outside the Salt River Hydrologic Unit (HUC-10) boundary, these RAWS sites are frequently utilized in regional hydrologic and fire-weather analyses. (Water Resource Data System & Wyoming State Climate Office, n.d.; Western Regional Climate Center, n.d.)

To capture high-elevation hydroclimatic conditions and snowpack dynamics within the watershed, three NRCS snowpack telemetry (SNOTEL) sites are also relevant: Salt River Summit, Cottonwood Creek, and Willow Creek. These SNOTEL stations provide continuous measurements of snow water equivalent (SWE), snow depth, precipitation, and temperature, offering critical insight into watershed-scale hydrology and seasonal water availability (Natural Resource Conservation Service, 2024). Collectively, the COOP, RAWS, and SNOTEL networks provide complementary datasets describing precipitation, temperature, snowfall, solar radiation, and snowpack variability across the Salt River Watershed. Refer to Figure 3-2 for a location map of the identified climate stations relevant to the Salt River Watershed. (Natural Resource Conservation Service, n.d.-b)

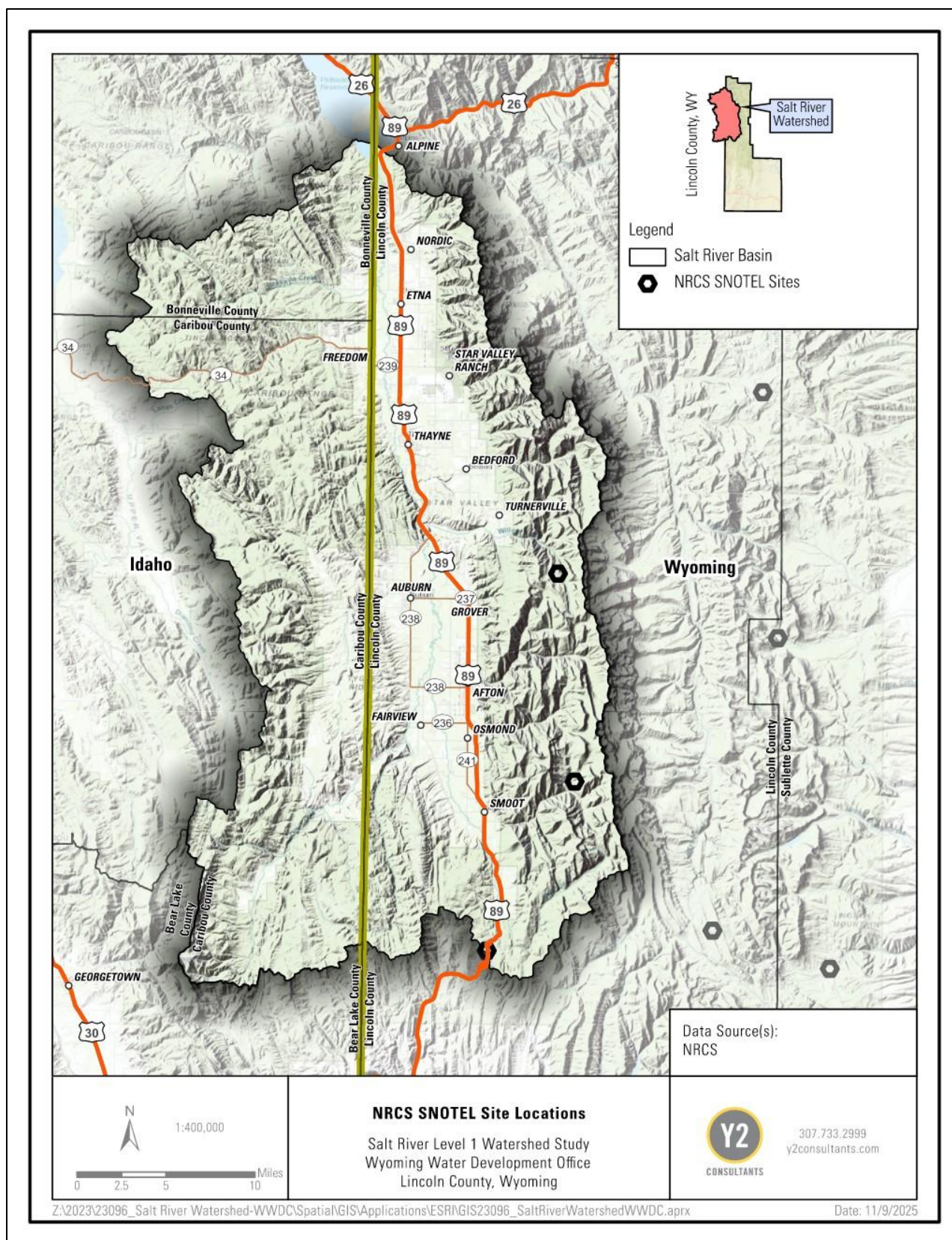


Figure 3-2. NRCS SNOTEL sites within the Salt River Watershed.

3.1.1.2 Air Temperature

StreamStats reports the mean annual temperature for the Salt River Watershed as 39°F (U.S. Geological Survey, 2025). Climate Engine records lower elevations, such as Etna (~5,820 ft), to have average maximum temperatures of approximately 55°F, with an average low temperature of 27°F, and an annual average of 41°F (GridMET-4km, 1989-2024) (UCMERCED, n.d.). For Afton, the average annual high temperature is 54°F, with lows around 26°F, and an annual average of 40°F (UCMERCED, n.d.). The StreamStats watershed mapper was used to determine climate data.

Higher elevations experience similar weather patterns with potential for lower maximum temperatures. Figure 3-3 depicts the average minimum and maximum temperatures across the four stations analyzed within the watershed. The Willow Creek SNOTEL site at 7,710 ft reports a median annual high temperature of 50°F and a low of 28°F (Climate Engine lists these values as 48°F and 27°F, respectively, with an annual average of 38°F) (1989-2024). Similarly, the Salt River Summit SNOTEL site, located at 7,630 ft, reports a median annual high temperature of 51°F and a low of 29°F (Climate Engine lists these values as 52°F and 28°F, respectively, with an annual average of 40°F). According to SNOTEL sites within the watershed, the average warmest and coolest months for the same time frame are July and December, respectively. Table 3-1 below displays the average monthly temperatures for the four primary stations evaluated within the watershed. (Natural Resource Conservation Service, n.d.-d, n.d.-e; UCMERCED, n.d.)

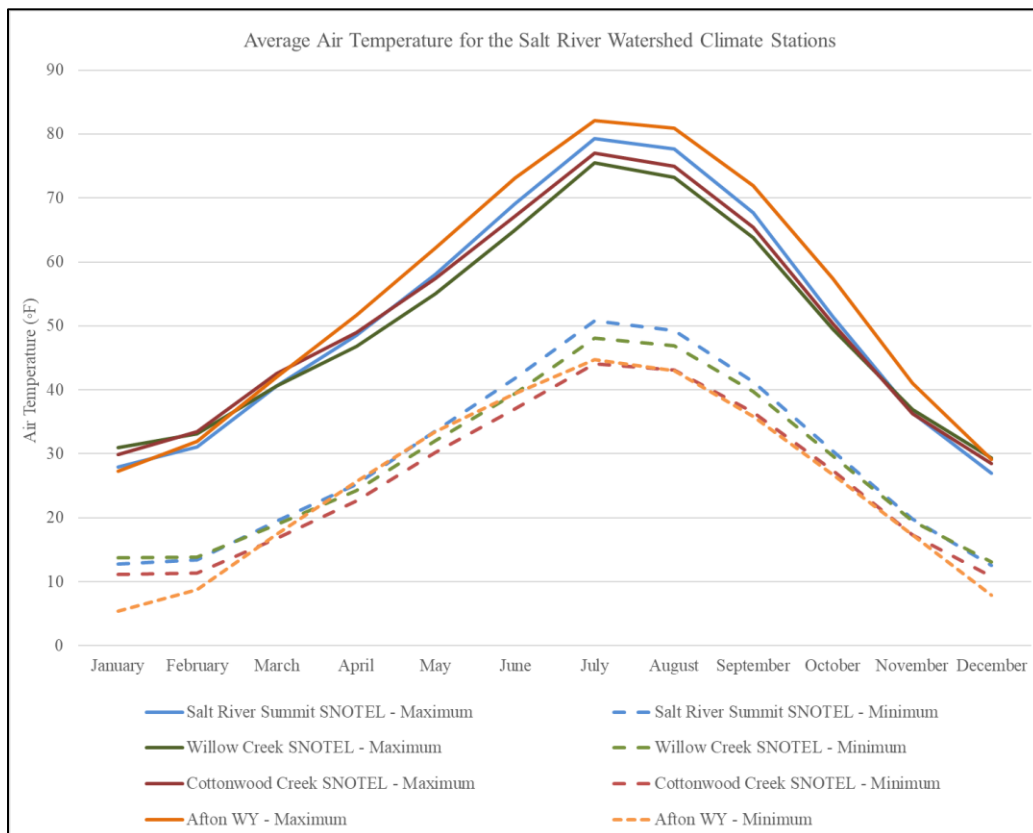


Figure 3-3. Salt River Watershed average air temperature by month as recorded by the Salt River Summit, Willow Creek, and Cottonwood Creek SNOTEL stations and the Afton, WY, climate station. (National Centers for Environmental Information, n.d.; Natural Resource Conservation Service, n.d.-a, n.d.-d, n.d.-e)

Table 3-1. Salt River Watershed 30+ year reporting climate stations recording daily temperature and precipitation data summaries for 1989-2024. (National Centers for Environmental Information, n.d.; Natural Resource Conservation Service, n.d.-a, n.d.-d, n.d.-e)

Salt River Summit (SNOTEL 730)													
Period of Record: 1989-10-01 to present		Reporting Period:1989-2024				Elevation: 7,630 ft.			Lat: 42.51			Long: -110.91	
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Annual Average
Average Max. Temperature (F)	51.5	36.4	27.0	28.0	31.1	40.7	48.5	58.1	69.1	79.3	77.7	67.7	51.4
Average Min. Temperature (F)	30.4	19.8	12.6	12.8	13.4	19.5	25.2	33.6	41.8	50.8	49.2	41.3	29.3
Average Total Precipitation (in.)	1.8	2.2	3.0	3.1	2.8	2.5	2.2	2.5	1.8	1.0	1.1	1.6	26.2
Cottonwood Creek (SNOTEL 419)													
Period of Record: 1980-10-01 to present		Reporting Period:1989-2024				Elevation: 7,710 ft.			Lat: 42.65			Long: -110.81	
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Annual Average
Average Max. Temperature (F)	50.3	36.3	28.5	29.9	33.5	42.6	49.0	57.4	67.1	77.0	74.9	65.4	51.1
Average Min. Temperature (F)	27.4	17.4	10.8	11.2	11.4	16.8	22.6	30.2	37.0	44.1	43.1	36.5	25.7
Average Total Precipitation (in.)	2.9	3.9	4.2	4.9	4.3	4.0	4.0	3.8	2.5	1.2	2.4	2.2	23.9
Willow Creek (SNOTEL 868)													
Period of Record: 1979-10-01 to present		Reporting Period:1989-2024				Elevation: 8,060 ft.			Lat: 42.82			Long: -110.84	
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Annual Average
Average Max. Temperature (F)	49.5	37.0	29.4	31.0	33.1	40.6	46.8	55.1	65.0	75.5	73.3	63.8	50.1
Average Min. Temperature (F)	29.7	19.4	13.1	13.7	13.8	19.0	24.3	32.1	39.4	48.0	46.9	39.8	28.4
Average Total Precipitation (in.)	3.8	5.2	5.7	6.1	5.4	5.2	5.5	4.7	3.1	1.2	2.9	2.5	24.7
Afton, WY COOP Station (USC00480027)													
Period of Record: 1957-05-01 to present		Reporting Period:1989-2024*				Elevation: 6,270 ft.			Lat: 42.73303			Long: -110.92168	
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Annual Average
Average Max. Temperature (F)	57.4	41.0	29.1	27.3	31.9	42.0	51.7	62.2	73.1	82.1	80.9	71.9	54.4
Average Min. Temperature (F)	26.7	17.3	7.9	5.4	8.8	17.4	25.7	33.5	39.4	44.7	43.0	35.8	25.6
Average Total Precipitation (in.)	1.6	1.3	1.4	1.4	1.3	1.4	1.6	2.2	1.6	1.0	1.2	1.6	17.7
*Years 1998, 2003, 2005, 2006, 2010, and 2011 were removed due to significant gaps in data skewing annual and monthly averaging.													

3.1.1.3 Precipitation

StreamStats lists the average annual precipitation for the Salt River Watershed as 28.9 inches. Annual precipitation varies with elevation. According to ClimateEngine, Etna receives 17.8 inches of precipitation annually, and Afton receives approximately 17.7 inches annually. In contrast, higher elevations receive more precipitation, with the Salt River Summit SNOTEL station reporting an annual average of 26.2 inches and Willow Creek receiving 24.7 inches from 1989 to 2024. The monthly temperature averages for all four stations evaluated are viewable in Table 3-1. This gradient illustrates the topography of the Salt River mountain range's role in capturing precipitation and contributing to the watershed's hydrology (Figure 3-4). (UCMERCED, n.d.)

Data from the four climate stations analyzed for the watershed illustrate the variability in precipitation accumulation between the low-lying valley and the Salt River Mountains. In Table 3-1, the data are presented by monthly and annual average precipitation per site, spanning from 1989 to 2024. The stations at higher elevations receive, on average, six to nine inches more precipitation annually. The data also demonstrate that moisture is seasonal, with higher precipitation values from November to May, while the summer months (June to August) are drier.

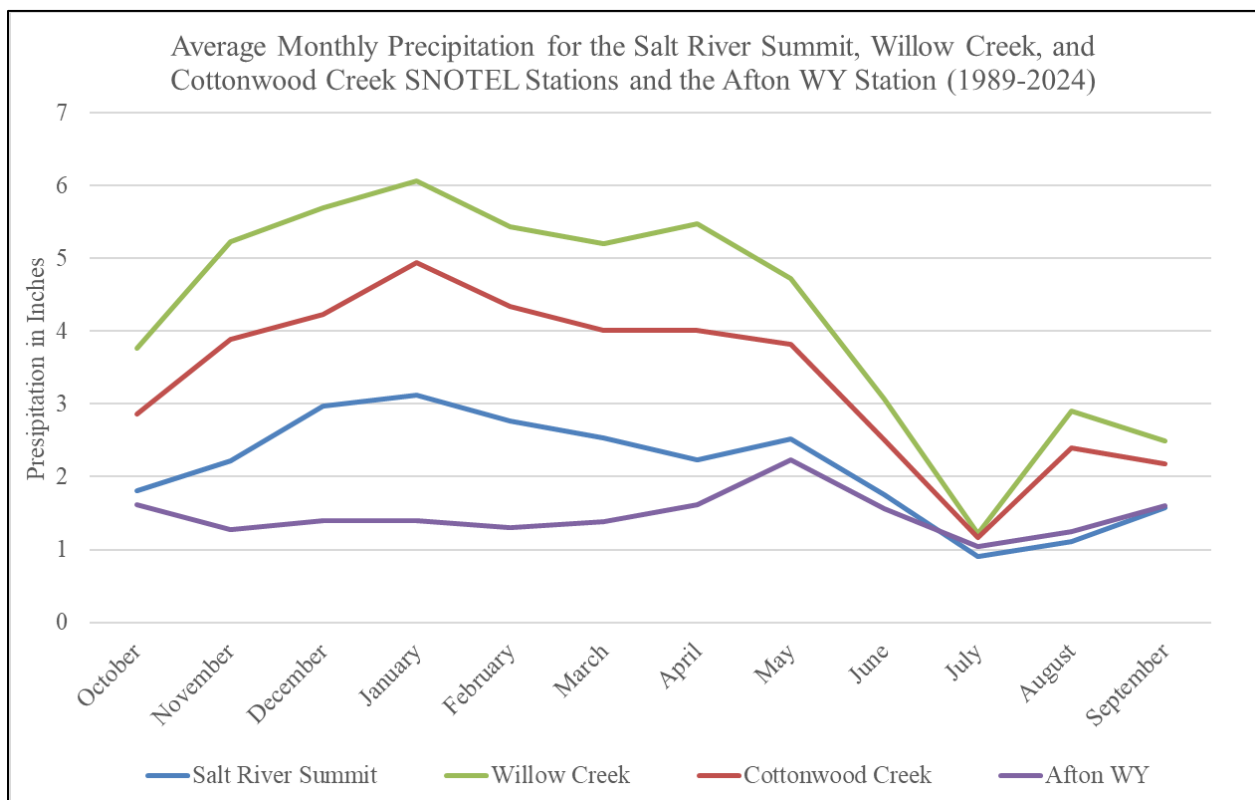


Figure 3-4. Average monthly precipitation charted for the Salt River Summit, Willow Creek, and Cottonwood Creek SNOTEL stations within the Salt River Watershed. (Natural Resource Conservation Service, n.d.-a, n.d.-d, n.d.-e)

Snowfall and snowpack development are significant components of the watershed's hydrology. The snow water equivalent data from all three SNOTEL sites have been charted for comparison (Figure 3-5). Salt River Summit reports the smallest snowpack of the three sites, with a snow water equivalent (SWE) of

13.4 inches at peak snowpack (averaged from 1989-2024). Cottonwood Creek’s SWE peaks at 21.9 inches, and Willow Creek’s SWE peaks at 28.8 inches. All three sites peak in the first week of April and experience snowpack melt-off from the peak period through late June. The Willow Creek site typically holds snowpack for over a month longer into the calendar year than the Salt River Summit site, on average. This data provides insight into how snowpack, water-holding capacity, and release timing vary across elevations throughout the watershed.

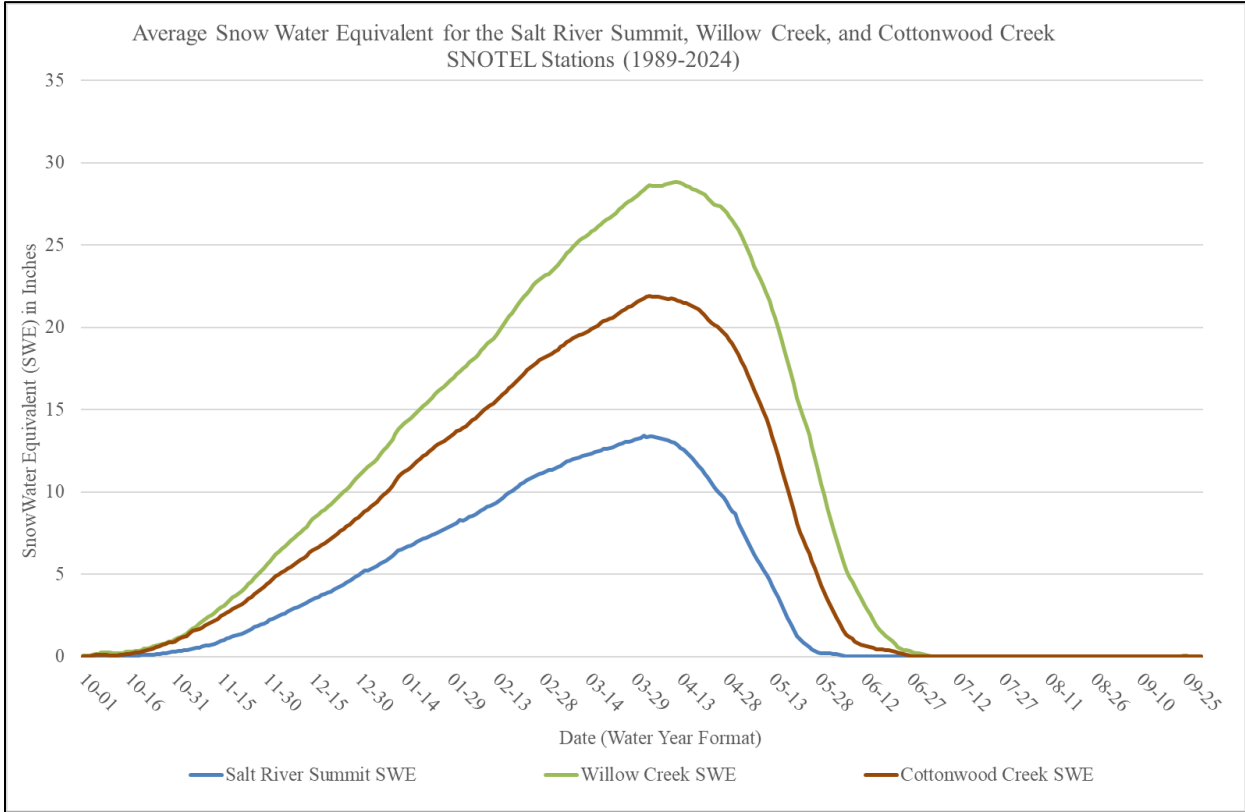


Figure 3-5. Average snow water equivalent (SWE) values throughout the water year for the Salt River Summit, Willow Creek, and Cottonwood Creek SNOTEL stations within the Salt River Watershed. (Natural Resource Conservation Service, n.d.-a, n.d.-d, n.d.-e)

The data indicate that, on average over the past 30 years, the Salt River Range, located along the eastern edge of the watershed, releases snowmelt water from the third week of April to the first week of July. The Salt River Summit site in the southern mountains of the watershed begins releasing snowmelt slightly earlier, in the first to second week of April, and has fully melted out at the start of June. According to USGS StreamStats data, approximately 36% of the watershed lies at elevations over 7,500 ft. All three SNOTEL stations are located above this elevation, indicating the span of potential snowpack areas within the basin that feed the watershed. (Natural Resource Conservation Service, n.d.-a, n.d.-d, n.d.-e; U.S. Geological Survey, 2025)

3.1.1.4 Growing Season

The growing season is defined by frost-free periods, which are shorter at higher elevations. In valley bottoms, frost-free periods may extend for a couple of months, whereas at higher elevations they may be several weeks shorter. This variation has a significant impact on agricultural practices and vegetation across the watershed.

The four analyzed climate stations indicate that the average last freeze date (the last minimum temperature below 32°F or 28°F before the growing season) occurs in late May to mid-June. The first freeze date (the first minimum temperature below 32°F or 28°F before the end of the growing season) typically occurs from late August to September (Table 3-2). Climate data from these four stations indicate an average frost-free period, or growing season, of 84 days from 1989 to 2024. (National Centers for Environmental Information, n.d.; Natural Resource Conservation Service, n.d.-a, n.d.-d, n.d.-e)

Table 3-2. Average frost-free periods for the Salt River Watershed evaluated climate stations (1989-2024).

Salt River Watershed Average Frost-Free Period						
		Salt River Summit	Willow Creek	Cottonwood Creek	Afton	Watershed Wide Average
Average Last Spring Freeze	32° F	June 14	June 11	June 18	June 12	June 14
	28° F	May 29	May 31	June 6	May 27	June 1
Average First Fall Freeze	32° F	September 15	September 12	August 24	September 1	September 7
	28° F	September 27	September 27	September 13	September 14	September 22
Growing Season Days	32° F	93	93	67	81	85
	28° F	121	119	99	107	113

3.1.2 Geology

This section describes the geologic and topographic conditions of the eastern half of the Salt River Watershed in Lincoln County, Wyoming, which lies along the Wyoming-Idaho border. The Salt River, approximately 84 miles long, originates at Mount Wagner (10,472 ft) in the Salt River Range and flows northward through Star Valley, a structural basin, before joining the Snake River at Palisades Reservoir near Alpine, Wyoming.

The watershed lies within the Overthrust Belt, a region shaped by the Sevier orogeny (~140–50 Ma), characterized by east-vergent thrust faults displacing Paleozoic and Mesozoic sedimentary rocks, such as limestone, sandstone, and shale (Figure 3-6). Quaternary alluvial fans, glacial deposits, and terrace gravels, formed by erosion from the Salt River Range, dominate the surficial geology of Star Valley. The Salt River Range bounds the watershed to the east, while the western portion includes Idaho's Gannett Hills, Webster, and Caribou Ranges. This section focuses on the Wyoming portion due to its significance for state resource management.

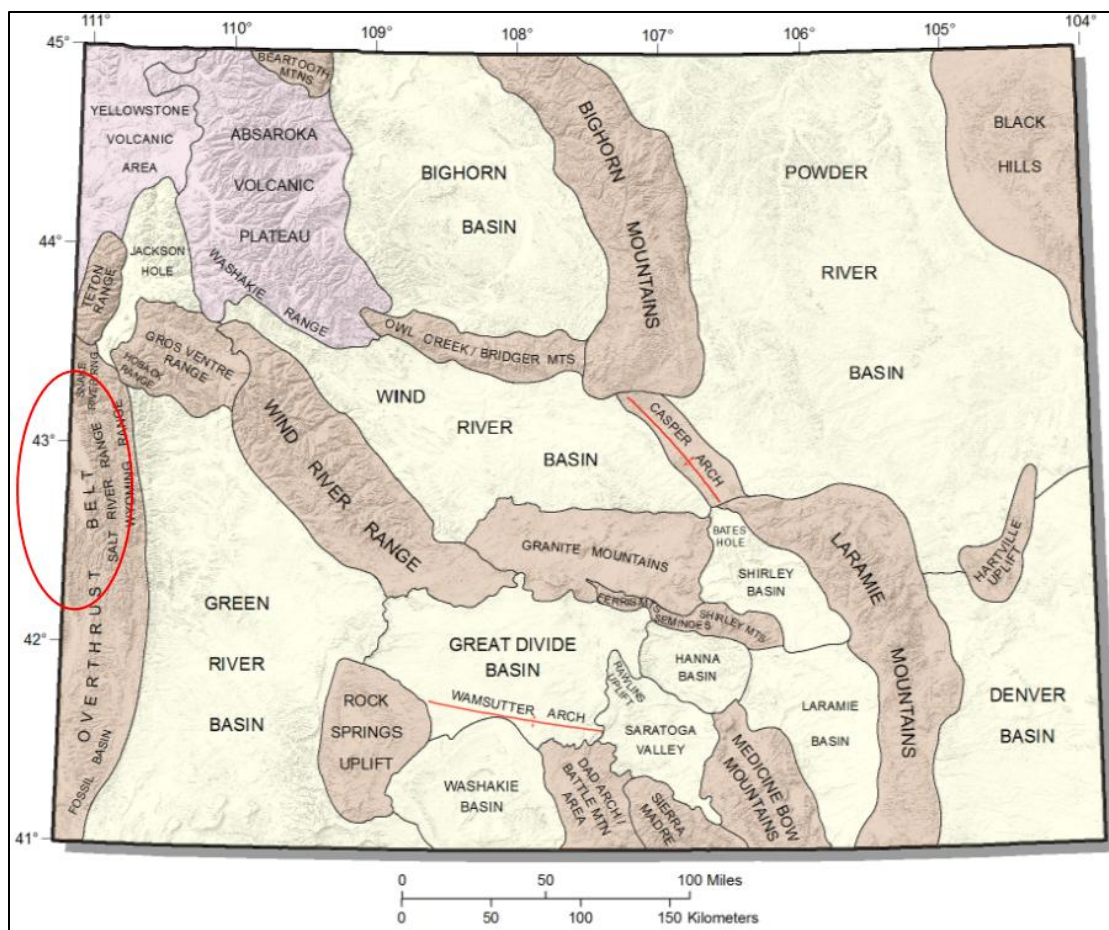


Figure 3-6. Geologic Provinces and Tectonic Structures (Love & Christiansen, 1985).

3.1.2.1 Topography

The Salt River Watershed spans a diverse topographic landscape between Idaho's Caribou National Forest to the west and Wyoming's Bridger-Teton National Forest to the east, within the Wyoming Fold-and-Thrust Belt of the Rocky Mountains. The Salt River Range, a prominent feature in Wyoming, dominates the eastern watershed with peaks exceeding 10,000 feet (3,048 meters), including Mount Wagner. These mountains, formed by Sevier thrust faulting, feature steep slopes and rugged cliffs. To the west, Idaho's Gannett Hills, Webster, and Caribou Ranges frame the watershed.

The Salt River flows through Star Valley, a broad structural basin shaped by normal faulting and filled with Quaternary alluvial and glacial deposits (Figure 3-7). The river meanders through fertile farmland, forming oxbows and floodplain deposits, before entering steep-walled canyons at constricted reaches. Numerous tributaries, originating in the alpine regions of the surrounding ranges, drain through forests and valleys to join the Salt River, contributing to its flow.

Star Valley is topographically divided into the Upper Valley (south) and Lower Valley (north) by the Thayne Narrows, a narrow corridor where the Salt River Range and Webster Range converge. This

constriction, shaped by faulting and erosion, marks a transition in valley width and river morphology, influencing local hydrology and land use.

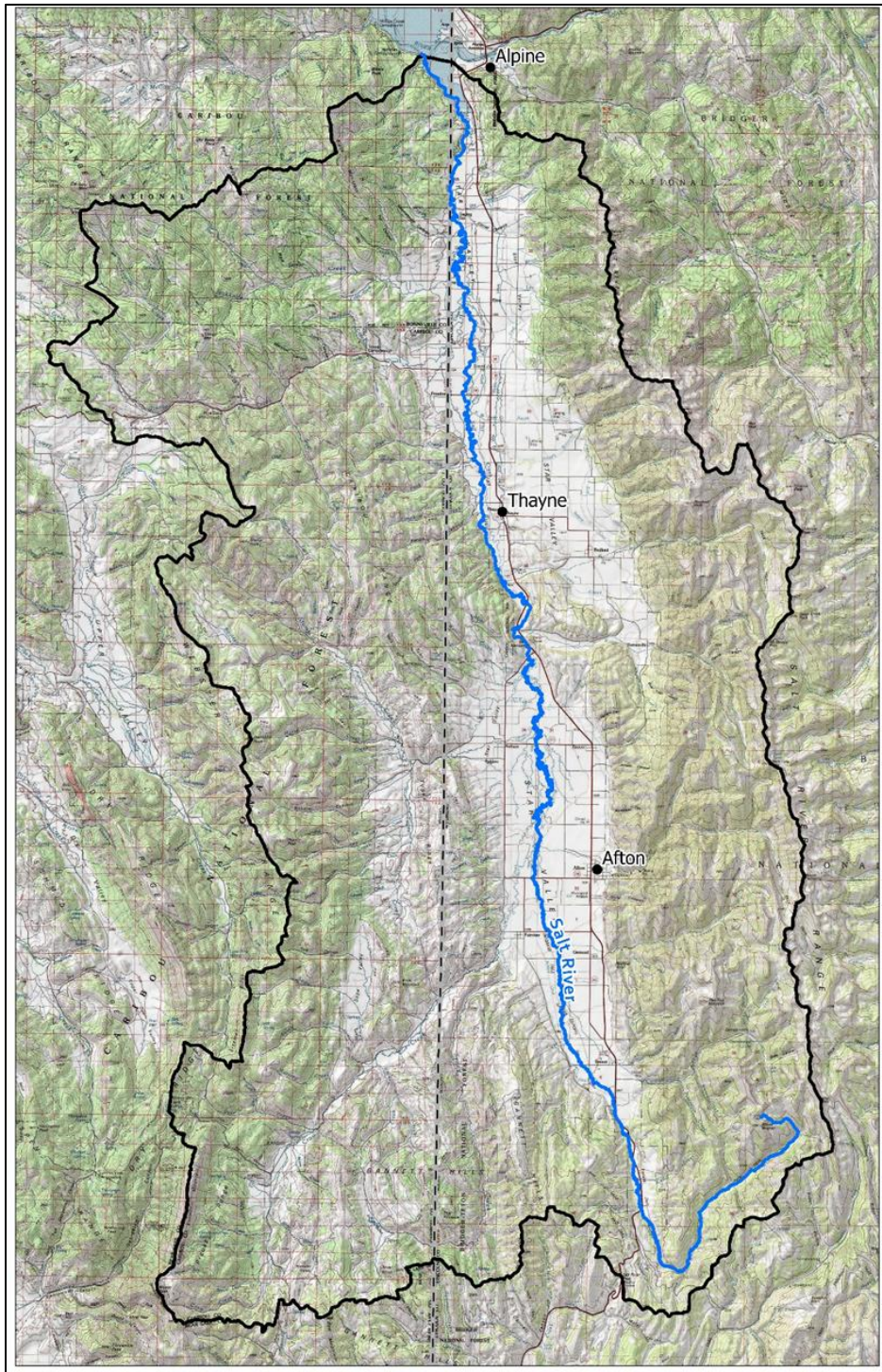


Figure 3-7. Topographic map of the Salt River Watershed (basemap from USA Topo).

3.1.2.2 Regional Geology

The Salt River Watershed's geology reflects a complex history of deposition, deformation, and erosion within the Wyoming Fold-and-Thrust Belt, part of the Overthrust Belt formed during the Sevier orogeny (140–50 Ma, Jurassic to Paleocene) (Figure 3-8). From the Paleozoic to the mid-Mesozoic (540–80 Ma), shallow marine and terrestrial environments deposited sedimentary rocks, including limestone, sandstone, and shale, preserved in formations such as the Twin Creek Limestone and the Preuss Sandstone. These rocks form the bedrock of the Salt River Range and underlie Star Valley.

Mountain building began in the Late Jurassic, driven by subduction of the Farallon Plate beneath the North American Plate. The Sevier orogeny created east-vergent thrust faults (e.g., Absaroka and Darby thrusts) and folds, uplifting the Salt River Range and the adjacent Caribou Range in Idaho. Star Valley, a structural basin formed between these ranges, was later modified by normal faulting during post-orogenic extension. The Laramide orogeny (~70–35 Ma, Late Cretaceous to Eocene), which formed basement-involved uplifts like the Wind River and Bighorn Ranges, had a minor influence on the watershed's eastern margin.

Erosion of the Salt River Range has shaped the modern landscape, depositing Quaternary alluvial fans, glacial moraines, and terrace gravels in Star Valley.

3.1.2.3 Structural Geology

The Salt River flows north through the Star Valley basin, bounded on the southeast by the north-south trending Star Valley Fault, part of the larger, 85-mile-long Grand Valley Fault System, which extends from eastern Idaho into western Wyoming. The Grand Valley Fault comprises four segments: the Swan Valley section, the Grand Valley section, the Prater Mountain section, and the Star Valley section.

As previously mentioned, the Salt River Mountain Range bounds the valley to the east and the Gannett Hills and Webster Mountain Range in Idaho to the west. The Salt River Range and Gannett Hills consist of Mesozoic-age sedimentary rock, including siltstone, sandstone, limestone, and shale.

Due to its location within the Grand Valley Fault System, Star Valley was created by extensional tectonics along normal faults, which created two half-graben features (down-dropped blocks), resulting in two asymmetric basins, during the Neogene time period (23.03 million years ago to 2.58 million years ago) (Larsen, 2014). The Star Valley Fault is considered to be an active fault. According to the USGS, the southernmost fault segment, including the Star Valley section, is the youngest and most active segment. Meaning, the Star Valley Fault has shown evidence of movement during the Quaternary period (the last 2.6 million years), including offset alluvial fans at canyon mouths and older rock formations exposed at the surface.

The elevation of the valley floor ranges from 6,000 to 7,000 feet and contains moderate slopes on alluvial/colluvial fans created by eroding and sloughing of the Salt River Range and Gannett Hills. The alluvial fans on the east side of the valley are steeper at the top than the alluvial fans on the west side of the valley, indicating that the east side of the valley is structurally active along normal faults associated with the Grand Valley fault system.

Star Valley is divided into two basins due to differing Quaternary displacement rates on different Grand Valley fault system segments. In the northern section of the valley, the Salt River Range front, geomorphic relations indicate a lower displacement rate along the Grand Valley fault than along the southern segment. The valley floor sediments in the northern section include older (early to late Pleistocene) alluvial fans and extensive Tertiary outcrops. In contrast, the valley's southern section encompasses numerous fault scarps separating younger valley sediments from deformed Mesozoic and Paleozoic strata in the Salt River Range (Figure 3-8). Additionally, steep-walled canyons, apparent range-front triangular facet spurs, and young, faulted range-front alluvial fans indicate rapid basin subsidence. Most recently, Pleistocene-age deposits in Star Valley consist of sand and gravel, which are the principal aquifers in the valley.

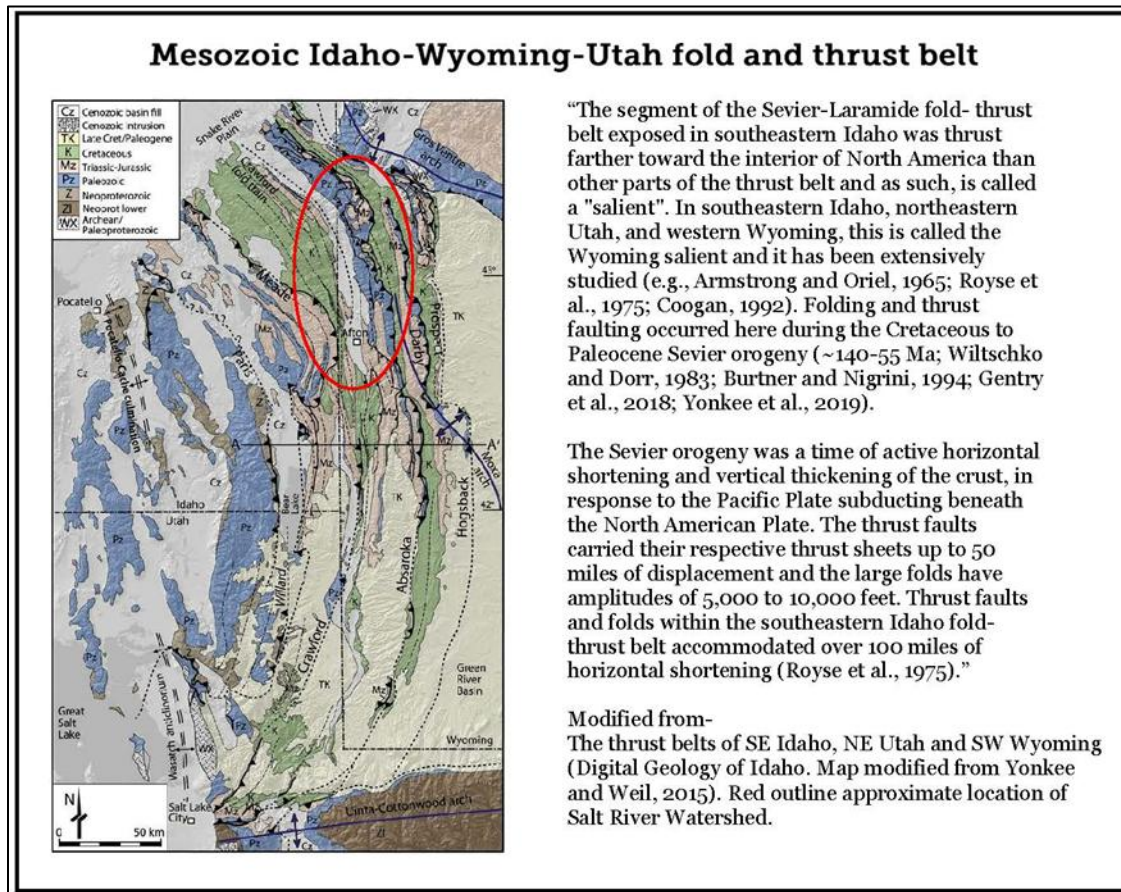


Figure 3-8. The Salt River Watershed is part of the Mesozoic Fold and Thrust Belt (Yonkee & Weil, 2015).

3.1.2.4 Soils

Soils in the Salt River Watershed in Wyoming are critical for understanding land use, ecology, and watershed management. Soil is the uppermost layer of the Earth’s surface, typically extending a few inches to a few feet deep, where biological activity, weathering, and organic processes occur. It is comprised of mineral particles (sand, silt, clay), organic matter, water, air, and living organisms, shaped by climate, vegetation, and time.

According to the USDA Web Soil Survey, soils in the Wyoming portion of the Salt River Watershed are mapped across four extensive soil surveys, depicted in Figure 3-9 with a corresponding legend in Figure 3-10. These surveys delineate soil types, textures, and distributions across the watershed.

- Soil Survey WY623: Star Valley Area, Wyoming-Idaho (2024)
 - This survey covers the western quarter of the watershed, excluding a small central area. The dominant soil type is the Paulson-Lail association (PL), occupying 12,218.8 acres. These silty clay loams, found at elevations of 5,800 to 7,500 feet on 6 to 30 percent mountain slopes, are derived from sandstone and shale colluvium.
- Soil Survey WY663: Bridger National Forest, Wyoming, Western Part (2024)
 - Located along the eastern quarter of the watershed, this survey's most prevalent soil type is the Pishkun-Helmville complex (Unit 256), covering 34,405.9 acres. These cobbly clay loams occur on 35 to 75 percent mountain slopes and are derived from limestone colluvium.
- Soil Survey ID713: Caribou National Forest, Idaho and Wyoming (2024)
 - This survey spans the west-central portion of the watershed's western half. The dominant soil is the Valmar-Warshod family (Unit 3002), covering 20,654.2 acres. These cobbly, silty, or sandy loams, found at elevations of 4,800 to 8,460 feet on 30 to 60 percent slopes, are derived from weathered quartzite or argillite colluvium.
- Soil Survey ID758: Targhee National Forest, Idaho and Wyoming (2021)
 - Covering a small area (approximately 1,634 acres) along the state line at the northern end of the watershed, this survey's primary soil type is the Cowdrey clay loam (COE). These clay loams occur at elevations of 5,500 to 9,000 feet on 10 to 30 percent slopes and are derived from alluvium of igneous, metamorphic, and sedimentary rocks.

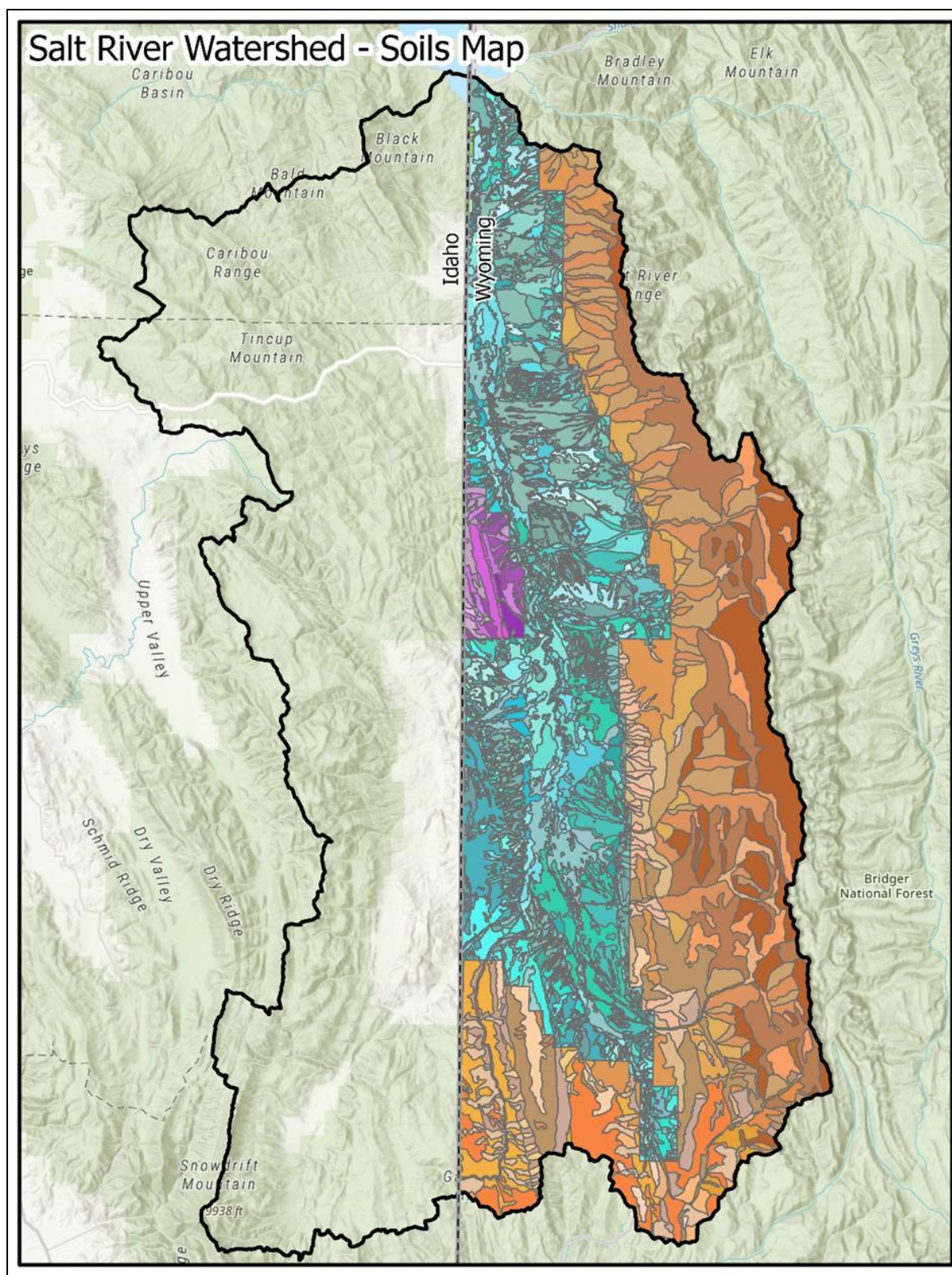


Figure 3-9. Four Large-area Soils Surveys within the Salt River Watershed.

Salt River Soils Map - Legend

 Salt River HUC8 Watershed

WY623

MUSYM

18643
375
405-BR
813
814
818
820
838
863
874
878
880A
881
882
BDC
BDD
COE
CR
DN
Dm
GHE
GP
GRD
GRE
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HOE
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881
882
931
935
945
951
955
Tu
W

ID758

MUSYM

1112
COE
GRD
GRE
RTC
RTD
Tu

Figure 3-10. Legend for Salt River Soils Map.

3.1.2.5 Surficial Geology

Surficial geology in the Salt River Watershed comprises Quaternary (<2.6 Ma) unconsolidated sediments overlying Mesozoic and Paleozoic bedrock, deposited through erosion and transport by water, wind, ice, or gravity. These deposits, including alluvium, colluvium, glacial sediments, and landslide debris, shape the watershed's modern landscape, particularly in Star Valley. Figure 3-11, adapted from Case et al.'s "Surficial Geologic Map of Wyoming," illustrates the distribution of these deposits in the Wyoming portion of the watershed.

The most common surficial deposits include:

- Alluvium (ai): Clay, silt, sand, and gravel deposited by streams, forming valley floors and terraces, often mixed with minor eolian, residuum, and glacial deposits. These deposits are critical aquifers in Star Valley.
- Alluvial Fan Deposits (fi): Coarse sand and gravel eroded from the Salt River Range and Gannett Hills, forming steep fans at canyon mouths, particularly along the active Star Valley Fault. Minor components include slope wash and eolian deposits.
- Landslide Deposits (li): Unconsolidated clay, silt, sand, gravel, and bedrock fragments moved downslope by gravity, mixed with residuum and slope wash. Landslides are numerous but small, often exposing bedrock outcrops.
- Glacial and Periglacial Deposits: Till, moraines, and outwash from Pleistocene glaciation, mixed with periglacial features (e.g., ice wedges, solifluction deposits) near former glacial margins, and minor alluvium and eolian deposits.

Less common deposits include:

- Residuum (ri): Weathered bedrock fragments mixed with alluvium, eolian, and slope wash, often near bedrock outcrops.
- Dissected Terrace Deposits (tdi): Eroded alluvial terraces mixed with alluvium, residuum, and eolian deposits.
- Slope Wash and Colluvium (sci): Heterogeneous sediments at the base of slopes, derived from creep or non-channelized flow, mixed with glacial, alluvium, and eolian deposits.

Definitions for key deposits (alluvium, colluvium, glacial, landslide, slope wash) align with the adjacent Hoback Watershed report (Rio Verde Engineering, 2022) to ensure regional consistency. Surficial deposits reflect ongoing erosion from the Salt River Range, influenced by normal faulting along the Star Valley Fault, and pose geohazards (e.g., landslides) while supporting groundwater resources.

3.1.2.6 Bedrock Geology

Bedrock forms the geological framework beneath Quaternary surficial deposits such as alluvium and colluvium. Mapped at a 1:500,000 scale by Love and Christiansen's Geologic Map of Wyoming (1985), shown in

Figure 3-12, eleven (11) bedrock formations, spanning the Cambrian to Miocene-Pliocene eras, are exposed across the Salt River Range and Star Valley, deformed by Sevier orogeny thrusting and Basin and Range extension.

The Salt River Range is dominated by carbonate rocks, including limestone and dolomite, depicted in pink and blue shades on

Figure 3-12, representing Jurassic and Mississippian-Ordovician units, respectively. Star Valley's lower hills and terraces expose clastic and Tertiary rocks, such as tuffaceous sandstone and conglomerate, often overlain by alluvium. The following formations are mapped (Love & Christiansen, 1985):

- Salt Lake Formation (Miocene-Pliocene): White, gray, and green limy tuff, siltstone, sandstone, and conglomerate, in Star Valley's terraces, linked to Basin and Range basins.
- Teewinot Formation (Miocene): White lacustrine clay tuff, limestone, and conglomerate, in Star Valley's lower hills.
- Red Conglomerate (Tertiary): Local unit at the north end of the Salt River Range, with Mesozoic-Paleozoic clasts in a red clay-sand matrix, likely related to regional Tertiary sedimentation.
- Wayan Formation (Cretaceous): Variegated mudstone, siltstone, and sandstone, in Star Valley's terraces.
- Gannett Group (Cretaceous): Red sandy mudstone, sandstone, chert-pebble conglomerate, with thin limestone and shale, along Star Valley's western margin.
- Stump Formation (Jurassic): Glauconitic siltstone, sandstone, and limestone, in lower slopes.
- Preuss Sandstone (Jurassic): Purple, maroon, and reddish-gray sandy siltstone and claystone, with salt and gypsum beds, in Star Valley terraces.
- Nugget Sandstone (Jurassic): Buff to pink cross-bedded quartz sandstone, forming outcrops in the Salt River Range, with oil and copper-silver-zinc mineralization.
- Phosphoria Formation (Permian): Upper chert, shale, and phosphorite; lower black shale and cherty dolomite, in the Salt River Range, valued for phosphate.
- Wells and Amsden Formations (Pennsylvanian-Mississippian): Wells: Gray limestone and yellow limy sandstone. Amsden: Red-gray cherty limestone, shale, and conglomerate, in thrust sheets.
- Madison Limestone and Darby Formation (Mississippian) Blue-Gray massive limestone and dolomite.
- Bighorn Dolomite, Gallatin Limestone, and Gros Ventre Formation (Ordovician-Cambrian): Bighorn: Gray-tan siliceous dolomite, cliff-forming. Gallatin: Gray limestone. Gros Ventre: Greenish-gray micaceous shale, in Salt River Range thrust sheets.

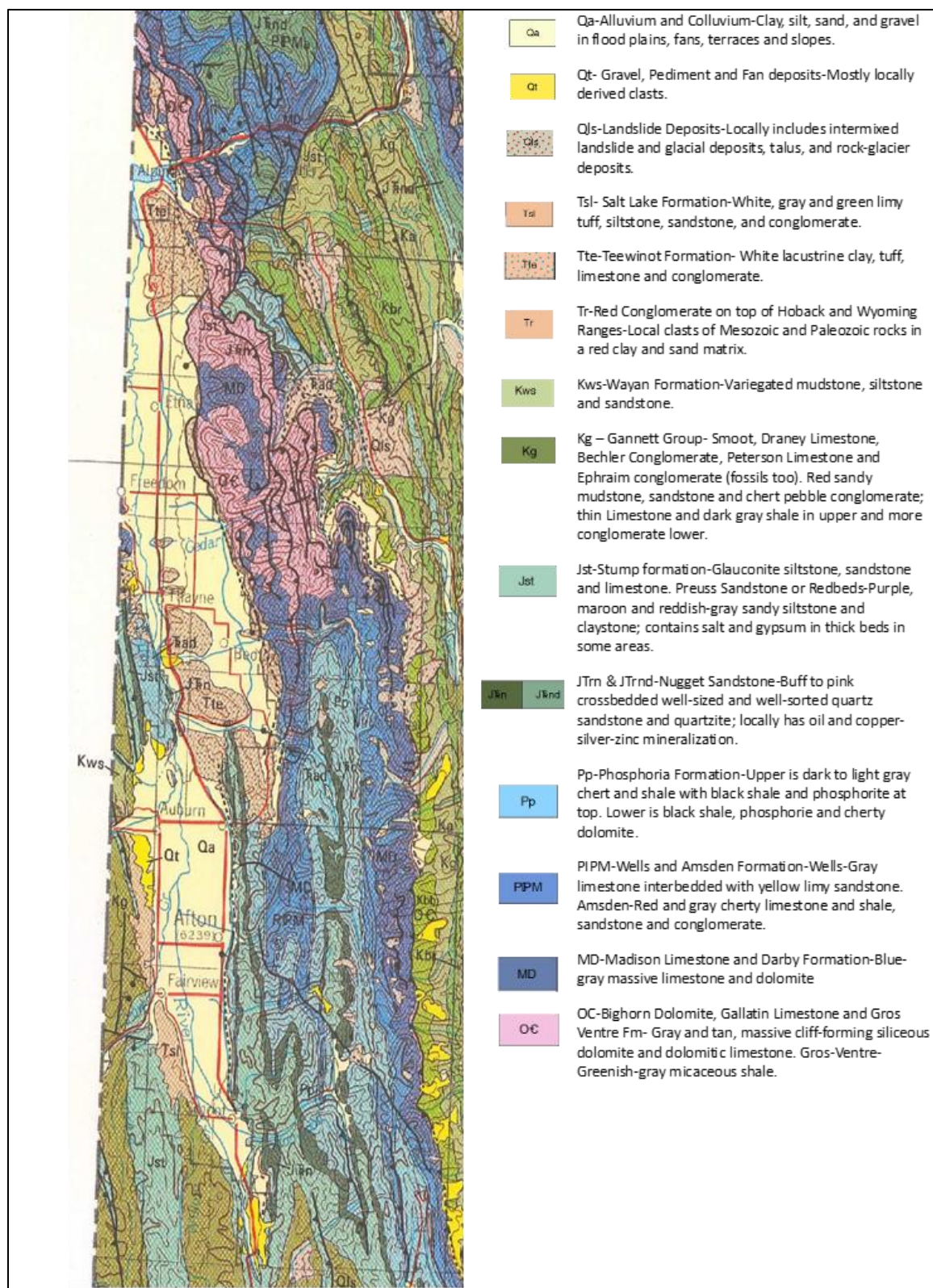


Figure 3-12. Area Bedrock Geology, Modified from (Love & Christiansen, 1985).

Subsurface structure is detailed in Cross Sections E-E' and F-F' (Figure 3-13 and Figure 3-14) adapted from (Love & Keefer, 1975a). Figure 3-13 (the Geologic Cross-Section of Northern Salt River Basin) shows Star Valley at the west end of the section, with limited subsurface data at depth (white areas), and colorful Paleozoic-Mesozoic stratigraphy to the east, reflecting the complexity of thrust faults. Figure 3-14, the Geologic Cross-Section of Southern Salt River Basin) shows bedrock units, such as the Salt Lake and Gannett Group formations, at Star Valley's south end. Index maps for each cross-section locate their paths within the watershed. These formations influence surficial deposits, soils, and hazards like karst and landslides. Carbonates support aquifers, while phosphate and salt deposits have economic value.

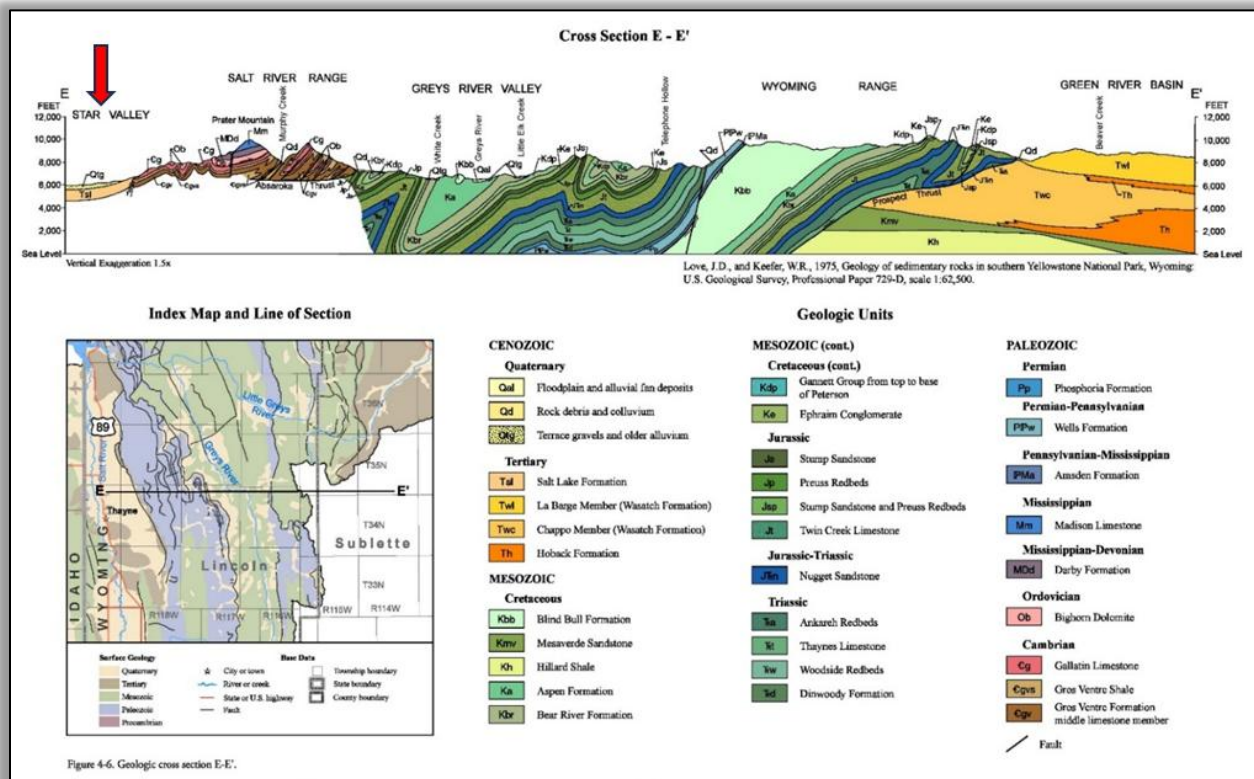


Figure 3-13. Geologic Cross-Section E-E' of Northern Salt River Basin (Love & Keefer, 1975a).

3.1.2.7 Geologic Hazards

Several potential geologic hazards exist within the Salt River Watershed due to its complex geologic structure. These include landslides, karst/cavernous topography, seismic shaking, liquefaction of soft sediments, and expansive soils. Figure 3-15 is a generalized map of geologic hazards in Wyoming dated between November 1, 2017, and October 31, 2018 (Wyoming State Geologic Survey, 2019). Hazards associated with earthquakes, landslides, and active faults are concentrated in the northwest part of the state, from Yellowstone in the northwest corner, to the Salt River Watershed, further south along the Idaho-Wyoming border, as shown in the red oval.

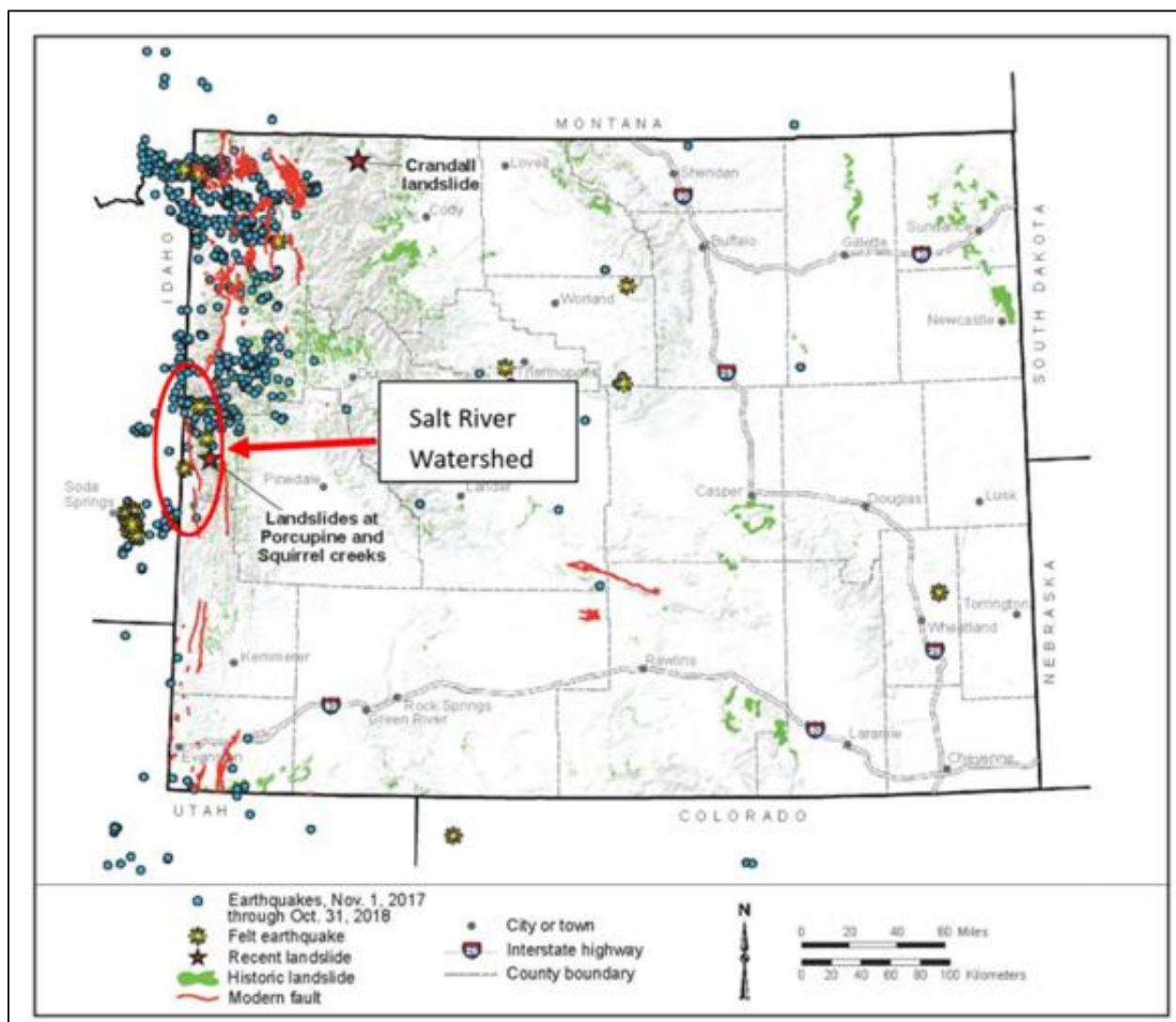


Figure 3-15. Geologic Hazards Map of Wyoming, showing concentration of hazards in the Salt River Watershed Area. (Wyoming State Geologic Survey, 2019).

3.1.3 Ground Water

Groundwater catchments, storage, and recharge are integral to the continuous exchange between surface and subsurface hydrologic processes within a watershed. Precipitation, snowmelt, surface flow, infiltration, and, in some cases, irrigation contribute to groundwater recharge. Once water has percolated into the subsurface, it moves along hydraulic gradients and eventually returns to the surface through discharge, such as stream baseflow, spring emergence, or extraction via wells. Groundwater represents a significant portion of a watershed's total water resources, though groundwater dynamics vary significantly from those of surface water.

3.1.3.1 Groundwater Recharge

Groundwater recharge dynamics are highly variable and depend on multiple factors, including elevation, precipitation regime, vegetation type, antecedent soil moisture, and soil and underlying geologic formation permeability. Recharge tends to be most effective in areas with both high water availability and high infiltration potential. Examples include coarse-textured alluvium along stream corridors, fractured bedrock zones, and high-altitude regions where seasonal snowmelt dominates the surface water inputs.

In irrigated landscapes, recharge is strongly influenced by irrigation methods, volume, and timing. In flood irrigation systems, groundwater recharge is greater than in sprinkler systems. Irrigation recharge is likely to coincide with the irrigation season and outside the crop's peak water requirement periods. Meaning that recharge potential from irrigation occurs in the valley from May through September, but is more likely in May-June and September, depending on irrigation practices.

In contrast, natural recharge is often concentrated in the spring, following snowmelt, and diminishes by late autumn. Additionally, natural recharge is more prevalent in the Salt River Range to the east, while any potential irrigation recharge returns are located in the valley bottom. The Snake/Salt River Basin Groundwater Study (2014) indicates that the Star Valley area recharges 5 to 6% of the annual precipitation received, while the Salt River Range can recharge between 30 and 40% of the annual precipitation received (Figure 3-16). This results in an estimated net annual recharge of 16 to 35 inches of water in the mountains, depending on the microsite's landform and infiltration potential, and 0 to 1 inches of natural recharge in the valley bottom (Figure 3-17). This variation further underscores the importance of the water catchment systems and snowpack in the Salt River Range for the watershed. Understanding the spatial and temporal characteristics of groundwater recharge is important for evaluating aquifer sustainability and the resilience of the watershed's hydrologic system. (Wyoming State Geological Survey, 2014)

3.1.3.2 Aquifers

Aquifers are typically defined as a geologic unit capable of storing and transporting groundwater. Within the Salt River Watershed, several aquifer groups, or hydrogeologic units, are defined by surficial geology and confining units. For this report, aquifers are grouped into major aquifers using the same definition as for the Snake/Salt River Basin Plan 2012 Update and the 2014 Groundwater Study. The Snake/Salt River Basin Plan Groundwater Study identifies four major aquifer groups within the Salt River Watershed: the Quaternary, Tertiary, Mesozoic, and Paleozoic (Figure 3-18). These categories group multiple geologic units based on the thickness of the majority of the geologic units present. (Wyoming Water Development Office, 2012)

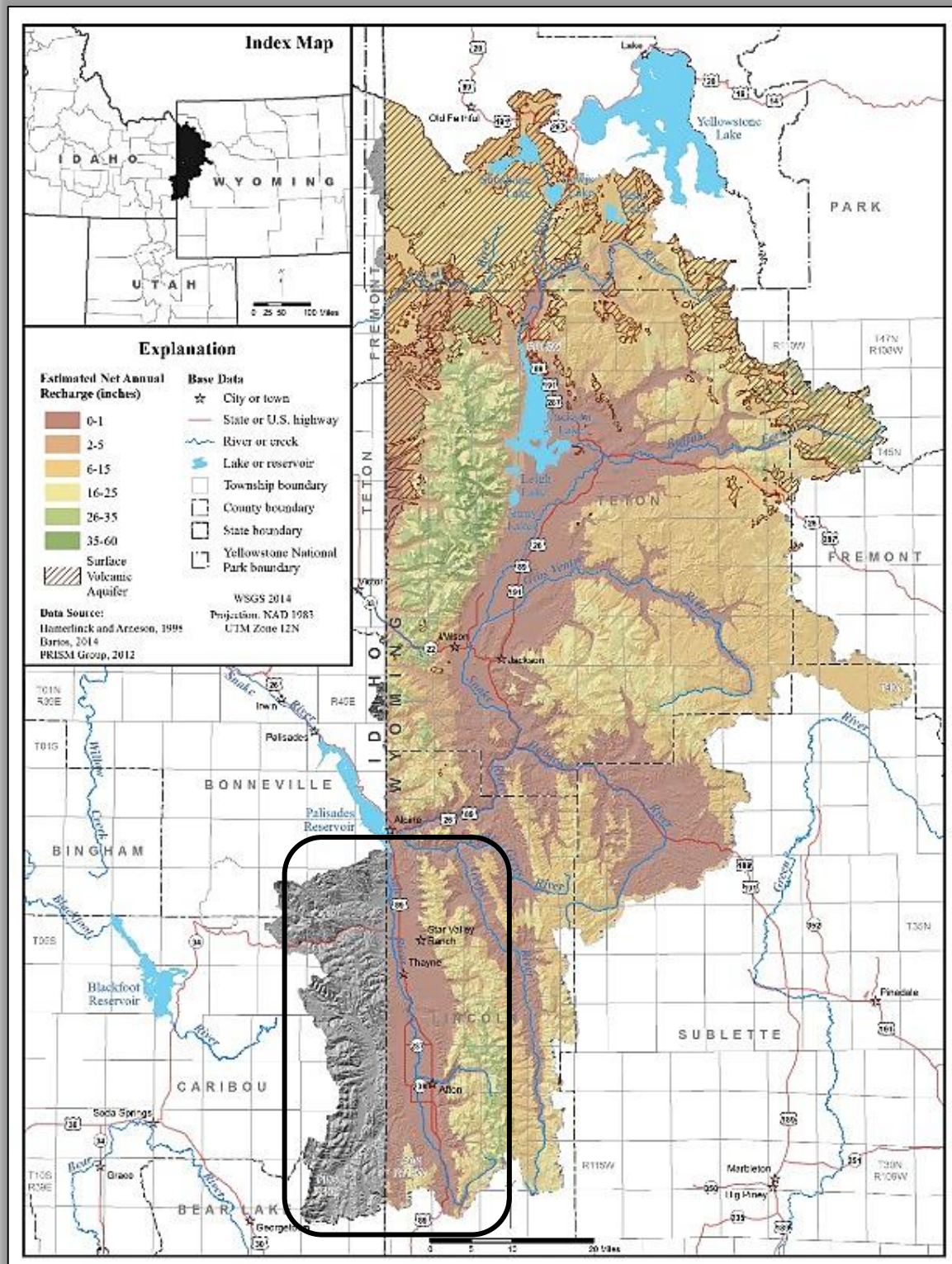


Figure 3-16. Estimated Aquifer Recharge Map (percentage) excerpt from the Snake/Salt River Basin Groundwater Study (2014) (pg. 6-111). The black box demarcates the general area of the Salt River Watershed. (Wyoming State Geological Survey, 2014)

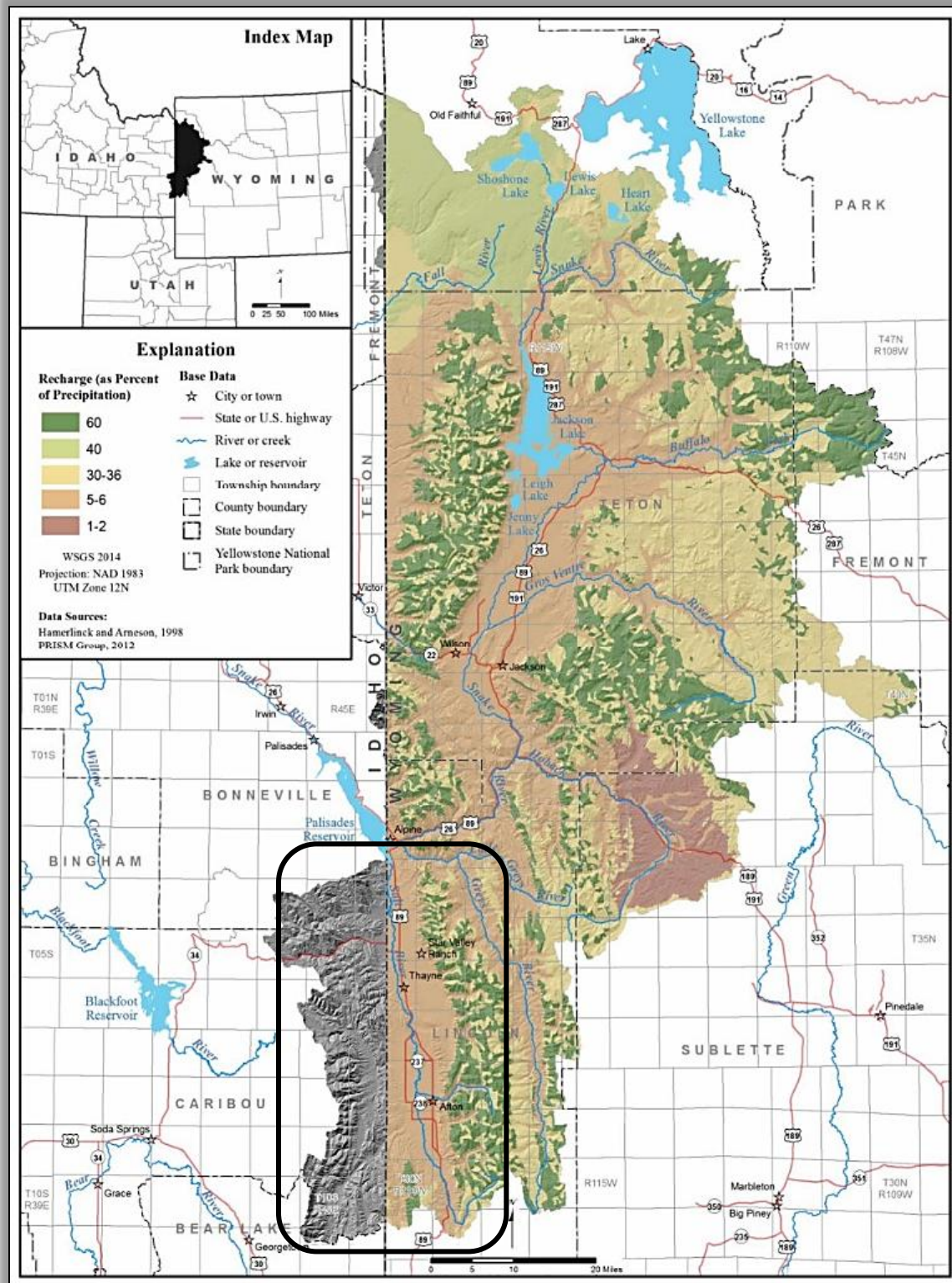


Figure 3-17. Estimated Aquifer Recharge Map (inches) excerpt from the Snake/Salt River Basin Groundwater Study (2014) (pg. 6-114). The black box demarcates the general area of the Salt River Watershed. (Wyoming State Geological Survey, 2014)

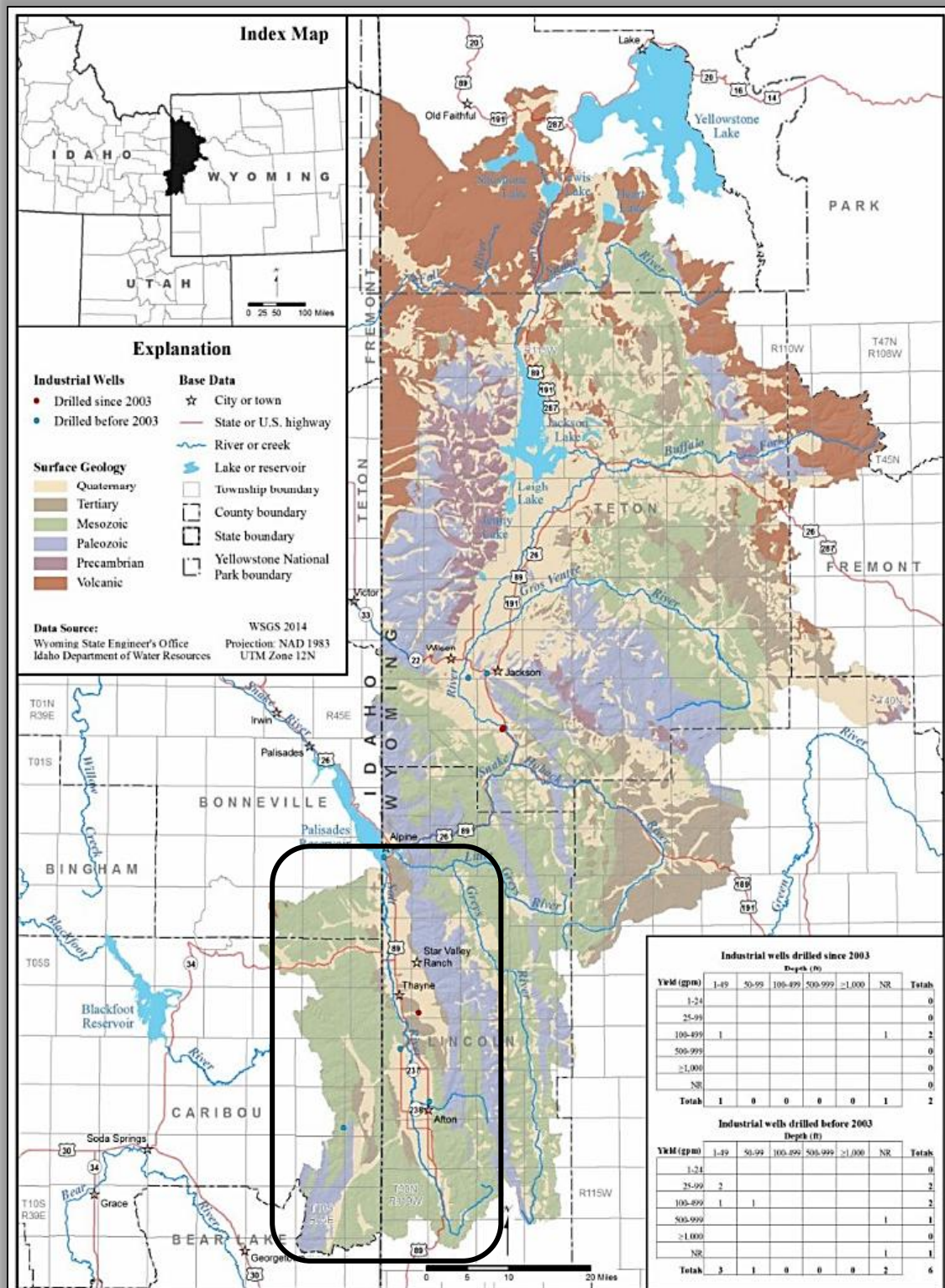


Figure 3-18. Major Aquifer Group Map excerpt from the Snake/Salt River Basin Groundwater Study (2014) (pg. 8-235). The figure depicts the major aquifer groups associated with the surficial geology of the greater Snake/Salt River Basin, which includes the Salt River Watershed. The black box demarcates the general area of the Salt River Watershed. (Wyoming State Geological Survey, 2014)

3.1.3.3 Groundwater Levels and Flow

As water enters Star Valley, groundwater behavior becomes more complex due to the wide alluvial basin and deep sedimentary deposits. The valley aquifer system consists of layers of gravel, sand, and finer materials deposited by rivers and ancient glaciers. Groundwater levels here are typically shallow—often just a few feet below the land surface in riparian and floodplain areas, which rise seasonally with spring snowmelt and decline through late summer and fall.

Groundwater flows generally from the Salt River Range westward toward the valley floor, then north-to-south along the valley axis, closely paralleling the Salt River. Numerous springs and seeps, along with diffuse subsurface inflow, continuously discharge groundwater to the Salt River and its tributaries. This groundwater contribution is crucial for maintaining baseflow, particularly during late summer and winter when surface runoff is limited.

Agricultural irrigation practices also influence groundwater dynamics. Irrigation return flows enhance local recharge in irrigated lands, sustaining shallow groundwater levels in parts of the valley. In contrast, areas experiencing increasing rural development and groundwater well use may see localized drawdown or altered flow patterns. However, the overall system remains strongly driven by natural snowmelt cycles and stream-aquifer interaction.

3.1.3.4 Groundwater Discharge

Groundwater discharge in the Salt River Watershed is naturally discharged through springs, seeps, and baseflow contributions to streams. Discharge is strongly controlled by mountain-block recharge, valley-fill stratigraphy, and hydraulic connectivity to the Salt River and its tributaries.

The primary mechanism of discharge is baseflow to perennial streams, including the main Salt River and its tributaries. In the alluvial valley, the hydraulic gradient directs shallow groundwater laterally toward stream channels, producing sustained gaining-stream conditions throughout much of the valley.

3.1.3.5 Groundwater Use

Groundwater use in the Salt River Watershed primarily supports agricultural, domestic, and municipal needs, with some commercial and industrial applications. Agricultural use, mainly irrigation, likely represents the largest demand, drawing from alluvial aquifers associated with the Salt River and its tributaries. Domestic use relies on individual wells. Groundwater quality is generally good, but localized concerns may exist regarding nitrate contamination from agricultural practices or septic systems. The WSEO regulate groundwater use through a permitting system to ensure sustainable management and protect existing water rights, carefully managing appropriations from aquifers that are often interconnected with surface water resources. WDEQ regulates groundwater through water quality and discharge permits, as well as cleanup programs, based on aquifer/groundwater conditions and standards. Long-term monitoring of groundwater levels and quality is essential to inform future management decisions and address potential challenges posed by increasing demand, climate variability, and the protection of baseflows for aquatic ecosystems. (Wyoming Department of Environmental Quality, 2025)

3.1.3.6 Aquifer Sensitivity and Groundwater Quality

Aquifer sensitivity is a metric used to assess the potential for a given aquifer to be contaminated via a surface vector. This aquifer sensitivity value, as defined in the Snake/Salt River Basin Plan Groundwater Study, is determined only by the hydrogeologic factors of the site. The Salt River Watershed's highest sensitivity areas are located in the valley bottoms. While the mountain areas are, on average, less sensitive, the northern section of the Salt River Range, adjacent to Star Valley Ranch, is more sensitive to surface contamination than the mountainous areas in the southern half of the watershed. Combining the relative hydrogeologic sensitivity of an aquifer with a site assessment provides a clearer picture of the higher risk areas of the watershed (Figure 3-19). (Wyoming State Geological Survey, 2014)

The Wyoming Pollution Discharge Elimination System (WYPDES) Program regulates all point source pollutant discharges in Wyoming. (Wyoming Department of Environmental Quality, n.d.-d). Within the Salt River Watershed, there are currently four known WYPDES-permitted outfall sites, defined as locations where stormwater, sewer overflow, or treated wastewater is discharged into a water body (Environmental Protection Agency, 2025). Table 3-3 summarizes these active WYPDES-regulated facilities:

Table 3-3. NPDES active outfall regulated facilities within the Salt River Watershed (Environmental Protection Agency, 2025).

Facility Name	Permit Number	Permit Name	Permit Type
Lancaster Dry Creek Pit	WYR320502	Avail Valley Construction WY, LLC	General Permit Covered Facility
Lancaster Pit	WYR320501	Avail Valley Construction WY, LLC	General Permit Covered Facility
Etna Pit	WYR320818	DePatco, Inc.	General Permit Covered Facility
Cedar Creek Pit	WYR320592	Avail Valley Construction WY, LLC	General Permit Covered Facility

For information on groundwater quality and contamination, the Snake/Salt River Basin 2014 Groundwater Study (Wyoming State Geological Survey, 2014) identified multiple groundwater sample points in Star Valley exceeding EPA domestic use standards, primarily for radon, nitrate, and nitrate plus nitrite. Additionally, the EPA has an updated record of the NPDES sites within the watershed. Consult the full Snake/Salt River Basin 2014 Groundwater Study, the [National Pollution Discharge Elimination System Map](#), and the National Water Quality Monitoring Council [data portal](#) for additional information. (Environmental Protection Agency, 2025; Environmental Protection Agency & U.S. Geologic Survey, 2024; Wyoming State Geological Survey, 2014)

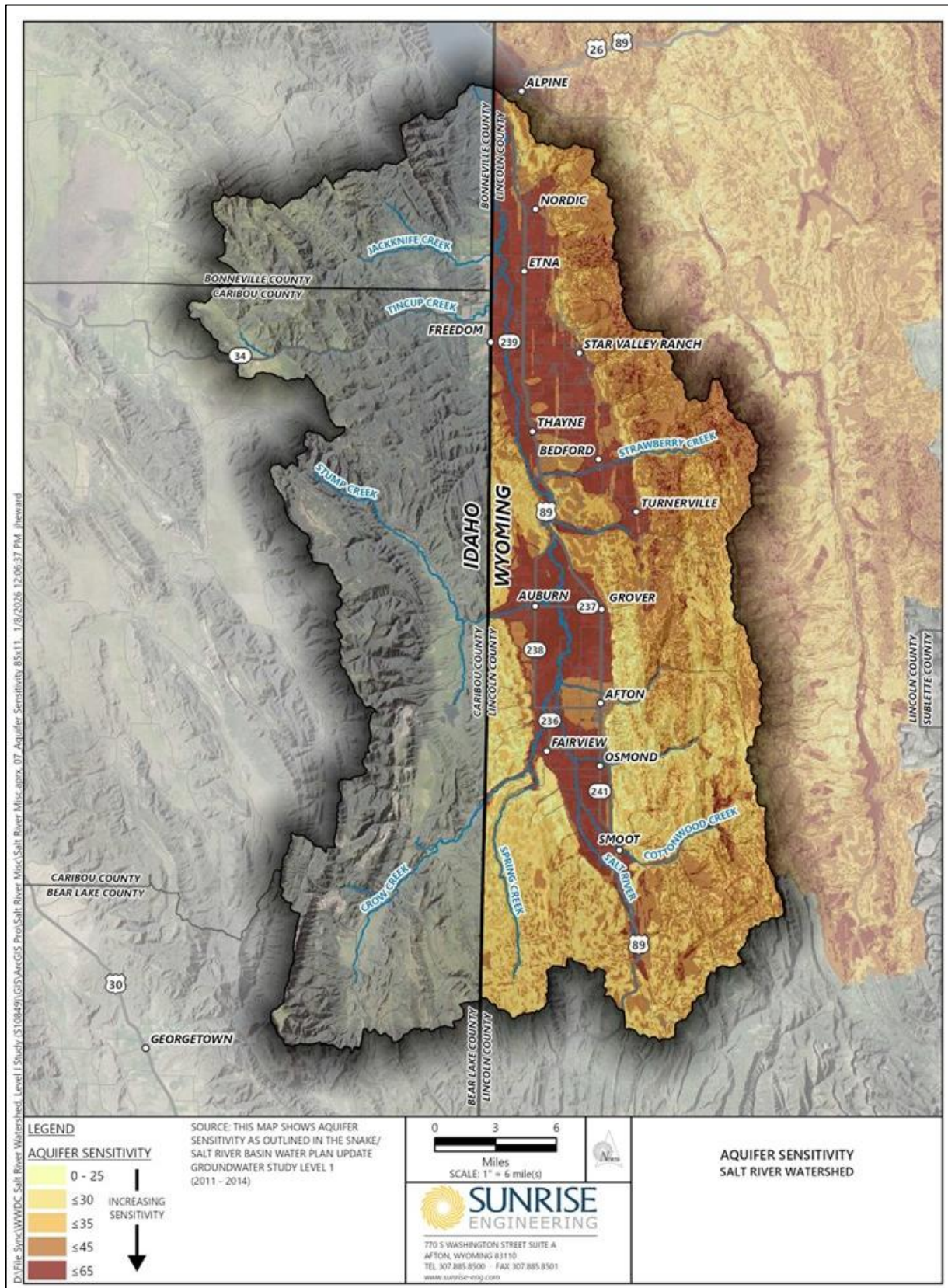


Figure 3-19. Aquifer sensitivity throughout the Salt River Watershed.

3.1.4 Surface Water

The Salt River Watershed is fed by tributaries in the Salt River Mountains to the east, the Gannett Hills to the south, and the Caribou Range to the west. It should be noted that most of the Caribou Range and the tributaries are not included in this study, as they are located in Idaho. The primary river in the study area is the Salt River, which is principally fed by the tributary watersheds of Smith Fork Creek, Cottonwood Creek, Crow Creek, Stump Creek, Willow Creek, and Strawberry Creek through spring snowmelt. The average monthly flows for the Salt River, according to the stream gage above the reservoir near Etna, vary between 429 cfs in January and 1684 cfs in May, with annual peak streamflow occurring in May and June ([StreamStats stream gage 13027500](#)). (U.S. Geological Survey, 2025)

3.1.4.1 Hydrography

3.1.4.1.1 Hydrologic Units

Hydrologic units (HUCs) are categorized into areas of hydrologic resources at the regional, basin, and watershed levels. HUCs are classified using a six-level numeric system by the United States Geological Survey (USGS). The Salt River Watershed study area is a fourth-level ‘subbasin’ with an eight-digit code. Within the Salt River Watershed Subbasin are three fifth-level ‘watersheds’, including the Lower Salt River Watershed, the Middle Salt River Watershed, and the Upper Salt River Watershed. This study assesses the portion of the Salt River Subbasin (HUC-8 17040105) that falls within Wyoming, hereafter referred to as the Salt River Watershed. HUC 12 sub-watersheds are shown below, although they have not been analyzed individually in this study. For ease of identification, Table 3-4 lists the HUCs within the Salt River Watershed Subbasin. (U.S. Geological Survey, n.d.-b) Figure 3-20 shows the HUC 10, which was used for this study.

Table 3-4. Hydrologic Unit Codes of the Salt River Watershed. (U.S. Geological Survey, n.d.-b)

Level	Unit	Digits	Code	Name
First	Region	2-digit	17	Pacific Northwest
Second	Subregion	4-digit	1704	Upper Snake
Third	Basin	6-digit	170401	Snake Headwaters
Fourth	Subbasin	8-digit	17040105	Salt
Fifth	Watershed	10-digit	1704010501	Upper Salt River
Sixth	Subwatershed	12-digit	170401050101	Cedar Creek - Salt River
			170401050102	Cottonwood Creek
			170401050103	Dry Creek
			170401050104	Swift Creek
			170401050105	Willow Creek – Salt River

Level	Unit	Digits	Code	Name
			170401050106	Upper Crow Creek
			170401050107	Sage Creek
			170401050108	Spring Creek
			170401050109	Lower Crow Creek
Fifth	Watershed	10-digit	1704010502	Middle Salt River
Sixth	Subwatershed	12-digit	170401050201	Upper Stump Creek
			170401050202	Tygee Creek
			170401050203	Lower Stump Creek
			170401050204	Willow Creek
			170401050205	Water Creek – Salt River
Fifth	Watershed	10-digit	1704010503	Lower Salt River
Sixth	Subwatershed	12-digit	170401050301	Strawberry Creek
			170401050302	Limekiln Creek – Salt River
			170401050303	South Fork Tincup Creek
			170401050304	Upper Tincup Creek
			170401050305	Lower Tincup Creek
			170401050306	Miller Creek – Salt River
			170401050307	Jackknife Creek
			170401050308	Newswander Canyon – Salt River
			170401050309	Dry Creek – Salt River

**This listing includes the HUC breakdown of the entire Salt River Watershed, not just those located within the study area in Wyoming.*

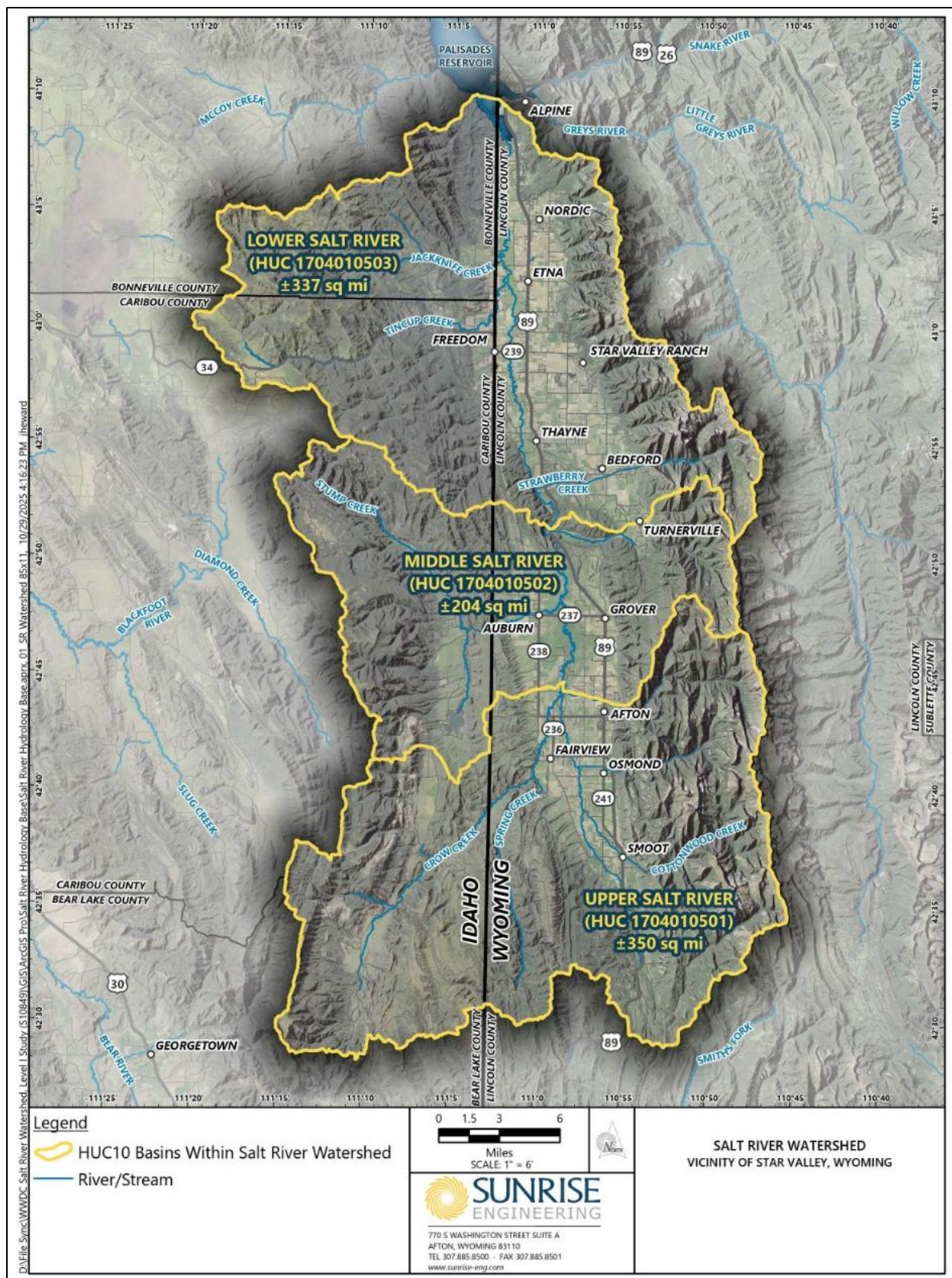


Figure 3-20. HUC 10 Basins within Salt River Watershed.

3.1.4.1.2 Stream Types

The Salt River Watershed is situated within a mountainous region. The primary river in the watershed is the Salt River, which flows through Star Valley and ranges in elevation from 5,600 to 6,700 feet. The mountain ranges bordering the valley reach elevations of up to 9,000 feet, with a few peaks surpassing 10,000 feet. The watershed's headwaters are fed by mountain snowmelt and spring systems that drain into the primary valley and the Salt River.

The majority of streams in the watershed are perennial, flowing year-round. Figure 3-21 shows the stream types throughout the watershed.

The Salt River originates in the Salt River Mountain Range in the southern end of the Upper Salt River Watershed. The Salt River flows from Smiths Fork Creek south of Mount Wagner as it approaches Star Valley. The river continues to flow northward through the valley along the Idaho-Wyoming border until it meets the Palisades Reservoir at the northern end of the Salt River Watershed. The Salt River is met by several major creeks originating in the Salt River Mountains to the east and the Caribou Range to the west. Headwater systems that flow into the Salt River, moving south to north, include: Cottonwood Creek, Willow Creek, Spring Creek, Dry Creek, Lower Crow Creek, Swift Creek, Water Creek, Lower Stump Creek, Strawberry Creek, Limekiln Creek, Miller Creek, Jackknife Creek, Birch Creek, and Dry Creek. Additional smaller creeks and waterways are associated with these primary creek systems.

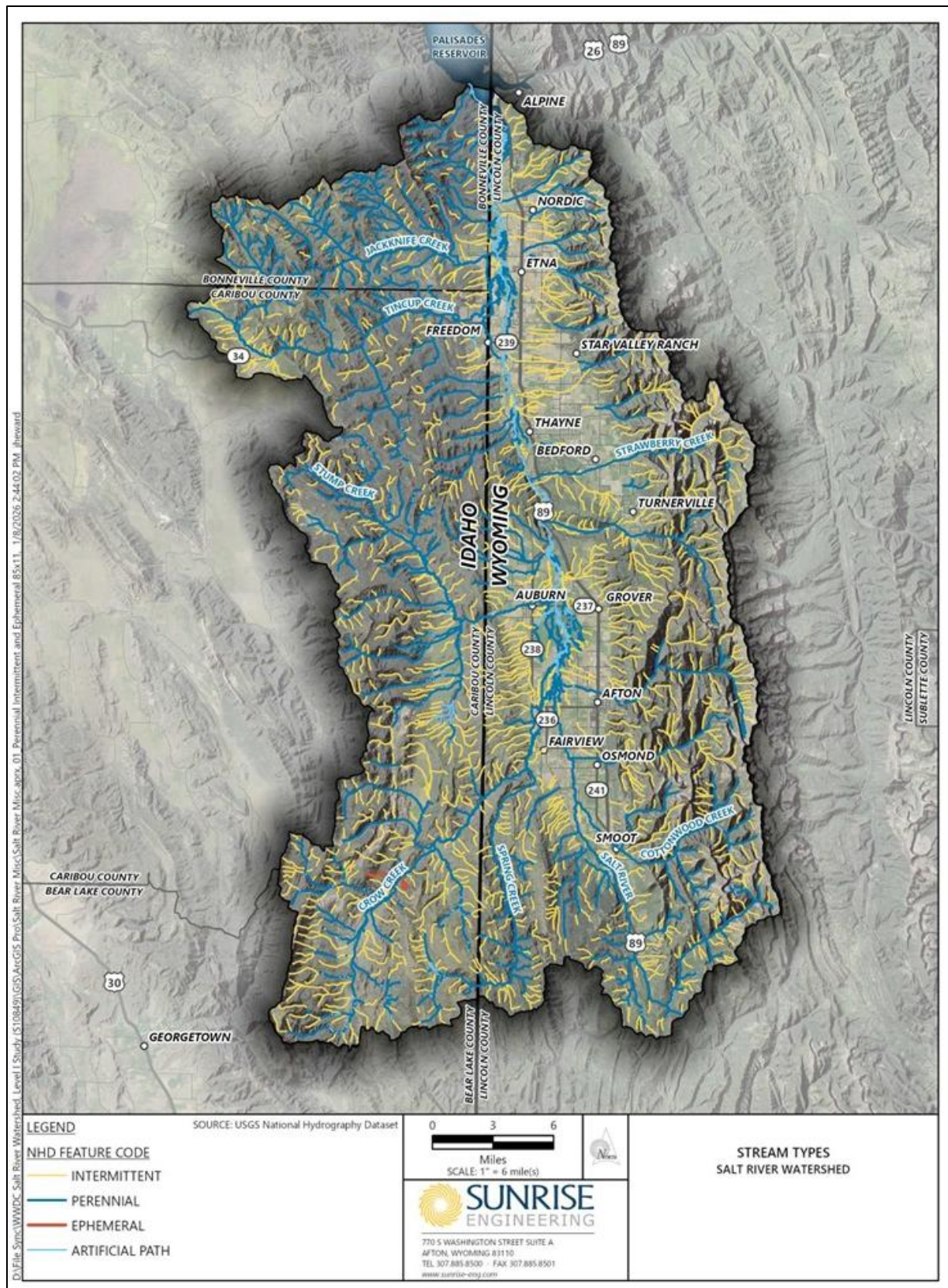


Figure 3-21. Stream types within the Salt River Watershed.

3.1.4.1.3 Streamflow Gages

There are nine recorded USGS Streamflow Gages within the Salt River Watershed. Of those, three gages are located on the Salt River. The gages within the watershed span varying dates of data collection. Two of the gages are currently active, one of which is located on the Salt River. Table 3-5 below describes the gages within the Salt River Watershed and the Mean Annual Flow for each gage with recorded data. Figure 3-22 depicts these gage locations within the study area.

Table 3-5. USGS Streamflow gages within the Salt River Watershed Study Area. (U.S. Geological Survey, 2025)

Stream Gage ID	Site Name	Status	Period of Record	Mean Annual Flow
13023800	Fish Creek NR Smoot WY	Unknown	Undefined	Not Available
13024000	Salt River NR Smoot WY	Inactive	06/01/1932 - 09/29/1957	36 cfs
13024500	Cottonwood Creek NR Smoot WY	Inactive	10/01/1932 - 09/29/1957	44 cfs
13025000	Swift Creek NR Afton WY	Inactive	10/01/1942 - 09/29/1980	87 cfs
13025500	Crow Creek NR Fairview WY	Active	04/01/1946 - 10/30/2024	59 cfs
13026500	Salt River NR Thayne WY	Inactive	07/01/1932 - 09/29/1967	448 cfs
13027000	Strawberry Creek NR Bedford WY	Inactive	06/01/1932 - 09/29/1943	62 cfs
13027500	Salt River above Reservoir NR Etna WY	Active	10/01/1953 - 10/30/2024	764 cfs
13028000	Salt River NR Alpine WY	Inactive	07/01/1917 - 09/29/1918	1120 cfs

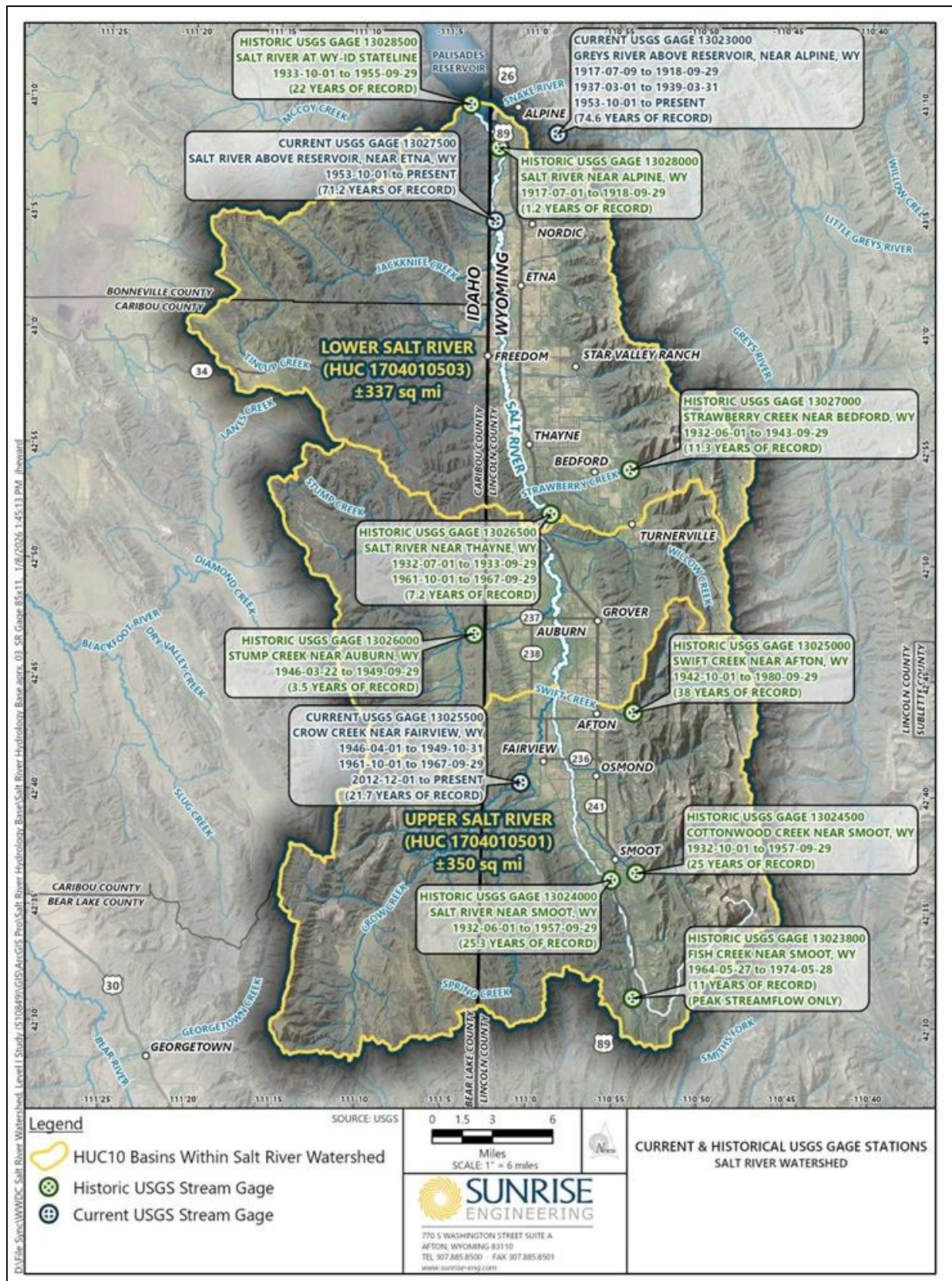


Figure 3-22. Current and historic USGS stream gages within the Salt River Watershed.

3.1.4.1.3.1 Stream Gage 13027500 Salt River above Reservoir Near Etna, WY

The stream gage 13027500 on the Salt River near Etna, Wyoming, remains active. Its data range is 10/01/1953 to 10/30/2024. Figure 3-23 depicts the annual peak streamflow at this site. The percentile categories for streamflow across all data collected for the site are in color gradation, with the lowermost red category being the 10th-25th percentile of streamflow and the uppermost category being the 90th–100th percentile of streamflow.

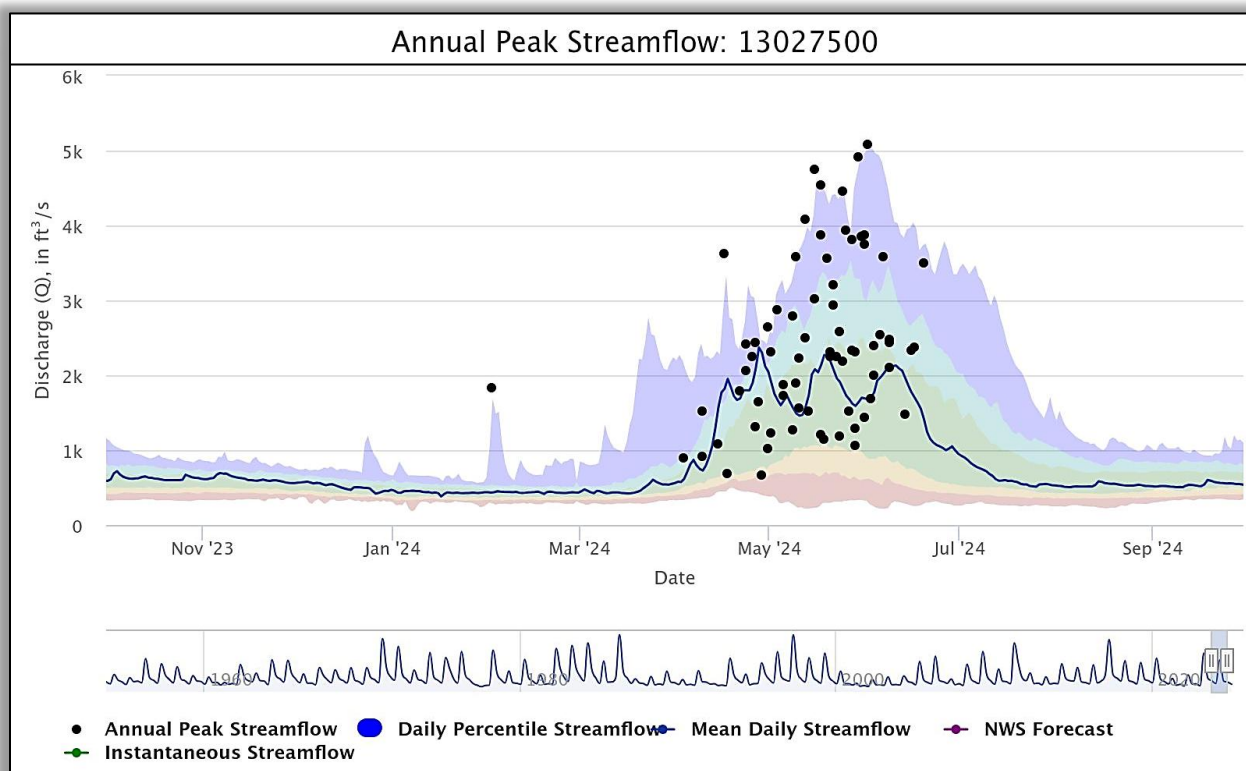


Figure 3-23. Annual Peak Streamflow for the stream gauge 13027500 Salt River Above Reservoir near Etna, WY. (U.S. Geological Survey, 2025)

3.1.4.1.3.2 Stream Gage 13026500 Salt River Near Thayne, WY

The stream gage 13026500 on the Salt River near Thayne, Wyoming, is inactive. The data range for this stream gage is 07/01/1932 to 09/29/1967. Figure 3-24 depicts the annual peak streamflow at this site. The percentile categories for streamflow across all data collected for the site are depicted in color gradation, with the lowermost red category being the 10th-25th percentile of streamflow and the uppermost category being the 90th–100th percentile of streamflow.

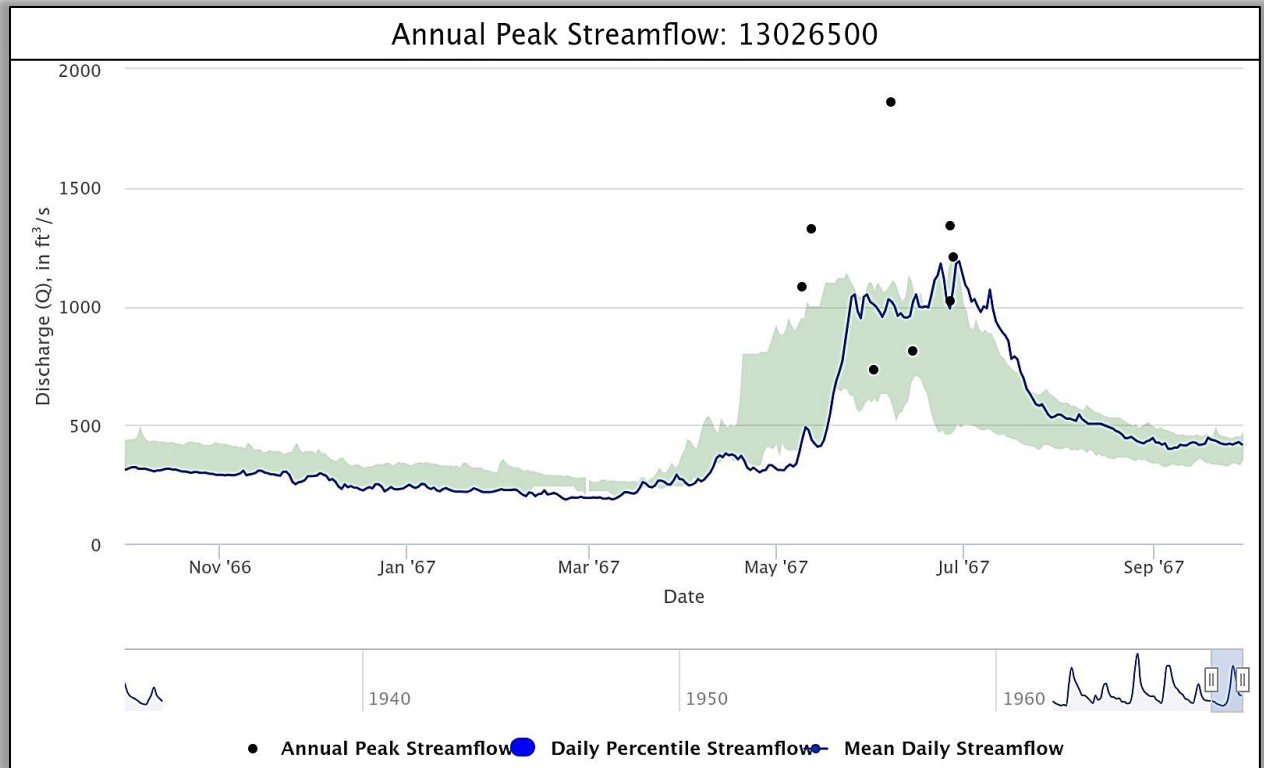


Figure 3-24. Annual Peak Streamflow for the stream gauge 13026500 Salt River near Thayne, WY. Mean Daily Streamflow is for the 1967 water year. (U.S. Geological Survey, 2025)

3.1.4.1.3.3 *Stream Gage 13024000 Salt River Near Smoot, WY*

The Salt River's stream gage 1324000 near Smoot, Wyoming, is inactive. The data range for this stream gage is 06/01/1932 to 09/29/1957. Figure 3-25 depicts the annual peak streamflow at this site. The percentile categories for streamflow across all data collected for the site are depicted in color gradation, with the lowermost red category being the 10th–25th percentile of streamflow and the uppermost category being the 90th–100th percentile of streamflow.

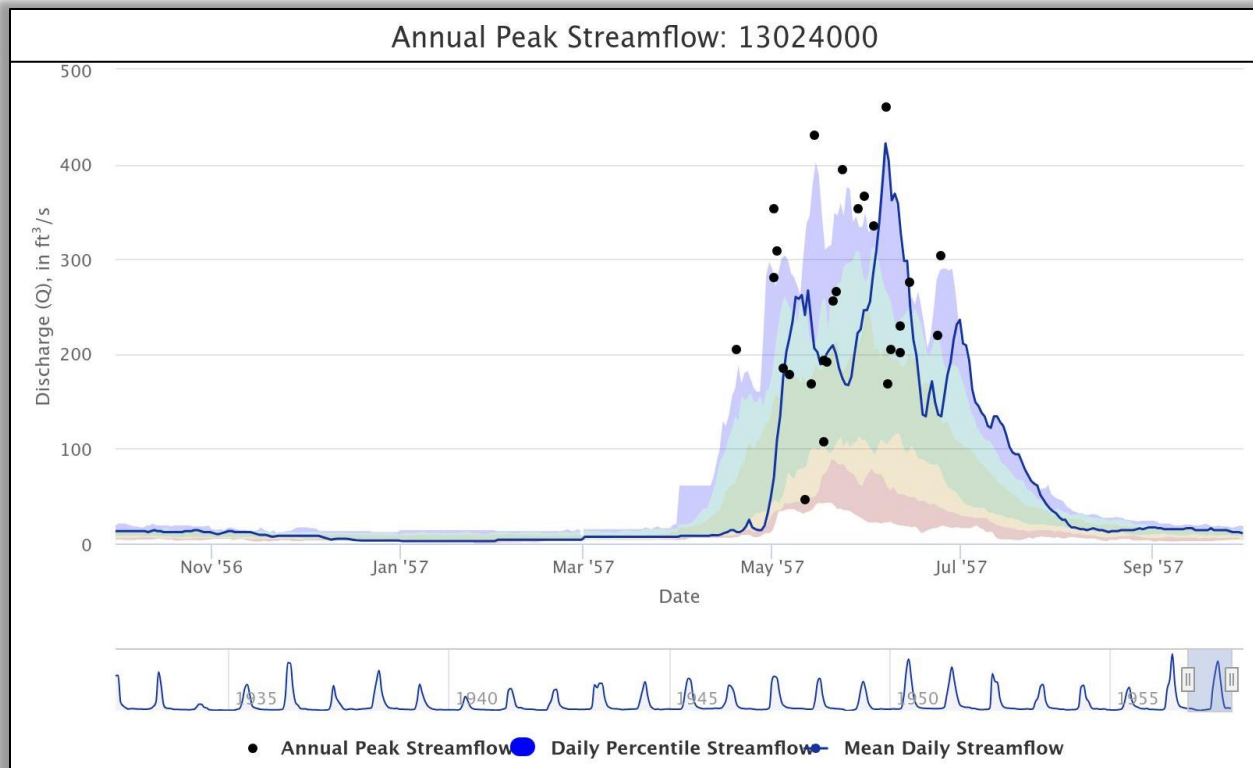


Figure 3-25. Annual Peak Streamflow for the water year 1957 for the stream gauge 13024000 Salt River near Smoot, WY. (U.S. Geological Survey, 2025)

3.1.4.2 Water Quality

3.1.4.2.1 Stream Classifications

The WDEQ classifies streams to protect water quality and designated uses, with higher classifications indicating a greater capacity to support a broader range of beneficial uses. Class 1 waters are classified based on existing water quality and receive the highest level of protection, regardless of use designation, ensuring no further degradation. Streams in lower classifications may have limitations on their ability to support certain uses. (Wyoming Department of Environmental Quality, 2001).

Overall, Wyoming's classification system includes four main classes. Class 1 waters are outstanding resources, such as those in wilderness areas, and receive the highest protection. Class 2 waters generally support fisheries and drinking water, with subcategories (2AB, 2A, 2B, 2C, 2D) distinguishing between game and non-game fisheries, aquatic life, fish consumption, recreation, and wildlife. Class 3 waters do not support fish but sustain other aquatic life, such as invertebrates and amphibians, in isolated wetlands and intermittent streams, and are also designated for recreation, wildlife, industry, agriculture, and scenic value. Class 4 waters are typically artificial or highly modified, designated for uses such as agriculture, industry, recreation, and wildlife. Across all classes, Wyoming protects uses including aquatic life, fisheries, drinking water, fish consumption, irrigation, livestock, recreation, scenic value,

and wildlife, ensuring compliance with the Clean Water Act. (Wyoming Department of Environmental Quality, 2001).

Within the Salt River Watershed, only a limited number of stream reaches have been formally assessed by WDEQ. Currently, the watershed includes three Class 2AB stream segments—Salt River, Stump Creek, and Crow Creek—totaling approximately 7.5 miles (Figure 3-26). Class 2AB waters are designated to support aquatic life other than fish, as well as recreation, agriculture, and industry. However, most streams in the watershed remain unassessed, highlighting the need for additional water-quality monitoring to fully characterize watershed health.

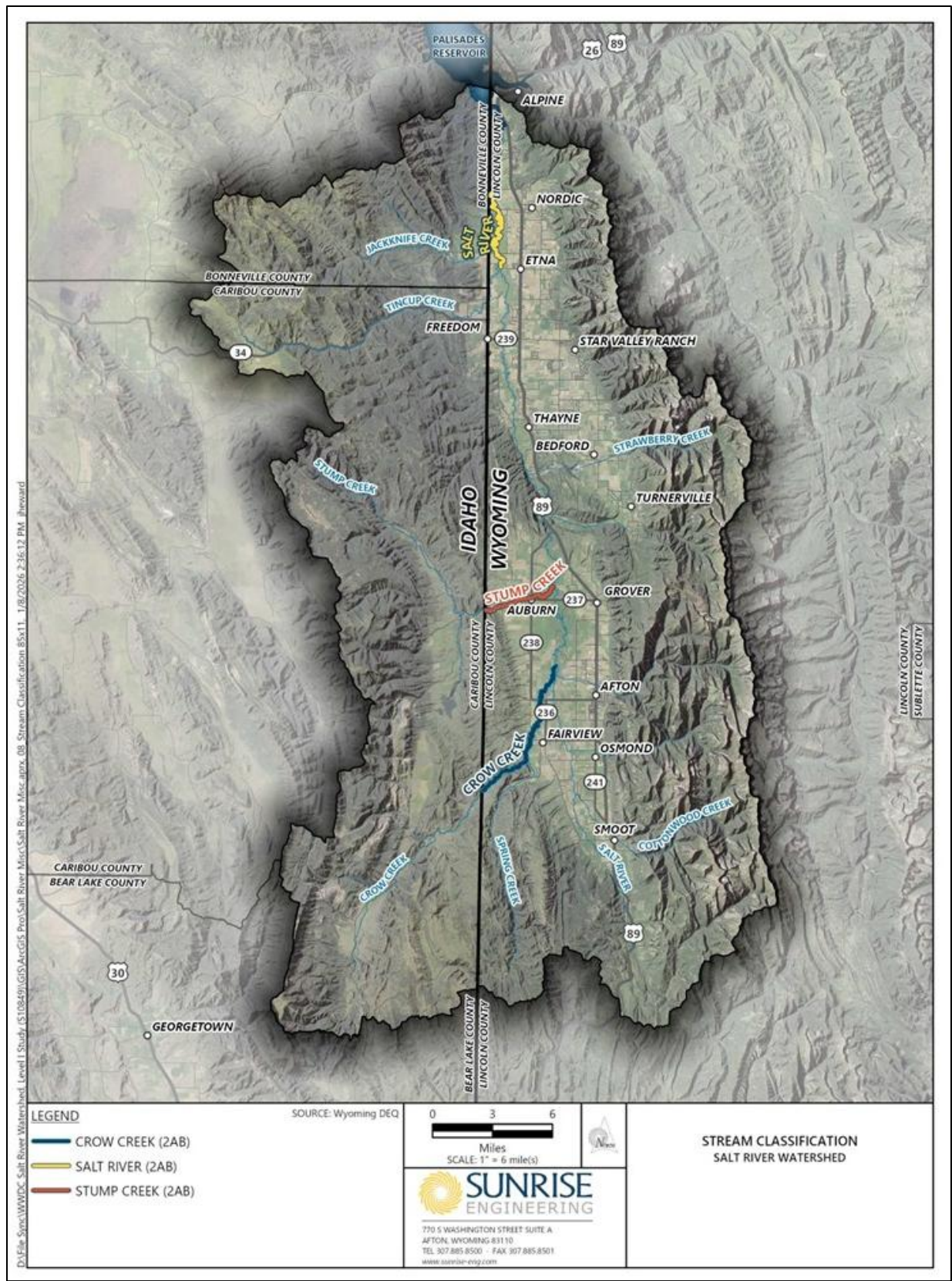


Figure 3-26. Stream classes within the Salt River Watershed.

3.1.4.2.2 Water Quality Sampling Sites

The EPA and USGS list a total of five water-quality sampling sites for the watershed through the National Water Quality Monitoring Council (NWQMC) and the National Water Information System (NWIS) (Table 3-6). Two listed sites coincide with stream gage locations on the Salt River and Crow Creek. Additionally, the WDEQ, SVCD, USGS, and Tetra Tech developed several bacterial water-quality datasets between 1970 and 2014 for the Salt River Water Quality Assessment and *E. coli* TMDL Report (TetraTech, 2015). The report can be found [here](#) for further information regarding *E. coli* testing within the watershed.

The following sections will discuss current water quality determinations and impairments within the Salt River Watershed. Consult the National Water Quality Monitoring Council [data portal](#) for additional information on water quality sampling.

Figure 3-28 shows the locations of the USGS water quality sites.

Table 3-6. USGS and EPA Water Quality Sampling Sites within the Salt River Watershed Study Area. (Environmental Protection Agency & U.S. Geologic Survey, 2024; U.S. Geological Survey, 2024a)

Organization	Organization Name	Site Identifier	Site Name	Site Type	Latitude	Longitude
USGS-WY	USGS Wyoming Water Science Center	USGS-13025500	Crow Creek Near Fairview, WY	Stream	42.6749287	-111.0077044
USGS-WY	USGS Wyoming Water Science Center	USGS-13027500	Salt River Above Reservoir, Near Etna, WY	Stream	43.07972222	-111.0372222
USGS-WY	USGS Wyoming Water Science Center	USGS-424355110571201	32-119-26ada01	Well	42.73185556	-110.9532222
USGS-WY	USGS Wyoming Water Science Center	USGS-430436111011501	36-119-27acc01	Well	43.07669167	-111.0207056
NARS_WQX	EPA National Aquatic Resources Survey (NARS)	NARS_WQX-WYSS-1201	East Side Canal	River/Stream	42.97962	-111.0067

3.1.4.2.3 Clean Water Act

3.1.4.2.3.1 Impairment

As of the 2020 Integrated 305(b) and 303(d) report, the Salt River Watershed contains three impaired stream reaches, varying between Class 4A and Class 5 (Wyoming Department of Environmental Quality, n.d.-a). Figure 3-27 shows the impaired stream reaches.

3.1.4.2.3.1.1 Salt River

A 7.5-mile section of the Salt River, 3.4 miles northwest of Etna, is classified with a use class of 2AB and an impairment rating of 4A. This reach was initially listed in 2002 as a designated use ‘threatened’ due to *E. coli* levels. In 2006, the reach was reassessed and classified as ‘not supporting’ a designated use. The Star Valley Conservation District completed additional sampling throughout the threatened segment. The Total Maximum Daily Load (TMDL) report for the site was completed in 2016, and in 2018 the reach was classified as Category 4A. The Use Support Decision Fact Sheet for this reach was updated in October 2023. (Wyoming Department of Environmental Quality, n.d.-c, 2023b)

3.1.4.2.3.1.2 Stump Creek

A 5.6-mile reach of Stump Creek from its confluence with the Salt River to the Idaho border is classified with a use class of 2AB and an impairment rating of 4A. This Stump Creek reach was first listed in 2008 due to *E. coli* levels. The Total Maximum Daily Load (TMDL) report for the site was completed in 2016, and the reach was recategorized as 4A in 2018. The Use Support Decision Fact Sheet for this reach was updated in October 2023. (Wyoming Department of Environmental Quality, n.d.-c, 2023c)

3.1.4.2.3.1.3 Crow Creek

A 15.6-mile reach of Crow Creek from the Utah/Wyoming border to its confluence with the Salt River is classified with a use class of 2AB and an impairment rating of 5. This Crow Creek reach was first listed in 2014 due to selenium levels. Between 2008 and 2012, WDEQ assessed the reach and determined the site to be in ‘non-attainment’ of ‘cold water game fish and aquatic life other than fish’ uses due to excessive levels of total selenium. The Use Support Decision Fact Sheet for this reach was updated in October 2023. (Wyoming Department of Environmental Quality, 2012, 2023a)

3.1.4.2.4 Pollution Discharge and Elimination Permits

Under the Clean Water Act, the WYPDES regulates the discharge of point source pollutants into surface waters. The Environmental Protection Agency (EPA) Enforcement and Compliance History Online (ECHO) platform provides data for ECHO Facilities and National Pollutant Discharge Elimination System (NPDES) discharge points. Three permits within the Salt River Watershed are not categorized as expired or terminated (Table 3-7). One active permit in the watershed has been identified as having current permit violations. (Environmental Protection Agency, n.d., 2025)

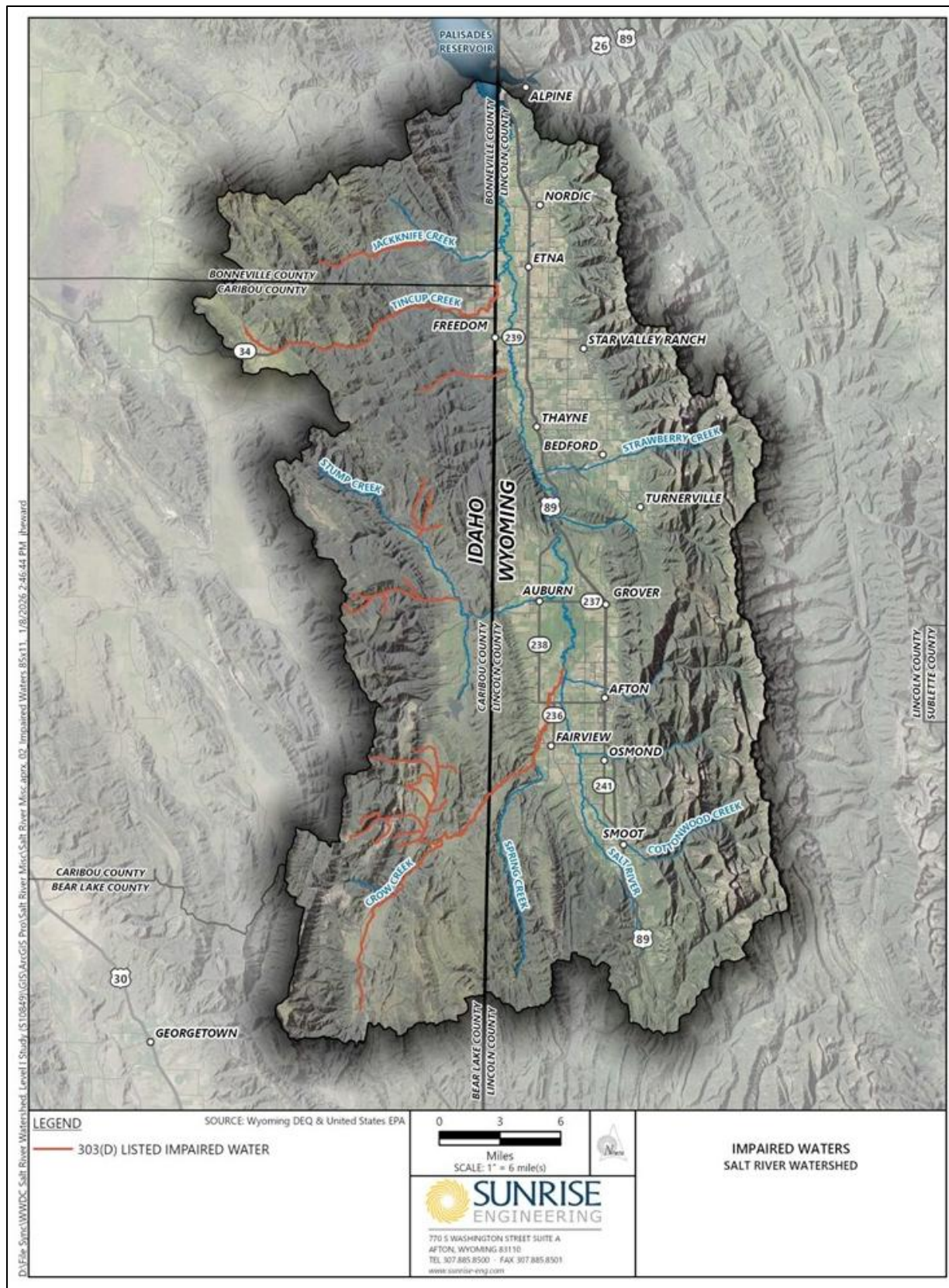


Figure 3-27. Impaired waters within the Salt River Watershed.

Table 3-7. The EPA ECHO platform lists discharge permits within the Salt River Watershed. (Environmental Protection Agency, n.d., 2025)

Permit Number	Facility Name	Industry	Town	Permit Status	Violation Identified	Permit Effective Date	Permit Expiration Date
WYR320971	ALPINE STATE PIT (2023)	Asphalt Paving Mixtures And Blocks	Alpine	Admin Continued	No	2/9/2023	3/30/2023
WY0025895	Thayne Wastewater Lagoon	Sewerage Systems	Thayne	Effective	Yes	01/31/2021	06/29/2025
WYR320502	Lancaster Dry Creek Pit	Construction Sand and Gravel	Osmond	Admin Continued	No	5/20/2018	3/30/2023

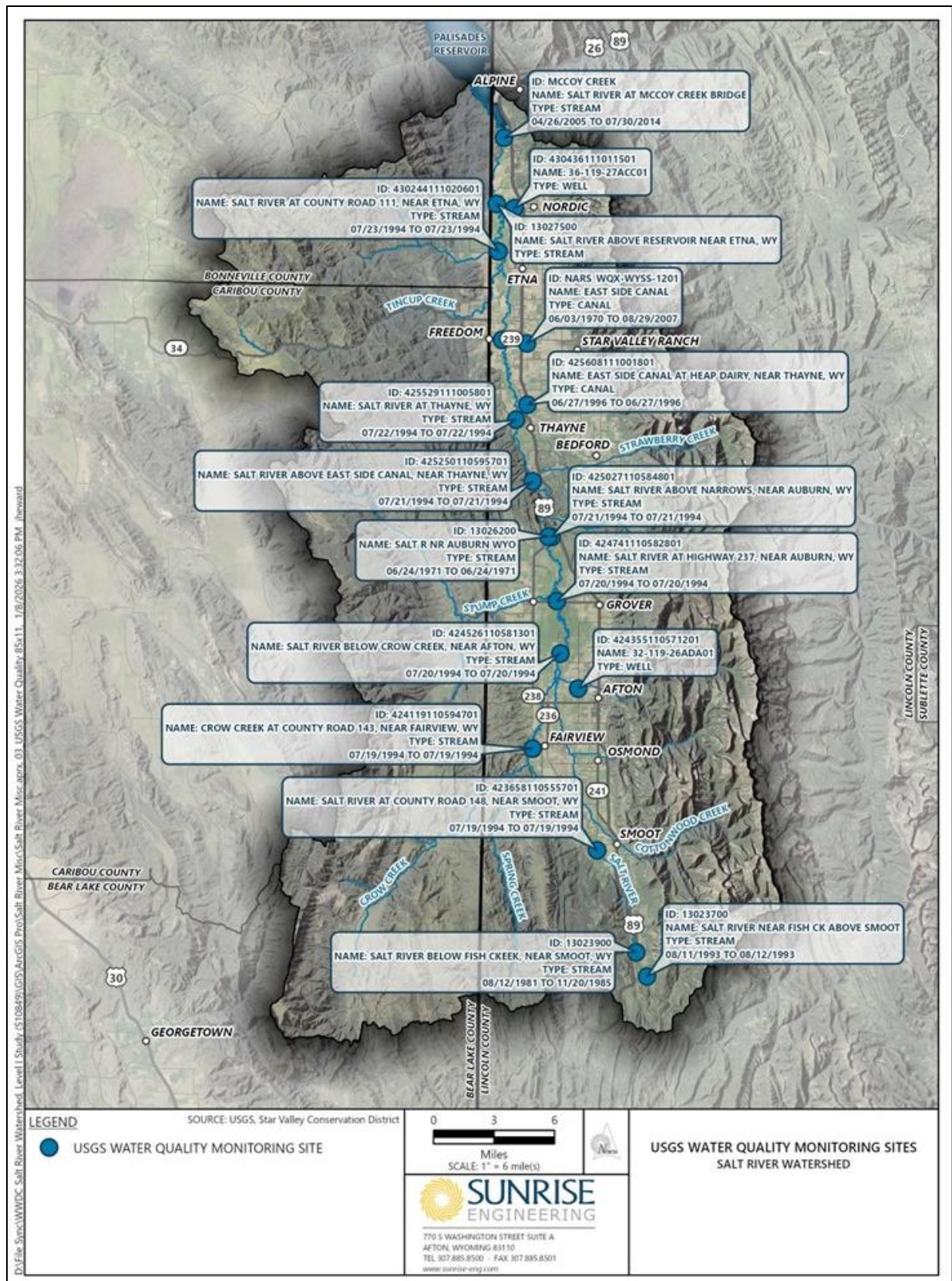


Figure 3-28. USGS water quality monitoring sites within the Salt River Watershed.

3.1.4.2.5 Snake River Compact

The Snake River Compact between Wyoming and Idaho was enacted in 1949. This compact was established to divide the waters of the Snake and Salt Rivers through negotiations between representatives from Idaho and Wyoming. The compact permits diverting 4% of the Snake River flow along the Wyoming-Idaho State line to Wyoming for new developments. The Snake River Compact permits unlimited domestic and livestock watering use, provided that stock reservoirs have a capacity of less than 20 acre-feet. The compact prioritizes domestic, livestock, and irrigation uses over power generation, allocating water accordingly. (Wyoming Water Development Commission, n.d.)

The Snake/Salt River Basin Plan: Summary of Interstate Compacts and Court Decrees Memo, released in 2002, provides a further discussion of the historical perspective on this water division. The 4% allocation to Wyoming accounts for the higher existing and potential use in Idaho, due to Wyoming's lower irrigable land and higher federal land percentage. As of this memo, Wyoming's water demand has remained within the compact allocation. (Fassett, 2002)

The Snake River Compact includes a provision for replacement storage. Following the diversion of the first 2% of water to beneficial use, Wyoming is required to provide replacement water storage for one-third of that use. The State of Wyoming is contracted for storage space in the Palisades Reservoir to meet this storage requirement. These storage provisions directly influence the Salt River Basin water usage and flow, as a percentage of use must be allocated to the reservoir. (Fassett, 2002)

3.1.4.3 Flooding and Runoff

The Salt River Watershed experiences a runoff regime typical of snowmelt-dominated systems, with peak flows generally occurring in late spring and early summer. High-elevation snowpack accumulates throughout the winter, then melts rapidly as temperatures warm, generating significant runoff volumes. Historically, this runoff has supported robust irrigation and riparian ecosystems, but altered hydrologic patterns, channel modifications, and land-use changes have exacerbated flooding and erosion in certain areas.

Existing conditions contribute to localized flooding issues:

- **Channel Incision:** Dncutting of the main Salt River channel and some tributaries has reduced floodplain connectivity, increasing flow velocities and shear stress during peak events, and increasing the frequency of bank erosion.
- **Infrastructure Constrictions:** Undersized or poorly maintained culverts, bridges, and road crossings can act as flow constrictions, causing backwater effects and localized flooding of adjacent lands.
- **Irrigation Diversions and Ditches:** Complex networks of irrigation diversions and ditches can alter natural flow paths, increasing flood risk in some areas while reducing flows in others. Leaky ditches can contribute to localized high water tables.
- **Development in Floodplains:** Development within designated or historic floodplains increases the risk of property damage and public safety hazards during high-flow events.
- **Rapid Snowmelt and Rain-on-Snow Events:** Unseasonably warm temperatures or rainfall events occurring on top of existing snowpack can trigger rapid snowmelt and amplified runoff, exceeding channel capacity and causing widespread flooding.

- Lack of Storage: Limited flood control storage capacity within the watershed increases the magnitude of peak flows and flood stages.
- Wildfire: With increasing temperatures, more wildfires have occurred in the surrounding hills, leading to increased runoff after a fire.

The extent and severity of flooding vary across the watershed depending on local topography, channel conditions, land use, and the magnitude and timing of precipitation and snowmelt events. Addressing these issues requires a multifaceted approach that combines infrastructure improvements, stream restoration, floodplain management, and community preparedness to enhance watershed resilience and mitigate flood risks.

3.1.4.3.1 Federal Emergency Management Agency (FEMA) Floodplains

The Federal Emergency Management Agency (FEMA) has primarily mapped Zone A and Zone AE floodplains along the Salt River, which stretches through the center of the watershed. There is an undetermined flood zone (Zone D) area located north of Grover and extending north of Bedford. Figure 3-29 shows the FEMA definitional designations for each flood zone. Figure 3-30 shows the FEMA flood zones mapped within the Salt River Watershed. (Federal Emergency Management Agency, n.d., 2020)

Moderate to Low Risk Areas	
ZONE	DESCRIPTION
B and X (shaded)	<u>Between the limits of the 100-year and 500-year Floodplain</u> , area with a 0.2% (or 1 in 500 chance) annual chance of flooding. This zone is also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	<u>500-year Floodplain</u> , area of minimal flood hazard.
High Risk Areas	
ZONE	DESCRIPTION
A	<u>100-year Floodplain</u> , areas with a 1% annual chance of flooding. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE A1-30 (old format)	<u>100-year Floodplain</u> . The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
AH	<u>100-year Floodplain</u> , areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	<u>100-year Floodplain</u> , river or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a <u>temporarily</u> increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam).
A99	100-year Floodplain, areas with a 1% annual chance of flooding that will be <u>protected by a Federal flood control system</u> where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
Undetermined Risk Areas	
ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

Figure 3-29. Federal Emergency Management Agency (FEMA) flood zone designations and definitions. (Federal Emergency Management Agency, n.d.)

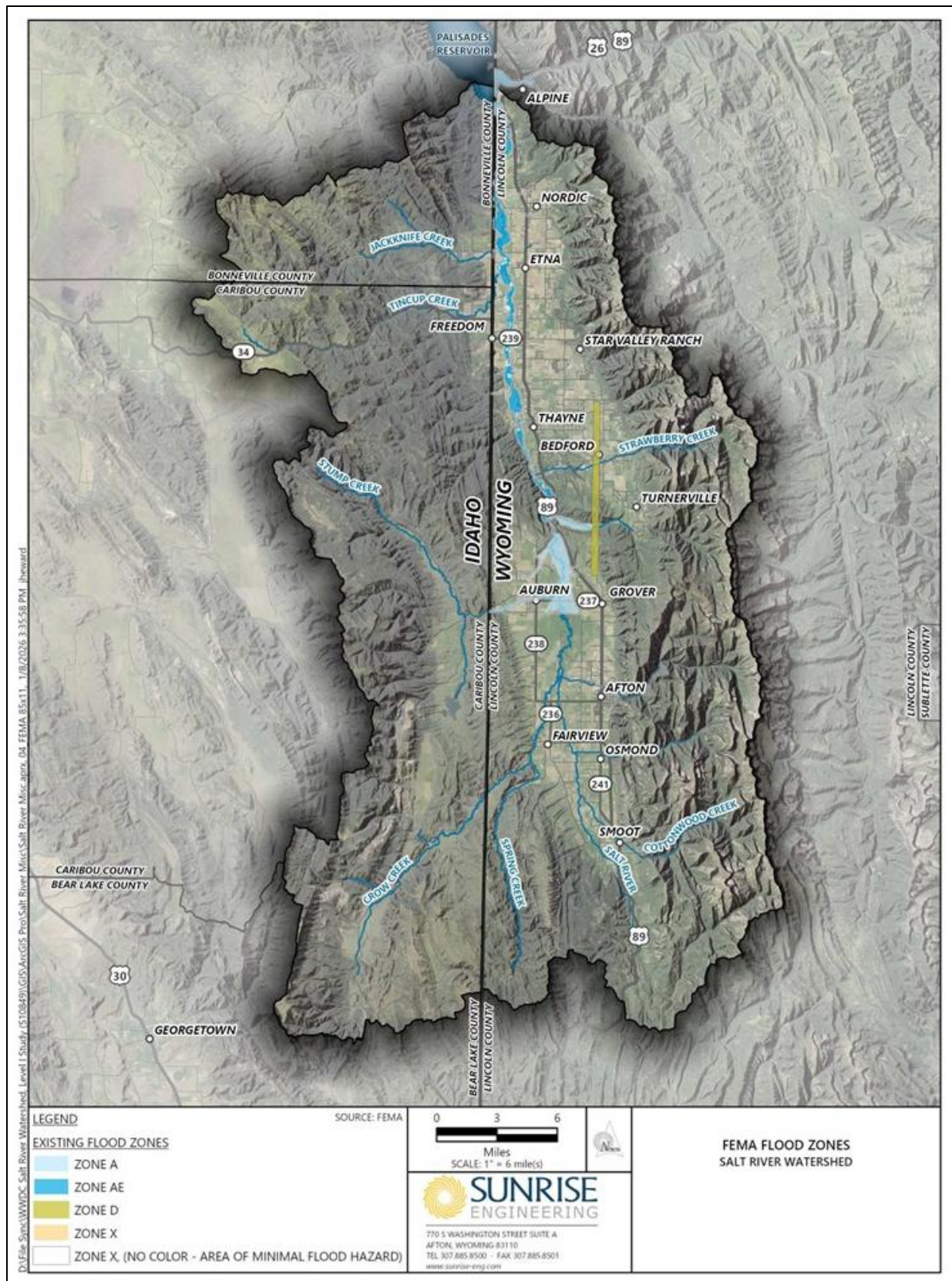


Figure 3-30. FEMA flood zones mapped within the Salt River Watershed.

3.1.4.3.2 Water Watch

U.S. Geological Survey's Water Watch program displays various hydrologic information, including current streamflow, flood, drought, and runoff data. Water Watch computes runoff data for hydrologic units throughout the United States. The Salt River Watershed (HUC 17040105) runoff data for 1952-2022 displays multiple peak runoff years below (Figure 3-31). Computed runoff within the watershed fluctuates between 160 mm, the lowest record in 2001, and 512 mm in 1997. Several computed peak runoff years correspond to the high-flow years recorded by the National Water Prediction Service (NWPS). (U.S. Geological Survey, 2022)

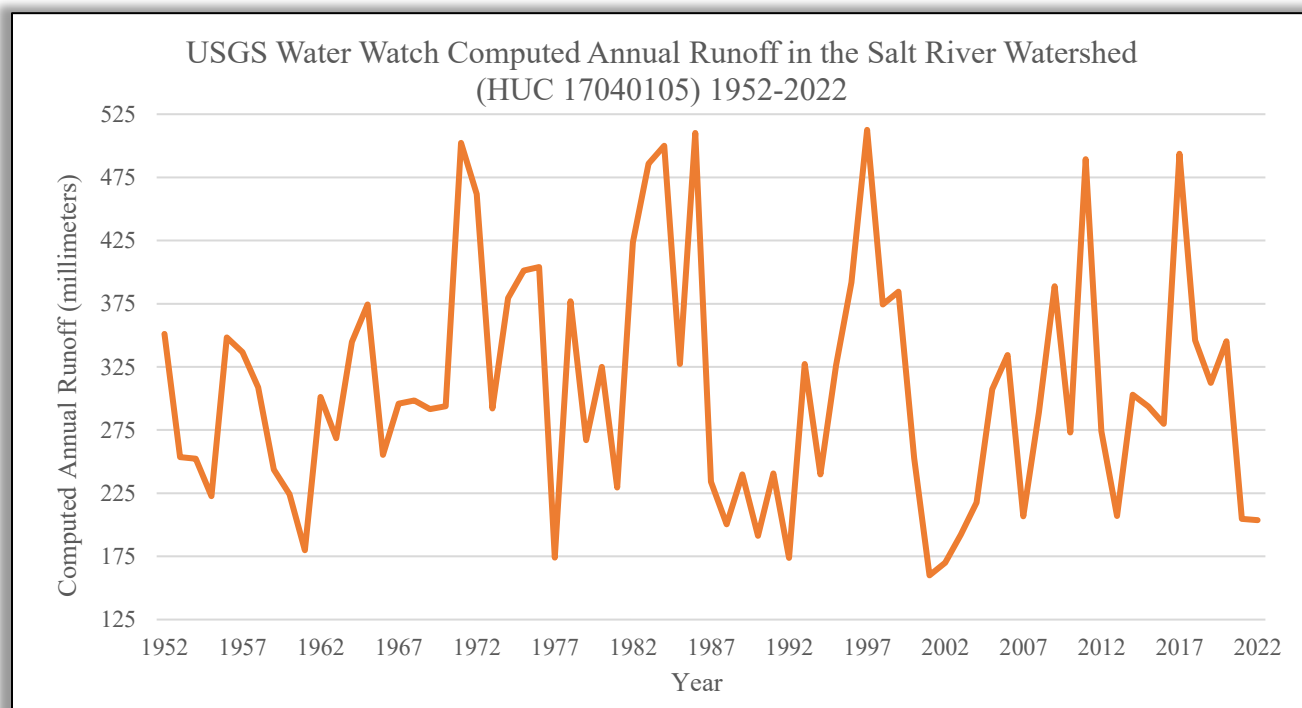


Figure 3-31. Computed annual runoff in the Salt River Watershed (HUC 17040105) from USGS Water Watch data. (U.S. Geological Survey, 2022)

3.1.4.3.3 National Water Prediction Service

NOAA National Water Prediction Service interpolates the probabilities of stream stage, flow levels, and potential flooding at National Weather Service (NWS) stream gauge locations. There is one NWS station within the Salt River Watershed located on the Salt River near Etna (Figure 3-32).

This gauge recorded a historic stage level in 2011 of 5.99 ft (4,500 cfs flow), resulting in flooding of the Salt River (Figure 3-33 and Figure 3-34). Additional historic high flows over 5.5 ft occurred in 1983, 1984, 2017, 1986, and 1997 (5.96, 5.87, 5.81, 5.71, and 5.67 stage feet, respectively). For active stream stage forecasting and flood probability tracking, the SALW4 station can be viewed on the NWPS [website](#). (National Oceanic and Atmospheric Administration, n.d.)

The NWPS lists the flood impacts for the Salt River near Etna Station as follows. Between stages 3.5 and 5, small creeks in the Fairview and Freedom areas reach bankfull levels, and flooding occurs in the low-lying areas. At stage five, the Salt River is at bankfull, Swift Creek is at high water, and flooding is occurring in Freedom and Fairview. Ranchland and pastureland are flooding near Etna. Between stage 5.5 and stage 6, the Salt River is in the flood stage, and there is extensive flooding in the northern and northeastern sections of Afton, throughout Freedom and Fairview, and in the farm/ranch houses both up and downstream of the gauge. (National Oceanic and Atmospheric Administration, n.d.)

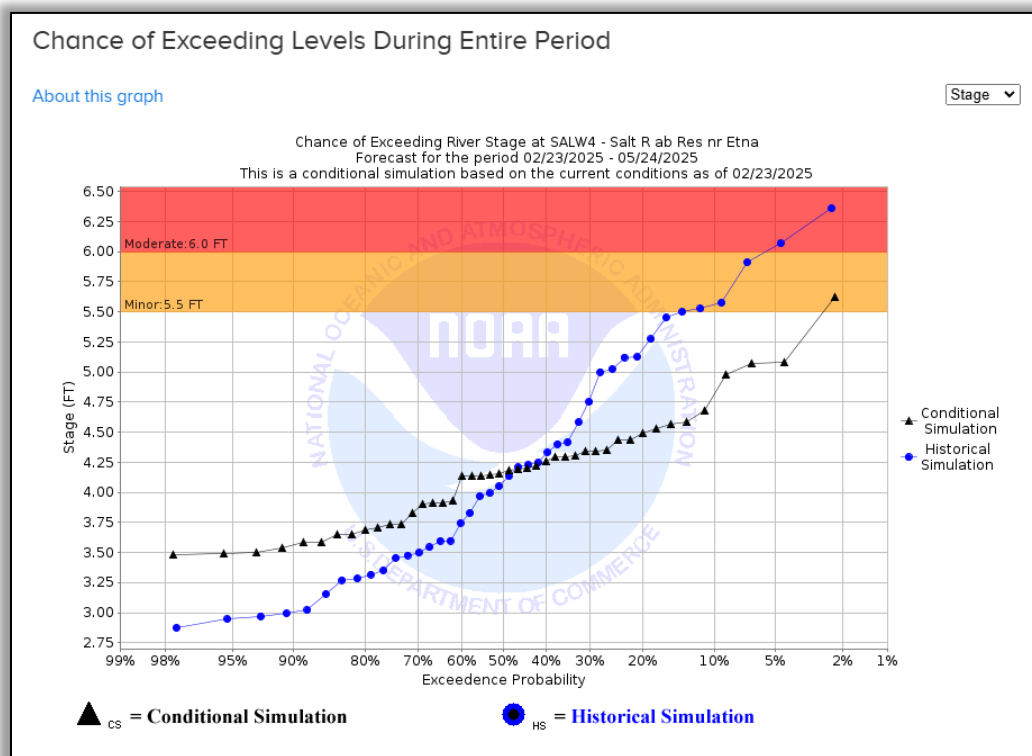


Figure 3-32. NOAA probability of exceeding river flow in stage (ft) at the SALW4 station on the Salt River near Etna, Wyoming. (National Oceanic and Atmospheric Administration, n.d.)



Figure 3-33. Photos of the SALW4 stream gage station on the Salt River near Etna, Wyoming. Viewing downstream (left) and upstream (right) at low flow on 10/14/2004. (National Oceanic and Atmospheric Administration, n.d.)



Figure 3-34. Photos of the SALW4 stream gage station on the Salt River near Etna, Wyoming. Viewing downstream (left) and upstream (right) at high flow (near 4,500 cfs) on 05/2011. (National Oceanic and Atmospheric Administration, n.d.)

3.1.5 Geomorphology

This section summarizes the geomorphology of the Salt River Watershed, outlining the key physical processes shaping its streams and landscapes. As detailed in the geology section, the watershed is characterized by faulted mountain complexes composed of sedimentary rocks dating from the Paleozoic to mid-Mesozoic eras. These sedimentary formations contribute to the creation of colluvial parent material, while both structural and surficial geology strongly influence the availability and transport of sediment throughout the watershed.

This analysis focuses on the Level I stream assessment method developed by Rosgen (Rosgen, 1994, 1996), which provides a framework for characterizing stream types based on morphology and channel characteristics. Streams are dynamic systems that respond to geologic and climatic forces, and the Rosgen classification system provides a framework for assessing their current condition in this context. The system offers multiple levels of classification, ranging from broad-scale desktop analyses to detailed field assessments that incorporate stream hydraulics. For this Level I study, general stream characteristics are evaluated based on the drainage network (including stream order and drainage density), valley type, channel slope, channel sinuosity, channel shape, and channel pattern, providing a broad overview of stream morphology across the watershed.

3.1.5.1 Rosgen Classification System

The Rosgen Stream Classification System is a widely used framework for describing and categorizing stream types based on their morphological characteristics, offering a standardized approach for assessing stream stability, predicting behavior, and designing effective restoration projects across multiple hierarchical levels. Level I provides a broad overview based on readily available data (valley type, channel sinuosity/slope/pattern, drainage density). In contrast, Level II involves field measurements of key channel dimensions to determine a specific stream type. Level III focuses on assessing stream stability and erosion susceptibility, and Level IV involves detailed hydraulic and sediment-transport modeling to validate classification and restoration designs (Figure 3-35).

The Rosgen Stream Classification System categorizes streams into nine major types (A, B, C, D, DA, E, F, G) based on their morphological characteristics and valley settings (Figure 3-36).

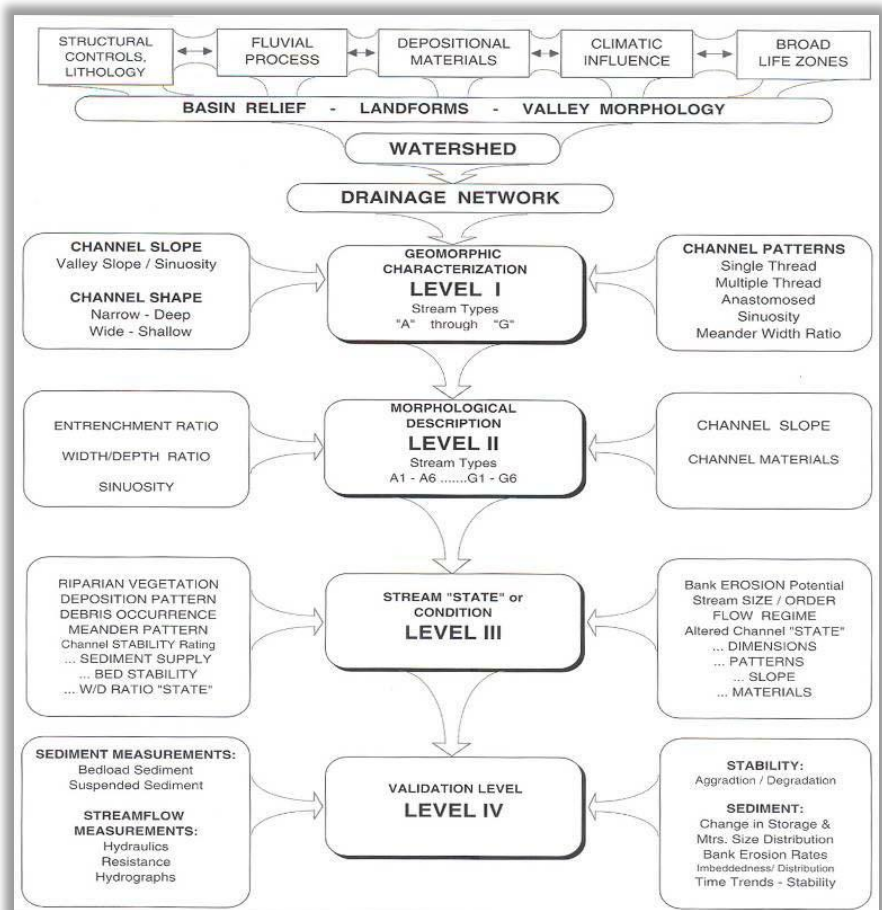


Figure 3-35. Hierarchy of the Rosgen Stream Classification System (North Carolina State Extension, n.d.).

A-Type Channels: A-channels are steep channels in headwater or bedrock canyon areas that are entrenched within narrow valleys, offering little to no floodplain. Their boundaries are typically resistant to erosion, making them resilient to human impacts. Most geomorphic changes in these systems result from major sediment-transport events that can block or redirect channel flow, such as landslides, debris

flows, or debris-jam failures. These systems are not prone to degradation due to the stability of the streambed and bank substrate. (Natural Resource Conservation Service, 2012; Rosgen, 1994)

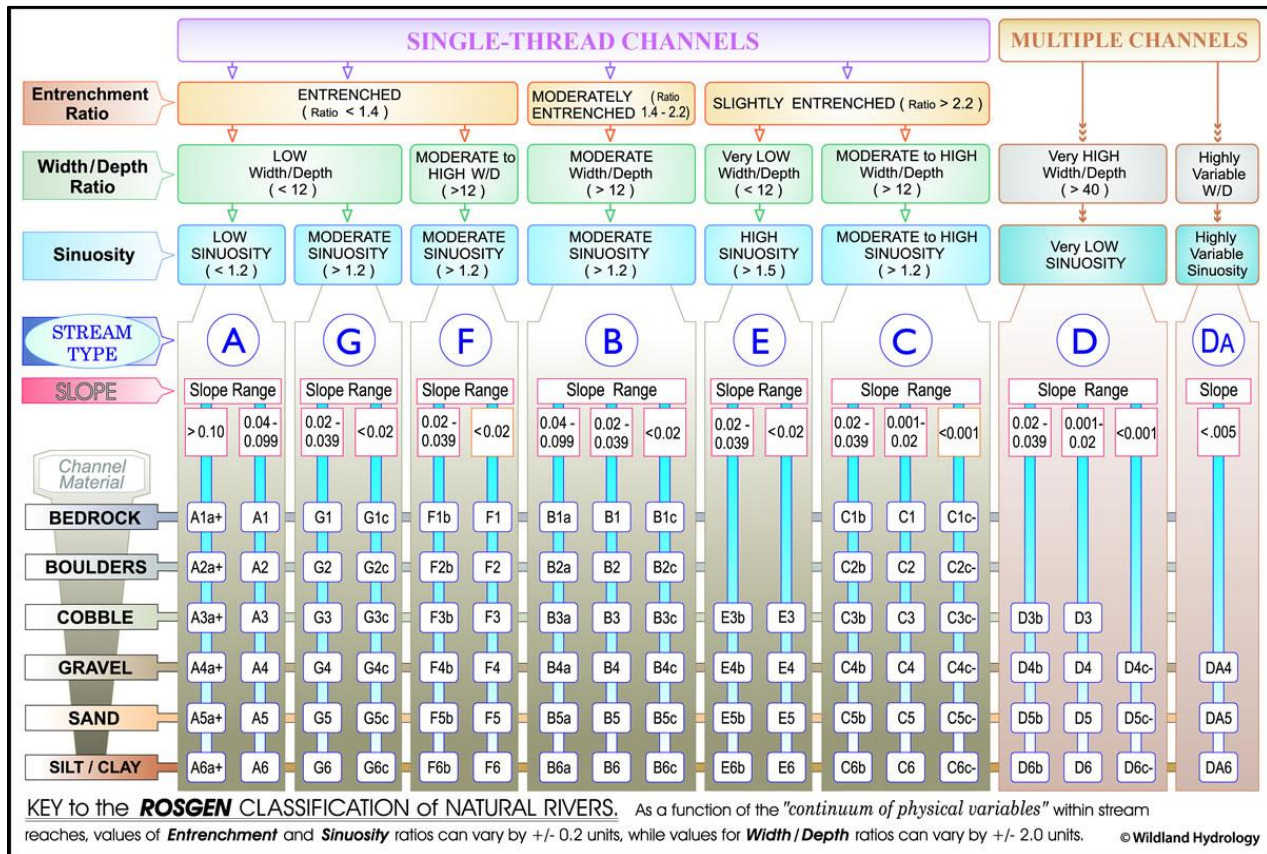


Figure 3-36. Rosgen Classification of Natural Rivers Key. Excerpt from Applied River Morphology by Rosgen. (Rosgen, 1996)

A-Type Channels: A-channels are steep channels in headwater or bedrock canyon areas that are entrenched within narrow valleys, offering little to no floodplain. Their boundaries are typically resistant to erosion making them resilient to human impacts; however, large-scale sediment transport events can alter channel flow.

B-Type Channels: B-channels form downstream of headwaters in areas of moderate slope, transitioning from headwater environments to valley bottoms. Characterized by moderate slopes, moderate entrenchment, and stable banks B-channels are moderately resistant to human impacts. However, they can be susceptible to sediment buildup and channel adjustments following major sediment-delivery events, such as upstream landslides, debris flows, or floods. In cases when B-type stream reaches are exhibiting widening or excessive deposition, treatments and practices may include restoring or maintaining upstream watershed runoff and sediment loads, reshaping floodplains and channels to expand the floodplain, installing toe protections, and re-establishing or improving stabilizing riparian corridor vegetation. (Natural Resource Conservation Service, 2012; Rosgen, 1994)

C-Type Channels: C-channels exhibit low slopes, meandering planforms, and pool/riffle sequences. Located in broad alluvial valleys, they connect with wide floodplains and are not entrenched. As a result, they are dynamic and respond rapidly to disturbances. For C-type stream reaches exhibiting widening without downcutting, treatments and practices may include maintaining existing watershed runoff volumes, patterns, and sediment loads, and reestablishing or improving existing riparian corridor vegetation. Other treatments to consider are physically modifying channel width and placing toe protections on shaped banks. In degraded systems with high banks (greater than or equal to eight feet tall), shaping banks to reduce slope failure may be necessary. (Natural Resource Conservation Service, 2012; Rosgen, 1994)

D-Type Channels: D-channels are characterized as wide, shallow, braided streams with multiple interwoven channels separated by bars and islands. High sediment loads, unstable banks, and flashy flow regimes are the norm, resulting in a highly dynamic environment.

DA-Type Channels: Similar to D-type (braided) streams, DA-type (anastomosing) channels are characterized by stable banks and vegetated islands that separate channels. Channels tend to be deeper and narrower than in braided channels.

E-Type Channels: E-channels exhibit low gradient, meandering planforms, and well-vegetated banks, with stable channels and riffle-pool morphology. Located in stable alluvial valleys with fine sediment deposits and well-established riparian vegetation, E-channels are highly stable and resilient to disturbance.

F-Type Channels: Similar to C and E channels with low slopes, F-channels are entrenched and feature a narrow floodplain relative to channel width, often resulting from a historic downcutting event. When formed in easily eroded sediments, the steep valley walls often become unstable, leading to channel widening within the entrenched cross-section. For F-type stream reaches exhibiting early widening following downcutting, treatments and practices may include reducing upstream watershed runoff and sediment loads, in addition to the treatments listed for late widening scenarios. For F-type stream reaches that are exhibiting late widening or early deposition, treatments and practices may include restoring or maintaining upstream watershed runoff and sediment loads, reshaping the floodplain and channel to expand the floodplain, installing toe protections, and re-establishing or improving stabilizing riparian corridor vegetation. In reaches exhibiting downcutting, treatments can include reducing watershed runoff and sediment loads, reconnecting the stream to the floodplain and reestablishing sinuosity by raising the channel bottom, establishing structural grade controls, and reestablishing or improving stabilizing riparian corridor vegetation. In degraded systems with high banks (greater than or equal to eight feet tall), shaping banks to reduce slope failure may be necessary. (Natural Resource Conservation Service, 2012; Rosgen, 1994)

G-Type Channels: G-type channels are narrow, steep, and deeply entrenched gullies. They commonly exhibit high rates of bank erosion and generate substantial sediment loads. Channel degradation and renewed side-slope erosion are characteristic processes in these systems. G-Type channels exhibiting downcutting can be restored through the following treatments: reducing watershed runoff and sediment loads, reconnecting the stream to the floodplain, and reestablishing sinuosity through raising the channel bottom, establishing structural grade controls, and re-establishing or improving stabilizing riparian corridor vegetation. In degraded systems with high banks (greater than or equal to eight feet tall), shaping

banks to reduce slope failure may be necessary. (Natural Resource Conservation Service, 2012; Rosgen, 1994)

3.1.5.2 Level I: Geomorphic Characterization

The Salt River Watershed study implemented a Level I stream classification, a broad, landscape-scale approach based on the Rosgen system, to identify stream types by their physical form. Instead of relying solely on field data, many defining characteristics—such as slope, sinuosity, and valley shape—are inferred from aerial imagery, topographic maps, and other geospatial sources. Stream types in this system are assigned letter codes from A to G. For this assessment, the National Hydrography Dataset (NHD) was used, and reaches were assigned based on NHD segments. Figure 3-37 depicts the Level I classification key (Rosgen, 1994, 1996).

To facilitate this Level I assessment, the project's GIS incorporated digital aerial photography, USGS topographic maps, Landsat color infrared imagery, a digital elevation model (DEM), and digitized hydrography (NHD), enabling analysis of key geomorphic parameters, such as sinuosity, slope, and stream station determination. Stream alignments were digitized using available aerial photography. Finally, the project team divided each stream into reaches based on geographic and geomorphic factors. Subsequently, each NHD segment was evaluated for channel slope, shape, pattern, and valley morphology in accordance with the Level I classification requirements. The resulting Level I classifications for the Salt River Watershed are displayed in Figure 3-38.

Note on Level I Assessment - Due to aerial imagery, slope models, and available soils data, some Rosgen Stream Types may be less prevalent in Level 1 Assessments. In the Level 1 Assessment completed for the Salt River Watershed Study, Rosgen D, E, and F were not prevalent, primarily due to important classification characteristics being less available in desktop analysis. The classification was conducted at the individual NHD stream segment level, with each segment assigned to a dominant Rosgen type based on features observable at that scale. Determining whether a channel fits into D, E, or F types requires evaluating entrenchment, width-to-depth ratios, pool-riffle relationships, and stream bed composition metrics that cannot be adequately measured from imagery alone. For example, C and E-type channels are very difficult to discern using remote sensing. They both have single-thread channels and similar entrenchment, sinuosity, and slope characteristics. Thus, they tend to be classified by width-to-depth and stream-bed characteristics.

In most cases in the Salt River Watershed, these stream segments were assigned C-type channels because they encompass a wider range of stream-bed compositions, exhibit greater slope variability, and have more common width-to-depth ratios for the landscape. Another example: D-type channels require clear evidence of braided morphology and active erosion, neither of which is particularly apparent in the imagery. Braided morphologies are difficult to assess with remote imagery due to external influences on riparian areas, such as livestock or wildlife trails, beaver activity, and the timing of imagery relative to runoff. Braided channels were not common in the watershed. A final example: F-type channels are single-stranded and exhibit higher entrenchment, similar to A- and G-type channels. F- and G-type channels exhibit similar sinuosity, slope, and streambed characteristics. They are classified by their width-to-depth ratios. In many cases across the watershed, these channels were more likely to be classified as G-type channels due to less apparent evidence of connectivity to floodplains, indicating a lower width-to-depth ratio. Because the key diagnostic features of these stream types are not discernible without field-level

assessment, few D, E, or F segments were identified in this mapping effort. Ultimately, Level 1 Rosgen Assessments are intended to efficiently characterize study areas into stream types. In most circumstances, Level 1 Assessments are improved by following assessments at smaller scales and by those that include field-level assessments, where width-to-depth ratios, pool-riffle relationships, and streambed composition can be assessed.

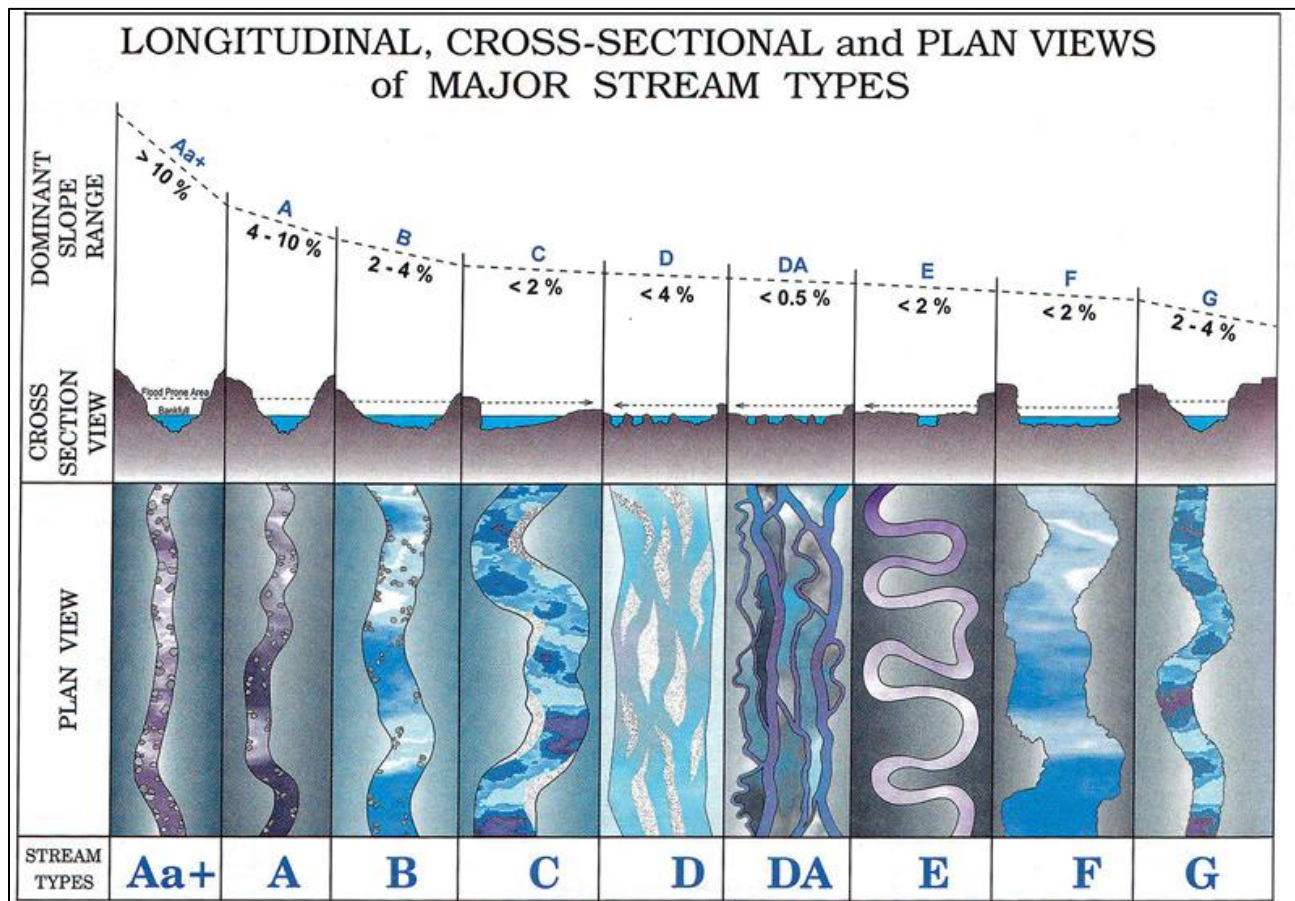


Figure 3-37. Rosgen's major stream types longitudinal, cross-sectional, and plan views. (Rosgen, 1994; SUNY ESF Department of Environmental Resources Engineering, n.d.)

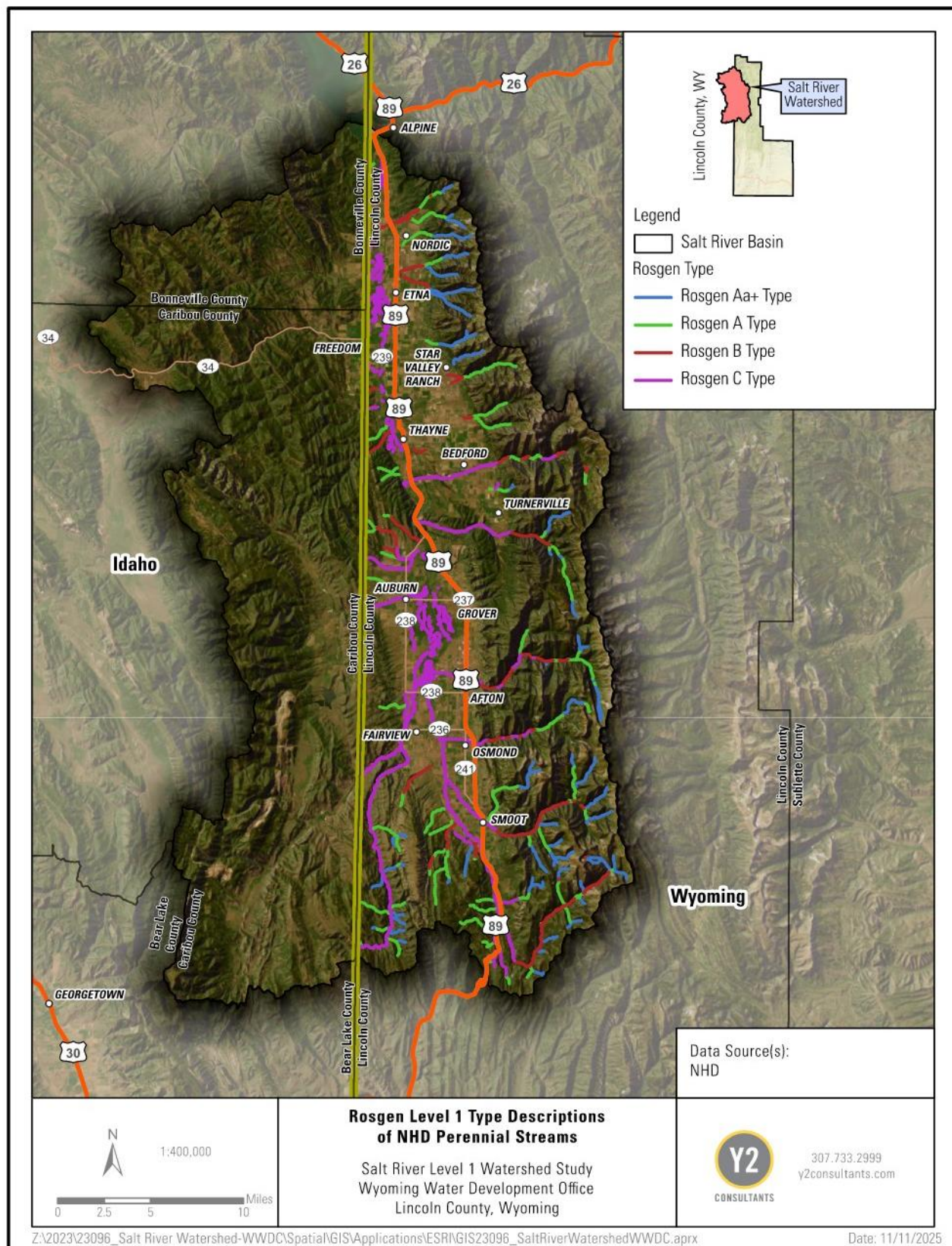


Figure 3-38. Rosgen Level I Classifications for Salt River Watershed.

3.2 Biological Systems

3.2.1 Land Cover

Land cover analysis within the Salt River Watershed was completed using the National Land Cover Database (NLCD), the Gap Analysis Project/Landscape Fire and Resource Management Planning Tools Project (GAP/LANDFIRE), and the National Wetland Inventory (NWI). (LANDFIRE Program, n.d.; U.S. Fish and Wildlife Service, 2025a; U.S. Geological Survey, 2019, 2020)

The USGS and the Multi-Resolution Land Characteristics (MRLC) Consortium collaboratively produce the National Land Cover Database (NLCD), a widely used resource for environmental research, land management, and urban planning for over 30 years (U.S. Geological Survey, 2020). NLCD provides land cover and land cover change maps for the conterminous U.S. The newest initiative, released in 2024, is called the Annual National Land Cover Database. It builds on previous NLCD efforts and improves coverage by providing higher-resolution, more frequent, and systematically updated land cover information by performing annual monitoring of national land cover and land change (historic and current), creating, validating, and distributing map products; establishing provenance and documentation, transparency, and openness; using continuous research and design to enhance change detection, augment classification, reduce latency, and add improvements; assessing causes and consequences of change through time (assessments, projections) (U.S. Geological Survey, 2024b)

The Gap Analysis Project/Landscape Fire and Resource Management Planning Tools Project (GAP/LANDFIRE) dataset, sourced from USGS, provides detailed vegetation and land cover patterns for the continental U.S., using the Ecological System classification developed by NatureServe. The Gap Analysis Project (GAP) develops data and tools to support conservation science, helping researchers and policymakers understand gaps in biodiversity protection. The LANDFIRE Program was established to address growing concerns regarding wildland fires by developing a national-scale biological and ecological dataset. LANDFIRE produces national-scale, spatial data that support wildland fire management, environmental research, and land management planning. LANDFIRE data provides a comprehensive view of vegetation, fire behavior, and landscape changes across the U.S. (LANDFIRE Program, n.d.; U.S. Geological Survey, 2019).

The National Wetland Inventory (NWI) is a collection of spatial wetland data gathered by the U.S. Fish and Wildlife Service (USFWS). This dataset has been developed over 50 years. The NWI data layers are estimates of wetland habitat presence and are not spatially accurate for evaluating small project areas. The NWI layers are valuable for evaluating wetland habitat types across large areas and for identifying areas that may require further ground-truthing. (U.S. Fish and Wildlife Service, 2024)

3.2.1.1 Plant Communities

The Salt River Watershed exhibits a diverse mosaic of plant communities, each playing a unique role in the ecosystem's health and function. The NLCD provides a framework for understanding the distribution of these plant communities. Table 3-8 shows the NLCD cover types for the Salt River Watershed, and Figure 3-39 maps these cover types across the watershed. The majority of the watershed is evergreen forest, cultivated crops/pasture/hayland, shrub/scrub, and emergent wetlands associated with the riparian corridor along the Salt River.

Table 3-8. National Land Cover Database for Salt River Watershed.

Classification	Description
Open Water	Lakes, ponds, reservoirs, streams, rivers.
Perennial Snow/Ice	A high-elevation area of snow and ice which acts as an integral part of the watershed's water supply and timing.
Developed Open Space	Includes parks, golf courses, and other areas with managed vegetation in urban or suburban settings.
Developed Low Intensity	Areas with a mix of constructed materials and vegetation, with low levels of human activity.
Developed Medium Intensity	Areas with more concentrated development, with moderate levels of human activity.
Developed High Intensity	Densely built-up areas with high levels of human activity and limited vegetation cover.
Barren Land	Areas with limited vegetation cover due to natural conditions (e.g., exposed rock, eroded soils) or human disturbance (e.g., mining, construction).
Deciduous Forest	Primarily found at lower elevations and along riparian corridors, characterized by trees that shed their leaves seasonally, offering diverse habitat and contributing to nutrient cycling.
Evergreen Forest	Dominated by coniferous trees, typically found at higher elevations, providing crucial habitat for wildlife, regulating snowmelt, and protecting water quality.
Mixed Forest	A combination of evergreen and deciduous trees creates transitional habitats with a mix of characteristics from both forest types.
Shrub/Scrub	A widespread community dominated by shrubs and low-growing vegetation, including sagebrush steppe, which provides critical habitat for sage grouse and other shrub-dependent species.
Grassland/Herbaceous	Open areas dominated by grasses and forbs, providing important forage for livestock and wildlife, and contributing to soil stability.
Pasture/Hay	Lands are primarily used for the production of forage crops, influencing soil health, water quality, and wildlife habitat.
Cultivated Crops	Areas dedicated to agricultural production, potentially impacting water quality through fertilizer and pesticide use.
Woody Wetlands	Characterized by trees and shrubs adapted to saturated soil conditions, found along streams and in low-lying areas, providing important habitat for waterfowl, amphibians, and other wetland-dependent species.
Emergent Herbaceous Wetlands	Dominated by grasses and other herbaceous vegetation adapted to saturated soil conditions, providing important habitat and water filtration services.

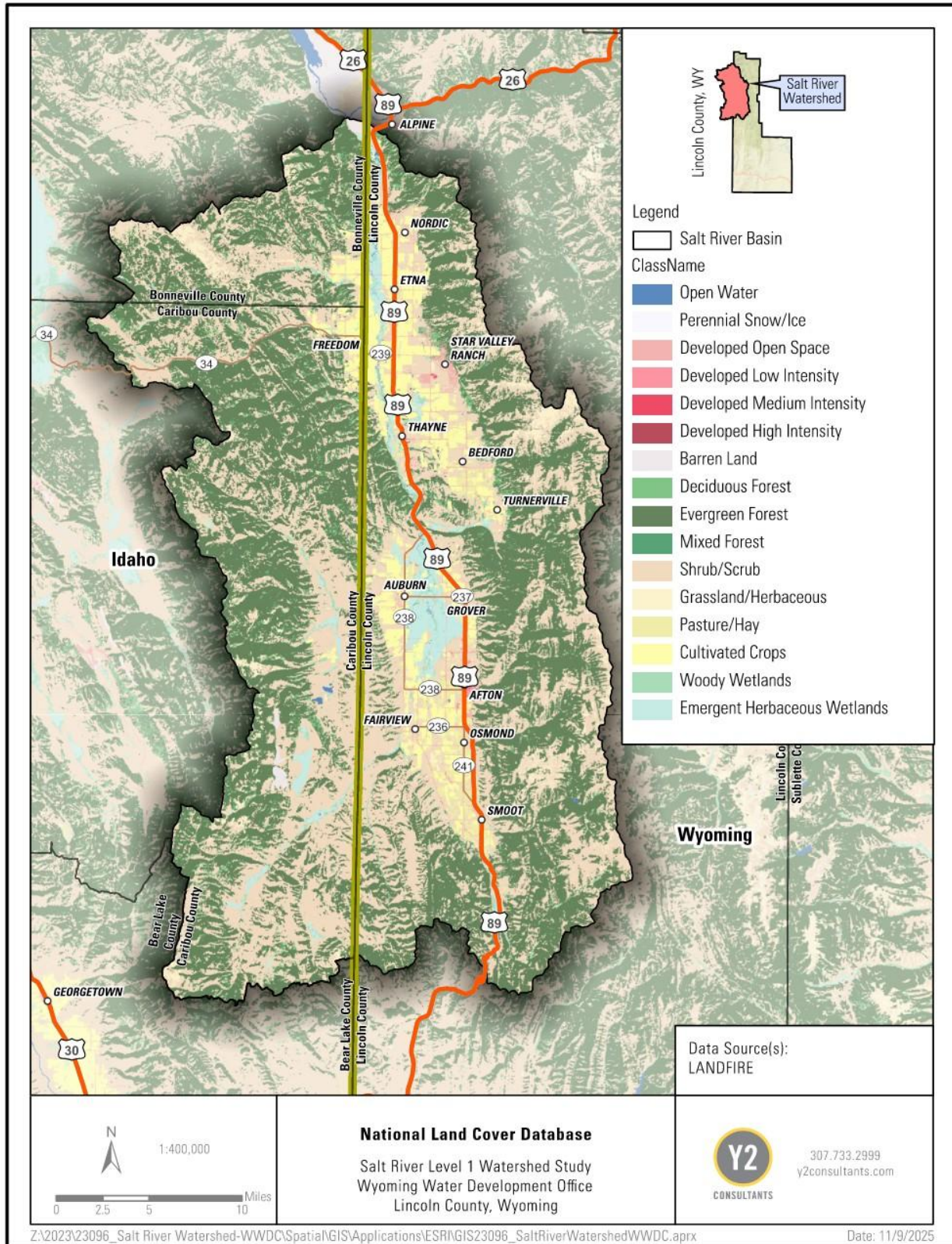


Figure 3-39. Land cover for the Salt River Watershed using NLCD.

To further define and characterize land cover within the Salt River Watershed, vegetative communities were analyzed using data from the Landscape Fire and Resource Management Planning Tools (LANDFIRE) project. LANDFIRE, a comprehensive source of geospatial data describing vegetation, fuel, and fire regimes across the U.S., provides valuable insights into the distribution and composition of plant communities. By incorporating LANDFIRE data, this assessment gains a more detailed understanding of existing vegetation types, their spatial extent, and their relationships with other environmental factors. Figure 3-40 maps LANDFIRE-derived land cover types across the watershed, providing a visual representation of the dominant vegetation patterns and their distribution across the landscape. This mapping effort can be used in future analyses to prioritize areas for focused restoration work and to provide insight into the watershed’s ecological functioning.

3.2.1.2 Riparian Areas

The LANDFIRE dataset provides limited delineation of riparian areas, offering some insight into the distribution of vegetation adjacent to streams and water bodies. However, due to the coarse resolution of the LANDFIRE data, riparian communities are not effectively represented graphically at the watershed scale. As a result, rather than displaying a map, the dominant riparian vegetation communities identified in the LANDFIRE dataset are summarized in Table 3-9.

Table 3-9. LANDFIRE Riparian/Wetland Classifications.

Existing Vegetation Types	Physiognomy
Forest-dominated riparian	Riparian
Grass-dominated riparian	Riparian
Grass-dominated wetland	Wetland
Shrub-dominated riparian	Riparian

3.2.1.3 Wetland Areas

The USFWS National Wetland Inventory (NWI) is a mapped dataset of wetland areas based on imagery analysis. This dataset maps and describes projected wetland habitat types across the United States, providing an approximate representation of riparian and wetland resources at each site. According to the NWI [Status Mapper](#), most of Star Valley and the associated lowlands of the Salt River were updated in 2025, while the Salt River Range and a portion of the watershed along the Wyoming border were mapped in the 1980s. The NWI data portrayed here does not differentiate between irrigation, natural, and wetland areas, and has not been ground-truthed. (U.S. Fish and Wildlife Service, 2024, 2025b)

The NWI-mapped wetland areas within the Salt River Watershed are concentrated along the Salt River and its tributaries and floodplains (Figure 3-41). There are two additional congregated wetland areas in the valley, located northeast of Thayne and along Willow Creek between Turnerville and the Salt River. There are sporadic wetland areas throughout the mountain range associated with the spring and creek systems in the headwaters.

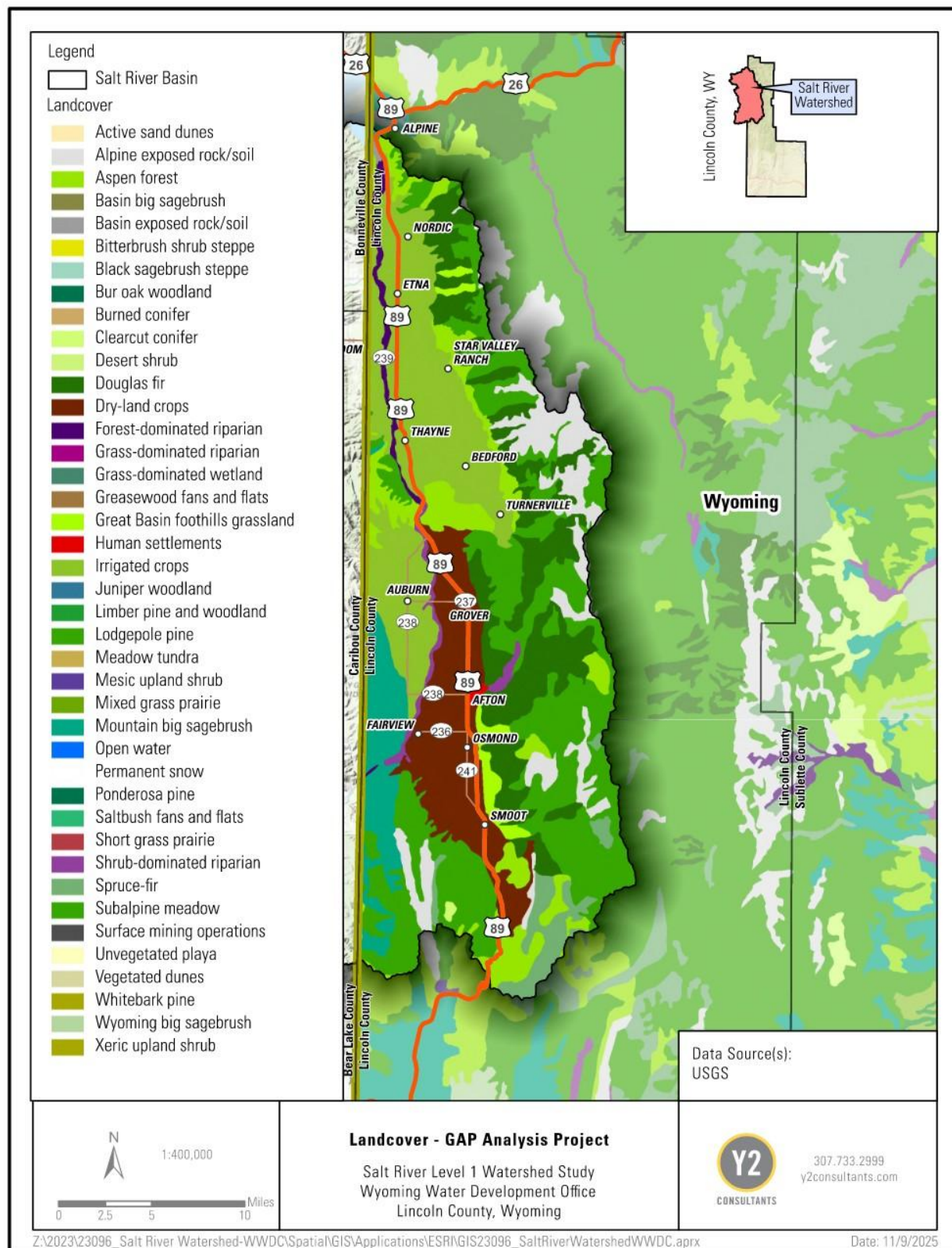


Figure 3-40. Land cover for the Salt River Watershed using GAP Analysis data.

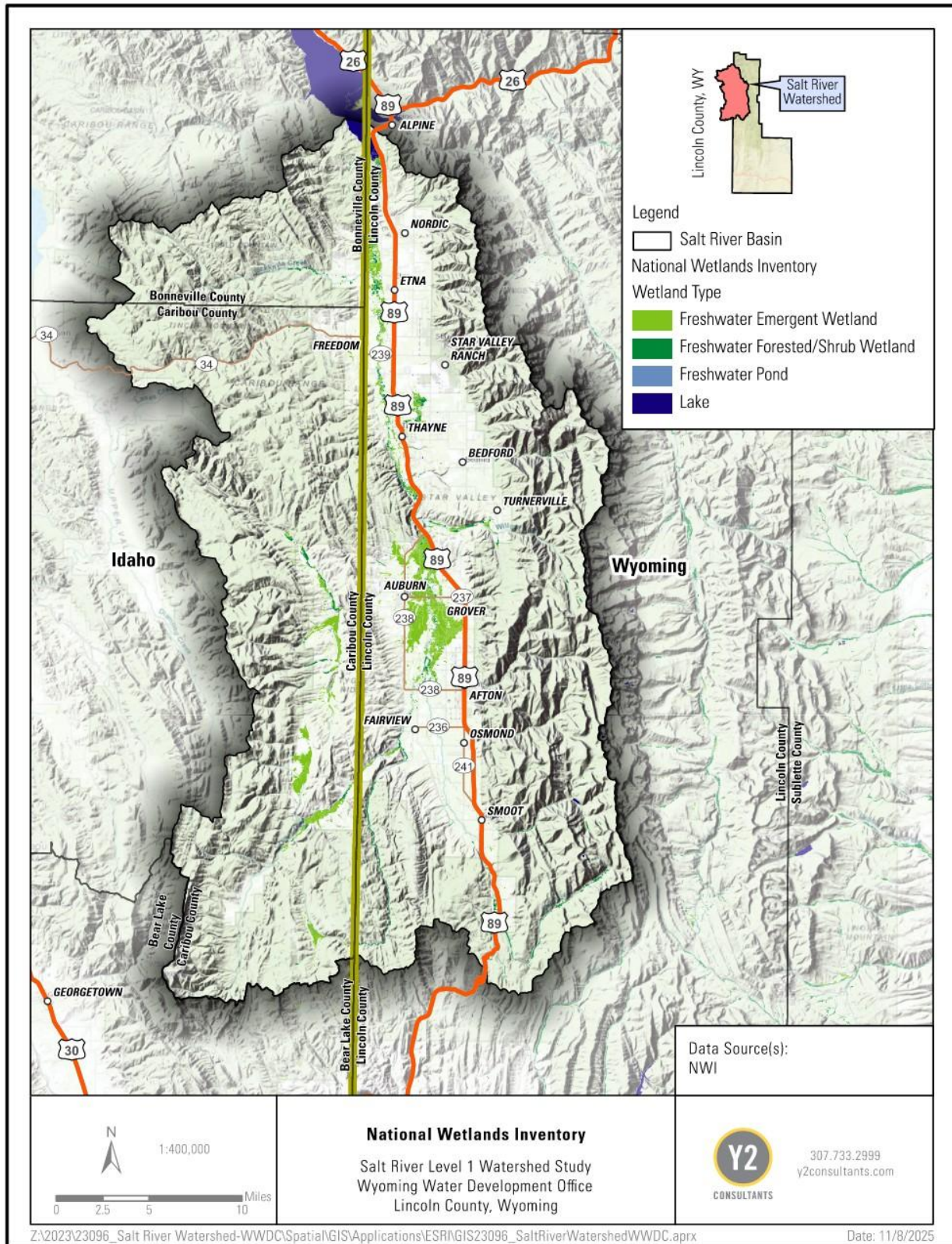


Figure 3-41. Wetlands mapped within the Salt River Watershed using the NWI dataset.

3.2.1.4 Weeds and Invasive Plant Species

Noxious weed and invasive plant management is crucial within the context of watershed management, as many invasive species have detrimental impacts on landscapes and, in turn, affect watershed hydrologic function. Weed monitoring and management are also critical following any disturbance or restoration work in a stream or wetland system. For the Salt River Watershed, the Wyoming Weed Pest Council and the Lincoln County Weed and Pest (LCWP) are the primary entities responsible for weed management. The U.S. Forest Service's Bridger-Teton National Forest (BTNF) has a published National Noxious Weed Policy under Region 4 of the USFS, which applies to Forest Service lands within the watershed. For additional information on USFS [exotic and invasive species](#) management, refer to their website.

The Wyoming state-designated weed list includes (Wyoming Weed & Pest Council, 2025):

- Field bindweed (*Convolvulus arvensis* L.)
- Canada thistle (*Cirsium arvense* L.)
- Leafy spurge (*Euphorbia esula* L.)
- Perennial sowthistle (*Sonchus arvensis* L.)
- Quackgrass (*Agropyron repens* (L.) Beauv.)
- Hoary cress (whitetop) (*Cardaria draba* and *Cardaria pubescens* (L.) Desv.)
- Perennial pepperweed (giant whitetop) (*Lepidium latifolium* L.)
- Ox-eye daisy (*Chrysanthemum leucanthemum* L.)
- Skeletonleaf bursage (*Franseria discolor* Nutt.)
- Russian knapweed (*Centaurea repens* L.)
- Yellow toadflax (*Linaria vulgaris* L.)
- Dalmatian toadflax (*Linaria dalmatica* (L.) Mill.)
- Scotch thistle (*Onopordum acanthium* L.)
- Musk thistle (*Carduus nutans* L.)
- Common burdock (*Arctium minus* (Hill) Bernh.)
- Plumeless thistle (*Carduus acanthoides* L.)
- Dyers woad (*Isatis tinctoria* L.)
- Houndstongue (*Cynoglossum officinale* L.)
- Spotted knapweed (*Centaurea maculosa* Lam.)
- Diffuse knapweed (*Centaurea diffusa* Lam.)
- Purple loosestrife (*Lythrum salicaria* L.)
- Saltcedar (*Tamarix* spp.)
- Common St. Johnswort (*Hypericum perforatum*)
- Common Tansy (*Tanacetum vulgare*)
- Russian olive (*Elaeagnus angustifolia*)
- Black Henbane (*Hyoscyamus niger* L.)
- Common Mullein (*Verbascum thapsus* L.)
- Yellow starthistle (*Centaurea solstitialis* L.)
- Ventenata (*Ventenata dubia* (Leers) Coss.)
- Medusahead rye (*Taeniatherum caput-medusae* (L.) Nevski)
- Palmer amaranth (*Amaranthus palmeri*)

Lincoln County recognizes the following species as declared weeds and pests within the County (Lincoln County et al., 2021):

- Alfalfa weevil (*Hypera postica*)
- Bull thistle (*Cirsium vulgare*)
- Mosquito (*Culicidae* spp.)
- Plains pocket gopher (*Geomys bursarius*)
- Poison hemlock (*Conium maculatum*)
- Poplar borer (*Saperda calcarata*)
- Western waterhemlock (*Cicuta douglasii*)
- Wild oat (*Avena fatua*)

3.2.2 Fish and Wildlife

The Salt River Watershed acts as an important habitat for many wildlife and fishery populations. A variety of data sources were referenced to gather information on wildlife within the watershed, including the Wyoming Game and Fish Department (WGFD) State Wildlife Action Plan (SWAP), USFWS Information, Planning, and Consulting System online database, Wyoming Natural Diversity Database (WYNDD), and other sources from the USFS and the BLM.

3.2.2.1 Fisheries

The Salt River Watershed provides critical fishery habitat and resources for a diversity of species. The WGFD manages fisheries for the Salt River Watershed. The WGFD classifies trout streams into four separate designations: (Wyoming Game & Fish Department, n.d.-a)

- Blue Ribbon (national importance) -> 600 pounds per mile
- Red Ribbon (statewide importance) – 300 to 600 pounds per mile
- Yellow Ribbon (regional importance) – 50 to 300 pounds per mile
- Green Ribbon (local importance) - <50 pounds per mile
- Orange Ribbon - any cool or warm water game fish presence
- Clear (black) - no trout are present

The lower Salt River is classified as a Blue Ribbon river from near Fairview north to the Palisades Reservoir. There are eight Yellow Ribbon streams within the Salt River Watershed, including Flat Creek, Christensen Spring, Big Spring, Cranney Creek, Burton Spring, Crow Creek, Spring Creek, and Cottonwood Creek. Many of the other creeks throughout the watershed are classified as Green Ribbon, including the upper Salt River from Fairview to its headwaters at Mount Wagner. Figure 3-42 shows these stream designations.

Per the WGFD Snake/Salt River Basin Aquatic Basins Report, there are twenty-three fish species within the basin, four of which are categorized as Species of Greatest Conservation Concern (SGCN) (Table 3-10).

Table 3-10. Fishes present in the Snake/Salt River basin. Species of Greatest Conservation Need (SGCN) are followed by an asterisk (*). Species confirmed within Lincoln County are italicized. (Lincoln County et al., 2021; Wyoming Game & Fish Department, 2017a)

Native game	Native nongame	Nonnative game	Nonnative nongame
Mountain Whitefish <i>Snake River Cutthroat Trout*</i> <i>Yellowstone Cutthroat Trout*</i>	Bluehead Sucker* Longnose Dace Mottled Sculpin Mountain Sucker Northern Leatherside Chub* Paiute Sculpin Redside Shiner Speckled Dace Utah Chub Utah Sucker	Bear River Cutthroat Trout <i>Brook Trout</i> <i>Brown Trout</i> Golden Trout Grayling <i>Kokanee Salmon</i> <i>Lake Trout</i> <i>Rainbow Trout</i>	Fathead Minnow White Sucker

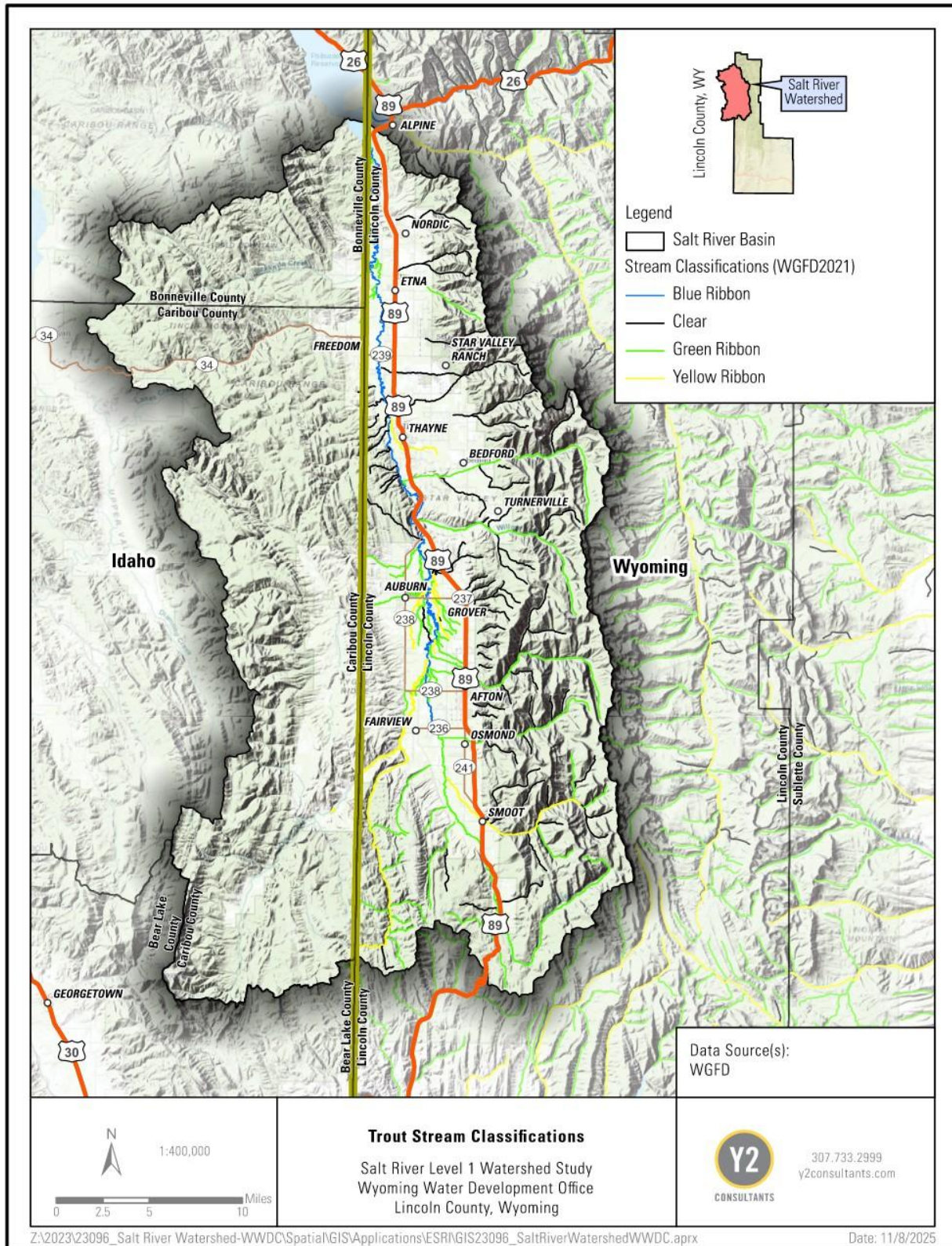


Figure 3-42. Salt River Watershed: Trout Stream Classification.

3.2.2.1.1 Aquatic Invasive Species (AIS)

The WGFD manages aquatic invasive species (AIS) within the state of Wyoming. The Aquatic Nuisance Species (ANS) Task Force of the USFWS also supports state invasive management planning and collaboration. More information on ANS can be found on the Wyoming Game & Fish Department's [website](#) (Wyoming Game & Fish Department, 2025b).

Many AIS introduced into the western U.S. pose a significant hazard to ecosystems and water infrastructure, and there are few, if any, effective treatment options for many of them. According to the Wyoming Aquatic Invasive Species Management Plan (2010), WGFD prioritizes preventing invasions and early identification and eradication of new populations based on priority categories. This is primarily achieved through mandatory watercraft inspections from March 1st through November 30th, and year-round if the craft has been in waters known to be inhabited by zebra/quagga mussels. There are two AIS inspection locations associated with the watershed: the Salt Pass Check Station on US 89 near the watershed's southern border and the Alpine US 89 Port of Entry. (Wyoming Game & Fish Department, n.d.-d, 2025a)

The listed AIS for the western United States are below in Table 3-11 (Wyoming Game & Fish Department, 2025b):

Table 3-11. Aquatic invasive species listed for the western U.S.

Aquatic Invasive Species	Presence/Management Information
Zebra/Quagga mussels (<i>Dreissena polymorpha</i> / <i>rostriformis bugensis</i>)	Not present in Wyoming. Widespread in the U.S. and present in all neighboring states except Montana. This species is of high concern because it is challenging to manage and wreaks havoc on native ecosystems.
New Zealand mudsnail (<i>Potamopyrgus antipodarum</i>)	Present in scattered locations throughout Wyoming. They are present in the Salt River. This species can outcompete native snails and change water chemistry at high densities.
Invasive/Asian carp	Widespread in the eastern U.S., they are not present in Wyoming.
Rusty crayfish (<i>Faxonius rusticus</i>)	Populations have been discovered in the North Platte River on multiple occasions. They are present in a few locations across Wyoming. They are not currently present within the Salt River Watershed.
Aquatic Plants	Hydrilla (<i>Hydrilla</i> spp. Rich.), Eurasian watermilfoil (<i>Myriophyllum spicatum</i> L.), and curly pondweed (<i>Potamogeton crispus</i> L.) are the primary invaders in the western U.S. and are present in Wyoming. There are no confirmed sightings in the Salt River Watershed. Invasive aquatic plants reduce native diversity and impact water uses at high densities.
Corbicula / Asian clams (<i>Corbicula fluminea</i>)	Present in eastern Wyoming. This species often disrupts water infrastructure piping.
Brook stickleback (<i>Culaea inconstans</i>)	It is present across several drainages in Wyoming, though it is not currently present within the watershed. This fish is commonly introduced through baitfish and aquaculture. The brook stickleback has negative impacts on native systems.
Snakehead (<i>Channidae</i> family)	The snakehead is not currently present in Wyoming. This species is a highly adaptable, predatory, air-breathing fish. They are challenging to manage.

As of the writing of this report, only the New Zealand mudsnail has been recorded within the watershed. This invasive has been identified in multiple locations along the Salt River. The New Zealand mudsnail is often spread by birds, fish, and on human fishing gear. It is advised to clean and dry equipment and not relocate plants, animals, or water from a location with confirmed invasive presence to another site. (Wyoming Game & Fish Department, n.d.-d).

3.2.2.2 Wildlife

3.2.2.2.1 Big Game

3.2.2.2.1.1 Elk

Elk (*Cervus canadensis*) are a prominent species within the Salt River Watershed, with the majority of the area serving as crucial spring, summer, and fall habitat. Key winter range, year-round habitat, and crucial winter habitat are also present, supporting elk populations year-round. Multiple elk migration corridors traverse the watershed, linking seasonal habitats and facilitating movement between summer and winter ranges.

The northern edge of the watershed, near the Town of Alpine, is home to the Greys River elk feedground. These feedgrounds serve as high-density use areas during the winter months, addressing herd management challenges associated with the loss of winter range and mitigating human-wildlife conflict. However, the increased ungulate density in these areas can influence surrounding ecosystems, alter water resource use patterns, and create specific management considerations. For detailed information on feedground

management practices and concerns, refer to the Wyoming Elk Feedgrounds Management Plan published by the Wyoming Game and Fish Department in 2024 (Wyoming Game & Fish Department, 2024). The distribution of seasonal elk habitat, migration corridors, and parturition areas within the Salt River Watershed is depicted in Figure 3-43.

3.2.2.2.1.2 Moose

Figure 3-44 illustrates the spatial distribution of essential moose (*Alces alces*) habitat across the Salt River Watershed. This map reveals that the majority of the area provides valuable spring, summer, and fall range, supporting moose during periods of active growth and reproduction. Significantly, critical year-round and winter habitats are concentrated along the Salt River valley floor, highlighting the importance of these lower-elevation riparian areas for moose survival during harsh winter conditions. This spatial understanding underscores the need for targeted management strategies that protect these critical habitats and ensure the long-term health of moose populations within the watershed. (Wyoming Wildlife Federation, 2018)

3.2.2.2.1.3 Mule Deer

Mule deer (*Odocoileus hemionus*) are widely distributed throughout the Salt River Watershed, with seasonal habitats spanning the entire area. Spring, summer, and fall ranges encompass the majority of the watershed, while critical winter and year-round habitat areas are primarily located along the Salt River valley. Though no officially designated state migration corridors exist within the watershed, documented migration routes connect seasonal ranges and facilitate the deer's annual movements. The distribution of seasonal habitat, migration routes, and parturition areas for mule deer within the Salt River Watershed is displayed in Figure 3-45. (Wyoming Wildlife Federation, 2018)

3.2.2.2.2 Greater Sage-Grouse

The 2019 [Wyoming Sage-Grouse Executive Order](#) is the State of Wyoming's primary regulatory mechanism to protect Greater sage-grouse and its habitat. The order outlines procedures to minimize disturbance and incentivize development outside designated core population areas. (State of Wyoming, 2019)

There are currently no designated sage-grouse core areas within the Salt River Watershed.

3.2.2.2.3 Nongame Birds and Mammals

The WGFD manages over 80 nongame mammal species, 470 nongame bird species, and 40 reptile and amphibian species across the State (Wyoming Game and Fish Department, n.d.-b). The Salt River Watershed supports a diversity of wildlife outside of game species. The area's diverse mix of streams, wetlands, forests, sagebrush, and agricultural land provides important habitat for many songbirds, raptors, waterfowl, small mammals, and bats. These nongame wildlife play an important role by:

- Supporting natural pest control and pollination
- Sustaining predators and scavengers in the food web
- Maintaining healthy forest, meadow, and wetland systems
- Contributing to the scenic, recreational, and ecological value of the watershed

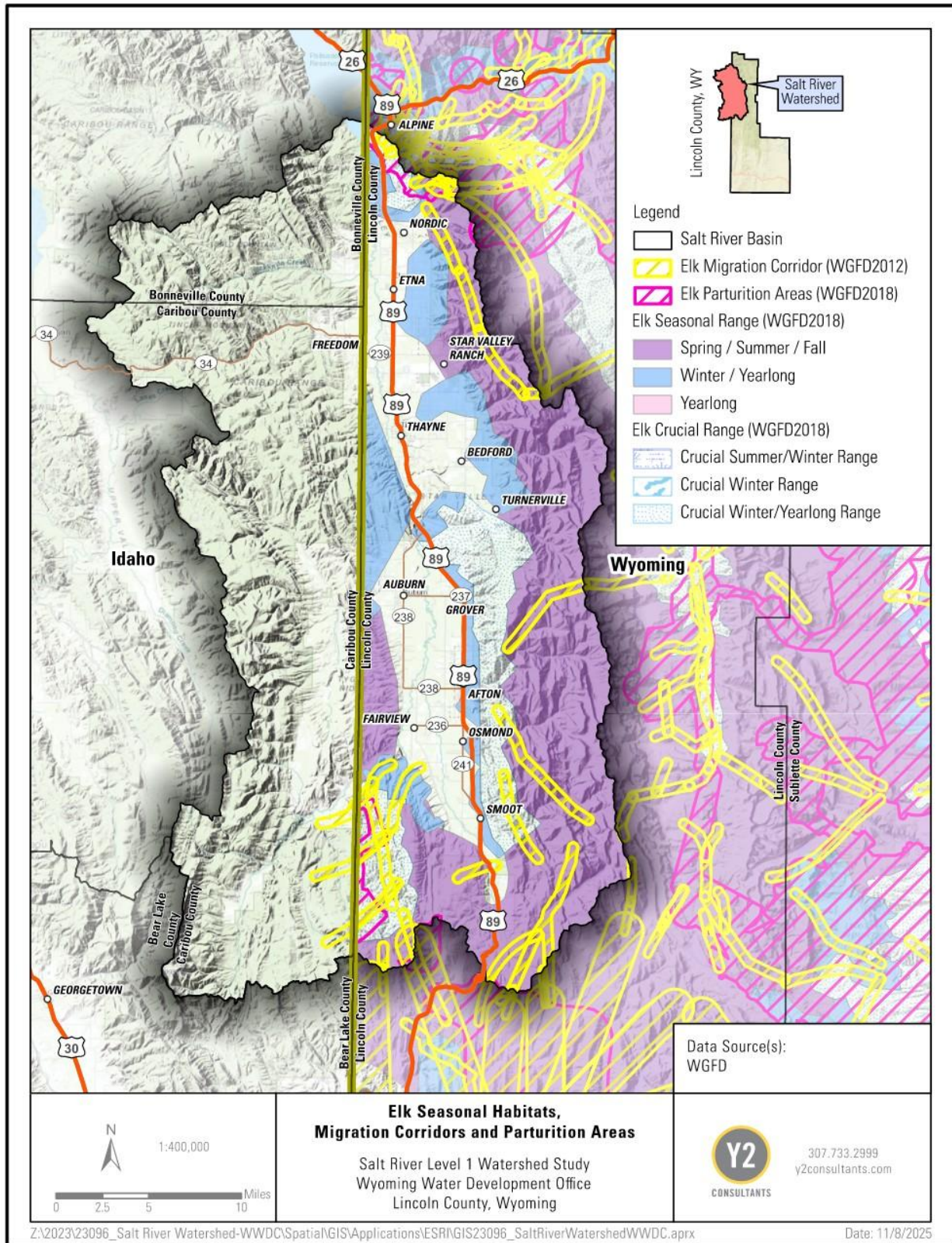


Figure 3-43. Elk seasonal habitats, migration corridors, and parturition areas in the Salt River Watershed.

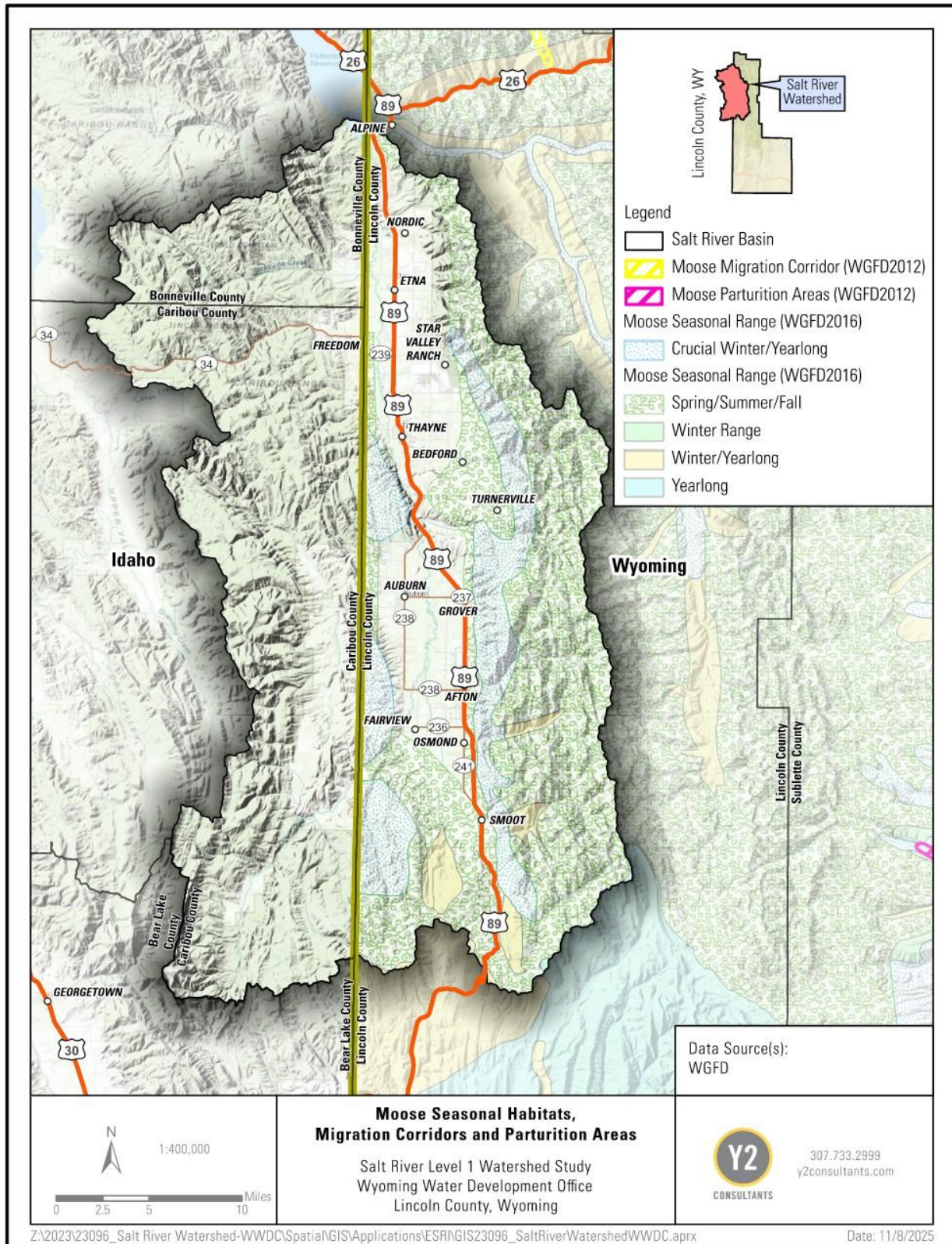


Figure 3-44. Moose seasonal habitat, migration corridors, and parturition areas in the Salt River Watershed.

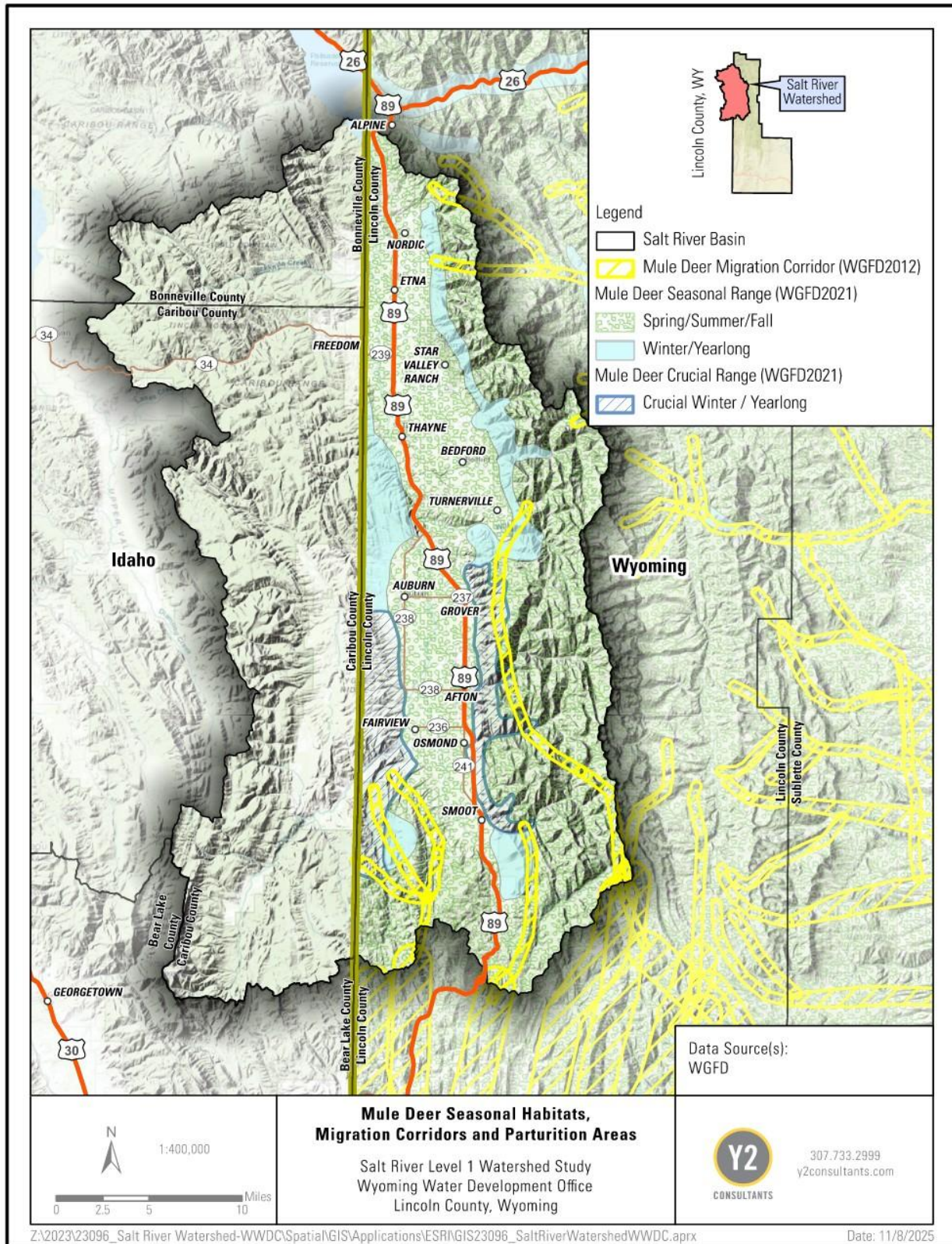


Figure 3-45. Mule deer seasonal habitat, migration corridors, and parturition areas in the Salt River Watershed.

3.2.2.3 Federally Listed Species

According to the USFWS Information for Planning and Consultation (IPAC) database, the Salt River Watershed is home to ten federally listed threatened or endangered species and two proposed threatened or endangered species.

3.2.2.3.1 Fish

There are four fish listed as threatened or endangered by the USFWS that are identified through IPAC for potential impact from the surrounding region of the watershed:

- Bonytail (*Gilia elegans*)
- Colorado Pikeminnow (*Ptychocheilus lucius*)
- Humpback Chub (*Gila cypha*)
- Razorback Sucker (*Xyrauchen texanus*).

All four of these species, along with their designated critical habitats, are impacted by water depletions in the Upper Colorado River Basin. IPaC lists that water depletions must be considered even outside of these species' occupied range. The Upper Colorado River Basin lies east of the Salt River Watershed, and the watershed does not contribute to it. Therefore, any depletions within the watershed would not impact the Upper Colorado River Basin. (U.S. Fish and Wildlife Service, n.d.-b)

3.2.2.3.2 Mammals

There are three mammals listed as threatened by the USFWS that are identified for the watershed: (U.S. Fish and Wildlife Service, n.d.-b)

- Canada Lynx (*Lynx canadensis*)
- Grizzly Bear (*Ursus arctos horribilis*)
- North American Wolverine (*Gulo gulo luscus*).

Critical habitats within the watershed boundary have been mapped for the Canada Lynx (Figure 3-46). Critical habitat is mapped along the eastern boundary and within the southern section of the watershed. (U.S. Fish and Wildlife Service, n.d.-b)

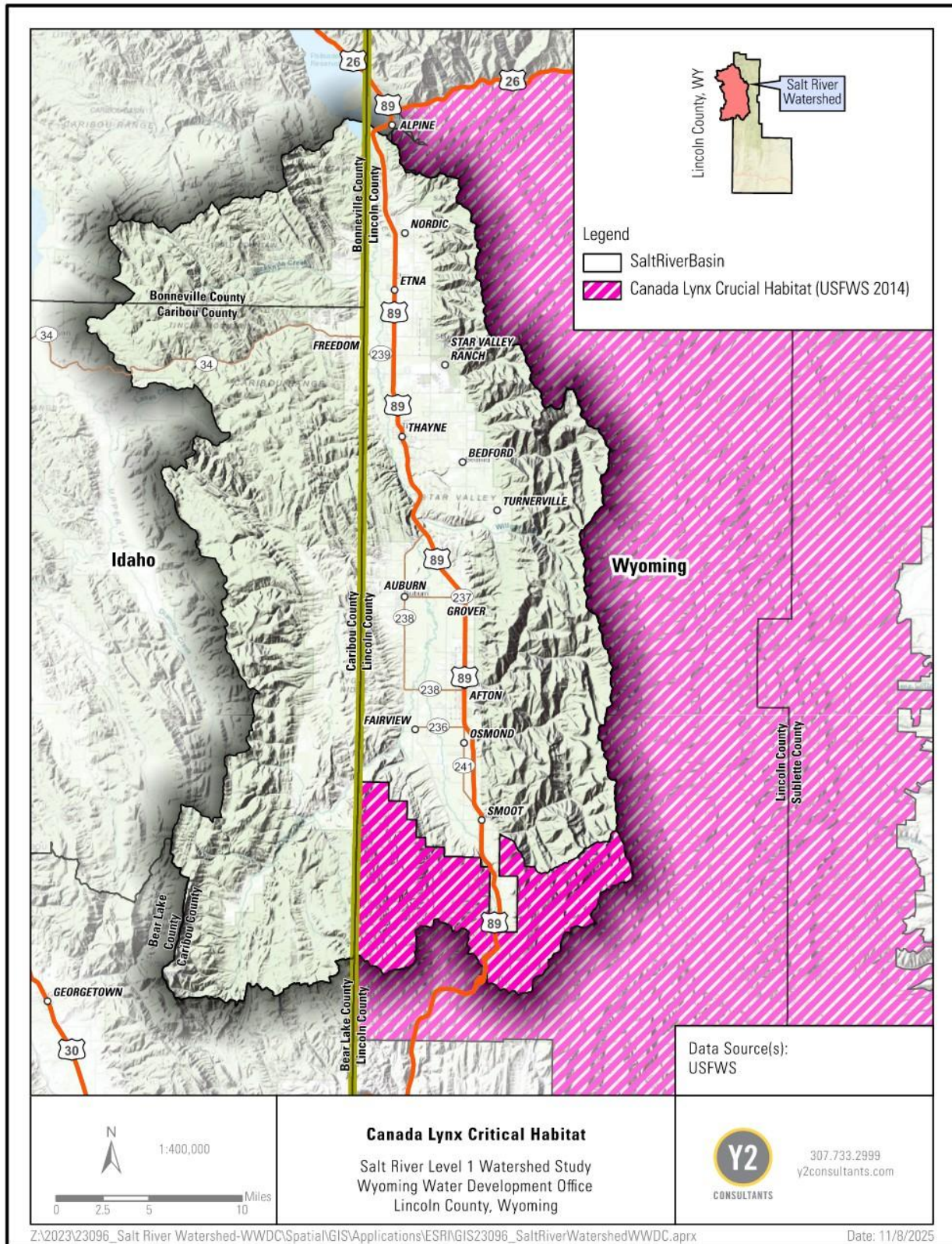


Figure 3-46. Critical Canada lynx habitat mapped within the Salt River Watershed.

3.2.2.3.3 Birds

There is one bird species listed as threatened by the USFWS identified for the watershed:(U.S. Fish and Wildlife Service, n.d.-b)

- Yellow-billed Cuckoo (*Coccyzus americanus*)

Within the watershed boundary, IPaC lists 17 bird species as protected by the Migratory Bird Act. Of these, 15 species are listed as Birds of Conservation Concern (BCC) throughout their range (U.S. Fish and Wildlife Service, n.d.-b). The listed BCC species are included below:

- Bobolink (*Dolichonyx oryzivorus*)
- Broad-tailed Hummingbird (*Selasphorus platycercus*)
- California Gull (*Larus californicus*)
- Calliope Hummingbird (*Selasphorus calliope*)
- Cassin's Finch (*Haemorhous cassinii*)
- Clark's Grebe (*Aechmophorus clarkii*)
- Evening Grosbeak (*Coccothraustes vespertinus*)
- Franklin's Gull (*Leucophaeus pipixcan*)
- Lewis's Woodpecker (*Melanerpes lewis*)
- Long-eared Owl (*Asio otus*)
- Olive-sided Flycatcher (*Contopus cooperi*)
- Rufous Hummingbird (*Selasphorus rufus*)
- Western Grebe (*Aechmophorus occidentalis*)
- Willet (*Tringa semipalmata*)
- Williamson's Sapsucker (*Sphyrapicus thyroideus nataliae*)

3.2.2.3.4 Insects

Two insects listed as proposed threatened by the USFWS are identified for the watershed: (U.S. Fish and Wildlife Service, n.d.-b)

- Monarch Butterfly (*Danaus plexippus*)
- Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)

3.2.2.4 Federally-Listed Plant Species

Two plant species listed as threatened by the USFWS are identified for the watershed: (U.S. Fish and Wildlife Service, n.d.-b)

- Ute Ladies'-tresses (*Spiranthes diluvialis*)
- Whitebark Pine (*Pinus albicaulis*)

Ute Ladies'-tresses (*Spiranthes diluvialis*) was initially listed in 1992. This species occupies wetland habitats, including perennial stream terraces, floodplains, oxbows, seasonally flooded river terraces, sub-irrigated or spring-fed stream channels and valleys, and lakeshores at various elevations. Ute Ladies'-tresses have been found along irrigation canals, berms, and meadows. (U.S. Fish and Wildlife Service, n.d.-d) There have been no known sightings of Ute Ladies'-tresses within the watershed. There have been specimens identified in Bonneville County, Idaho, which borders the watershed.

Whitebark Pine (*Pinus albicaulis*) was listed as threatened in January of 2023. Whitebark pine is considered a keystone species in the western United States. According to the USFWS IPaC species profile, this species is an early successional pioneer at higher elevations. The whitebark pine is a slow-growing, long-lived tree that can live up to 500-1,000 years. The whitebark pine range is mapped along the eastern portion of the watershed within the Bridger National Forest. (U.S. Fish and Wildlife Service, n.d.-e)

3.2.2.5 Sensitive Plant Species

3.2.2.5.1 State Sensitive Plant Species

The WYNDD has identified 42 plant species as sensitive within the watershed (Table 3-12). Of these, 16 are classified as critically imperiled in Wyoming, indicated by a State Rank of S1 in Table 3-12. Additionally, the USFS designates five species as sensitive, and the BLM classifies eight as sensitive. (Wyoming Natural Diversity Database & University of Wyoming, n.d.)

Table 3-12. WYNDD listed sensitive plant species with known or suspected occurrence within the Salt River Watershed. (Wyoming Species List, n.d.)

Scientific Name	Common Name	Global Rank	State Rank	USFS Sensitive	BLM Sensitive
<i>Achnatherum swallenii</i>	Swallen's needlegrass	G3G4	S2S3		
<i>Antennaria aromatica</i>	scented pussytoes	G4	S3		
<i>Arceuthobium douglasii</i>	Douglas-fir dwarf mistletoe	G5	SH		
<i>Astragalus drabelliformis</i>	Big Piney milkvetch	G3	S4		
<i>Astragalus lentiginosus var. salinus</i>	salty loco milkvetch	G5T5	S1		
<i>Astragalus paysonii</i>	Payson's milkvetch	G3	S2	R4	
<i>Astragalus racemosus var. treleasei</i>	Trelease's milkvetch	G5T3	S2		Sensitive
<i>Astragalus shultziorum</i>	Shultz's milkvetch	G3Q	S3		
<i>Botrychium simplex</i>	little grapefern	G5	S2	R4	
<i>Carex infirmivervia</i>	weak-nerved sedge	G5	S2		
<i>Ceanothus martinii</i>	Martin's ceanothus	G4	S1		
<i>Cirsium barnebyi</i>	Barneby's thistle	G3G4	S1		
<i>Cuscuta occidentalis</i>	Western dodder	G5	S1		
<i>Draba borealis</i>	boreal draba	G5?	S2		
<i>Draba fladnizensis</i>	Austrian draba	G5	S2		
<i>Draba globosa</i>	beavertip draba	G3	S3	R4	
<i>Draba paysonii</i>	Payson's draba	G5	S2S3		
<i>Ericameria winwardii</i>	Winward's goldenweed	G1	S1		Sensitive
<i>Eriogonum divaricatum</i>	divergent buckwheat	G4G5	S1		
<i>Ipomopsis congesta ssp. crebrifolia</i>	ballhead ipomopsis	G5T4	S3		
<i>Ipomopsis tenuituba</i>	slendertube skyrocket	G4G5	S1		
<i>Ipomopsis tenuituba ssp. tenuituba</i>	slendertube skyrocket	G4G5TNR	S1		
<i>Lepidium integrifolium</i>	thickleaf pepperweed	G2?	S1		Sensitive
<i>Leymus simplex var. simplex</i>	alkali wildrye	G3T2	S2		
<i>Lomatium andrusianum</i>	Andrus' desert-parsley	G2	S1		
<i>Monardella odoratissima var. glauca</i>	pale monardella	G3G5T3T5	S1		
<i>Oreocarya rollinsii</i>	No Common Name Available	G3	S1		
<i>Penstemon paysoniorum</i>	Payson's beardtongue	G3	S3		
<i>Phacelia glandulosa var. deserta</i>	desert glandular phacelia	G4T3	S2		
<i>Phacelia salina</i>	Bitter Creek phacelia	G3?Q	S2		

Scientific Name	Common Name	Global Rank	State Rank	USFS Sensitive	BLM Sensitive
<i>Phlox albomarginata</i>	whitemargin phlox	G4	S1		
<i>Phlox opalensis</i>	Opal phlox	G3G4	S3		
<i>Phlox pungens</i>	Beaver Rim phlox	G3	S3		Sensitive
<i>Physaria carinata ssp. paysonii</i>	Payson's bladderpod	G3G4T3	S3	R4	
<i>Physaria condensata</i>	tufted twinpod	G2G3	S3		Sensitive
<i>Physaria dornii</i>	Dorn's twinpod	G2G3	S2		Sensitive
<i>Physaria macrocarpa</i>	large-fruited bladderpod	G2	S2		Sensitive
<i>Physaria multiceps</i>	western bladderpod	G3	S1		
<i>Physaria prostrata</i>	prostrate bladderpod	G2G3	S2		Sensitive
<i>Silene douglasii</i>	Douglas's catchfly	G5	S1		
<i>Silene douglasii var. douglasii</i>	Douglas's catchfly	G5T5	S1		
<i>Triteleia grandiflora</i>	largeflower triteleia	G4G5	S2	R2	

G = Global rank: range-wide probability of extinction assigned by NatureServe (1 = critically imperiled, 2 = imperiled, 3 = vulnerable, 4 = apparently secure, 5 = secure)

S = State rank: range-wide probability of extinction assigned by WYNDD (1 = critically imperiled, 2 = imperiled, 3 = vulnerable, 4 = apparently secure, 5 = secure)

T = Trinomial rank: refers to the range-wide probability of extinction for a subspecies or variety

Rank modifiers: H = possibly extinct or extirpated, Q = questions exist regarding taxonomic validity of species or subspecies, NR = not ranked, U = unrankable, X = presumed extirpated, ? = questions exist regarding the assigned numerical score.

USFS: R2 = region 2, R4 = region 4=

3.2.2.6 State Listed Species

The WGFD SWAP identifies SGCN to highlight species that require conservation and management efforts within the state. In the Salt River Watershed, there are five amphibians, 67 birds, 32 mammals, nine reptiles, seven fish, and 24 branchiopoda, gastropoda, and malacostraca designated as SGCN (Appendix B: SGCN Wildlife and Plants - Table 0-1). The BLM also tracks sensitive species, with 34 known or likely present in the study area. Additionally, the USFS maintains a regional list of sensitive species, with 51 species listed in Regions 2 and 4 that are known or suspected to occur in the Salt River Watershed. (Wyoming Natural Diversity Database & University of Wyoming, n.d.)

3.2.2.7 State and Federal Important Habitats

In the 2017 Wyoming SWAP, WGFD identified most of the Snake/Salt basin as having a high conservation value for SGCN. The Lower Salt River Watershed and the Middle Salt River Watershed are listed as Aquatic Wildlife Conservation Areas, and the full length of the Salt River is a Crucial Stream Corridor. Threats to these areas include altered flow regimes resulting from water development, drought, and climate change, as well as the introduction of invasive species. Altered flow regimes have reduced flow access to the floodplain for the Salt River and associated tributaries. Residential development within the Salt River Valley has also influenced groundwater levels. Additionally, nonnative trout species, such

as the rainbow trout, pose a risk to the Yellowstone and Snake River cutthroat trout populations through hybridization, predation, and competition. (Wyoming Game & Fish Department, n.d.-b, 2020)

3.2.2.7.1 Wyoming Game and Fish Department Habitat Priority Areas

The WGFD delineates priority habitat within the agency's jurisdictional areas to meet management goals. These Habitat Priority Areas are designated as Crucial, Restoration, or Connectivity. (Wyoming Game & Fish Department, 2020)

3.2.2.7.1.1 *Crucial Habitat Priority Areas*

The WGFD-designated Crucial Habitat Priority Areas are crucial to conserving and maintaining aquatic and terrestrial wildlife populations. These sites include functioning habitats and habitats that should be restored or enhanced, which hold significant biological and ecological values for maintaining game species, important species, SGCN, or vegetation communities.

There are a variety of values used to identify crucial habitats including big game seasonal ranges, Greater sage-grouse core, SGCN presence and diversity, ecological condition of riparian and upland vegetation communities, movement and migration corridors (bottlenecks, routes, stopovers, high use areas) of aquatic and terrestrial species, presence of cutthroat trout populations, watershed hydrologic function, stream flow, connectivity, and physical access by aquatic and terrestrial wildlife populations to all habitats necessary to persist. (Wyoming Game & Fish Department, 2020)

3.2.2.7.1.1.1 *Aquatic Crucial Habitat*

The entire length of the Salt River and two Salt River spawning tributary areas are designated as crucial habitat. The watershed areas associated with Crow Creek and Willow Creek are the two sites allocated as crucial Salt River spawning tributaries (Figure 3-47) (Wyoming Game & Fish Department, n.d.-c)

3.2.2.7.1.1.2 *Terrestrial Crucial Habitat*

The crucial range for elk, moose, and mule deer spans the foothills of the Salt River Mountain Range and the eastern portion of Star Valley, as well as a few patches along the watershed's western and northern borders (Figure 3-48) (Wyoming Game & Fish Department, n.d.-c)

3.2.2.7.1.2 *Restoration Habitat Priority Areas*

The WGFD-designated Restoration Habitat Priority Areas are important aquatic and/or terrestrial habitats that can be restored to provide improved ecological value. These sites focus on aspen communities, advanced-stage successional communities, beetle-kill risk coniferous forests, aquatic habitats at risk due to declining water availability and quality, unstable stream systems, stream diversions that entrap fish, shrub communities, and sites at risk from invasive species.

Other important considerations when identifying habitats for restoration include the probability of treatment success, the current status of the wildlife species present, managing the impacts that caused the habitat loss or degradation, providing or improving recreational access to high-quality habitats, and the

opportunity to partner with others to increase the likelihood of successful restoration and long-term management. (Wyoming Game & Fish Department, 2020)

3.2.2.7.1.2.1 Aquatic Restoration Habitat

The entire length of the Salt River and a central area of the watershed are designated as restoration habitat priorities. The watershed area spanning from the Willow Creek confluence with the Salt River to the south of Smoot, where Cedar Creek meets the Salt River, is designated as the Upper Salt River tributaries and floodplain Restoration Habitat Priority Area (Figure 3-47) (Wyoming Game & Fish Department, n.d.-c)

3.2.2.7.1.2.2 Terrestrial Restoration Habitat

Two Terrestrial Restoration Habitat Priority Areas span or are within the Salt River Watershed (Figure 3-48), the Mule Deer Initiative and the Greys River Wildlife Habitat Management Area (WHMA) in the northernmost area of the watershed, south of Alpine. The Greys River WHMA is an elk feedground with restricted access from December 1st to May 1st. The site is primarily forested, with steep, westerly slopes. A variety of wildlife frequent this area, including songbirds, raptors, grouse, mule deer, moose, black bear, deer, and elk. (Wyoming Game & Fish Department, n.d.-c, 2025c)

3.2.2.7.1.3 Connectivity Habitat Priority Areas

The WGFD-designated Connectivity Habitat Priority Areas include officially designated wildlife corridors and identified migration routes. Fish passage areas are included in these areas.

3.2.2.7.1.3.1 Aquatic Connectivity Habitat

There is one Aquatic Connectivity habitat Priority Area located at the northern boundary of the watershed where the Salt River meets the Palisade Reservoir. This area is titled the Grey's Hoback Subbasin Area. (Wyoming Game & Fish Department, n.d.-c)

3.2.2.7.1.3.2 Terrestrial Connectivity Habitat

No mapped Terrestrial Connectivity Habitat Priority Areas span or lie within the Salt River Watershed. (Wyoming Game & Fish Department, n.d.-c)

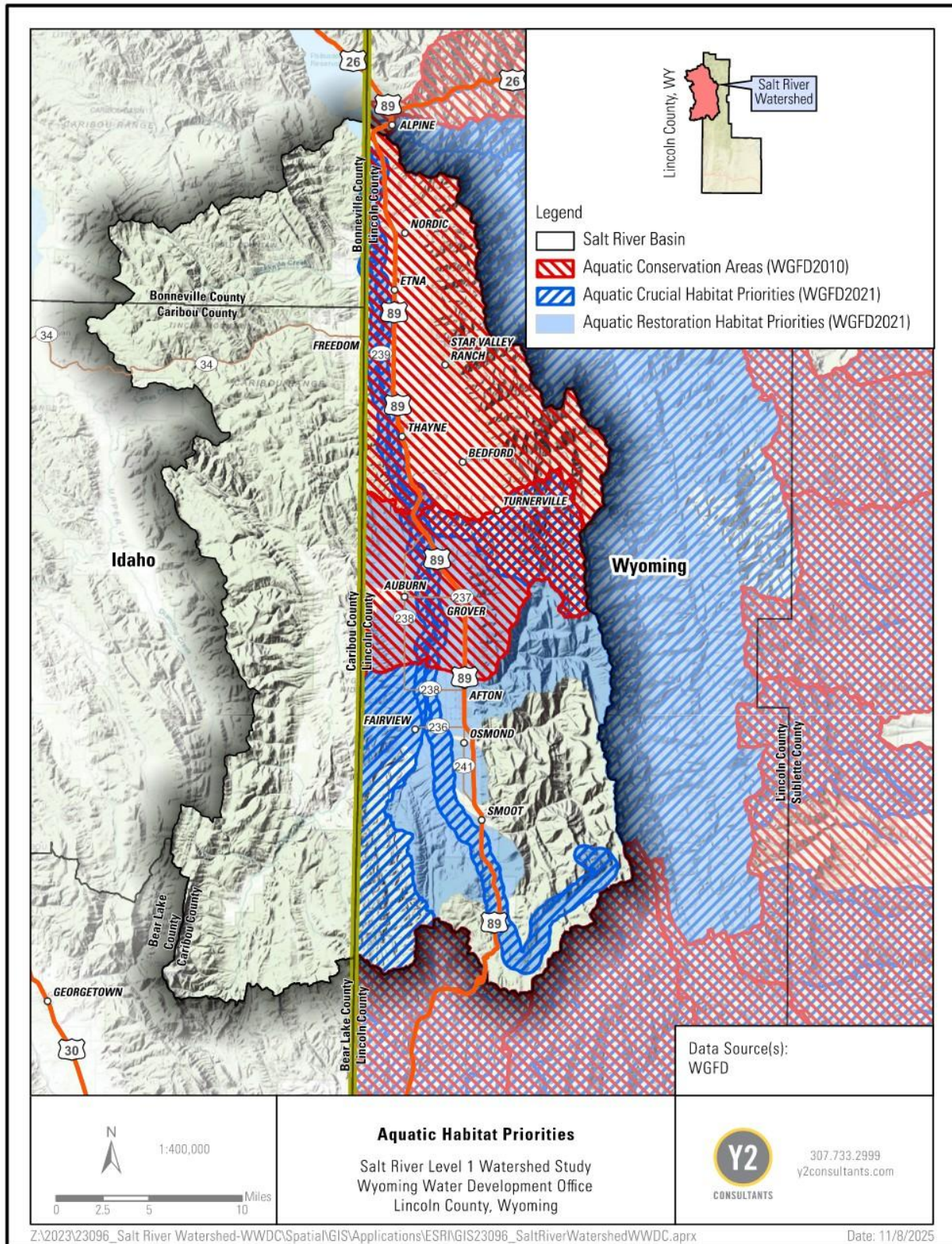


Figure 3-47. Aquatic priority areas identified by the WGFD within the Salt River Watershed.

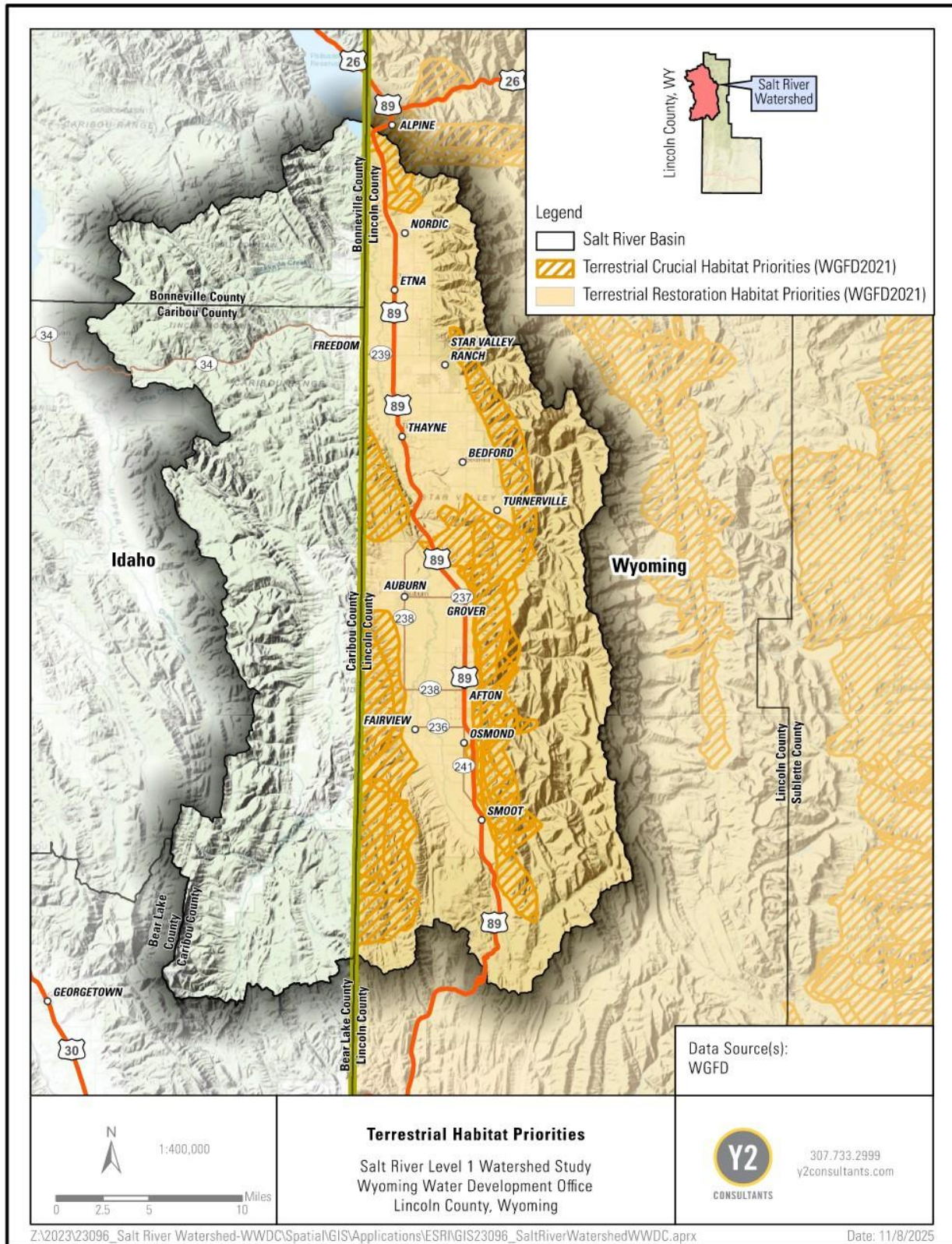


Figure 3-48. Terrestrial priority areas identified by the WGFD within the Salt River Watershed.

3.2.2.7.2 Habitat Restoration Collaborations

3.2.2.7.2.1 Wyoming Game and Fish Department

The WGFD has coordinated several aquatic habitat conservation projects throughout the Snake/Salt Rivers basin. Within the Salt River Watershed, Snake River cutthroat trout habitat conservation on Crow Creek was completed through channel enhancements to improve channel form and pools, spawning habitat, and creek shade cover. (Wyoming Game & Fish Department, 2017b)

3.2.2.7.2.2 Salt River Watershed Group

The Salt River Watershed Group (SRWG) is a collaborative working group that seeks to “maintain and enhance the ecological function and resiliency of the Salt River watershed through collaborative projects, resource management, and community engagement.” The steering committee includes representatives from the USFWS, the WGFD, the Idaho Department of Fish and Game (IDFG), the BTNF, the Caribou-Targhee National Forest (CTNF), the NRCS, the SVCD, and TU. The group has identified multiple challenges in the Salt River Watershed, including dewatered systems, development, water-quality issues, degradation of aquatic and riparian habitats, and loss of stream function. For additional information, refer to the [SRWG](#) web page and the Trout Unlimited Salt River Watershed [storymap](#).

SRWG identified restoration projects that have been completed or are upcoming, include the following list. Several additional projects have been included as part of the Watershed Management and Rehabilitation Plan for this study.

- Lower Swift Creek Stream Restoration and Stabilization
- Rico Diversion Fish Passage and Stabilization
- Salt River Clarks Barn Fish Passage and Habitat Restoration
- Salt River Narrows Meander Activation and Restoration
- North Fork Tincup Creek Process-Based Restoration

3.2.3 Wildfire

Wildfires pose a significant threat to the Salt River Watershed in Wyoming, affecting water quality, water quantity, and overall ecosystem health. Long-term temperature increases and prolonged drought exacerbate susceptibility to intense and frequent wildfires, which can drastically alter watershed conditions and lead to a range of adverse consequences.

Wildfire degrades water quality by increasing sedimentation, releasing nutrient pulses, and potentially introducing chemical contaminants from fire retardants. They also alter runoff patterns, increase evapotranspiration, reduce water availability, destabilize stream banks, damage spawning habitats, and harm aquatic life. Furthermore, wildfires can damage water supply infrastructure and increase flood risk by reducing water interception by vegetation.

The risk of wildfire within the Salt River Watershed is generally considered high (Wildfire Risk to Communities, 2025), with most communities exhibiting wildfire likelihoods of 70-80% compared to communities nationwide and 50-60% compared to those in Wyoming. Although the County has previously considered itself relatively immune to extensive wildfires, the recent Willow Creek Fire, which

burned 4,066 acres, demonstrates the potential for significant impacts on the Salt River following snowmelt and heavy rainfall. This and similar events can introduce ash, debris, and sediment, leading to catastrophic consequences, including burying streambeds, extensive flooding, and infrastructure damage. For example, Star Valley Ranch, a town of over 2,100 residents, relies on a well system located high up in Prater Canyon, a steep canyon with heavy fuel loads, numerous diseased trees, and the water delivery line running through the canyon's base. A fire in Strawberry Canyon or Prater Canyon could easily compromise this system.

Given that the bulk of the land surrounding these communities and their water sources is managed by the USFS Bridger-Teton National Forest and USFS Caribou-Targhee National Forest, there should be a strong emphasis on fuels management. By fostering collaboration between communities in the watershed, the county, and the USFS, a fuels management program can reduce the risk to water supplies and enhance the overall health of the Salt River Watershed. Figure 3-49 shows the historic wildfires that have occurred in the watershed.

3.3 Anthropogenic Systems

This section of the document examines systems influenced by human activity. Topics include Agricultural Water Use, Domestic Water Use, Water Storage, and Land. Each component has been inventoried and analyzed to better understand the anthropogenic systems within the Salt River Watershed.

3.3.1 Agricultural Water Use

3.3.1.1 Irrigation

Most water usage in the Salt River Watershed is dedicated to irrigation, concentrated along the river's main channel and tributaries. These agricultural efforts are tied closely to privately held lands—historically developed where water diversion was accessible and economically viable. Given the short growing season typical of the valley, water storage facilities such as stock reservoirs, spring capture systems, and wells are vital to both crop and livestock operations.

3.3.1.1.1 Irrigated Lands

The Snake/Salt River Basin Plan (SSRBP) update, published in 2012 by the WWDO, included an irrigation analysis for both the Snake and Salt River Basins. This analysis divided the Salt River Basin into two irrigation areas within the Salt River Watershed project area: the Lower Salt and the Upper Salt. The Upper Lower Salt includes the irrigated sites along the Salt River in the southern half of Star Valley, including Afton. The Lower Salt includes irrigated lands in the northern half of the valley from the approximate region of Thayne to Alpine (Figure 3-50). PRISM (Parameter-elevation Regressions on Independent Slopes Model) datasets were used to evaluate precipitation, temperature, and growing-season length for these irrigation areas in the Basin Plan Update. This data, along with crop types, was then used to determine the evapotranspiration (ET) rates and diversion quantities projected for each irrigation area. (Wyoming Water Development Office, 2012)

The Snake/Salt River Basin Plan (2012) states that there is a total of 65,190 acres of irrigated land within the Salt River Watershed, distributed between alfalfa, grain, grass pasture, and mountain meadow hay. It is likely that due to increased development within the Star Valley area over recent years, this total has decreased. (Wyoming Water Development Office, 2012) Figure 3-51 shows the mapped irrigated lands for the watershed.

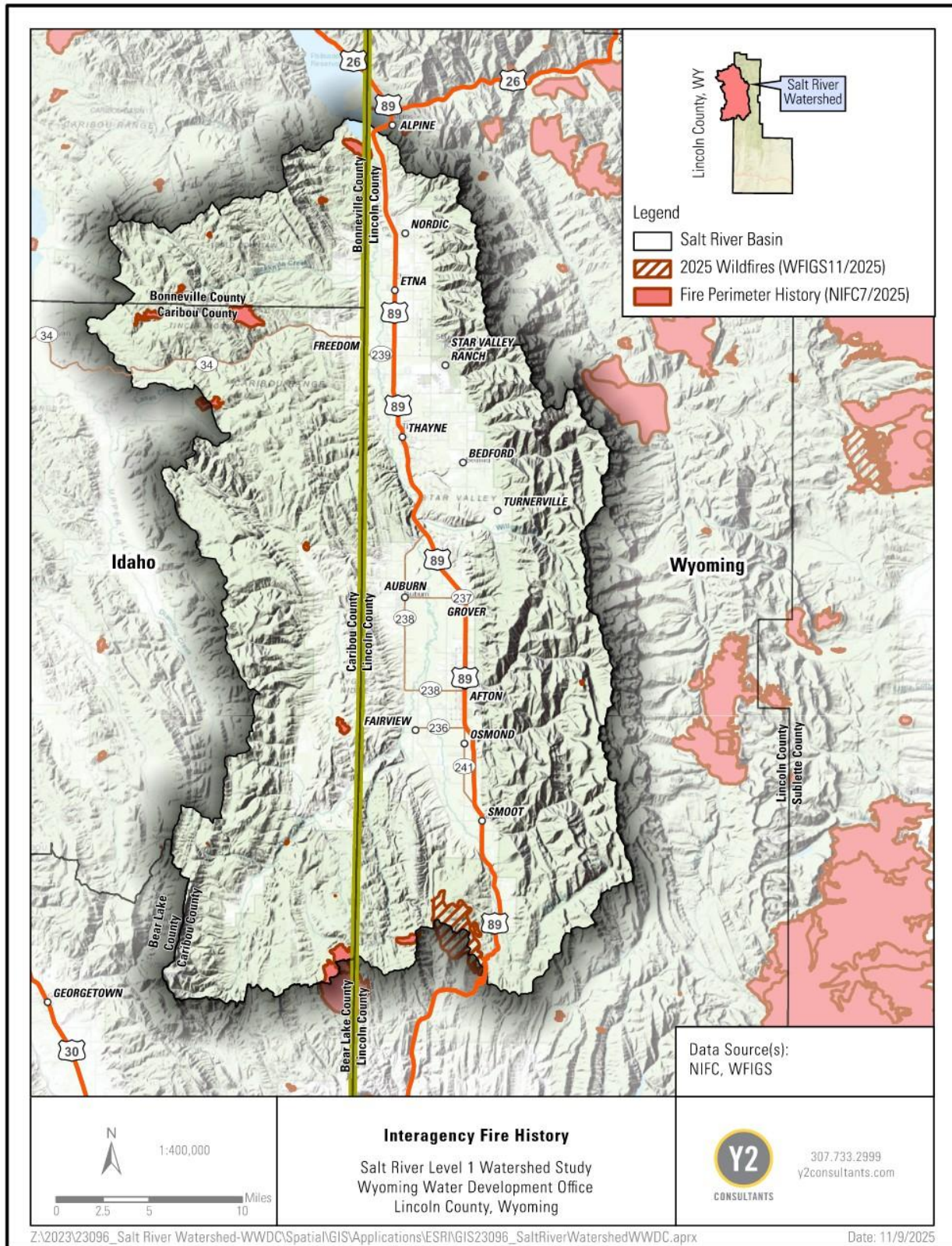
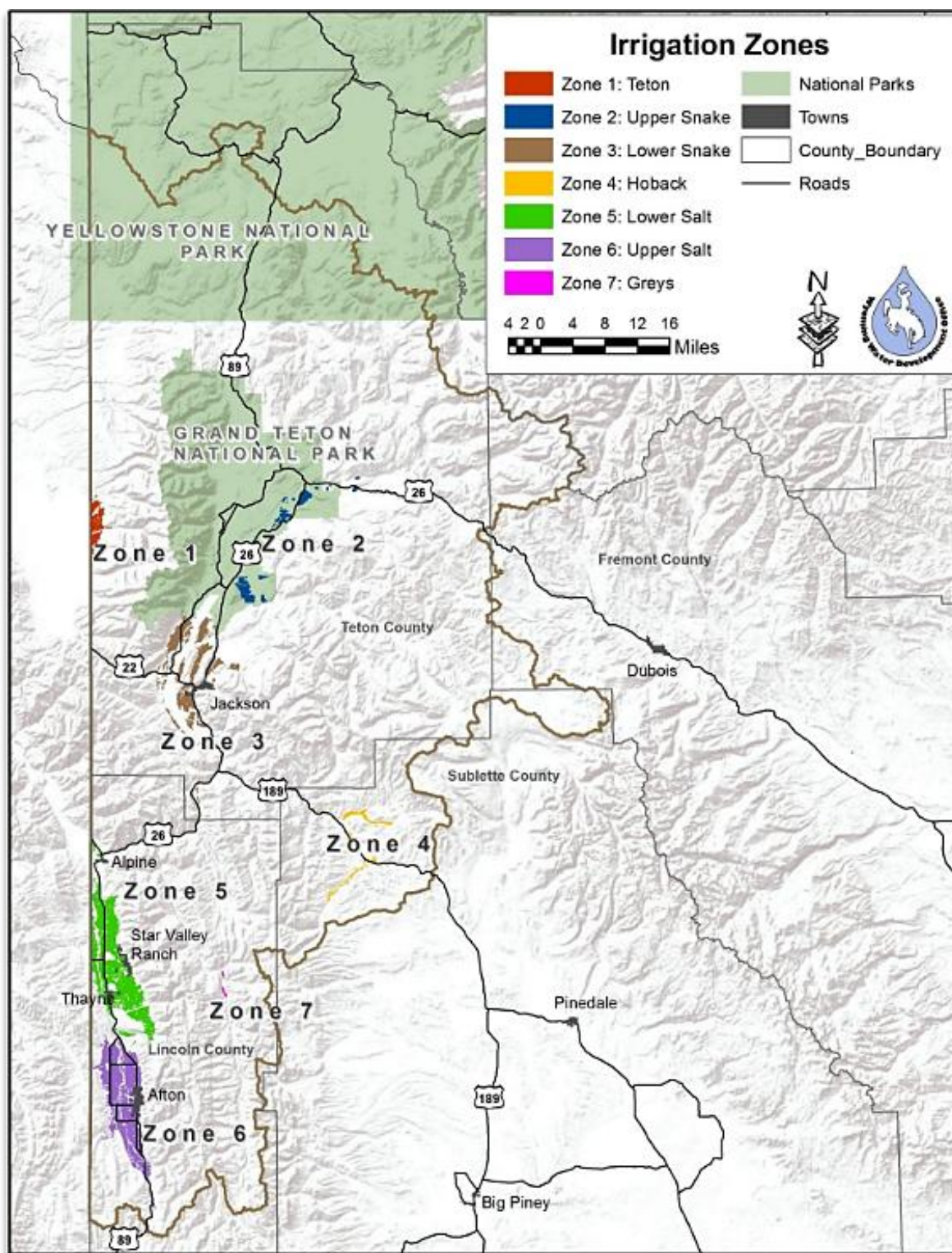


Figure 3-49. Wildfire history within the Salt River Watershed.



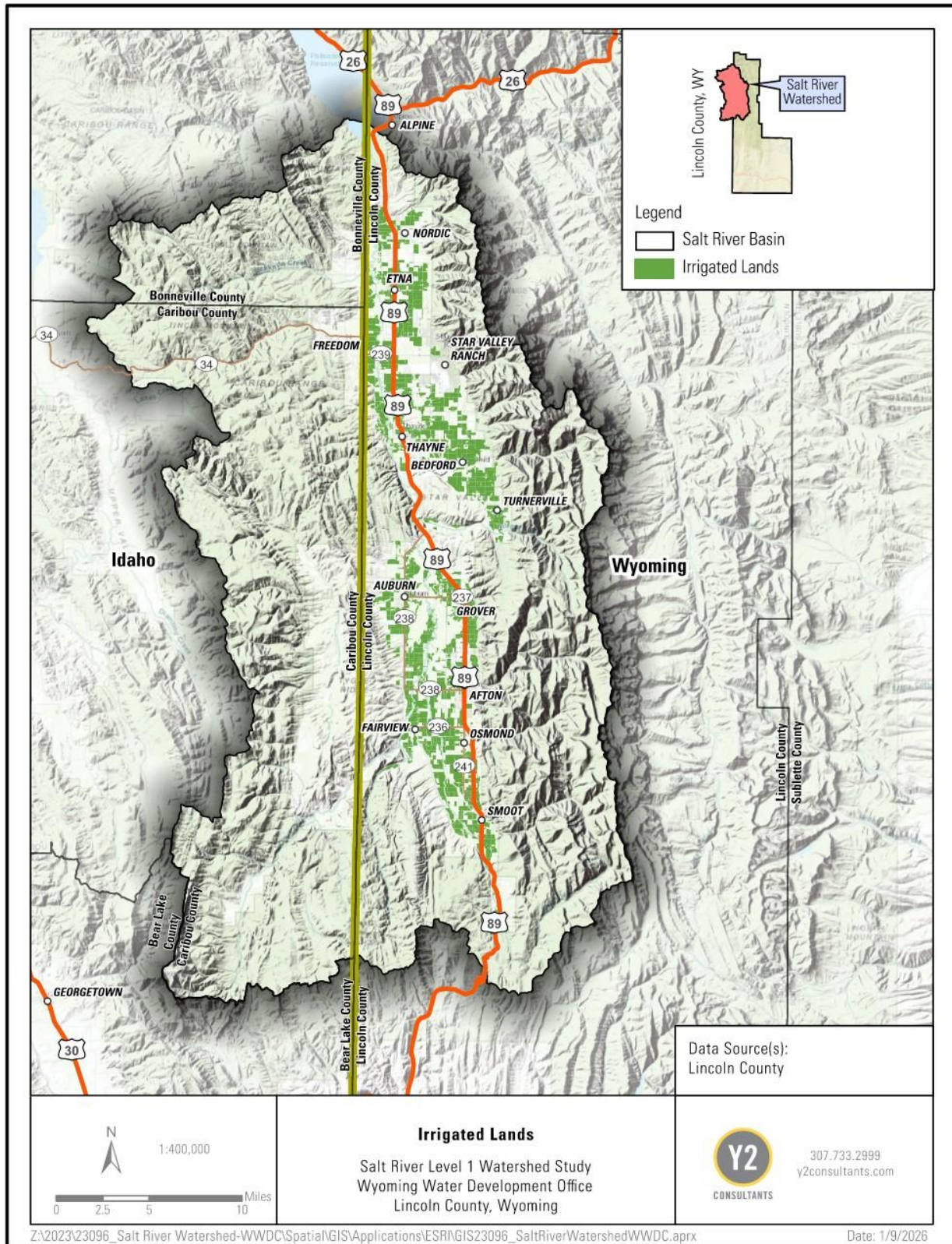


Figure 3-51. Irrigated lands mapped within the Salt River Watershed.

The Snake/Salt River Basin Plan (2012) reports the Consumptive Use (CU), or ET, the Effective Precipitation (Re), and the Crop Irrigation Requirements (CIR) by month. This data indicates that the Salt River Watershed's irrigated areas incur the highest water requirements in July and August, with the Lower Salt region having higher irrigation needs than the Upper Salt irrigation region (Figure 3-52 and Figure 3-53). Crop Irrigation Requirements for the irrigation season in the Salt River Watershed total 13.3 inches, on average, across the irrigated areas of the watershed. Using the CIR data and the total area in consideration, the Snake/Salt River Basin Plan calculates that the Salt River Watershed irrigation areas generated a total of 54,294 acre-feet in depletions throughout the year based on irrigation acreage in 2012. This number is considered an estimate of irrigation diversions when other diversion data is unavailable. The PRISM data used to calculate these variables were collected from 1971 to 2010. (Wyoming Water Development Office, 2012)

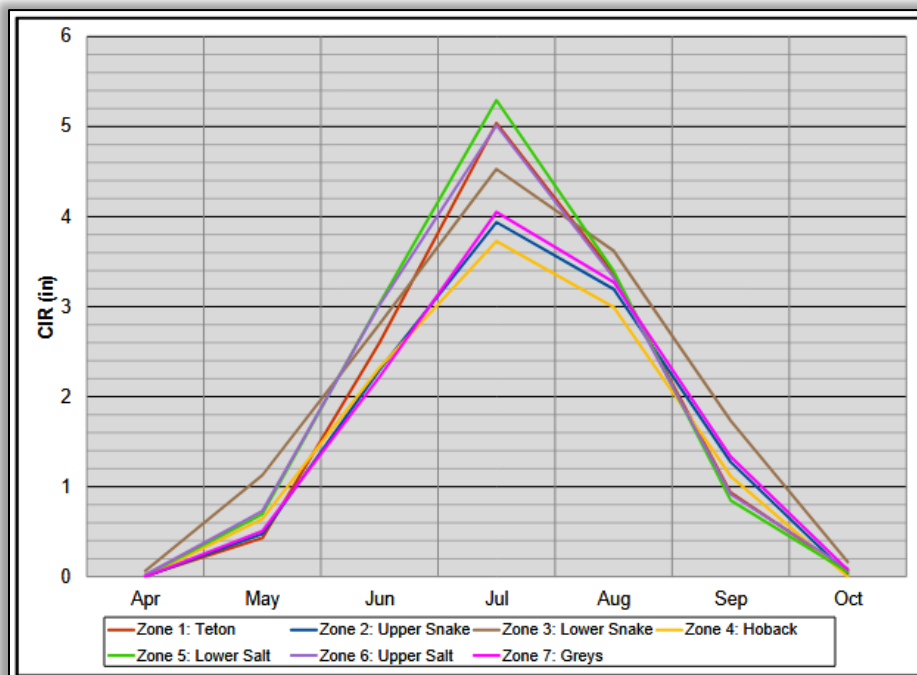


Figure 3-52. Excerpt chart from the Snake/Salt River Basin Plan 2012 Update depicting the monthly CIR by irrigation zone. The Salt River Watershed zones are depicted as Zones 5 and 6 (Sec 5.1.6.3, pg. 59). (Wyoming Water Development Office, 2012)

Month	Zone 5: Lower Salt			Zone 6: Upper Salt		
	CU (in)	Re (in)	CIR (in)	CU (in)	Re (in)	CIR (in)
Apr	0.03	0.01	0.01	0.03	0.01	0.02
May	1.39	0.69	0.70	1.37	0.64	0.73
Jun	4.28	1.25	3.03	4.17	1.15	3.02
Jul	6.19	0.89	5.29	5.89	0.88	5.02
Aug	4.29	0.90	3.40	4.20	0.87	3.33
Sep	1.37	0.52	0.85	1.43	0.52	0.91
Oct	0.11	0.05	0.05	0.15	0.06	0.09
Season	17.66	4.32	13.33	17.25	4.13	13.11

Figure 3-53. Excerpt chart from the Snake/Salt River Basin Plan 2012 Update depicting the monthly crop Consumptive Use (CU), the Effective Precipitation (Re), and the CIR by irrigation zone (Sec 5.1.6.3, pg. 60). (Wyoming Water Development Office, 2012)

The information provided by these calculations is important for water and land managers when considering resource management. Irrigation water consumption and the impact of drought or low snowpack years are critical factors to consider when evaluating water management and improvement options within the watershed. Refer to the Snake/Salt River Basin Plan 2012 update, Section 5.0, for additional information on the calculations and data used to generate the values discussed in this section. (Wyoming Water Development Office, 2012)

3.3.1.1.2 Irrigation Systems

Irrigation in the Salt River Watershed relies primarily on surface diversions and flood irrigation, though sprinkler systems are emerging. Open ditches and simple diversion structures lead to water losses and inefficiencies, while aging infrastructure requires upgrades. Key management considerations include water rights, accurate measurement, and stakeholder collaboration. Opportunities for improvement include ditch lining or piping, transitioning to sprinkler systems, and integrated water management planning to balance agricultural needs with ecosystem health.

The WWDC's 2021 Irrigation Survey Report lists five irrigation districts and six other irrigation entities within the Salt River Watershed. In total for the watershed, the report lists 1,122 water users, an estimated 5,868 cubic feet per second irrigation capacity, and 25,412 irrigated acres (Table 3-13).

Table 3-13. Listed irrigation water entities by the Wyoming Water Development Commission in the 2021 Irrigation Survey Report. (Wyoming Water Development Commission, 2021)

Entity	City	Surface Source	Diversion Type	Conveyance Type	Conveyance Capacity (cfs)	Water Users	Irrigated Acres
Alto Canal Sprinkler Company	Thayne	Alto-Canal	Headgate	Ditch	12 ^a	19	681
Cottonwood Irrigation District	Smoot	Cottonwood Creek	Concrete headgate	Pipe	71	360	5,200
Eastside Irrigation District	Etna	Strawberry Creek	Headgate	Ditch	23 ^a	15	1,300
Etna Irrigation District	Freedom	Stream	Dam	Ditch	5600	140	3,000
Fairview Irrigation District	Afton	Salt River	Headgate	Ditch	15	110	2,500
Nield String Sprinkler Company	Afton	Swift Creek	Headgate	Pipe	15 ^b	29	632
North Strawberry Canal Co.	Thayne	Ditch, Stream	Headgate	Ditch	36 ^a	47	6,300
Porto Irrigation District	Thayne	Cedar Creek	Concrete headgates	Pipe	35	24	901
Stewart Creek Irrigation Co.	Etna	Stewart Creek	Concrete headgate	Pipe	12 (diversion capacity is 6.8 cfs)	200	1,053
Upper Strawberry Canal Company	Bedford	Strawberry Creek & Willow Creek	Headgate	Ditch	23 ^a	77	1,340
West Afton Irrigation District	Afton	Swift Creek	Headgate	Pipe	15 ^b	87	834
Total					5,977	1122	26,041ac

*This table is primarily sourced from the WWDC 2021 Irrigation Survey Report. Some data in the report reflect conditions from prior years. Where data were not provided, values have been populated as noted in the footnotes below.

a. Estimated based on gate geometry, assuming 1.0 ft of flow depth through the gate. Actual discharge will vary with upstream water surface elevation and actual height of gate opening.

b. The Nield String Sprinkler Company and West Afton Irrigation District share an intake structure from the Afton Canal, which is sourced from Swift Creek.

3.3.1.1.3 Trans-Watershed Diversions

A single trans-watershed diversion affects the Salt River Watershed—the Enl. Ames Ditch (permit number 1227.0E; C.R. 42, pg 586). This ditch transfers water from the Salt River to lands near and within Alpine,

WY, supplying approximately 253 acres from the Salt River Watershed to the Greys River watershed. Table 3-14 shows the details related to the Enl. Ames Ditch (Rio Verde Engineering, 2022).

Table 3-14. Permitted Trans-watershed Diversion Tabulation.

Permit #	Facility Name	Priority	Use	CFS/AF	Acres	Proof #	C.R. #	In/Out
P1227.0E	Enl. Ames Ditch	6/20/1904	IRR, STO	~3.61	~253.0	17415	CR CC42/586	In

3.3.2 Domestic Water Use

3.3.2.1 Potable Water Systems

The Salt River Watershed contains multiple rural municipalities, with private lands primarily located along the Star Valley drainage. Potable water is obtained from spring or groundwater well sources.

The Wyoming Water Development Commission's 2022 Public Water Systems Report lists 15 public water system entities within the Salt River Watershed (Table 3-15). For the watershed, the report lists 19 wells, totaling 5,155 gallons per minute (gpm) yield, and 15 springs, totaling 51,125 gpm yield. Six of the public water systems are treated through chlorination, while the remaining nine are untreated. The report lists the population served at 8,017 and the annual domestic water use for the watershed at 2,657,429,183 gallons. (Wyoming Water Development Commission, 2022)

Table 3-15. Listed public water system entities by the Wyoming Water Development Commission in the 2022 Public Water Systems Report. (Wyoming Water Development Commission, 2022)

Entity	Entity Type	City	# Wells	# Springs	Total System Capacity (gal/day)	Water Storage Capacity (gal) (raw and treated)	Treatment Method	Population Served	Annual Water Use (gal)
Afton, Town of	Municipality	Afton	2	4	3600000	2,600,000	Chlorination	2100	1,825,000,000
Alpine	Municipality	Alpine	3	0	750,000	750,000	Chlorination	750	73,000,000
Bedford Water & Sewer District	Water and Sewer Improvement District	Bedford	1	1	1000000	540,000	Chlorination	850-950	200,000,000
Broken Wheel Ranch Improvement and Service District	District	Alpine	1	0	10000	10,000	Untreated	40-50	3,650,000
Etna Water & Sewer District	Municipality	Etna	1	0	750000	250,000	Untreated	150	63,000,000
Fairview Water & Sewer District	Private	Afton	1	2	210,600	148,000	Chlorination	250	Unknown
Happy Valley Pipeline	Private	Afton	0	0	0	3,150	Chlorination	75	0
Nordic Ranches Water LLC	Private	Etna	3	0	300	70,000	Untreated	490	14,109,553
North Afton W&S	NA	NA	0	1	2875	350,000	Untreated	330	178,653,630
Osmond Pipeline Company	Shareholder owned	Afton	0	3	432000	11,000	Untreated	250	157,680,000
Greater Smoot Water and Sewer District	Special Water District	Smoot	1	1	NA	1,000,000	Untreated	217	Unknown
Star Valley Ranch, Town of	Municipality	Star Valley	3	1	Unknown	1,155,000	Untreated	1,890	Unknown
Star Valley Trailer Court	Ranch	3	1	1	>15,000	12,000	Untreated	96	Unknown

Entity	Entity Type	City	# Wells	# Springs	Total System Capacity (gal/day)	Water Storage Capacity (gal) (raw and treated)	Treatment Method	Population Served	Annual Water Use (gal)
Thayne, Town of	Private Company	Afton	1	0	2009000	640,000	Chlorination	394	140,000,000
Westview Village Subdivision	Municipality	Thayne	1	4	Unknown	2,000,000	Untreated	80	2,336,000

**Some data provided in the WWDC 2022 Public Water System Report is from prior years. Blank cells indicate where data was incomplete in the report.*

3.3.3 Water Storage

3.3.3.1 Reservoirs

The Salt River Watershed reservoir dataset was extracted from storage records in the WSEO ePermit system. These data were integrated into the GIS framework for analysis and illustration purposes.

Overall, there are very few large reservoirs within the Salt River Watershed. Cottonwood Lake Dam is one of the larger reservoirs in the watershed located west of Afton in the Salt River Range. This dam impounds Cottonwood Lake, generating a small reservoir used primarily for irrigation and recreation. The dam is operated by an authority responsible for managing water levels and releases and is subject to regulatory oversight by the WSEO.

3.3.3.2 Upland Water Storage

Upland water storage in the Salt River Watershed, typically in the form of stock ponds and wildlife water developments, aims to improve grazing management, enhance wildlife habitat, reduce erosion, and increase water availability. However, these facilities require compliance with Wyoming water rights law, careful consideration to avoid negative environmental impacts, such as altered drainage, habitat fragmentation, and water quality issues, and ongoing maintenance. Responsible planning, appropriate design, and the implementation of best management practices are essential for maximizing the benefits of upland water storage while protecting the watershed's ecological integrity.

3.3.3.3 Domestic Ponds

A domestic pond is a man-made water feature constructed within or near a residential property, typically for aesthetic enhancement, recreational use, or practical purposes such as small-scale irrigation. In the Salt River Watershed of Wyoming, these ponds are generally small, privately owned impoundments designed for landscaping appeal, lawn and garden watering, or amenities like fishing and swimming. Most rely on surface water diversions, groundwater wells, or captured stormwater runoff for their water supply.

Over the past 10–15 years, domestic pond development in the Salt River Watershed has grown significantly alongside increased residential development. While these ponds offer benefits, they also introduce notable challenges to watershed health.

Domestic ponds provide several advantages. They enhance the appearance of the property and create a tranquil outdoor environment. They offer recreational opportunities such as fishing, swimming, and wildlife observation. Additionally, they can serve as a source for limited irrigation or emergency water supply and support aquatic and terrestrial species, increasing biodiversity.

However, domestic ponds also present significant drawbacks. They can disrupt natural drainage patterns and reduce streamflow, altering hydrology. Water quality often declines due to sediment, nutrient, and pollutant accumulation. Habitat loss and fragmentation occur as wetlands and riparian areas are filled or modified. Other issues include bank erosion, sedimentation, increased evaporation losses, and changes to the landscape's visual integrity.

In Wyoming, constructing or enlarging a pond requires a permit from the State Engineer's Office. Applicants must submit the appropriate reservoir application—Form SW 3 for standard ponds or SW 3A/SW 4 for small stock ponds under 20 acre-feet in capacity and 20 feet in dam height. Applications must include details such as location, storage volume, water source, outlet design, and land ownership, along with the filing fee. Water rights must be secured under the prior appropriation system, and additional permits are needed if groundwater wells supply the pond. Projects that impact wetlands or streams may require additional approvals. Construction must be completed within the timeframe specified in the permit.

Research suggests that many ponds in the Salt River Watershed lack proper authorization, raising concerns about compliance and cumulative environmental impacts.

To guide sustainable pond development, the Salt River Watershed can draw inspiration from Teton County, Wyoming's Land Development Regulations (LDRs). The LDRs provide insights into best practices, construction standards, permit review processes, and interagency coordination strategies. Specific regulations address location, buffer establishment, outfall standards, aerator use, liner materials, and side slope requirements. Habitat ponds are subject to additional standards based on location and must include sufficient shallows for wildlife habitat. (Teton County, Wyoming, 2025)

Adapting Teton County's regulations involves reviewing their LDRs, assessing Lincoln County's regulatory framework, consulting local stakeholders, tailoring the regulations to the Salt River Watershed, and incorporating them into land-use plans and zoning ordinances. By drawing on Teton County and implementing proactive measures, communities in the Salt River Watershed can strengthen their regulatory framework for pond development to ensure ponds are designed and managed to protect water quality, habitat, and other valuable resources. (Teton County, Wyoming, 2025)

3.3.4 Land

3.3.4.1 Land Use

Private lands in the Salt River Watershed are primarily used for residential and ranching purposes, with limited industrial development. Much of the watershed consists of public land, which supports a variety of uses including seasonal livestock grazing, timber harvest, energy leasing, recreation, and tourism.

Public lands in the watershed offer opportunities for big-game hunting, fishing, hiking, horseback riding, ATV/UTV riding, snowmobiling, and boating. The Salt River Range contains an extensive network of motorized and non-motorized trails and is accessible by snowmobile in many areas during the winter months, making it a year-round outdoor destination.

Like many places in Wyoming, early settlement in the watershed focused along rivers and streams. This pattern reflects the region's importance of water. Groundwater serves as the primary domestic water source, while surface water supplies agricultural and livestock needs and remains essential to the valley's working lands and rural character.

Oil and gas activities are limited within the Salt River Watershed. Only a small number of wells occur in the basin, with most development located in southern Lincoln County outside the watershed boundary.

3.3.4.1.1 Zoning Regulations

Lincoln County's regulations and policies impact development and, by extension, the watershed's hydrology. The Lincoln County Comprehensive Plan addresses both land use and environmental resources. The Land Use section prioritizes conserving existing agricultural lands and operations while promoting clustering future development near established service centers, maintaining historic public land access, and protecting the county's scenic resources. Lincoln County's Conservation Plan lists several objectives regarding water management, including preventing stream erosion and its impacts, promoting safe and adequate water quality and quantity, and protecting wetlands, riparian areas, and the 100-year floodplain from development. For additional Lincoln County Zoning information, refer to Table 3-16 and the [Lincoln County Comprehensive Plan](#) and associated regulatory documents. (Lincoln County, 2021)

Table 3-16. Lincoln County zoning category definitions. (Lincoln County, 2019)

Lincoln County Zoning		
Code	Category	Description
R	Rural Zone	The purpose of the Rural Zone is to maintain the essential rural character of the great majority of the private lands in the county. The zone will provide for agricultural uses combined with low density (typically 5 or more acres averaged per lot) residential uses, including residential subdivisions where three or more lots are created. The zone will allow home occupation businesses as well as a few other commercial uses which will have a low impact for the neighbors and which are best suited for rural areas.
M	Mixed Zone	The purpose of the Mixed Zone is to provide a variety of land uses, allowing generally the land uses allowed in the Rural Zone, plus higher density residential development, community services, and most commercial activities. Areas zoned Mixed are generally grouped around areas historically recognized as community centers, including incorporated towns. This zone makes it more feasible to provide needed utility and transportation facilities to support growth, while maintaining the rural areas relatively free from traffic, noise, lights, etc., which tend to distract from the rural atmosphere. This zone will also provide for the establishment of Planned Unit Developments which will allow higher density but will require the installation of more services such as central sewer treatment.
RC	Recreational Zone	A significant attraction of Lincoln County is the scenic, sporting, and recreational resources of the county. The purpose of the Recreational Zone is to provide locations for the business and commercial facilities needed for tourist and recreational activities, along with residential uses, while preventing the intrusion of other types of commercial activities which will tend to spoil or detract from the scenic beauty and natural surroundings of these recreational areas. This zone will also provide for the establishment of Recreational Planned Unit Developments, which will allow higher density but will require the installation of more services, such as central sewer treatment.
I	Industrial Zone	Lincoln County depends on industrial activities for economic well being. The purpose of the Industrial Zone is to provide areas for industrial activities to take place. Most other land uses are not allowed in the Industrial Zone to minimize conflicts between important industrial land uses and other residential and commercial needs. The Industrial Zone may provide for light industrial or all types of industrial land uses depending upon the specific community overlay zone.

Lincoln County Zoning		
Code	Category	Description
P	Public Zone	Over half of the land in Lincoln County is managed by state and federal government. Because of this government ownership, this land is subject to different sets of uses, goals, and regulations. State and federal policies apply on these lands which do not apply to the privately held lands. At the same time, these public lands can normally be compatible with, and even enhance, the desirable characteristics of Lincoln County. The purpose of the Public Zone is to, in part, recognize areas owned/administered by the federal government, the State of Wyoming, and Lincoln County, and in part, provide for land uses appropriate for the publicly owned lands which are consistent with the historical uses of the public lands.

3.3.4.1.2 Mining

Mining has played a limited but locally notable role in the Salt River Watershed. Historical records indicate that within the watershed region (for example, in the Salt River Range), there is evidence of phosphate mining claims. One documented site is the “Salt River Range Combined” mine, which is listed in the U.S. Geological Survey’s Mineral Resources Data System (MRDS) and described as a phosphorus-phosphate commodity site in the Salt River Range. (Western Mining History, 2025)

While no large-scale modern hard-rock mining operations are currently active within the watershed boundary, the historic presence of mining activity is supported by mining-claim databases and state-level documentation of Wyoming’s mineral potential (Bureau of Land Management, n.d.-b). The only currently active mining in the watershed are sand and gravel pits. Table 3-17 lists the active mining permits in the watershed, the Wyoming State Geological Survey [map application](#) gives information on the mineral resources throughout the State.

Table 3-17. Active mine permits in the Salt River watershed (Wyoming State Geological Survey, 2025).

Permit Number	Company Name	Mine Name	Mineral	Mine Type	Status
ET0566	Depatco Inc.	N/A	Sand & Gravel	Limited Mine Operation	Active
ETO559	Hebdon Const.	Hebdon	Sand & Gravel	Limited Mine Operation	Active
ET1437	Avail Valley Construction – WY, LLC	Kilroy	Sand & Gravel	Limited Mine Operation	Active
SP0692	Naef, Douglas A & Jacquelin I	Call	Sand & Gravel	Small Mine	Active
SP0779	Evans Const. Co.	Etna	Sand & Gravel	Small Mine	Active
SP0791	GEGR LLC	Rocky Top	Sand & Gravel	Small Mine	Active
SP0693	H K Contractors Inc.	Jenkins	Sand & Gravel	Small Mine	Active
SP0671	Avail Valley Construction – WY, LLC	N/A	Sand & Gravel	Small Mine	Active
SP0848	Peavlers Mountain Star, Inc.	Gardner Ranch	Sand & Gravel	Small Mine	Active

Permit Number	Company Name	Mine Name	Mineral	Mine Type	Status
SP0713	Avail Valley Construction – WY, LLC	Call	Sand & Gravel	Small Mine	Active
SP0482	Lincoln County	Linford Pit	Sand & Gravel	Small Mine	Active
ET0999	Lynn Veigel	N/A	Sand & Gravel	Limited Mine Operation	Active
SP0843	Avail Valley Construction – WY, LLC	Dry Creek Pit	Sand & Gravel	Small Mine	Active

3.3.4.1.3 Oil and Gas Production

There is no mapped oil and gas production within the Salt River Watershed. The Wyoming State Geological Survey [map application](#) gives information on the oil and gas throughout the State.

3.3.4.1.4 Transportation, Energy, and Communication Infrastructure

U.S. Highway 89 is the watershed’s main north-south transportation route and provides the regional connection for freight, tourism, and local travel. A network of county roads, ranch access roads, and forest roads connects private lands, ranches, campgrounds, and public-land trailheads.

The watershed lies within the service territory and transmission footprint of regional utilities (PacifiCorp/Rocky Mountain Power). Local distribution lines serve towns and rural customers. There is little to no utility-scale generation inside the Salt River Watershed itself; energy needs are met by regional grid supply delivered via distribution networks to communities and rural customers.

Communication infrastructure within the watershed includes broadband, cellular, and satellite. Infrastructure is located near towns.

3.3.4.2 Land Ownership

Land ownership within the Salt River Watershed is mainly composed of private and USFS managed lands (Figure 3-54). The private lands follow the Star Valley, bordering the Salt River through the center of the watershed. The USFS-managed lands are located along the Salt River Mountain Range to the east in the Bridger National Forest, as well as in western sections where the Caribou National Forest borders Wyoming. There are a few parcels of BLM dispersed along the valley. State of Wyoming lands are also present throughout the watershed. The most significant portion is located in the northern section of the watershed within the Greys River Wildlife Habitat Management Area. A small portion of the Bureau of Reclamation (BOR) managed land associated with the Palisades Reservoir is located in the northern portion of the watershed.

The Salt River is primarily located on private land. Its headwaters and adjoining creek systems are situated within USFS-managed lands.

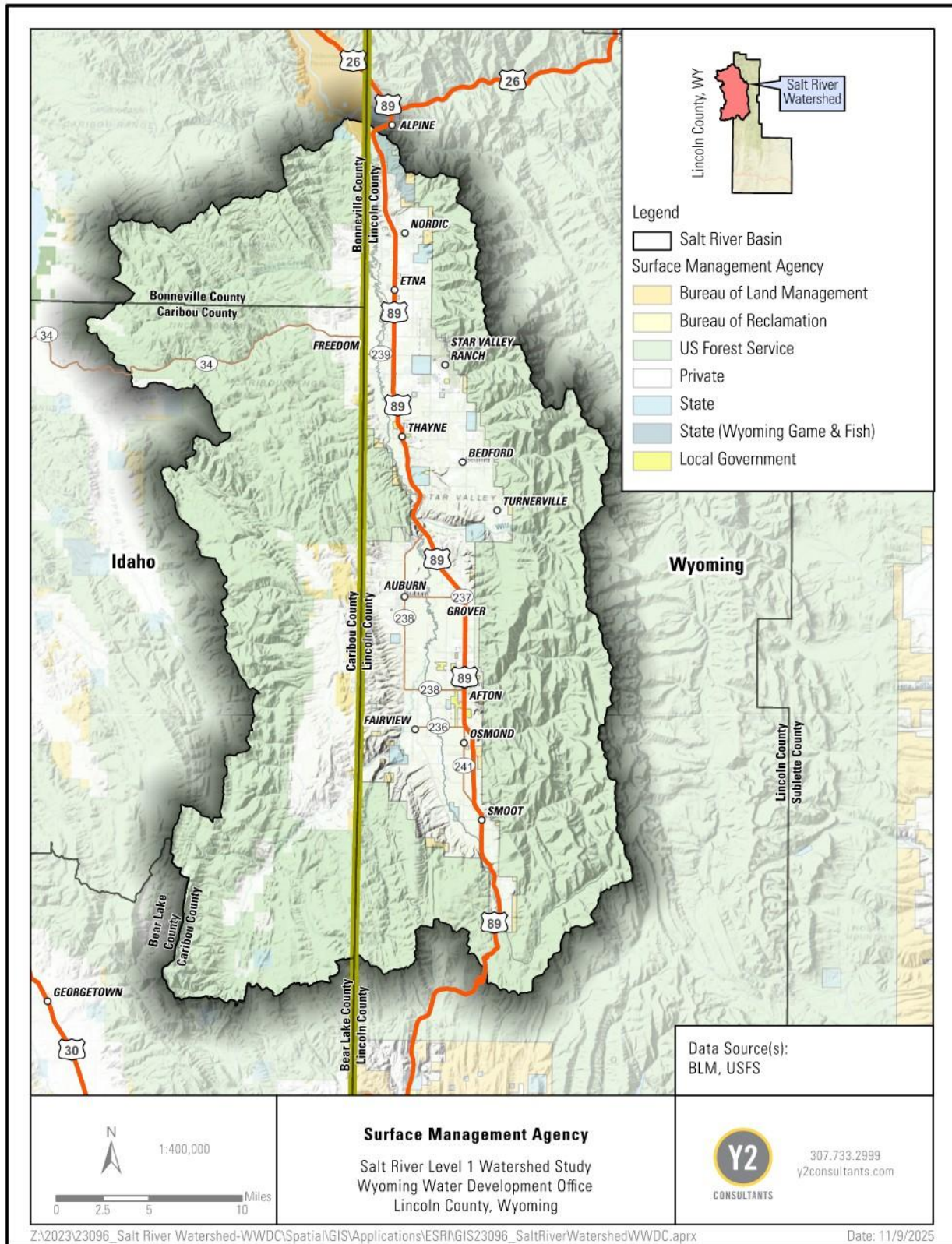


Figure 3-54. Land ownership within the Salt River Watershed.

3.3.4.3 Land Management

Land ownership in the watershed is a mix of private, federal, and state holdings, reflecting the watershed's agricultural heritage and strong public-land base.

Large portions of both public and private land are used for livestock grazing, a land use that has shaped the region's working-lands character and continues to play an essential role in the local economy. Public-land grazing provides seasonal forage that supports valley-based ranching operations, helping maintain open space, agricultural production, and the rural landscape.

Grazing on both public and private lands contributes to:

- Economic productivity and ranch sustainability
- Maintenance of open space and rural character
- Wildlife habitat continuity, particularly across working rangelands
- Conservation of irrigated meadows and riparian areas

Through coordinated management and monitoring by landowners and agencies, livestock grazing in the watershed continues to support healthy rangelands, functioning watersheds, and a resilient agricultural community.

3.3.4.3.1 Bureau of Land Management

Livestock grazing on BLM lands occurs through a system of permitted allotments, as shown in Figure 3-55. BLM and USFS allotments in the Salt River Watershed. The BLM Kemmerer Field Office administers BLM grazing allotments.

Grazing on BLM lands is authorized and managed under the Taylor Grazing Act of 1934 and the Federal Lands Policy and Management Act (FLPMA) of 1976, which provides direction for sustainable multiple-use management. Permitted livestock grazing must meet BLM's Standards for Health Rangelands and Guidelines for Livestock Grazing (1997). These standards focus on:

- Maintaining soil stability, infiltration, and watershed function
- Supporting healthy riparian vegetation and streambank stability
- Promoting channel conditions that support natural hydrology
- Protecting groundwater recharge areas and wet meadows
- Constructing range improvements and water development in ways that protect sensitive resources
- Ensuring grazing intensity and timing support water quality and upland vegetation health

Range improvements on BLM lands may include spring developments, pipelines, tanks, fencing, and rotational grazing systems, all intended to support healthy watersheds while sustaining agricultural uses.

3.3.4.3.2 U.S. Forest Service

The BTNF - Greys River Ranger District administers the USFS allotments in the Salt River Watershed (Figure 3-55). Grazing permits are managed to align with the Forest's Land and Resource Management Plan, which establishes desired conditions, goals, standards, and monitoring requirements.

USFS grazing management emphasizes:

- Maintaining riparian and wetland health
- Monitoring livestock distribution and use levels
- Protecting sensitive habitats and water resources
- Coordinating recreation, wildlife, and grazing uses
- Adapting management based on monitoring and ecological conditions

USFS staff conduct ongoing field monitoring, including riparian condition assessments, range inspections, trail and road evaluations, and wildlife-use observations. Monitoring information informs grazing plans and helps ensure that allotments operate in a manner that protects watershed function, stream habitat, and plant communities.

3.3.4.3.3 State Lands

State lands in the watershed are generally leased for agriculture and livestock grazing, with lease agreements administered by the Wyoming Office of State Lands and Investments (OSLI) and approved by the State Board of Land Commissioners.

Lessee-driven improvements – such as fencing, stock tanks, and pasture management – are common and help maintain the productivity and long-term stewardship of these lands.

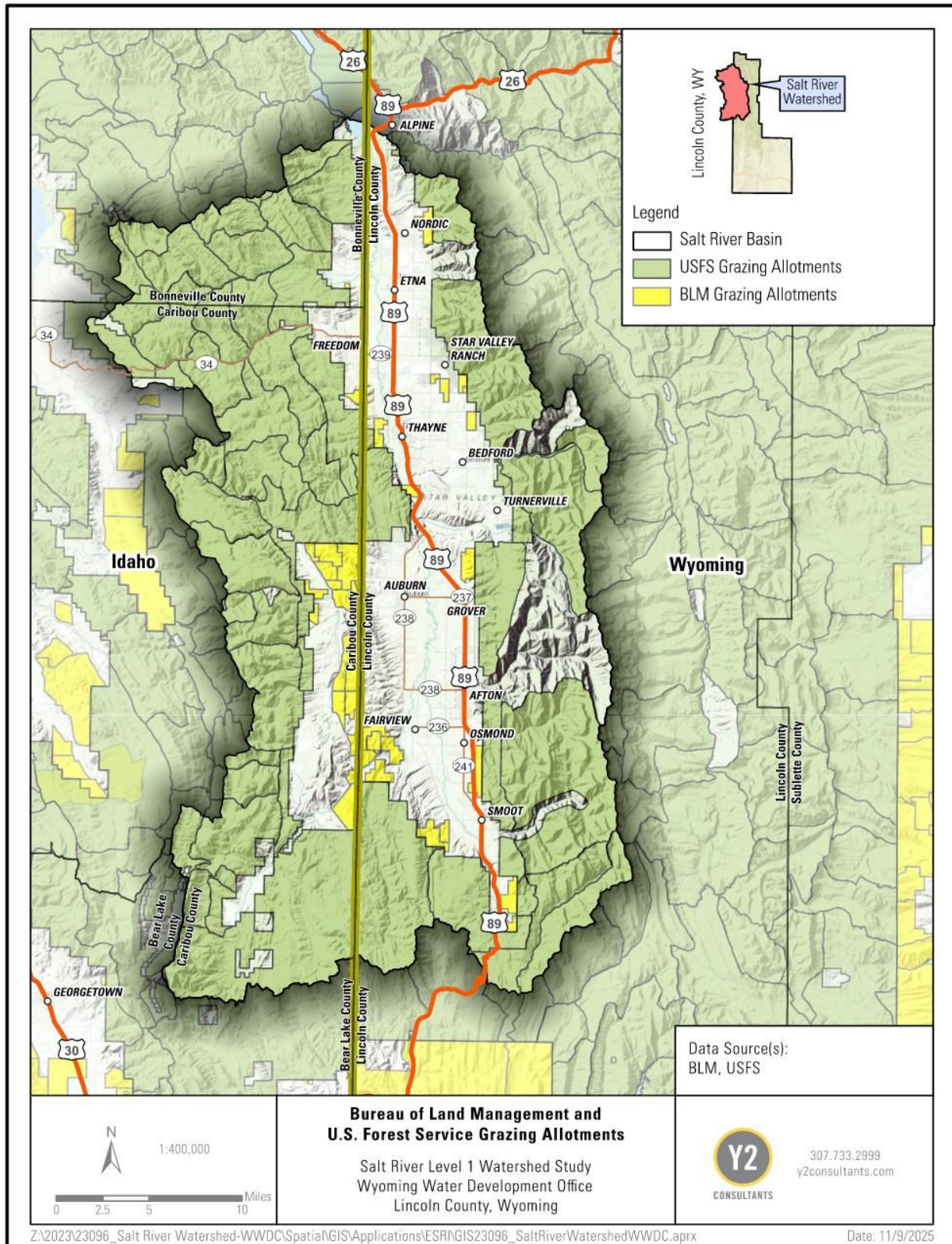


Figure 3-55. BLM and USFS allotments in the Salt River Watershed.

3.3.4.4 Upland Water Resources

The Salt River Watershed's upland water sources—primarily natural springs, groundwater wells, and ponds—play a critical role in sustaining hydrologic function, ecological integrity, and agricultural productivity throughout the basin.

Springs, such as the renowned Periodic Spring near Afton, discharge from karst systems within the Madison Limestone formation. This unique hydrogeology produces rhythmic high flows during snowmelt and maintains base flows during dry periods, buffering seasonal variability and supporting aquatic ecosystems. Numerous smaller perennial springs feed headwater streams, maintaining riparian habitats, stabilizing stream connectivity, and contributing to overall watershed resilience.

Groundwater wells complement these natural sources by tapping perched aquifers and deeper formations to supply irrigation, livestock watering, and domestic needs. When managed responsibly, wells help stabilize streamflow and reduce pressure on sensitive spring habitats during drought. However, over-pumping or poorly designed infrastructure can disrupt aquifer recharge and diminish spring discharge, underscoring the need for integrated water management strategies.

Upland ponds serve as vital water sources by capturing precipitation and runoff, regulating streamflow, reducing flood risk, and maintaining base flows during dry periods. They improve water quality by trapping sediment and nutrients, support biodiversity through habitat creation, and provide essential resources for irrigation and livestock. As climate variability increases, these ponds enhance resilience by acting as natural reservoirs, though challenges like sedimentation and maintenance require ongoing management. Integrating pond systems into broader watershed strategies maximizes ecological and agricultural benefits.

Together, springs, wells, and ponds form an interconnected upland hydrologic network that underpins watershed health, supports wildlife habitat, and sustains rural economies. Their combined influence ensures reliable water availability for multiple uses while preserving ecological functions essential to the Salt River Watershed.

Development of springs typically involves installing spring boxes at the source, sediment traps, and protective fencing, with pipelines conveying water to storage tanks or troughs. Well development includes drilling, casing, sealing, and installing pumps—often solar-powered in remote areas—connected to frost-protected troughs or storage systems. Both require careful design to prevent contamination and overuse.

The dataset of upland water sources for this watershed was compiled from records in the WSEO's ePermit system and integrated into a GIS framework for spatial analysis and visualization. Figure 3-56 illustrates the distribution of these upland water sources across the Salt River Watershed, providing a foundation for planning, resource management, and conservation prioritization.

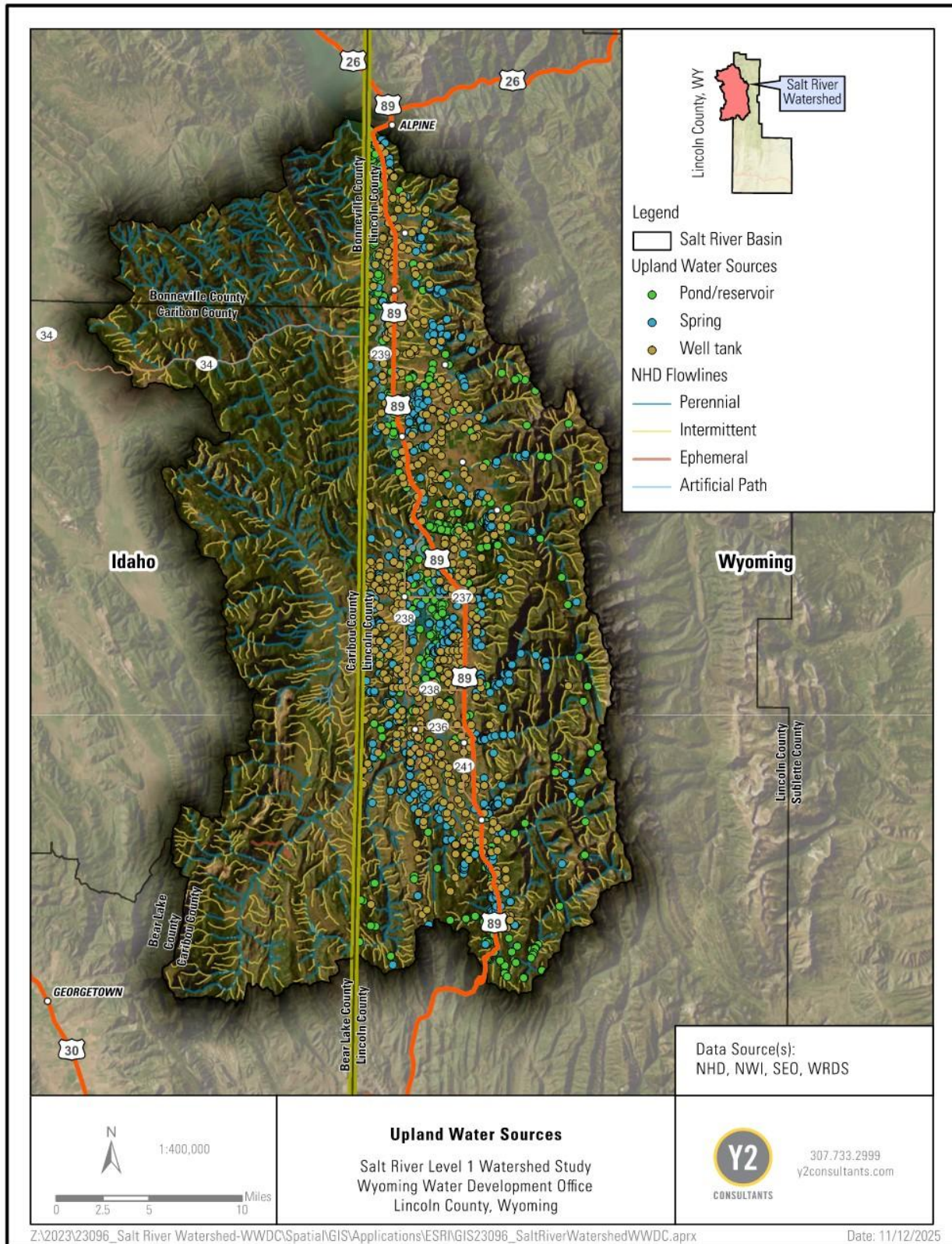


Figure 3-56. Upland water sources within the Salt River Watershed.

3.3.4.5 Cultural Resources

Cultural resources, such as historic and archeological resources, are typically overseen by the Wyoming State Historic Preservation Office (SHPO) and the regulations set forth by the Advisory Council on Historic Preservation (ACHP). Two sites are listed in the National Register of Historic Places (NRHP) within the Salt River Watershed. The continued management and protection of historic and culturally valuable places are vital to preserving the cultural heritage of the Salt River Watershed and the surrounding areas. (Lincoln County et al., 2021; Wyoming State Historic Preservation Office, 2025) An updated map and list of cultural resources can be found on the SHPO [website](#).

The Salt River Hydroelectric Power Plant near Etna, Wyoming, is an NRHP-listed site displaying Star Valley's rich water and energy history. This hydroelectric power plant was constructed in 1938 along the Salt River, providing power for ranches and farms in the area. This site contributed significantly to the development of the Star Valley region and has shaped the valley's resource use to the present day. The Salt River Hydroelectric Power Plant provided electricity to the area until 1967. (Wyoming State Historic Preservation Office, 2025)

The old rock church in Auburn, Wyoming, is one of Star Valley's earliest surviving buildings. Settlers first arrived in 1879, and by 1888, they had surveyed the town into twenty-four ten-acre blocks. In 1889, community members built the stone church at the center of town. It served not only as a Church of Latter-Day Saints chapel but also as the main gathering place for social and cultural events, including dances, plays, operas, parties, and holiday celebrations. Although larger church buildings have since been constructed, the original rock church remains an enduring landmark and a symbol of the strength, resilience, and values of Star Valley's early pioneers. (Wyoming State Historic Preservation Office, 1985)

The California National Historic Trail runs south to north through a significant portion of the valley bottom of the watershed. An interactive map of the trail and its location can be found on this [website](#). The California National Historic Trail marks the routes used by more than 250,000 emigrants who traveled west to California between the 1840s and 1860s. Motivated by farmland, opportunity, and especially the Gold Rush of 1848–1855, pioneers followed a network of wagon roads stretching roughly 2,000 miles from Missouri and other Midwestern jumping-off points to the Sierra Nevada and into California. (National Park Service, n.d.)

4 STREAMFLOW HYDROLOGY

4.1 Introduction and Study Purpose

4.1.1 Background and Objectives

This study updates and refines the characterization of streamflow conditions in the Salt River Basin through Water Year 2025. It builds on the modeling framework developed in the 2012 Snake/Salt River Basin Plan Update, which included a spreadsheet-based hydrologic model and regression tools to estimate streamflows at both gaged and ungaged sites.

The 2025 update improves the model by extending the hydrologic record, updating key inputs, refining flow estimation methods, and enhancing result visualization. It aims to support better water management, planning, and decision-making throughout the basin. All figures associated with this study are located in Appendix C: Hydrology Report Exhibits (Figure 4-1 to 4-105).

The primary objectives of this study are to:

- Extend USGS streamgage records through Water Year 2025
- Generate mean monthly and annual flows for dry, average, and wet hydrologic conditions
- Conduct peak-flow frequency analyses at key gaged sites
- Evaluate seasonal streamflow patterns and water supply availability
- Identify data gaps and recommend future monitoring improvements

4.1.2 Salt River Watershed

The Salt River Basin lies in western Wyoming and is part of the larger Snake River watershed. The basin's hydrology is strongly influenced by spring snowmelt, followed by declining flows through summer and low winter baseflows. The basin is divided into three Hydrologic Unit Code (HUC10) sub-watersheds as noted below and shown in Appendix C: Hydrology Report Exhibits, Figure 4-1.

1. Upper Salt River HUC10: From the headwaters to the confluence with Crow Creek
2. Middle Salt River HUC10: From the Crow Creek confluence to Willow Creek
3. Lower Salt River HUC10: From Willow Creek downstream to Palisades Reservoir

4.2 Surface Water Modeling Methodology

4.2.1 Modeling Updates

The Salt River Basin surface water model used in this study builds on the spreadsheet-based framework developed for the 2012 Snake and Salt River Basin Plan. For this update, the model was extended to cover Water Years 1971 through 2025, which provides 55 years of hydrologic conditions for analysis.

Model inputs were revised to incorporate updated streamgage records, irrigation data, and spatial watershed characteristics. A major enhancement is the standardized use of USGS StreamStats to delineate drainage areas and compute mean basin elevations for both gaged and ungaged tributaries. This tool replaced manual methods used previously and improved the consistency and accuracy of watershed parameters throughout the modeling effort.

Flow routing in the Lower Valley was refined to more accurately represent the interaction between west-flowing tributaries and the East Side Canal. In earlier model versions, tributaries such as Strawberry Creek, Cedar Creek, Lee Creek, Prater Creek, Green Creek, Birch Creek, and Stewart Creek were shown as directly discharging into the Salt River. In practice, several of these are intercepted by the East Side Canal and do not consistently reach the main channel. Strawberry Creek and Cedar Creek are typically fully intercepted. Lee, Prater, Green, and Birch Creeks are commonly diverted during the irrigation season. The updated model schematic is presented in Figure 4-106, and the spatial layout of model nodes and reaches is shown in (Appendix C: Hydrology Report Exhibits– Figure 4-2).

Three hydrologic scenarios were evaluated. These represent dry, average, and wet year conditions within the basin. Each scenario simulates monthly flows for one representative calendar year. This approach supports analysis of seasonal and spatial variability in water availability using a consistent model structure.

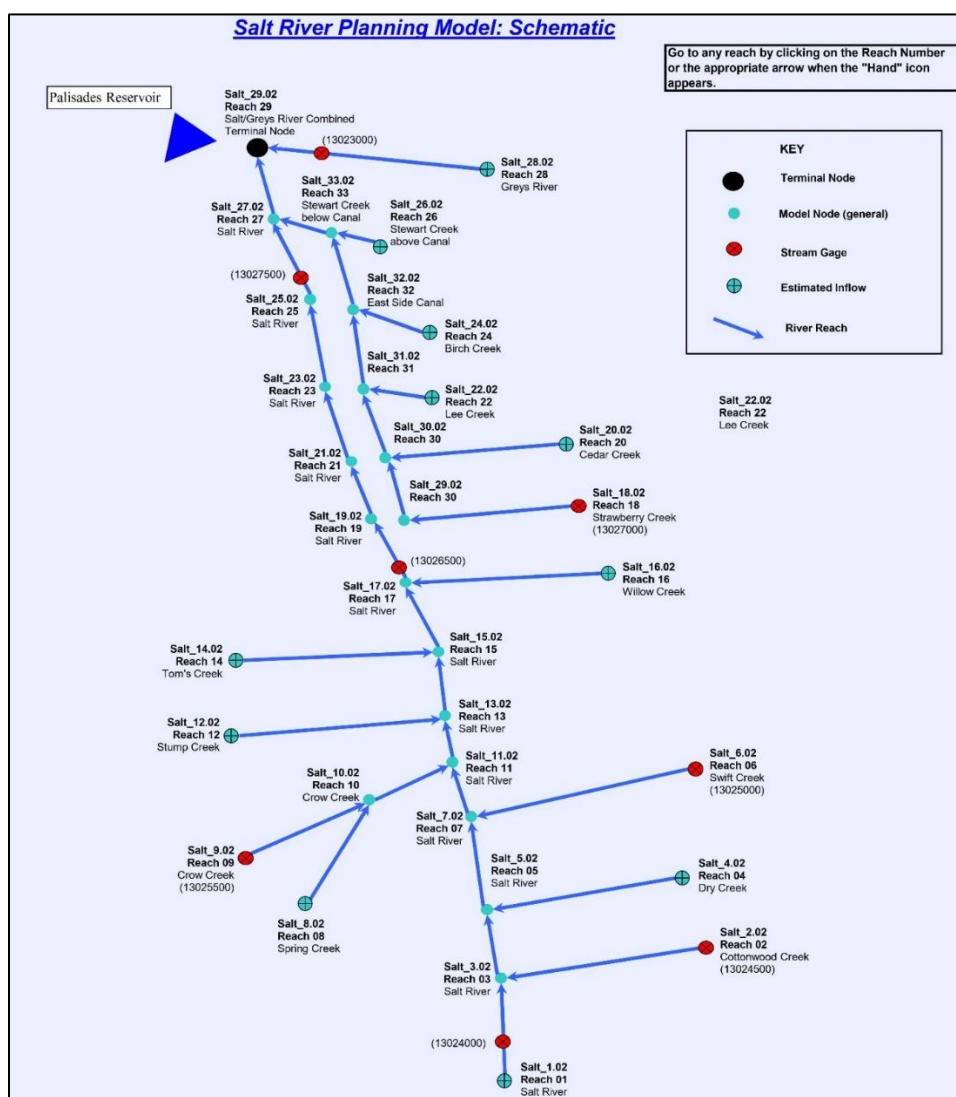


Figure 4-106: Salt River Model Network Schematic (developed by Sunrise).

4.2.2 Model Inputs and Structure

The surface water model is supported by a centralized hydrologic database that organizes all input data and links directly to the spreadsheet models. A screenshot of the database welcome page is shown in Figure 4-107. The model uses a mass balance approach to simulate streamflow through each reach of the Salt River and its tributaries.

Primary model inputs include:

- USGS streamflow data extended through Water Year 2025
- Drainage area and elevation values derived using USGS StreamStats
- Irrigated acreage estimates based on updated GIS analysis
- Diversion volumes estimated from crop water requirements
- Flow contributions from ungaged tributaries

Each modeled reach includes one or more nodes where inflows, diversions, and return flows are calculated. These nodes are placed at gage locations, major confluences, canal junctions, or other hydrologic breakpoints. The full layout of nodes and reaches is shown in (Appendix C: Hydrology Report Exhibits– Figure 4-2).

All watershed characteristics for ungaged tributaries, including drainage area and mean basin elevation, were derived using StreamStats. This ensures consistent delineation across the basin and improves confidence in the regression-based flow estimates used for these inputs.

Separate models were developed for dry, average, and wet year conditions. Each model simulates monthly flow over a single calendar year. Monthly outflows at the downstream end of each reach are calculated based on upstream inflow, local tributary input, and estimated water use within the reach. This structure supports both seasonal and spatial analysis of surface water availability across the entire Salt River Basin.

4.2.3 Model Validation and Visualization Improvements

To ensure model reliability, an internal validation step was included by comparing simulated flows to measured data at two key USGS streamgages on the Salt River, corresponding to Nodes 17.04 and 25.06. This comparison serves as a basic calibration check, confirming that the modeled output aligns with observed flows at these locations. This is consistent with the approach used in the 2012 study, which also relied on gage comparisons as a practical validation method.

This step helps confirm that the updated inputs, tributary routing, and flow estimation methods continue to produce realistic streamflow values at critical points in the system. While this approach does not

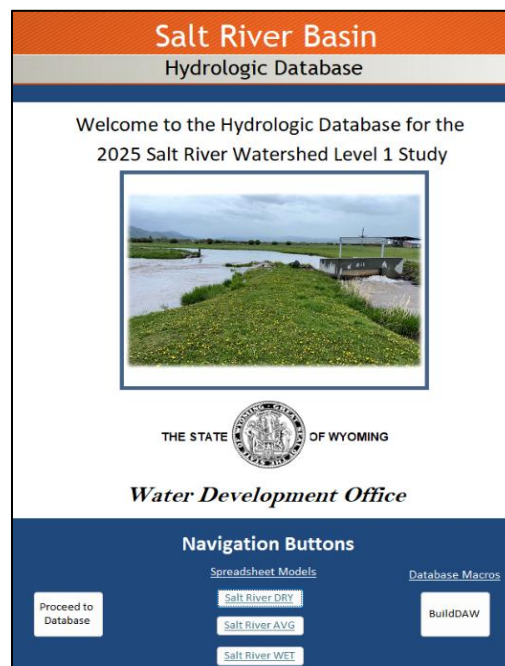


Figure 4-107: Screenshot of Hydrologic Database.

represent full calibration or continuous simulation, it supports the planning-level intent of the model and verifies that the overall structure and assumptions are reasonable.

4.2.4 USGS Stream Gage Data

4.2.4.1 USGS Gage Locations and Records

The Salt River Basin contains several active and historic USGS streamgages, most of which are located along the mainstem Salt River or its major tributaries. These gages provide the foundation for estimating streamflow throughout the basin and are critical for both model input and validation. Most of the gage records span multiple decades, with several extending from the 1950s or earlier. Gages with long-term, continuous records were prioritized as index sites for model input and internal checks. The location of each gage and its operating period is shown in Figure 4-3 (Appendix C: Hydrology Report Exhibits).

Figures 4-4 through 4-14 (Appendix C: Hydrology Report Exhibits) illustrate the contributing watershed area for each current and historic gage and include hydrographs showing the mean daily discharge measured at each station. These measured records reflect observed daily mean flow conditions and demonstrate the characteristic seasonal pattern of the Salt River watershed, with low winter baseflows followed by snowmelt-driven runoff that typically begins in mid-April and peaks in May or June, depending on watershed size and elevation.

4.2.4.2 USGS Gage Data Processing

The measured streamflow records form the foundation for updating the hydrologic spreadsheet models. Using these data and the analytical methods described in the following sections, the USGS records were applied to classify dry, average, and wet hydrologic years within the Salt River Basin.

TSTool, a time-series data-processing software developed by the Colorado Division of Water Resources, was used to acquire, process, and fill streamflow records through Water Year 2025 for the Salt River Basin (State of Colorado, 2025). Daily streamflow data from multiple USGS gage sites were retrieved using the *ReadUsgsNwisDaily* command and converted to monthly averages. These monthly values were then added into the model database for further use.

Some USGS gages have periods of record that end before 1971, leaving gaps during the model analysis period. However, those historical records still capture the characteristic patterns and magnitudes of flow at each site. To extend these records through 2025, missing data were filled using the TSTool *FillMixedStation* command, which estimates values through statistical correlation with nearby gages that have longer or continuous records. This approach, consistent with the 2012 Basin Plan methodology, produces complete time series that maintain the general monthly flow relationships among gages without altering the original seasonal character of the data.

The model uses the full daily record from each gage, converting it to monthly mean inflows standardized to the 1971–2025 analysis period and grouping those monthly means by hydrologic year type (dry, average, or wet). Because the model data are processed, filled, and averaged in this way, the resulting inflows differ slightly from the measured mean daily flow hydrographs shown in the preceding figures. The resulting datasets provide continuous, standardized monthly inflows suitable for comparative analysis

across all modeled sites and form the basis for the hydrologic year-type classification described in the following section.

4.2.5 Ungaged Tributaries

This study builds upon the methodology established in the 2012 Snake/Salt River Basin Plan, which provided a standardized process for estimating flows from tributaries in the Salt River Basin that lack streamflow gaging stations. That methodology is retained and expanded in the 2025 update.

Several tributaries included in the model network do not have gage records but still contribute to the overall surface water supply, particularly those with active irrigation diversions. For these ungaged tributaries, natural inflows were estimated based on physical watershed characteristics—specifically, drainage area and mean basin elevation—both derived from USGS StreamStats. Smaller tributaries without modeled diversions were not individually estimated; their flows were accounted for through basin-gain calculations in the spreadsheet models.

As in the 2012 study, mean annual flows were estimated using a regional regression equation developed for mountainous regions of Wyoming, published in USGS Water-Resources Investigations Report 88-4045 (Lowham, 1988):

$$Q_a = 0.0015A^{1.01} \left(\frac{ELEV}{1000} \right)^{2.88} \quad \text{Equation 1}$$

Where:

Q_a = estimated mean annual flow (cfs)

A = drainage area (square miles)

ELEV = mean basin elevation (feet)

For the 2025 update, the drainage area and mean elevations were derived using the USGS StreamStats tool, which automates watershed delineation and computes relevant hydrologic parameters using national elevation data. This represents a significant improvement over prior manual methods by increasing the consistency and accuracy of drainage area and elevation estimates. An improvement in this study is the clear spatial definition of each ungaged tributary included in the model. Figures 4-15 through 4-22 (Appendix C: Hydrology Report Exhibits) illustrate the contributing drainage area, mean elevation, and mapped location of each modeled ungaged tributary basin.

After estimating mean annual flow using Equation 1, monthly flows were developed by correlating each ungaged tributary to a nearby gaged watershed with similar hydrologic and physical characteristics. This step, consistent with the 2012 Plan, uses historical records from selected correlation gages to distribute the annual volume across months. The correlation process is based on the procedures outlined in Lowham (1988) and is implemented through automated queries in the hydrologic database.

4.2.5.1 Ungaged Tributaries Correlated to Strawberry Creek

As carried forward from the 2012 Snake/Salt River Basin Plan, an alternative estimation method was used for select ungaged tributaries where the standard regression equation (Equation 1) produced inflow values that appeared unrealistically low compared to flows in nearby gaged basins.

To address this, Cedar Creek, Lee Creek, Birch Creek, and Stewart Creek were estimated using a simple area-weighted scaling method. In this approach, monthly streamflows from Strawberry Creek (USGS Gage 13027000) were proportionally scaled to each ungaged tributary based on the ratio of drainage areas. This method assumes that watersheds in close proximity with similar topography and land cover produce comparable flow patterns per unit area.

Strawberry Creek was selected as the reference watershed due to its historical streamflow record and geographic similarity to the target tributaries.

4.2.6 Improved Irrigation and Diversion Data Estimates

4.2.6.1 Diversions in the Spreadsheet Water Models

The spreadsheet models use a mass balance approach, with streamflow data being the input for water entering the basin. Diversions, primarily for irrigation, represent the main outflow or use of water within the basin.

As outlined in the 2012 Study, diversion data in the models are used to represent irrigation depletions. Because there is no metering of irrigation diversions, the 2012 Study also describes the methodology for estimating Crop Irrigation Requirements (CIR). Rather than repeating that methodology here, readers are referred to Tabs VI and VII of the Snake/Salt River Basin Plan Update (2012). In short, the method estimates water requirements based on crop type and irrigated acreage throughout the watershed to approximate total diversions.

4.2.6.2 Limitations of Unmeasured Diversion Data

As irrigation diversions are not measured directly, it is important to understand that these figures represent best estimates. Irrigation volumes can vary widely from year to year due to factors such as weather conditions, crop types, and user behavior. For example, the act of opening or closing a headgate can significantly alter flow through a canal or diversion, and such actions are impossible to model accurately across the entire basin.

To accurately model the diversions, each and every diversion would need to be measured and logged throughout the year. This is likely unfeasible due to the number of users, from large systems to individual users pulling from a canal. Future studies should prioritize measuring diversions at headworks. Comparing measured data with modeled estimates would allow for calibration and refinement of diversion assumptions. Currently, irrigation remains one of the largest uncertainties in the model, though the existing estimates are the best available.

4.2.6.3 Irrigated Acreage Estimates

The 2012 Study reported approximately 62,000 irrigated acres across the watershed, a figure that generally aligned with the 2007 Wyoming Water Framework Plan (Wyoming Water Development Office, 2007). However, closer inspection revealed that this estimate was significantly overestimated, as it included dryland farms and areas that have since been developed.

To develop a more accurate estimate of irrigated acreage in the Salt River Basin, GIS tools were used to refine the 2007 dataset. The irrigated lands layer from the 2007 Wyoming Water Framework Plan was first loaded into GIS and intersected with Lincoln County parcel data. Parcel-level land use codes provided by the County Assessor identified which properties were classified as actively irrigated. This step allowed the removal of parcels incorrectly identified as irrigated, including dryland agriculture and recently developed lands.

After filtering the dataset by active irrigation classification, wetland areas were removed using the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI). This ensured that permanently saturated areas not typically irrigated for agriculture were excluded. The use of GIS for spatial filtering and dataset integration significantly improves the accuracy of the final irrigated acreage estimate.

It is important to note that this method does not capture all irrigated areas. It relies on land-use coding in tax records, which may not always reflect actual irrigation practices, and may miss small or informal irrigation areas not tracked at the parcel level. Future studies should include field verification and direct measurement of diversion flows to further refine irrigated land and diversion estimates.

The refined dataset identifies approximately 34,257 acres of actively irrigated land within the Salt River Basin, as shown in Figure 4-23 (Appendix C: Hydrology Report Exhibits). For modeling purposes, these acreages were assigned to the nearest corresponding model junction.

4.3 Hydrologic Modeling Results

4.3.1 Dry, Average, and Wet Years Classification

The classification of dry, average, and wet years is a key step in developing representative streamflow scenarios for water availability modeling in the Salt River Basin. Similar to previous studies, this analysis uses a single indicator gage to represent natural annual flow conditions in the Salt River Basin. USGS Gage 13023000, located on the Greys River above the reservoir near Alpine, Wyoming, was selected due to its long-term, continuous record and minimal influence from upstream diversions or regulation. Although the gage lies just outside the Salt River Basin boundary, the Greys River originates in the Salt River Range, the same mountain range that feeds many of the Salt River's tributaries. As a result, it exhibits similar snowmelt-driven hydrology and watershed characteristics. Because of this shared source region and natural flow conditions, the gage is considered a reliable indicator for classifying year types across the Salt River Basin.

The year-type classification was based on the updated streamflow record spanning Water Years 1971 through 2025, capturing both historical and recent hydrologic variability. After compiling and preparing the daily gage data, annual flow volumes were calculated for each year in the study period. The wettest

20 percent and driest 20 percent of years, based on total annual discharge, were designated as wet years and dry years, respectively. The remaining 60 percent of years were classified as average.

This analysis was performed using the BuildDAW macro within the hydrologic model database, which automates the classification process based on USGS streamflow data. This tool ensured consistent application of the method and allowed the resulting year types to be directly integrated with the spreadsheet models and associated inflow datasets. Figure 4-108 shows the classification of dry, average, and wet years across the full 1971 to 2025 study period.

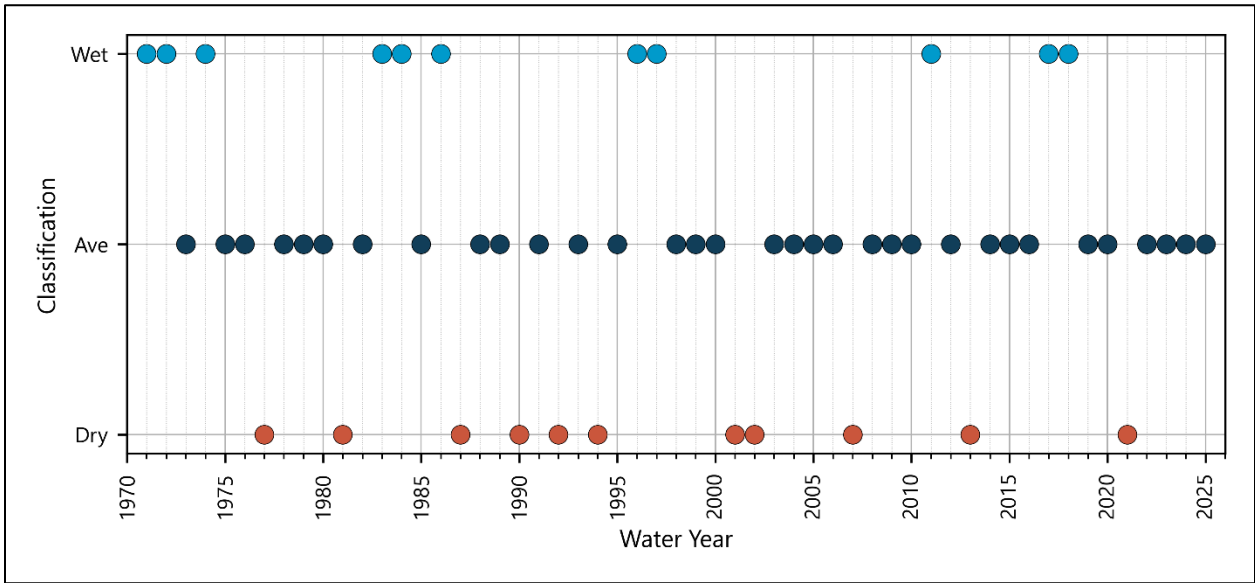


Figure 4-108: Classification of Dry, Average and Wet Years (developed by Sunrise).

4.3.2 Physically Available Surface Flow per Spreadsheet Models

The Salt River Basin spreadsheet model estimates physically available surface water, referred to as “Reach Outflows.” These values represent the volume of water present at the downstream end of each stream reach, accounting for natural hydrologic supply and existing water use. The model simulates three representative hydrologic conditions: dry, average, and wet years. Year types are based on historical streamflow records, as described in earlier sections. Water availability is evaluated on a monthly time step and varies across the basin depending on location and season.

The model divides the Salt River Basin into a network of stream reaches, each composed of multiple nodes, or water balance points. Reaches are typically defined by USGS gaging stations or tributary confluences and represent distinct segments of the main channel or its tributaries. An output summary within the model calculates monthly flow at the downstream end of each reach, providing a spatial and temporal view of surface water supply. The full layout of modeled reaches and nodes is shown in Figure 4-2, Appendix C: Hydrology Report Exhibits.

Table 4-1, Table 4-2, and Table 4-3 present the annual modeled flow for each reach under dry, average, and wet conditions. Total annual flow results for each reach are also shown graphically in Figures 4-24

through 4-26, Appendix C: Hydrology Report Exhibits, allowing for basin-wide comparison of physically available surface water under different scenarios.

Reach 7, Reach 15, and Reach 27 represent the outlet points for the Upper, Middle, and Lower Salt River HUC10 watersheds, respectively. These reaches provide a summary of modeled flow conditions at the downstream end of each major watershed unit within the basin.

4.3.2.1 Hydrologic Model Output Figures

To improve the clarity and usability of the modeling results, a new series of reach-specific summary figures has been developed. Each figure presents a visual summary that combines a spatial map with a modeled hydrograph, allowing users to quickly interpret flow conditions without needing to navigate large tables or spreadsheets.

The map portion of each figure displays the location and extent of the modeled reach, along with estimated inflows, junction nodes, terminal nodes, and any associated USGS streamgages. Topographic contours are included to provide geographic context and help the reader understand the physical setting of each reach within the basin.

The hydrograph portion shows modeled monthly surface water flow for dry, average, and wet year types. Flow values are displayed in acre-feet and labeled directly above each plotted point for clarity. These graphs highlight seasonal patterns and provide a clear visual comparison of flow variability across different hydrologic conditions.

Figures 4-27 through 4-60, Appendix C: Hydrology Report Exhibits, include summary visualizations for each reach in the modeled network. These figures serve as a practical reference for water managers, planners, and basin stakeholders. By consolidating key model results into a single, easy-to-read format, they improve the accessibility of the data and support a more intuitive understanding of streamflow behavior across the Salt River Basin.

Table 4-1. Reach Outflows for Salt River Basin in Dry Hydrologic Conditions (Units in acre-feet).

Reach	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1	371	312	424	1,544	5,626	2,537	628	402	439	691	533	432	13,937
2	881	757	959	1,066	2,859	4,716	2,719	2,128	1,445	1,543	1,108	975	21,157
3	3,593	2,746	3,914	6,012	9,355	6,679	5,685	4,349	3,178	5,732	4,573	3,981	59,796
4	285	245	310	344	914	1,463	797	647	458	498	358	315	6,633
5	4,495	3,434	4,891	7,253	10,418	7,522	6,470	5,158	3,906	7,149	5,705	4,975	71,376
6	2,156	1,867	2,307	2,531	5,439	10,988	5,314	3,371	2,589	3,088	2,363	2,244	44,256
7	7,728	6,073	8,363	11,349	16,203	17,930	12,434	9,153	7,042	11,843	9,417	8,403	125,938
8	843	742	926	1,326	1,276	982	756	777	790	996	1,003	882	11,300
9	2,237	1,969	2,458	3,518	3,389	2,620	2,023	2,070	2,099	2,644	2,660	2,341	30,030
10	3,080	2,711	3,385	4,843	4,639	3,448	2,573	2,743	2,866	3,639	3,663	3,224	40,815
11	10,808	8,784	11,748	16,192	20,741	20,788	14,217	11,497	9,819	15,477	13,080	11,627	164,777
12	1,827	1,608	2,008	2,873	2,749	2,031	1,507	1,618	1,698	2,158	2,173	1,912	24,162
13	13,878	11,284	15,100	20,872	23,862	21,990	16,263	13,727	12,125	19,488	16,810	14,906	200,305
14	237	209	261	373	358	272	207	216	222	280	282	248	3,165
15	14,693	11,907	15,986	22,085	24,443	22,164	17,106	14,422	12,673	20,633	17,817	15,790	209,719
16	343	299	361	612	950	666	280	307	370	446	391	365	5,393
17	15,752	12,720	17,121	23,741	25,959	24,332	20,376	16,434	13,703	22,166	19,105	16,943	228,353
18	2,180	1,904	2,296	3,894	6,074	4,591	2,278	2,198	2,381	2,840	2,490	2,323	35,448
19	16,565	13,499	18,004	25,127	27,473	25,148	20,723	16,930	14,558	23,321	20,253	17,987	239,588
20	604	527	636	1,079	1,674	1,173	493	541	652	786	690	643	9,499
21	20,522	17,292	22,299	31,874	34,811	28,720	21,850	19,074	18,692	28,945	25,839	23,070	292,989
22	676	590	711	1,207	1,886	1,465	765	710	741	880	771	720	11,121
23	23,366	20,019	25,387	36,724	40,089	31,333	22,724	20,645	21,666	32,988	29,855	26,724	331,519
24	287	250	302	512	805	672	395	336	318	374	327	305	4,882
25	25,210	21,787	27,389	39,869	43,543	33,356	23,750	21,889	23,622	35,610	32,458	29,093	357,576
26	809	706	851	1,444	2,278	1,983	1,239	1,008	904	1,054	923	862	14,061
27	29,765	25,765	32,185	48,005	56,102	41,484	26,450	25,478	28,486	41,539	37,660	33,946	426,865
28	12,281	10,509	13,446	33,450	69,913	54,696	26,850	17,986	14,981	19,195	15,719	13,684	302,710
29	2,180	1,904	2,296	3,894	6,038	4,189	1,713	1,923	2,351	2,839	2,490	2,323	34,139
30	2,784	2,432	2,932	4,973	7,654	4,716	1,296	2,020	2,954	3,623	3,179	2,967	41,530
31	3,459	3,022	3,643	6,179	9,511	5,847	1,591	2,501	3,670	4,502	3,951	3,686	51,562
32	3,746	3,272	3,945	6,691	10,302	6,371	1,779	2,736	3,977	4,875	4,278	3,992	55,964
33	4,555	3,978	4,796	8,136	12,566	8,199	2,800	3,637	4,870	5,929	5,201	4,853	69,520
34	42,046	36,274	45,631	81,455	126,016	96,180	53,300	43,463	43,467	60,734	53,378	47,630	729,574

Table 4-2. Reach Outflows for Salt River Basin in Average Hydrologic Conditions (Units in acre-feet).

Reach	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1	378	317	459	2,008	8,374	7,443	2,794	992	788	697	527	427	25,207
2	887	765	1,009	1,187	4,416	9,226	5,973	3,010	1,894	1,542	1,096	963	31,967
3	3,711	2,847	4,050	8,411	18,075	19,369	10,539	7,000	5,353	5,546	4,436	3,970	93,307
4	287	247	326	384	1,417	2,921	1,848	932	603	498	354	311	10,128
5	4,643	3,560	5,057	10,170	20,805	22,533	12,227	8,406	6,589	6,912	5,533	4,961	111,397
6	2,162	1,883	2,401	2,578	6,984	16,119	11,203	5,125	3,556	2,950	2,318	2,232	59,512
7	7,932	6,254	8,646	15,148	30,167	39,577	23,820	14,697	11,327	11,381	9,146	8,380	186,476
8	838	763	940	1,705	3,108	2,654	1,538	1,103	1,003	975	976	858	16,461
9	2,224	2,024	2,493	4,526	8,250	7,057	4,099	2,935	2,665	2,588	2,589	2,277	43,726
10	3,062	2,786	3,433	6,231	11,332	9,557	5,430	3,934	3,645	3,561	3,565	3,135	59,673
11	10,993	9,041	12,079	21,378	41,398	48,545	28,459	18,233	14,882	14,937	12,711	11,516	244,173
12	1,816	1,653	2,036	3,696	6,719	5,655	3,202	2,324	2,160	2,112	2,115	1,860	35,347
13	14,109	11,631	15,487	27,844	50,835	55,109	31,899	21,796	18,382	18,801	16,320	14,746	296,960
14	236	215	264	480	874	743	427	307	282	274	275	241	4,617
15	14,949	12,281	16,389	29,612	53,022	56,562	32,823	22,873	19,330	19,892	17,290	15,625	310,649
16	343	301	372	655	1,177	1,182	712	484	482	444	388	362	6,902
17	16,041	13,123	17,551	31,866	56,115	60,271	36,352	25,423	20,894	21,365	18,538	16,776	334,315
18	2,181	1,916	2,367	4,168	7,514	7,869	5,024	3,323	3,093	2,827	2,466	2,300	45,047
19	16,874	13,926	18,459	34,075	60,530	63,149	37,626	26,251	22,088	22,483	19,666	17,810	352,937
20	604	531	656	1,155	2,072	2,081	1,253	853	849	783	683	637	12,158
21	20,935	17,835	22,876	44,832	81,994	76,762	43,268	30,004	27,873	27,926	25,157	22,847	442,309
22	676	594	734	1,292	2,332	2,480	1,616	1,058	962	876	764	713	14,095
23	23,853	20,645	26,052	52,563	97,427	86,593	47,387	32,732	32,034	31,838	29,105	26,467	506,696
24	287	252	311	548	994	1,103	756	484	412	372	324	302	6,144
25	25,745	22,467	28,111	57,576	107,464	93,295	50,518	34,727	34,759	34,376	31,664	28,814	549,516
26	809	711	878	1,546	2,812	3,199	2,258	1,425	1,168	1,049	914	853	17,621
27	30,302	26,470	33,056	66,285	123,031	108,271	58,954	40,665	41,112	40,279	36,815	33,619	638,859
28	12,373	10,632	14,200	40,037	105,976	112,037	56,725	29,919	22,194	19,183	15,540	13,508	452,323
29	2,181	1,916	2,367	4,168	7,478	7,467	4,458	3,047	3,063	2,826	2,466	2,300	43,738
30	2,785	2,447	3,023	5,323	9,493	8,902	4,802	3,457	3,864	3,607	3,148	2,937	53,787
31	3,461	3,040	3,757	6,614	11,795	11,048	5,948	4,286	4,801	4,483	3,912	3,650	66,794
32	3,748	3,292	4,068	7,162	12,776	12,003	6,497	4,669	5,201	4,854	4,237	3,952	72,458
33	4,557	4,003	4,946	8,708	15,573	15,047	8,536	5,987	6,358	5,903	5,151	4,805	89,573
34	42,675	37,102	47,256	106,321	229,007	220,308	115,680	70,584	63,305	59,462	52,355	47,128	1,091,182

Table 4-3: Reach Outflows for Salt River Basin in Wet Hydrologic Conditions (Units in acre-feet).

Reach	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1	503	444	824	2,881	12,513	15,615	4,969	1,588	1,094	823	680	556	42,490
2	1,031	935	1,445	1,403	6,256	14,498	8,849	3,762	2,246	1,743	1,303	1,111	44,583
3	4,241	3,527	6,164	12,848	28,843	33,142	13,990	9,827	7,385	6,694	5,744	4,815	137,221
4	349	313	474	451	2,042	4,766	2,927	1,215	742	589	445	375	14,688
5	5,304	4,406	7,666	15,559	33,463	38,238	16,333	11,907	9,123	8,368	7,181	6,021	163,569
6	2,447	2,206	3,179	2,803	8,575	21,593	16,286	6,664	4,230	3,320	2,652	2,400	76,354
7	8,997	7,600	12,637	22,303	46,620	60,908	32,273	20,417	15,166	13,585	11,564	9,870	261,941
8	1,003	970	1,373	2,538	5,122	4,749	2,556	1,451	1,239	1,226	1,219	1,095	24,542
9	2,595	2,515	3,628	6,549	12,703	11,684	6,358	3,702	3,165	3,138	3,103	2,797	61,937
10	3,598	3,485	5,001	9,087	17,798	16,279	8,708	5,050	4,381	4,362	4,323	3,891	85,964
11	12,595	11,085	17,638	31,389	64,317	76,598	40,191	25,068	19,457	17,941	15,886	13,762	345,928
12	2,174	2,102	2,976	5,500	11,083	10,194	5,410	3,079	2,669	2,656	2,642	2,373	52,858
13	16,208	14,328	22,683	41,440	80,662	87,877	44,988	30,171	24,196	22,786	20,527	17,807	423,672
14	282	273	386	714	1,440	1,332	714	405	348	345	343	308	6,891
15	17,159	15,131	24,032	44,269	84,598	90,001	45,803	31,712	25,550	24,150	21,799	18,892	443,097
16	392	350	468	738	1,422	1,774	1,076	657	590	509	451	409	8,838
17	18,379	16,139	25,692	47,630	89,403	94,403	49,206	34,887	27,642	25,939	23,401	20,265	472,987
18	2,423	2,181	2,946	4,718	8,994	11,413	7,095	4,289	3,674	3,149	2,773	2,535	56,191
19	19,376	17,121	27,095	50,760	95,903	99,621	51,720	36,086	29,133	27,268	24,666	21,487	500,237
20	691	617	825	1,300	2,505	3,125	1,895	1,157	1,040	896	795	721	15,567
21	24,230	21,902	33,927	66,002	127,518	124,626	63,401	41,648	36,363	33,735	30,826	27,437	631,616
22	773	691	923	1,454	2,816	3,648	2,334	1,398	1,175	1,003	890	807	17,910
23	27,719	25,339	38,838	76,958	150,247	142,645	71,860	45,678	41,564	38,383	35,254	31,714	726,199
24	328	293	391	617	1,199	1,598	1,061	628	502	426	377	342	7,762
25	29,981	27,568	42,022	84,061	165,015	154,656	77,805	48,515	44,962	41,398	38,125	34,487	788,596
26	925	827	1,105	1,740	3,391	4,596	3,117	1,831	1,423	1,201	1,065	965	22,187
27	35,120	32,176	48,212	93,890	183,764	177,280	90,838	56,613	52,645	48,068	44,026	39,858	902,490
28	15,206	13,487	20,944	51,947	152,860	186,085	84,404	40,432	28,427	21,701	18,937	16,362	650,791
29	2,423	2,181	2,946	4,718	8,959	11,011	6,530	4,013	3,644	3,148	2,773	2,535	54,882
30	3,114	2,798	3,771	6,017	11,406	13,489	7,516	4,727	4,636	4,042	3,569	3,256	68,341
31	3,886	3,489	4,694	7,471	14,192	16,803	9,380	5,896	5,786	5,044	4,458	4,063	85,162
32	4,214	3,782	5,085	8,088	15,378	18,254	10,234	6,422	6,277	5,469	4,836	4,405	92,444
33	5,139	4,608	6,190	9,828	18,755	22,695	13,133	8,147	7,688	6,670	5,901	5,371	114,125
34	50,326	45,663	69,156	145,836	336,624	363,365	175,242	97,045	81,072	69,769	62,963	56,220	1,553,281

4.3.3 Adjusted Physically Available Surface Flow from Models

The modeled results presented in Section 4.2.2 indicate the volume of water physically present in each reach. However, a portion of this flow is already obligated to downstream water rights or instream flow requirements. Therefore, physical flow alone does not represent water legally available for new appropriations, and these legal constraints must be considered when interpreting the results.

An important downstream constraint exists on the Salt River. The WGFD holds an instream flow right (Permit No. 106F) for fisheries habitat protection, extending from the southern boundary of Section 21, T36N, R119W to the northern boundary of Section 16, T36N, R119W. This reach corresponds to Reach 27 in the hydrologic model. The permitted flow is 221 cfs, or approximately 13,589 acre-feet per month, and must be continuously maintained for fish spawning and passage.

To properly account for downstream obligations such as this, the adjusted physically available flow is calculated using the methodology established in Tab X of the 2012 Snake/Salt River Basin Plan Update. At each reach, the quantity of water available for additional use is the minimum of:

1. The physically available flow at that reach, and
2. The surplus required to satisfy instream flow needs and downstream appropriators in the next reach downstream.

If the surplus remaining after downstream demands are satisfied is the limiting value, then that entire surplus is considered available without impacting either local instream needs or downstream water rights. Because the 221 cfs instream flow requirement is located in the most downstream modeled reach of the Salt River, the adjustment process begins at that location and progresses upstream. This ensures that any modeled upstream use does not reduce flows needed to satisfy the required 221 cfs.

The resulting adjusted flows were applied to the model output presented in Section 4.2.2. Summaries for dry, average, and wet hydrologic conditions are presented in Table 4-4, Table 4-5, and Table 4-6. Total annual adjusted flows by reach are illustrated in Figures 4-61 through 4-63, Appendix C: Hydrology Report Exhibits, and detailed reach-by-reach values, along with annual hydrographs, are shown in Figures 4-64 through 4-97, Appendix C: Hydrology Report Exhibits.

It is important to note that the 221 cfs adjustment applies only to the Salt River mainstem and does not modify tributary inflows. Under dry year conditions, the upstream influence of this requirement extends to Reach 11 (downstream of the Crow Creek confluence). In average and wet years, the influence extends farther upstream to just below the Cedar Creek confluence.

Table 4-4. Adjusted Physically Available Reach Outflows for Salt River Basin in Dry Hydrologic Conditions (Units in acre-feet).

Reach	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1	371	312	424	1,544	5,626	2,537	628	402	439	691	533	432	13,937
2	881	757	959	1,066	2,859	4,716	2,719	2,128	1,445	1,543	1,108	975	21,157
3	3,593	2,746	3,914	6,012	9,355	6,679	5,685	4,349	3,178	5,732	4,573	3,981	59,796
4	284.94	244.58	310.04	344.4	913.54	1463	796.55	646.51	457.83	498.37	358.27	315.3	6,633
5	4,495	3,434	4,891	7,253	10,418	7,522	6,470	5,158	3,906	7,149	5,705	4,975	71,376
6	2,156	1,867	2,307	2,531	5,439	10,988	5,314	3,371	2,589	3,088	2,363	2,244	44,256
7	7,728	6,073	8,363	11,349	16,203	17,930	12,434	9,153	7,042	11,843	9,417	8,403	125,938
8	843	742	926	1,326	1,276	982	756	777	790	996	1,003	882	11,300
9	2,237	1,969	2,458	3,518	3,389	2,620	2,023	2,070	2,099	2,644	2,660	2,341	30,030
10	3,080	2,711	3,385	4,843	4,639	3,448	2,573	2,743	2,866	3,639	3,663	3,224	40,815
11	10,808	8,784	11,748	16,192	20,741	20,788	12,862	11,497	9,819	15,477	13,080	11,627	163,422
12	1,827	1,608	2,008	2,873	2,749	2,031	1,507	1,618	1,698	2,158	2,173	1,912	24,162
13	13,878	11,284	15,100	20,872	23,862	21,990	12,862	11,889	12,125	19,488	16,810	14,906	195,066
14	237.17	208.76	260.66	373	358.41	272.09	206.93	215.69	221.73	280.31	282.09	248.25	3,165
15	14,693	11,907	15,986	22,085	24,443	22,164	12,862	11,889	12,673	20,633	17,817	15,790	202,942
16	343	299	361	612	950	666	280	307	370	446	391	365	5,393
17	15,752	12,720	17,121	23,741	25,959	24,332	12,862	11,889	13,703	22,166	19,105	16,943	216,294
18	2,180	1,904	2,296	3,894	6,074	4,591	2,278	2,198	2,381	2,840	2,490	2,323	35,448
19	16,176	13,491	18,004	25,127	27,473	25,148	12,862	11,889	14,558	23,321	20,253	17,987	226,288
20	604	527	636	1,079	1,674	1,173	493	541	652	786	690	643	9,499
21	16,176	13,491	18,597	31,874	34,811	28,333	12,862	11,889	15,335	27,950	24,509	20,358	256,185
22	676	590	711	1,207	1,886	1,465	765	710	741	880	771	720	11,121
23	16,176	13,491	18,597	34,854	40,089	28,333	12,862	11,889	15,335	27,950	24,509	20,358	264,443
24	286.58	250.31	301.79	511.91	804.55	671.74	395.41	335.74	318.03	373.5	327.27	305.39	4,882
25	16,176	13,491	18,597	34,854	42,514	28,333	12,862	11,889	15,335	27,950	24,509	20,358	266,868
26	809	706	851	1,444	2,278	1,983	1,239	1,008	904	1,054	923	862	14,061
27	16,176	13,491	18,597	34,854	42,514	28,333	12,862	11,889	15,335	27,950	24,509	20,358	266,868
28	0	0	902	12,624	48,393	33,870	14,306	5,442	2,842	6,652	3,580	1,140	129,751
29	2,180	1,904	2,296	3,894	6,038	4,189	1,713	1,923	2,351	2,839	2,490	2,323	34,139
30	2,784	2,432	2,932	4,973	7,654	4,716	1,296	2,020	2,954	3,623	3,179	2,967	41,530
31	3,459	3,022	3,643	6,179	9,511	5,847	1,591	2,501	3,670	4,502	3,951	3,686	51,562
32	3,746	3,272	3,945	6,691	10,302	6,371	1,779	2,736	3,977	4,875	4,278	3,992	55,964
33	4,555	3,978	4,796	8,136	12,566	8,199	2,800	3,637	4,870	5,929	5,201	4,853	69,520
34	16,176	13,491	19,499	47,478	90,906	62,203	27,168	17,331	18,177	34,602	28,089	21,498	396,619

Table 4-5. Physically Available Reach Outflows for Salt River Basin in Average Hydrologic Conditions (Units in acre-feet).

Reach	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1	378	317	459	2,008	8,374	7,443	2,794	992	788	697	527	427	25,207
2	887	765	1,009	1,187	4,416	9,226	5,973	3,010	1,894	1,542	1,096	963	31,967
3	3,711	2,847	4,050	8,411	18,075	19,369	10,539	7,000	5,353	5,546	4,436	3,970	93,307
4	286.69	247.23	326.14	383.73	1417	2920.8	1848.5	931.58	602.84	498	354.2	311.31	10,128
5	4,643	3,560	5,057	10,170	20,805	22,533	12,227	8,406	6,589	6,912	5,533	4,961	111,397
6	2,162	1,883	2,401	2,578	6,984	16,119	11,203	5,125	3,556	2,950	2,318	2,232	59,512
7	7,932	6,254	8,646	15,148	30,167	39,577	23,820	14,697	11,327	11,381	9,146	8,380	186,476
8	838	763	940	1,705	3,108	2,654	1,538	1,103	1,003	975	976	858	16,461
9	2,224	2,024	2,493	4,526	8,250	7,057	4,099	2,935	2,665	2,588	2,589	2,277	43,726
10	3,062	2,786	3,433	6,231	11,332	9,557	5,430	3,934	3,645	3,561	3,565	3,135	59,673
11	10,993	9,041	12,079	21,378	41,398	48,545	28,459	18,233	14,882	14,937	12,711	11,516	244,173
12	1,816	1,653	2,036	3,696	6,719	5,655	3,202	2,324	2,160	2,112	2,115	1,860	35,347
13	14,109	11,631	15,487	27,844	50,835	55,109	31,899	21,796	18,382	18,801	16,320	14,746	296,960
14	235.78	214.58	264.38	479.85	873.83	742.54	426.96	307.4	281.67	274.32	274.55	241.46	4,617
15	14,949	12,281	16,389	29,612	53,022	56,562	32,823	22,873	19,330	19,892	17,290	15,625	310,649
16	343	301	372	655	1,177	1,182	712	484	482	444	388	362	6,902
17	16,041	13,123	17,551	31,866	56,115	60,271	36,352	25,423	20,894	21,365	18,538	16,776	334,315
18	2,181	1,916	2,367	4,168	7,514	7,869	5,024	3,323	3,093	2,827	2,466	2,300	45,047
19	16,713	13,926	18,459	34,075	60,530	63,149	37,626	26,251	22,088	22,483	19,666	17,810	352,776
20	604	531	656	1,155	2,072	2,081	1,253	853	849	783	683	637	12,158
21	16,713	14,196	19,468	44,832	81,994	76,762	43,268	27,076	27,873	26,690	23,664	20,030	422,567
22	676	594	734	1,292	2,332	2,480	1,616	1,058	962	876	764	713	14,095
23	16,713	14,196	19,468	52,563	97,427	86,593	45,366	27,076	27,961	26,690	23,664	20,030	457,748
24	286.72	251.85	311.2	547.93	993.78	1102.6	756.35	483.6	411.67	371.87	324.1	302.34	6,144
25	16,713	14,196	19,468	53,134	107,464	93,295	45,366	27,076	27,961	26,690	23,664	20,030	475,058
26	809	711	878	1,546	2,812	3,199	2,258	1,425	1,168	1,049	914	853	17,621
27	16,713	14,196	19,468	53,134	109,443	95,120	45,366	27,076	27,961	26,690	23,664	20,030	478,862
28	0	0	1,656	19,210	84,455	91,210	44,182	17,375	10,055	6,640	3,401	965	279,150
29	2,181	1,916	2,367	4,168	7,478	7,467	4,458	3,047	3,063	2,826	2,466	2,300	43,738
30	2,785	2,447	3,023	5,323	9,493	8,902	4,802	3,457	3,864	3,607	3,148	2,937	53,787
31	3,461	3,040	3,757	6,614	11,795	11,048	5,948	4,286	4,801	4,483	3,912	3,650	66,794
32	3,748	3,292	4,068	7,162	12,776	12,003	6,497	4,669	5,201	4,854	4,237	3,952	72,458
33	4,557	4,003	4,946	8,708	15,573	15,047	8,536	5,987	6,358	5,903	5,151	4,805	89,573
34	16,713	14,196	21,124	72,345	193,898	186,331	89,547	44,452	38,016	33,330	27,065	20,995	758,012

Table 4-6. Adjusted Physically Available Reach Outflows for Salt River Basin in Wet Hydrologic Conditions (Units in acre-feet).

Reach	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1	503	444	824	2,881	12,513	15,615	4,969	1,588	1,094	823	680	556	42,490
2	1,031	935	1,445	1,403	6,256	14,498	8,849	3,762	2,246	1,743	1,303	1,111	44,583
3	4,241	3,527	6,164	12,848	28,843	33,142	13,990	9,827	7,385	6,694	5,744	4,815	137,221
4	349	313	474	451	2042	476	2927	1215	742	589	445	375	14,688
5	5,304	4,406	7,666	15,559	33,463	38,238	16,333	11,907	9,123	8,368	7,181	6,021	163,569
6	2,447	2,206	3,179	2,803	8,575	21,593	16,286	6,664	4,230	3,320	2,652	2,400	76,354
7	8,997	7,600	12,637	22,303	46,620	60,908	32,273	20,417	15,166	13,585	11,564	9,870	261,941
8	1,003	970	1,373	2,538	5,122	4,749	2,556	1,451	1,239	1,226	1,219	1,095	24,542
9	2,595	2,515	3,628	6,549	12,703	11,684	6,358	3,702	3,165	3,138	3,103	2,797	61,937
10	3,598	3,485	5,001	9,087	17,798	16,279	8,708	5,050	4,381	4,362	4,323	3,891	85,964
11	12,595	11,085	17,638	31,389	64,317	76,598	40,191	25,068	19,457	17,941	15,886	13,762	345,928
12	2,174	2,102	2,976	5,500	11,083	10,194	5,410	3,079	2,669	2,656	2,642	2,373	52,858
13	16,208	14,328	22,683	41,440	80,662	87,877	44,988	30,171	24,196	22,786	20,527	17,807	423,672
14	282	273	386	714	1440	1332	714	405	348	345	343	308	6,891
15	17,159	15,131	24,032	44,269	84,598	90,001	45,803	31,712	25,550	24,150	21,799	18,892	443,097
16	392	350	468	738	1,422	1,774	1,076	657	590	509	451	409	8,838
17	18,379	16,139	25,692	47,630	89,403	94,403	49,206	34,887	27,642	25,939	23,401	20,265	472,987
18	2,423	2,181	2,946	4,718	8,994	11,413	7,095	4,289	3,674	3,149	2,773	2,535	56,191
19	19,376	17,121	27,095	50,760	95,903	99,621	51,720	36,086	29,133	27,268	24,666	21,487	500,237
20	691	617	825	1,300	2,505	3,125	1,895	1,157	1,040	896	795	721	15,567
21	21,531	19,902	33,927	66,002	127,518	124,626	63,401	41,648	36,363	33,735	30,826	26,269	625,749
22	773	691	923	1,454	2,816	3,648	2,334	1,398	1,175	1,003	890	807	17,910
23	21,531	19,902	34,623	76,958	150,247	142,645	71,860	43,025	39,495	34,479	30,875	26,269	691,910
24	328	293	391	617	1199	1598	1061	628	502	426	377	342	7,762
25	21,531	19,902	34,623	80,739	165,015	154,656	77,249	43,025	39,495	34,479	30,875	26,269	727,860
26	925	827	1,105	1,740	3,391	4,596	3,117	1,831	1,423	1,201	1,065	965	22,187
27	21,531	19,902	34,623	80,739	170,175	164,129	77,249	43,025	39,495	34,479	30,875	26,269	742,493
28	2,662	2,157	8,401	31,120	131,339	165,259	71,861	27,888	16,288	9,157	6,798	3,818	476,750
29	2,423	2,181	2,946	4,718	8,959	11,011	6,530	4,013	3,644	3,148	2,773	2,535	54,882
30	3,114	2,798	3,771	6,017	11,406	13,489	7,516	4,727	4,636	4,042	3,569	3,256	68,341
31	3,886	3,489	4,694	7,471	14,192	16,803	9,380	5,896	5,786	5,044	4,458	4,063	85,162
32	4,214	3,782	5,085	8,088	15,378	18,254	10,234	6,422	6,277	5,469	4,836	4,405	92,444
33	5,139	4,608	6,190	9,828	18,755	22,695	13,133	8,147	7,688	6,670	5,901	5,371	114,125
34	24,194	22,059	43,024	111,859	301,514	329,388	149,110	70,913	55,783	43,637	37,674	30,087	1,219,243

4.3.4 Water Shortages During Dry Years

The 2012 Basin Plan Update identified minor irrigation shortages during dry years along Dry Creek and Thoms Creek. In the current study, using updated irrigated acreage estimates and revised modeling inputs, no irrigation shortages were identified under modeled dry-year conditions. However, it is important to note that this result reflects generalized assumptions and historical averages. Actual shortages may still occur due to changes in crop types, weather variability, irrigation practices, or human decision-making. These dynamic factors can significantly influence water demand and availability at the local level.

4.3.5 Peak Flow & Flooding Analysis at Gaged Sites

PeakFQ, a USGS-developed tool, was used to estimate flood frequency statistics at all gaged locations within the Salt River Watershed that had adequate periods of recorded annual peak flow data (U.S. Geological Survey, n.d.-a). The analysis followed Bulletin 17C procedures, applying the log-Pearson Type III distribution to develop frequency estimates for various recurrence intervals (e.g., 2-year, 10-year, 50-year, 100-year floods). At each site, the regional skew option was selected with the map skew value applied to improve the accuracy and consistency of results, particularly for sites with shorter records or high variability.

These estimates are based on annual peak flow values, the single highest instantaneous flow recorded in each water year. As such, they represent brief, high-intensity events rather than sustained flow conditions. In most cases, the peak flows underlying these analyses lasted only a few minutes to hours. While these values provide critical insight into flood magnitude and frequency, they reflect a snapshot in time and should not be interpreted as average or prolonged discharge levels.

The results include flood discharge estimates corresponding to key return intervals at each gage, offering a statistical basis for understanding the frequency and magnitude of flood events across the watershed. Frequency plots and tables generated by PeakFQ are included in this report, showing both the observed peak flow data and the fitted probability distributions. These visualizations help illustrate how well the statistical model aligns with historical records and highlight any influential high-flow or low-flow years.

Mapped extents of the individual gaged watersheds within the Salt River Basin are also presented, allowing for spatial comparison of flood behavior and contributing area. Together, this information supports a more detailed understanding of hydrologic response across the basin and can inform infrastructure design, floodplain management, and watershed planning efforts.

Figures 4-98 through 4-105 in Appendix C: Hydrology Report Exhibits show the flood frequency plots, associated data tables, and watershed boundaries for each analyzed gage.

4.3.6 Hydrologic Modeling Limitations

Although spreadsheet-based modeling on a monthly time step has limitations, it remains a valuable tool for understanding the overall hydrologic behavior of the Salt River Watershed in western Wyoming. Given the basin's size, topographic diversity, snowmelt-driven hydrology, and complex network of tributaries and diversions, a fully distributed, high-resolution model would be ideal but is impractical without

extensive data and resources. The spreadsheet model offers a reasonable balance between complexity and practicality, providing useful insights into seasonal water availability, long-term flow patterns, and general watershed behavior.

The model relies primarily on historical USGS streamflow data as input. For ungaged tributaries, flow estimates are based on correlations with nearby gaged sites, scaled by drainage area. While some of these gages have long been discontinued, many between 40 and 80 years ago as shown in Appendix C: Hydrology Report Exhibits Figure 4-3, they still represent the best available data. For example, the Strawberry Creek near Bedford gage, discontinued in 1943, recorded consistent winter baseflows between 30 and 40 cfs, as shown in Figure 4-10, Appendix C: Hydrology Report Exhibits. Tributaries north of Strawberry Creek, with similar watershed characteristics, are modeled using proportional scaling based on basin size. Although streamflow measurement methods and watershed conditions may have changed over time, these records remain the most reliable foundation for estimating baseflows in ungaged areas.

This approach introduces limitations. The model simulates year-round flow in the East Side Canal to Stewart Creek based on the assumption of continuous baseflow from west-flowing tributaries, informed by the historic Strawberry Creek gage and its relationship to those basins. In reality, the canal is often dry during the winter months. Headgates along this canal are typically reopened at the end of the irrigation season to allow natural drainage to resume. However, the timing of these operations varies and is not consistently documented, which makes monthly scale modeling of diversions and returns difficult. In these parts of the model, particularly in the Lower Valley, inflow estimates are generally more reliable than diversion estimates due to the unpredictable nature of human operations.

Another significant challenge is capturing the movement of water between subbasins through manmade diversions. Canals such as the Willow Creek Canals, Strawberry Creek Canals, and Hardman Canals can move water from one stream to another, depending on operational decisions. Because diversion gates can be opened or closed at any time and are often undocumented, these transfers are extremely difficult to represent with accuracy in the model.

Despite these challenges, the modeling effort provides a structured framework for evaluating hydrologic trends, understanding regional water movement, and supporting future planning and water resource management. While not intended for detailed event modeling or operational forecasting, it successfully highlights the broader dynamics of the watershed under both current and historic conditions.

Although the hydrologic model simulates continuous flow along the Salt River mainstem, field conditions routinely differ during the irrigation season. In the reach between Cottonwood Creek and Swift Creek, located generally between the communities of Smoot and Afton, irrigation withdrawals and canal interceptions regularly exceed local inflows during late summer and early fall. As a result, this segment of the river becomes seasonally dewatered, with sections of dry channel or isolated pools typically observed each year after spring runoff. These conditions are a function of irrigation operations rather than natural hydrology, and are not fully captured by the model's monthly time-step representation of diversion timing and return-flow lag. Because the spreadsheet model estimates flow based on average diversion requirements and simulated baseflows, it does not resolve short-duration or operationally driven shortages that occur at a sub-monthly scale.

Because irrigation diversions represent the largest consumptive use in the basin and exert substantial influence on streamflow during the growing season, improved measurement of actual diversion volumes would significantly reduce model uncertainty. The current approach estimates irrigation depletions using crop irrigation requirements applied to mapped irrigated acreage. While this method provides a defensible estimate of consumptive use, it does not capture the variability in real-time diversion operations, return flows, conveyance losses, or operational decisions that can result in seasonal dewatering of individual stream reaches. Furthermore, crop rotations and parcel irrigation can change every year.

4.3.7 Future Modeling Recommendations

A key challenge is the large number and diversity of diversion points located throughout the watershed. These range from major irrigation company headworks serving thousands of acres to individual irrigators diverting water from a canal to irrigate yards, gardens, or small pastures. Many of these smaller diversions are unmetered and may change hands or operational patterns frequently, making comprehensive accounting difficult without additional monitoring infrastructure.

To reduce uncertainty and improve future model calibration, the following phased approach is recommended to better understand irrigation use throughout the watershed:

1. **Flow Measurement at Priority Headworks:** Install meters or other measurement devices at major canal and lateral headgates where the majority of diversions occur.
2. **Standardized Diversion Data Logging:** Implement a system for periodic reporting or telemetry-based transfer of diversion volumes during the irrigation season.
3. **Improved Operational Documentation:** Track headgate operations, cross-basin transfers, and seasonal timing of canal shutdowns to support more realistic diversion routing.
4. **Model Integration:** Incorporate measured diversion data into future hydrologic model updates to reduce uncertainty and improve the representation of irrigation-driven flow depletion.

Given the scope of irrigation within the Salt River Basin, enhancements to diversion measurement and reporting represent the most effective means of reducing hydrologic uncertainty and improving the defensibility of future water availability assessments.

In addition to improving diversion data, expanding the streamflow monitoring network would further support model refinement. Reestablishing or adding continuous flow gages on key tributaries, such as Strawberry Creek and other westward flowing streams in the lower valley, as well as within the seasonally dewatered reach of the Salt River between Smoot and Afton, would provide critical information to confirm baseflow assumptions, document the extent and duration of late-season drying, and improve calibration of inflow estimates.

4.4 Conclusions

This study provides a comprehensive update to the Salt River Basin hydrologic model through Water Year 2025. It incorporates over fifty years of streamflow data, refines the modeling of both gaged and ungaged tributaries, and improves flow routing across the basin. The model was expanded to include updated irrigated acreage based on parcel-level land use data and enhanced GIS analysis. It also accounts for key diversions and instream flow requirements, providing a more accurate representation of water availability

under dry, average, and wet conditions. Peak flow frequency analyses were completed for all active and historic gages with sufficient records, offering updated flood recurrence estimates. Visualization tools were developed to help users interpret hydrologic conditions across different year types. Overall, this update strengthens the technical foundation for water planning and provides a clearer picture of seasonal and long-term streamflow patterns in the Salt River Basin.

5 WATERSHED MANAGEMENT AND REHABILITATION

5.1 Overview

The WWDC's Level I Watershed Study is a basin-scale assessment defined by hydrologic boundaries. It includes two primary components. The first is a detailed evaluation of the watershed's physical setting, developed through a comprehensive inventory of natural resources and summarized into a clear description of current conditions. The second component is a strategic, long-term management plan that identifies opportunities for improving watershed processes, ecological health, and overall system function.

Best management practices (BMPs) and related conservation actions identified in the plan may qualify for funding through the WWDC Small Water Project Program (SWPP). SWPP cost-share assistance is commonly used for on-the-ground improvements such as stock ponds, livestock wells, buried pipelines, stock tanks, spring developments, solar pumping systems, wetland restoration or enhancement, windmills, and upgrades to irrigation diversions and conveyance infrastructure.

Benefits associated with a given BMP can be categorized as direct, indirect, or cumulative. Direct and indirect benefits are generally measurable or otherwise observable. For example, a reservoir designed to increase late-season irrigation supply provides a direct benefit equal to the usable storage it delivers, while improved wildlife habitat represents an indirect benefit. The same project may also produce cumulative benefits, such as increased agricultural productivity and a more resilient local economy. Depending on site conditions and project goals, benefits may be quantitative or qualitative, localized or watershed-wide, and specific to the project or represented by surrogate indicators. Together, these outcomes support key watershed goals, including improved ecological function, reliable water supply, economic stability, healthy stream and riparian systems, and protection of open space.

5.2 Small Water Project Program

5.2.1 Overview

The SWPP provides cost-share funding of up to 50% of eligible project expenses, capped at \$35,000 per project. Eligible projects include small reservoirs, wells, pipelines, springs, solar or windmill platforms, irrigation works, wetlands, riparian or wildlife habitat improvements, rural community fire suppression systems, and recreation-related enhancements. (Wyoming Water Development Office, 2024)

Information on timelines and deadlines for applications is below:

- **Application Deadline:** Applications must be submitted by November 15 each year to be considered for funding.
- **Eligibility:** All project applications will be reviewed for eligibility and prioritized by the SWPP manager.
- **Review & Approval:** Applications are evaluated by the WWDC staff and the Small Water Project Technical Committee during the winter and early spring.
- **Funding Cycle:** Approved projects are announced in March following the WWDC's review and legislative budget authorization.

Implementation requirements for SWPP projects are:

- Sponsors must obtain the necessary permits and clearances (e.g., environmental, cultural, and water rights).
- Projects must meet design standards (NRCS, Professional Engineer, or Professional Geologist).
- A formal Project Agreement with the WWDC is required before disbursement.
- Sponsors must also prepare a long-term operation and maintenance plan to ensure sustainability.
- SWPP is a sponsor-driven program. Sponsoring entities are defined by statute and include, but are not limited to, conservation districts, watershed improvement districts, water conservancy districts, irrigation districts, and municipalities. (Wyoming Water Development Office, 2021a)

This process ensures that small-scale, high-impact projects with clear public benefits—such as improved water quality, habitat restoration, or watershed function—receive targeted support within the state’s broader water development program. A detailed description of this process is well-documented on the Wyoming Water Development Office website at the following link (Wyoming Water Development Office, 2021b):

- https://static1.squarespace.com/static/5a6fa5d38dd04135ed6864e3/t/610947e791c31045c4441682/1627998184003/SWPP_COMBINED.pdf

To maximize the likelihood of approval and avoid delays, applicants are strongly encouraged to collaborate closely with the SWPP manager during the planning phase. Early engagement ensures that all proposed components meet program eligibility requirements and align with funding priorities before the application is submitted. This proactive approach clarifies guidelines, identifies potential issues, and incorporates any necessary adjustments, ultimately strengthening the application and improving project outcomes.

5.3 Salt River Watershed Projects

Projects developed through the study are described by type below. Table 5-1 lists each project’s details, and Figure 5-1 shows the proposed projects’ locations throughout the watershed.

5.3.1 Irrigation Projects

During this study, five irrigation improvement projects were identified and advanced for further evaluation. Each project focuses on upgrading existing infrastructure to increase water-use efficiency, improve delivery reliability, reduce losses, and lower long-term operation and maintenance costs. The portfolio includes three diversion replacement projects to modernize intake structures and improve sediment and debris management; two headgate replacement projects to provide more precise flow control at diversion points; and one project consisting of a series of culvert replacements to restore conveyance capacity, reduce erosion, and ensure reliable roadway and ditch crossings. Culvert replacement is not covered under the SWPP; however, consultation with the SWPP coordinator should occur, as it could be eligible if it is an environmental project and includes a fish passage. The irrigation projects carried forward for this study are:

1. IRR-01 – East Side Canal Diversion Replacement
2. IRR-02 – Willow Creek Spillover Diversion Headgate Replacement
3. IRR-03 – A Frame Diversion Headgate Replacement
4. IRR-04 – Stump Creek Diversion Replacement
5. IRR-05 – Craney Creek Culvert Replacement

5.3.2 Pipeline Projects

During this study, four pipeline projects were identified and advanced for further evaluation and preliminary design. Three of these projects involve replacing aging or undersized pipelines to improve conveyance efficiency, reduce leaks and energy losses, and lower ongoing maintenance requirements. The fourth project is a ditch-to-pipeline conversion that will replace an open conveyance with a buried pipeline to eliminate seepage and evaporation losses, reduce sediment transport, and free up former ditch corridors for restoration or productive use. Together, these projects aim to enhance water delivery reliability, conserve resources, improve water quality, and reduce lifecycle costs for the water system. The pipeline projects carried forward for this study are:

1. PIPE-01 – West Cedar Creek Pipeline Improvements
2. PIPE-02 – Miller Transmission Line Pipeline Improvements
3. PIPE-03 – Upper Strawberry Transmission Main Pipeline Improvements
4. PIPE-04 – Star Valley Ranch Pipeline Conversion

5.3.3 Fire Suppression Projects

During the course of this study, three fire-suppression projects were identified for development and further evaluation. Two projects involve retrofitting existing drafting stations to provide reliable, code-compliant water supplies for local fire response—upgrades include pump and control replacements, improved suction fittings, strainers, frost protection, secured enclosures, and standardized fire-department connection points to ensure required flow and pressure. The third project calls for installing a new drafting station at an existing pond, including development of the spring/pond intake or installation of a screened suction, a hardened pump pad and access, piping and turnout connections, and appropriate inlet/outlet protection and screening to prevent clogging and protect water quality. Collectively, these efforts will enhance community fire protection, improve emergency response capability, reduce wildfire and structure-loss risk, and provide durable, low-maintenance water infrastructure for first responders. The fire suppression projects carried forward for this study are:

1. FIRE-01 – Star Valley Ranch Draft Station
2. FIRE-02 – Alpine Village Draft Station Retrofit
3. FIRE-03 – Granite Ridge Draft Station Retrofit

5.3.3 Solar Projects

During this study, two solar-powered water projects were identified and advanced for further evaluation. Both projects aim to provide reliable, off-grid livestock watering and distribution systems that reduce livestock use of sensitive riparian areas. Proposed components include solar arrays paired with appropriately sized submersible or surface pumps, buried conveyance piping to frost-protected troughs,

float controls, and overflow. By shifting watering points away from ponds and stream edges, these installations will prevent bank trampling and erosion, reduce sediment and nutrient loading to waterways, improve livestock health and herd management, and lower long-term operating costs through renewable energy. The solar projects carried forward for this study are:

1. SOLAR-01 – Nield Solar Water Development 01
2. SOLAR-02 – Nield Solar Water Development 02

5.3.4 Spring Development Projects

During this study, one spring-development project was advanced for further evaluation. This spring development project is proposed on Wyoming State Lands. The project's primary objective is to protect a degraded spring by piping its water to an off-site, frost-protected livestock trough, thereby preventing livestock from accessing the springhead directly. Project elements will include springhead stabilization (sanitary cap or collection box and screened intake), buried conveyance piping sized to meet herd demand, a hardened trough pad with float control and overflow, and exclusion fencing or hardened access at the spring to prevent hoof impact. The SWPP will not cover riparian and spring exclusion fencing. Exclusion fencing around the built spring box can be covered but any additional fencing will need to find a separate funding source such as Wyoming Wildlife and Natural Resource Trust (WWNRT) funding. The spring development project carried forward for this study is:

1. SPRING-01 – Brown State Spring Development

5.3.5 Environmental Projects

During this study, four environmental projects were advanced for further evaluation and preliminary design. Three projects focus on channel and streambank restoration to reduce incision and erosion, reconnect floodplains, and rehabilitate riparian habitat—each will include reach-scale geomorphic assessments, bank stabilization measures (a blend of engineered toe protection and bioengineering), revegetation, and habitat-enhancement features to improve water quality, reduce sediment delivery, and support fish and wildlife. The fourth project targets critical erosion control to protect culinary water supply and adjacent roadway; it will likely include installation of an appropriately sized pipe to safely convey concentrated runoff, upstream sediment-capture measures, outlet energy dissipation, localized slope armoring or bank protection around the buried pipeline, and revegetation and long-term monitoring to ensure pipeline security and reduced turbidity risk. Together, these projects aim to increase channel stability and resilience, improve aquatic and riparian ecosystems, protect infrastructure and water resources, and lower future maintenance and emergency repair costs. The environmental projects carried forward for this study are:

1. ENV-01 – Stewart Creek Channel Stabilization
2. ENV-02 – Prater Canyon Erosion Protection
3. ENV-03 – Nield Livestock River Channel Restoration
4. ENV-04 – West Fork Salt Riverbank Stabilization

5.3.6 Recreational Projects

During this study, one recreation project was advanced for further evaluation, led by the Wyoming Game and Fish Department: an assessment and potential upgrade of up to nine public access sites along the Salt River. The primary focus is improving boat-ramp access—evaluating ramp geometry, shoreline stability, launch surfaces, and safe vehicle/boat maneuvering—but the scope also examines parking capacity, ADA accessibility, signage, bank protection, erosion control, riparian restoration, restroom and waste facilities, and public safety features such as lighting and emergency access. The effort will include site assessments, stakeholder and user engagement, preliminary engineering (including hydraulic and geotechnical reviews where needed), permitting coordination, and cost estimates to prioritize improvements that enhance recreational access, protect riverine resources, reduce bank damage and sedimentation, and support local tourism and outdoor recreation economies. The portions of this project that would be eligible for SWPP funding include bank protection, erosion control, riparian restoration, protection of riverine resources, reduction of bank damage, and sedimentation. All other portions of the project would need to find alternative funding sources. The recreation project carried forward for this study is:

1. REC-01 – WGFD Salt River Public Access Area Improvements

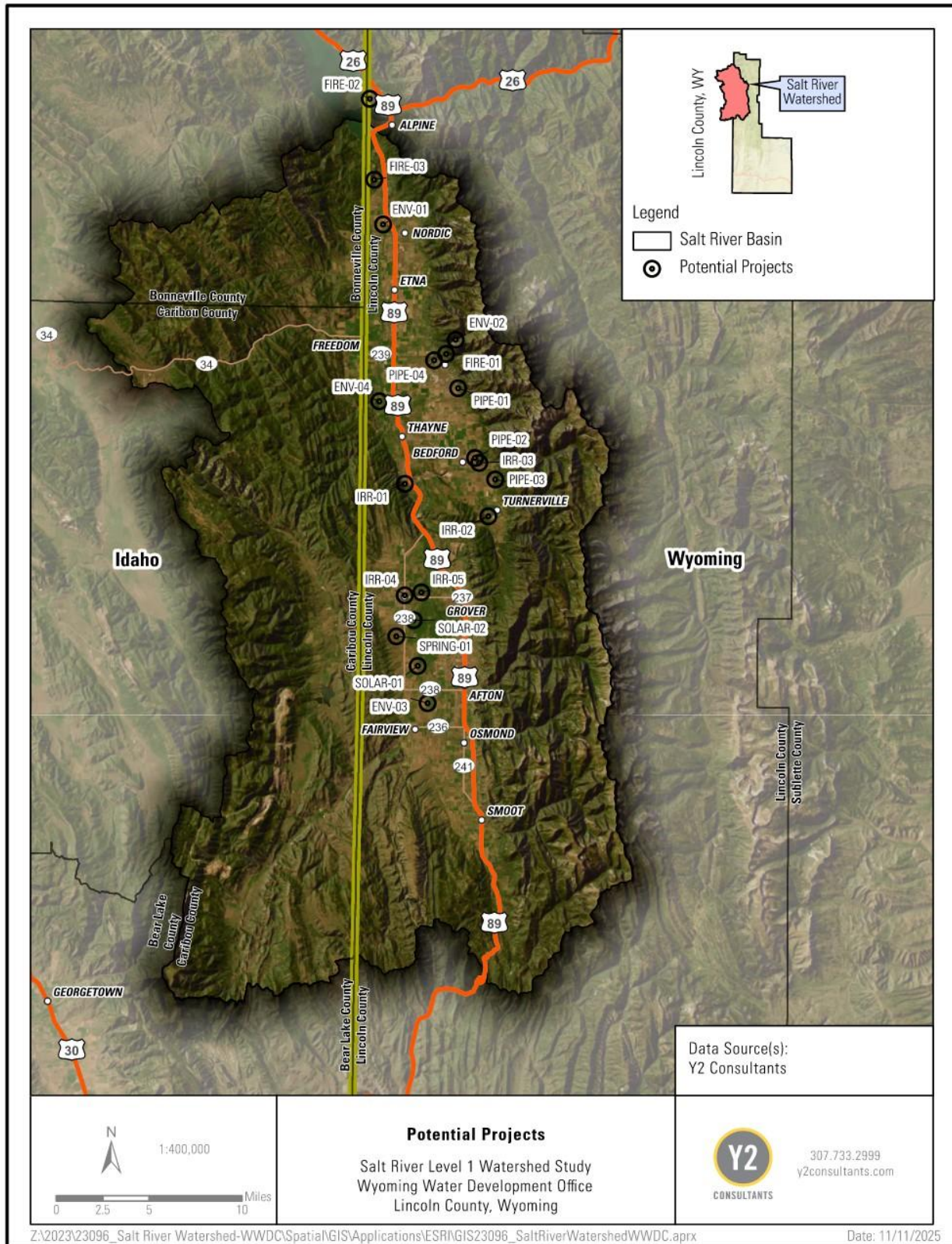


Figure 5-1. Potential projects within the Salt River Watershed.

Table 5-1. Projects developed from the Salt River Watershed Level I Study.

						PLSS Location				GEODETIC COORDINATES (WGS84)	
Project ID	Sponsor	Project Name	Existing Permit Number	Landowner	SWPP Project Type	SEC	Q/Q	T (N)	R (W)	LAT. (N)	LONG. (W)
IRR-01	Etna Irrigation District	East Side Canal Diversion Replacement	P1266	490 LLC	Irrigation	35	SE1/4 SW1/4	34	119	42.8822	-110.9989
IRR-02	SVCD	Willow Creek Spillover Diversion Headgate Replacement	P20352	Verdean G & Helen Heiner Trustees	Irrigation	10	NW1/4 SW1/4	33	118	42.8575	-110.9100
IRR-03	SVCD	A Frame Diversion Headgate Replacement	P137	Mark Dickson	Irrigation	28	NW1/4 SE1/4	34	118	42.8991	-110.9202
IRR-04	SVCD	Stump Creek Diversion Replacement	P1685	Jenny Luthi (Trout Unlimited Project Proponent)	Irrigation	35	SE1/4 SE1/4	33	119	42.7952	-110.9977
IRR-05	SVCD	Craney Creek Culvert Replacement	NA	Daniel M. Hesse Trustee (Trout Unlimited Project Proponent)	Irrigation	3, 9, 10, 15, & 36		32 & 33	119	42.7976	-110.9801
PIPE-01	SVCD	West Cedar Creek Pipeline Improvements	Unknown	Multiple landowners - West Cedar Creek Company	Pipeline	1, 2, 5, & 6		34	118 & 119	42.9572	-110.9434
PIPE-02	SVCD	Miller Transmission Line Pipeline Improvements	Unknown	Multiple landowners - Strawberry Canal Company	Pipeline	19, 20, 28, 29, & 24		34	118 & 119	42.9029	-110.9247
PIPE-03	SVCD	Upper Strawberry Transmission Main Pipeline Improvements	Unknown	Multiple landowners - Strawberry Canal Company	Pipeline	32, 33, & 34		33	118	42.8863	-110.9030
PIPE-04	Town of Star Valley Ranch / SVCD	Star Valley Ranch Pipeline Conversion	P33684	Town of Star Valley Ranch	Pipeline	31	NW1/4 NW1/4	35	118	42.9788	-110.9692
FIRE-01	Town of Star Valley Ranch / SVCD	Star Valley Ranch Draft Station	P7528	Town of Star Valley Ranch	Rural Fire Suppression	30	SE1/4 SE1/4	35	118	42.9839	-110.9565

						PLSS Location				GEODETIC COORDINATES (WGS84)	
Project ID	Sponsor	Project Name	Existing Permit Number	Landowner	SWPP Project Type	SEC	Q/Q	T (N)	R (W)	LAT. (N)	LONG. (W)
FIRE-02	SVCD	Alpine Village Draft Station Retrofit	P15184	Signature Investments LLC (Lyn Ferguson)	Rural Fire Suppression	19	NE1/4 NE1/4	37	118	43.1823	-111.0407
FIRE-03	Town of Alpine / SVCD	Granite Ridge Draft Station Retrofit	None	Lincoln County (Road & Bridge)	Rural Fire Suppression	9	NE1/4 SE1/4	36	119	43.1192	-111.0349
SOLAR-01	SVCD	Nield Solar Water Development 01	NA	Nield Livestock	Solar Platform	22	NE1/4 SW1/4	32	119	42.7402	-110.9832
SOLAR-02	SVCD	Nield Solar Water Development 02	NA	Nield Livestock	Solar Platform	10	SW1/4 NW1/4	32	119	42.7759	-110.9880
SPRING-01	SVCD	Brown State Spring Development	NA	Wyoming State Land (Nield Livestock)	Spring Development	16	SE1/4 NW1/4	32	119	42.7631	-111.0062
ENV-01	Etna Irrigation District	Stewart Creek Channel Stabilization	NA	Multiple landowners - Etna Irrigation District	Environmental	21 & 22		36	119	43.0844	-111.0250
ENV-02	Town of Star Valley Ranch / SVCD	Prater Canyon Erosion Protection	NA	Town of Star Valley Ranch	Environmental	29		35	118	42.9950	-110.9465
ENV-03	SVCD	Nield Livestock River Channel Restoration	NA	Nield Livestock	Environmental	35	NW1/4 SW1/4	32	119	42.7112	-110.9723
ENV-04	SVCD	West Fork Salt River Bank Stabilization	NA	Ralph K. Haderlie Revoc Trust (Trout Unlimited Project Proponent)	Environmental	10	NE1/4 SW1/4	34	119	42.9464	-111.0270
REC-01	SVCD	WGFD Salt River Public Access Area Improvements	NA	Wyoming Game & Fish	Recreational						

6 STAR VALLEY CONSERVATION DISTRICT GIS PLATFORM DEVELOPMENT

6.1 Overview

As an added benefit of this project, the scope includes developing a foundational GIS platform to support the Star Valley Conservation District in future watershed planning, development, and implementation. This platform leverages an existing GIS license secured through the Lincoln County GIS Department, providing SVCD with powerful tools to manage, visualize, and analyze watershed data independently.

Under this arrangement, the GIS license will remain with Lincoln County GIS, which has shared one of its licenses with SVCD. All data collected and generated will be hosted by Lincoln County GIS, ensuring centralized storage and accessibility. To enhance field operations, SVCD requested a mobile mapping solution that enables data collection on cellular or tablet devices. This functionality will allow staff to record project points, inventory locations, and other critical data directly in the field, streamlining workflows and improving data accuracy.

Additionally, Y2 will provide the dataset as map packages and geodatabases with associated metadata, ensuring that SVCD has well-structured, documented, and portable data resources for future use. These deliverables will support seamless integration into the GIS platform and facilitate long-term data management.

The mobile map will utilize data hosted by Lincoln County GIS; however, annual maintenance and updates will be the responsibility of SVCD or a contracted third-party consultant. This includes ensuring system functionality, updating datasets, and adding new information as needed. It is recommended that SVCD budget approximately \$2,000 annually to cover maintenance costs and retain the capability to update or expand the system over time. By investing in this GIS infrastructure, SVCD will gain a long-term asset that strengthens its capacity for data-driven decision-making and integrated watershed management.

6.2 Salt River Watershed Study SVCD GIS Data Catalog

This catalog outlines the datasets included in the stand-alone GIS platform for the Salt River Watershed Study, tailored to SVCD's needs. This platform will support future planning, development, and implementation efforts.

Table 6-1. Data catalog for SVCD GIS product.

Data	Source	Data Sharing
Allotments	BLM and USFS	Public facing
Roads	Lincoln County	Public facing
National Hydrology Data (NHD)	USGS	Public facing
National Wetland Inventory (NWI)	USFWS	Public facing
Irrigation and Water District Boundaries	Project database	Public facing
Location of previous projects in the watershed (WWDO and others)	Project database	Internal to SVCD
Wildlife (Big game crucial winter range, migration corridors)	WGFD	Public facing
Existing ditches and canals	Project database	Internal to SVCD
Irrigated lands	Project database	Internal to SVCD
Ponds/Reservoirs	Project database	Internal to SVCD
Springs	Project database	Internal to SVCD
Wells	Project database	Internal to SVCD
Structures	Project database	Internal to SVCD
Conveyances	Project database	Internal to SVCD

7 COST ESTIMATES

This section presents cost estimates for each project evaluated in Section 5. Table 7-1 summarizes the estimated Total Project Cost for each project, derived from current local material and labor rates and prior small-water-project experience. Estimates for each project include mobilization (typically assumed at 15% of construction costs) and were developed using the best available information for this stage of project development. Detailed, itemized cost breakdowns for each project are provided in the project worksheets in Appendix D: Project Descriptions and Cost Estimates.

The Total Project Cost figures in Table 7-1 encompass construction materials and labor, final design and preparation of specifications, permitting and mitigation expenses, construction engineering/inspection, and an appropriate contingency allowance.

Table 7-1. Project cost for each project identified as part of the Salt River Watershed study. More information on potential funding partners and grants can be found in Section 15 in the detailed project descriptions.

Project ID	Project Name	Landowner	Total Cost Estimate	Potential Funding Partners	
IRR-01	East Side Canal Diversion Replacement	490 LLC	\$451,070.00	USFWS NRCS BOR NOAA	WWDO WGFD TU NFWF
IRR-02	Willow Creek Spillover Diversion Headgate Replacement	Verdean G. & Helen Heiner Trustees	\$174,659.00	NRCS BOR WWDC	WGFD TU NFWF
IRR-03	A Frame Diversion Headgate Replacement	Mark Dickson	\$207,566.00	NRCS BOR WWDC	WGFD TU NFWF
IRR-04	Stump Creek Diversion Replacement	Jenny Luthi (Trout Unlimited is the project proponent)	\$ 328,083.50	USFWS NRCS BOR NOAA	WWDC WGFD TU NFWF
IRR-05	Craney Creek Culvert Replacement	Daniel M. Hesse Trustee (Trout Unlimited is the project proponent)	\$ 467,401.80	USFWS NRCS BOR FHA	WGFD TU NFWF
PIPE-01	West Cedar Creek Pipeline Improvements	Multiple landowners – West Cedar Creek Company	\$741,591.00	NRCS BOR EPA	WWDC WGFD TU
PIPE-02	Miller Transmission Line Pipeline Improvements	Multiple landowners – Strawberry Canal Company	\$2,193,830.99	NRCS BOR EPA	WWDC WGFD TU
PIPE-03	Upper Strawberry Transmission Main Pipeline Improvements	Multiple landowners – Strawberry Canal Company	\$1,875,269.96	NRCS BOR EPA	WWDC WGFD TU
PIPE-04	Star Valley Ranch Pipeline Conversion	Town of Star Valley Ranch	\$255,839.97	NRCS BOR	WWDC WGFD

Project ID	Project Name	Landowner	Total Cost Estimate	Potential Funding Partners	
				EPA	TU
FIRE-01	Star Valley Ranch Draft Station	Town of Star Valley Ranch	\$47,149.50	BLM FEMA USDA-RD	WSF WWDC
FIRE-02	Alpine Village Draft Station Retrofit	Signature Investments, LLC	\$20,631.00	BLM FEMA USDA-RD	WSF WWDC
FIRE-03	Granite Ridge Draft Station Retrofit	Lincoln County (Road & Bridge)	\$20,631.00	BLM FEMA USDA-RD	WSF WWDC
SOLAR-01	Nield Solar Water Development 01	Nield Livestock	\$51,330.63	NRCS WWDC	WWNRT TU
SOLAR-02	Nield Solar Water Development 02	Nield Livestock	\$51,330.63	NRCS WWDC	WWNRT
SPRING-01	Nield Livestock Spring Development	Nield Livestock	\$82,126.37	NRCS WWDC	WOSLI WWNRT
ENV-01	Stewart Creek Channel Stabilization	Multiple landowners – Etna Irrigation District	\$282,162.29	NRCS EPA WWDC	WGFD TU NFWF
ENV-02	Prater Canyon Erosion Protection	U.S. Forest Service	\$196,171.38	USFS FHA NRCS EPA WDEQ	WWDO WGFD TU NFWF
ENV-03	Nield Livestock River Channel Restoration	Nield Livestock	\$364,173.87	NRCS USFWS EPA WWDO	WGFD TU NFWF TNC
ENV-04	West Fork Salt River Bank Stabilization	Ralph K. Haderlie Revoc Trust (Trout Unlimited Project Proponent)	\$614,062.26	NRCS USFWS EPA WWDP	WGFD TU NFWF TNC
REC-01	WGFD Salt River Public Access Areas (9 sites)	Wyoming Game & Fish	\$2,109,916.00 (cost for all 9 sites)	USFWS NOAA WWDO WGFD	WY-State Parks TU NFWF
Total Cost of All Projects			\$11,387,611.39		
Average Project Cost			\$569,380.57		

8 ECONOMIC ANALYSIS

8.1 Overview

A variety of funding sources and technical assistance programs are available to support proposed watershed improvement projects. These resources originate from local, private, state, and federal entities. Within the context of this Level I watershed study and associated watershed management planning efforts, the identification and successful acquisition of project funding are highly contingent upon effective local coordination and voluntary stakeholder participation.

Coordinated efforts among local stakeholders, including landowners, managers, irrigators, residents, organizations, and agencies, are crucial to addressing the identified water resource concerns and to developing integrated management plans and financing strategies.

Entities interested in advancing conservation and watershed restoration projects should become familiar with the available technical and financial assistance programs, many of which offer cost-sharing, in-kind support, or capacity-building resources. The following sections of this report outline relevant programs and institutions that can support the implementation of the proposed projects for this watershed study. Information on funding mechanisms and partnership opportunities was compiled from primary sources, including federal and state agency program materials, conservation funding databases, and planning guidance documents.

Information from previous watershed studies completed by WWDC about potential funding sources was reviewed and incorporated. Water Management and Conservation Assistance Programs Directory, published by the WWDO, was referenced and is often excerpted in the following sections. (Wyoming Water Development Commission, 2014). These potential sources described in this chapter are certainly not all-inclusive of the available opportunities for water management and conservation projects. Available funding for these programs varies annually, as they are subject to budget adjustments, spending authorizations, and, in some instances, donation amounts for private organizations. Additionally, the contact information for these sources may change. Table 7-1 shows a summary of the potential fundings sources described below and provides available contact information.

8.2 Local Agencies

8.2.1 Star Valley Conservation District

The study area lies within the Star Valley Conservation District in Lincoln County. Conservation districts are county-level governmental entities governed by locally elected boards that represent community interests in natural resource management. Acting as a local conduit between landowners, resource users, and state and federal agencies, the SVCD facilitates communication, coordinates project implementation, and helps align regional conservation objectives with on-the-ground needs.

In addition to providing outreach and education on resource issues, the district offers technical assistance where staff capacity and expertise allow, supports the development of conservation programs, and helps prepare proposals and identify funding opportunities from state and federal sources. Conservation districts commonly contribute in-kind resources—such as staff time, technical guidance, and project administration—and can serve as grant administrators or fiscal agents for projects undertaken by local cooperators.

Because of their local presence, institutional knowledge, and community trust, districts are particularly effective at convening partners, leveraging financial and technical resources, and delivering integrated watershed solutions. The SVCD's role includes prioritizing projects, coordinating interagency permitting and technical review, and ensuring that conservation investments respond to local conditions and stakeholder priorities to achieve measurable watershed goals. (Star Valley Conservation District, n.d.)

8.3 State Agencies

8.3.1 Wyoming Department of Environmental Quality

The WDEQ Water Quality Division administers the Nonpoint Source Program, which addresses nonpoint sources of pollution in Wyoming under Sections 319 and 205(j) of the Clean Water Act. The program is funded by federal budget appropriations and the annually allocated funds from the EPA to the state of Wyoming. Funded proposals usually address multiple program objectives, such as agricultural and urban, information and education, and water quality monitoring.

- **Section 319** grant funds are available to local, state, and federal agencies; non-governmental organizations; and private individuals for projects that reduce nonpoint source pollution and improve surface water and groundwater quality. (Wyoming Department of Environmental Quality, n.d.-b)
- **Section 205(j)** funds are available to cities, towns, counties, and conservation districts for water quality management planning projects. These funds are designated for water quality planning and assessment purposes only. (Grants Office, 2025)

Information regarding program eligibility, priorities, and applications is available at the WDEQ Non-point Source Grant Resource website: <https://deq.wyoming.gov/water-quality/watershed-protection/nonpoint-source/>

8.3.2 Wyoming Game and Fish Department

The Wyoming Game and Fish Department is the state agency responsible for managing and conserving Wyoming's fish, wildlife, and their habitats while providing safe and sustainable outdoor recreation opportunities. WGFD develops and enforces hunting and fishing regulations, issues licenses and permits, conducts scientific research and population monitoring, implements habitat restoration and conservation programs, manages wildlife conflict and public-safety issues, and partners with federal agencies, local governments, tribes, landowners, and nonprofits. The agency also provides outreach, education, technical assistance, and grant programs to support habitat projects, public access, and community-based stewardship across the state. (Wyoming Game and Fish Department, n.d.-a)

The WGFD offers several funding opportunities to support watershed- and habitat-related projects. Key programs and features include:

- **Habitat Partnership Program:** Locally driven grants administered through regional Habitat Advisory Boards; supports habitat enhancement, water developments, wetland/riparian restoration, and projects that benefit big game and other wildlife. Typical funding covers on-the-ground construction, materials, and some labor; local match and partner involvement are strongly favored.
- **Aquatic Habitat Trust Fund:** A key source of funding for projects aimed at protecting, restoring, and enhancing aquatic ecosystems across Wyoming. Funded primarily through conservation stamps, license fees, and other dedicated sources, the Trust leverages matching investments and rigorous project review to support initiatives such as fish screen installations, diversion structure upgrades, streambank stabilization, and barrier removals—particularly those improving fish passage. Large and small habitat projects are evaluated by a multi-member board, often in collaboration with partners such as irrigation districts and the Wyoming Wildlife and Natural Resources Trust. Grant cycles typically occur in spring and fall, with applications assessed based on their ecological benefits, long-term sustainability, and potential to improve habitat connectivity, public access, and community resilience.
- **Wildlife Restoration and Habitat Enhancement Grants:** Competitive grants for projects improving fish and wildlife habitat and public access. Emphasis on measurable habitat outcomes, multi-benefit projects, and partnerships with local agencies or landowners.
- **Access and Habitat Program:** Funds public access improvements and habitat work that increase recreational opportunities and conservation outcomes; useful for projects that restore riparian areas while enhancing public use.
- **Small grants and local partnership funds:** Regional WGFD offices often administer smaller cost-share or matching-fund pools for watershed, riparian, or livestock-watering projects—best accessed through direct contact with the local game warden or regional habitat biologist.
- **Technical assistance and in-kind support:** WGFD provides design input, habitat expertise, site prioritization, and can help with project planning, monitoring frameworks, and letters of support for grant applications.

8.3.3 Wyoming Office of State Lands and Investments

The Wyoming Office of State Lands and Investments manages state trust lands and related financial assets to generate revenue for public beneficiaries (primarily public schools). OSLI administers land sales and

leases (agriculture, grazing, mineral, commercial, and recreational), oversees surface and subsurface resource development, manages state trust investments, and issues permits for land use and rights-of-way. The office also coordinates land management activities that balance revenue generation with responsible stewardship, conservation, and multiple-use considerations, and works with local, state, federal, and tribal partners on land-use planning, reclamation, and restoration projects.

The OSLI offers several funding and partnership opportunities that can support watershed projects, often through programs that align land management, restoration, and long-term stewardship with state trust objectives. (Wyoming Office of State Lands and Investments, n.d.) Key opportunities and pathways include:

- **State Land Trust Land Sales/Leases & Revenue Sharing:** Proceeds from state land transactions and leases may be available to support projects that improve productivity and stewardship on trust lands; coordinate with OSLI to explore mutually beneficial land use adjustments or lease terms that include conservation actions.
- **Reclamation and Restoration Partnerships:** OSLI partners on reclamation and habitat restoration projects on disturbed state lands (e.g., post-mining, range improvements). OSLI may provide in-kind support, access to disturbed lands for restoration, or contribute funds when projects advance responsible land stewardship that benefits trust beneficiaries.
- **Cost-share and Matching Opportunities:** While OSLI does not run a large competitive grant program like some agencies, it frequently participates as a funding partner and can provide match or in-kind contributions (land access, technical review, permitting facilitation) to leverage state or federal grant funds (e.g., RCPP, NRCS, WGFD, NOAA, EPA).
- **Rights-of-Way and Easement Agreements:** OSLI can grant easements or rights-of-way for project infrastructure (pipelines, culverts, access roads, water-delivery facilities) across state trust lands, sometimes in exchange for mitigation, lease adjustments, or project benefits; these arrangements can reduce project cost and expedite implementation.
- **Cooperative Agreements & Memoranda of Understanding:** OSLI enters cooperative agreements with local conservation districts, state and federal agencies, and non-profits to implement watershed projects that provide long-term land stewardship and resource protection on state lands.
- **Technical Assistance & Permitting Facilitation:** OSLI staff provide technical review, surveys, and coordination support for projects affecting state lands, helping applicants navigate leasing, permitting, and compliance requirements—reducing administrative barriers and improving fundability of projects.
- **The Farm Loan Program** (est. 1921) provides long-term real-estate financing to Wyoming agricultural operators. It has expanded to include irrigation loans, beginning agricultural producer and livestock enhancement loans, and, most recently, hydropower development loans. Eligible uses encompass acquisition, construction, or installation of equipment and improvements that maintain or enhance the earning capacity of agricultural operations. Eligibility includes Wyoming residents (individual applicants) and legal entities in which a majority ownership meets the residency requirement.
- **The Joint Powers Act Loan Program** (est. 1974) is authorized to support local infrastructure needs. This program helps cities, counties, and special districts deliver governmental services and public facilities. The program is capitalized at \$60 million from the Wyoming Permanent Fund and is designed to assist local entities in financing priority capital projects.

8.3.4 Wyoming Water Development Commission

The Wyoming Water Development Commission coordinates, plans, and advances development of the state's water and related land resources.

WWDC administers the Wyoming Water Development Program and develops financing recommendations under W.S. 41-2-112(a). The program's purpose is to foster optimal development and preservation of the state's human, industrial, mineral, agricultural, water, and recreational resources by providing procedures and policies for planning, selecting, financing, constructing, acquiring, and operating water projects and facilities in the public interest. Eligible objectives include conservation, storage, distribution, and beneficial use of water for municipal, domestic, agricultural, industrial, instream flow, hydroelectric, and recreational purposes, as well as flood reduction, pollution abatement, fish and wildlife conservation, and protection of public lands and public health and safety.

8.3.4.1 Wyoming Water Development Programs

The WWDC administers several programs to plan, fund, and implement water-resource projects across the state:

- **New Project Development:** Supports planning, feasibility, design, and construction of projects that develop unused or unappropriated water supplies to meet current and future needs. Projects may be sponsor-led, state-funded, or cost-shared, and are evaluated for technical feasibility, water rights, environmental impacts, and economic benefit.
- **Rehabilitation of Existing Facilities:** Provides funding and technical support to restore performance and extend the service life of water storage and conveyance infrastructure that has been in operation (typically 15+ years). Sponsors are required to cost-share and assume long-term operation and maintenance responsibilities.
- **Dams and Reservoir Projects:** Focuses on major storage proposals—new reservoirs ($\geq 2,000$ acre-feet) or significant expansions ($\geq 1,000$ acre-feet). While water supply is the primary objective, evaluations also consider secondary benefits such as recreation, habitat enhancement, flood control, and hydropower, with rigorous engineering, environmental review, and permitting.
- **Small Water Project Program:** Targets smaller-scale local water needs and community projects that may not fit larger funding categories. The program provides streamlined planning, design, and limited funding support for modest infrastructure improvements that yield local water-supply, quality, or distribution benefits.
- **Statewide Water Resources Planning:** Conducts basin and statewide planning, data collection, modeling, and technical studies to inform resource allocation, identify priorities, and guide investment. Planning outputs include water availability assessments, demand projections, and strategic project lists to support coordinated decision-making.
- **Administration of Bureau of Reclamation Funds:** Manages and allocates federal funds or program dollars received from the Bureau of Reclamation, ensuring compliance with federal requirements while leveraging these funds to support eligible state and local water projects.

Collectively, these programs use staged project levels, cost-share mechanisms, technical studies, and interagency coordination to advance water projects that improve water supply reliability, ecosystem health, and public benefits across Wyoming.

Generally, on-farm improvements (gated pipe, side rolls, center pivots, pumps, power lines) are not eligible for WWDC funding. For specific eligibility, deadlines, and application guidance, contact WWDC staff or consult the commission's program materials

8.3.5 Wyoming Wildlife and Natural Resource Trust

The Wyoming Wildlife and Natural Resources Trust (WWNRT) is a state grant program that funds projects to protect and enhance Wyoming's fish, wildlife, water, and other natural resources. Established to conserve habitat, improve watershed health, and support public recreation, the Trust awards competitive grants for land protection, riparian and wetland restoration, stream/river corridor projects, erosion control, invasive species treatment, and habitat connectivity actions that yield measurable ecological benefits. Eligible applicants include local governments, conservation districts, tribes, nonprofits, and state or federal agencies (often with required match or partner contributions). Funding priorities favor projects that protect high-value habitat, leverage other funding sources, demonstrate long-term stewardship, and provide clear public benefits, such as improved water quality, enhanced fish and wildlife habitat, and increased recreational access. Applicants should coordinate early with Trust staff, provide strong technical justification and monitoring plans, and demonstrate matching funds or in-kind support to be competitive. (Wyoming Wildlife and Natural Resource Trust, n.d.)

8.3.6 Wyoming State Forestry Division

The Wyoming State Forestry Division (WSFD), within the Wyoming Department of Agriculture, provides leadership, technical assistance, and funding support to manage and protect Wyoming's forest and rangeland resources, reduce wildfire risk, and conserve watershed values. WSFD's role focuses primarily on non-federal lands, including state, local government, and private ownerships, where wildfire risk reduction and forest health improvements are critical to protecting communities, infrastructure, and watersheds.

WSFD supports hazardous fuels mitigation and wildfire risk reduction projects, including vegetation thinning, defensible space treatments, hazardous tree removal, and forest health improvements. These activities are often referred to as emergency fire suppression-related efforts in planning documents, but more accurately represent pre-fire mitigation and fuels reduction actions intended to reduce wildfire severity, protect water quality, and minimize post-fire erosion and sedimentation.

WSFD does not have the state funding authority to fund fuel mitigation on private land directly. Instead, implementation on non-federal lands is typically supported through federal grant programs, most commonly administered by the U.S. Forest Service. WSFD frequently applies for and manages these federal grants to implement fuels mitigation projects on private, state, and local lands. Depending on staff capacity and project structure, WSFD may:

- Administer projects directly, or
- Pass funding through to counties, fire departments, conservation districts, or other local partners for implementation.

Funding structures vary by grant program and project, with some projects requiring local cost share and others being fully funded. Many of these funding sources are competitive and subject to annual federal

appropriations. As a result, there is uncertainty regarding which federal grant programs will be available in 2026, and funding availability cannot be guaranteed. (N. Wilson, personal communication, December 17, 2025; Wyoming State Forestry Division, n.d.)

The Wyoming Volunteer Fire Assistance (VFA) Program, administered by the Wyoming State Forestry Division, offers 50/50 reimbursement grants of up to \$20,000 to rural fire departments in communities of 10,000 people or fewer. Funded through the Federal Cooperative Forestry Assistance Act via USDA Forest Service, VFA supports essential wildfire preparedness and suppression needs—such as firefighter training, personal protective equipment, communication tools, and water supply enhancements like dry hydrants. While it does not fund capital improvements (e.g., new fire stations or pressurized water systems), recipients must provide local matching funds, and applications are typically submitted by year-end.

8.3.7 Wyoming State Parks and Cultural Resources

The Wyoming State Parks and Cultural Resources Office of Outdoor Recreation promotes outdoor recreation as an economic driver and supports projects that improve access, stewardship, and visitor experience. Wyoming State Parks funding and technical assistance can support watershed-related projects when they advance public recreation, public access to rivers and lakes, trailheads, boat ramps, and riparian restoration that enhances outdoor recreation assets. Development and/or acquisition of public outdoor recreation lands and facilities are eligible for a 50% reimbursement through Land and Water Conservation (LWCF) grants. Applicants should engage Wyoming State Parks Outdoor Recreation Office staff early to identify current grant opportunities, eligibility requirements, and application timelines. (Wyoming Outdoor Recreation, n.d.; Wyoming State Parks, 2025)

8.4 Federal Agencies

8.4.1 United States Forest Service

The U.S. Forest Service manages national forest lands and resources, provides technical expertise in watershed and forest health, and partners with local stakeholders to plan and implement restoration, erosion control, and aquatic habitat projects. In the Salt River Watershed (portions within the Bridger-Teton National Forest), USFS roles include project permitting and NEPA review, on-the-ground implementation on federal land, and coordination with state and local partners to protect water supplies and riparian ecosystems. (U.S. Forest Service, 2022)

Funding and partnership opportunities relevant to Salt River Watershed projects:

- **Cooperative Agreements & Grants:** USFS funds and in-kind support projects through cooperative agreements, Challenge Cost Share, and stewardship or partnership funding with local sponsors, conservation districts, tribes, and NGOs.
- **Forest Health and Fuels Programs:** Grants and cost-share programs (often in partnership with state forestry) support hazardous fuels reduction and post-fire watershed stabilization that reduces erosion and sediment delivery.
- **Watershed Restoration & Aquatic Organism Passage:** Funding and technical support for stream restoration, culvert replacements, road/stream crossing upgrades, and riparian rehabilitation to improve fish passage and water quality.

- **Good Neighbor Authority & Stewardship Contracts:** Mechanisms for cross-jurisdictional work that allow states or partners to perform restoration work on National Forest lands with federal funding or project exchange.
- **Technical Assistance & Planning Support:** USFS provides engineering, geomorphic, and hydrologic expertise, NEPA support, and scheduling/permit coordination for projects affecting national forest lands.

8.4.2 Natural Resources Conservation Service

The Natural Resources Conservation Service is a USDA agency that delivers technical and financial assistance to private landowners, tribes, and partners to conserve soil, water, and related natural resources. NRCS supports watershed projects through programmatic and funding tools that emphasize -the-ground conservation practices, improved water management, and long-term stewardship. (Natural Resource Conservation Service, n.d.-c)

Key programs and opportunities relevant to Salt River Watershed projects:

- **Environmental Quality Incentives Program (EQIP):** Provides cost-share and technical assistance for practices that reduce erosion and sedimentation, improve grazing and riparian management, install watering systems (troughs, pipelines, solar pumps), and upgrade irrigation efficiency.
 - The EQIP WaterSMART Initiative targets designated priority areas in the western U.S. and Tribal lands to improve water conservation and drought resilience by modernizing irrigation systems, enhancing water-use efficiency, and addressing resource concerns like water quantity, soil health, and runoff reduction. These areas are selected through collaboration between NRCS and local partners to align with Bureau of Reclamation WaterSMART efforts, ensuring coordinated investments in infrastructure upgrades and sustainable agricultural practices. Projects within these zones receive dedicated EQIP funding and technical support to promote long-term water management and ecosystem benefits.
- **Conservation Stewardship Program (CSP):** Rewards producers who adopt or maintain high levels of conservation performance and can support enhancements that benefit watershed function.
- **Regional Conservation Partnership Program (RCPP):** Funds larger, multi-partner projects that leverage NRCS funds with local, state, or private contributions to address watershed-scale priorities (salmon, livestock water, irrigation efficiency, riparian restoration). The Salt River Watershed received an RCPP grant for watershed-related projects in 2025.
- **Emergency Watershed Protection (EWP):** Provides assistance after natural disasters (floods, wildfires) to address imminent threats to life and property and to reduce erosion and sediment hazards.
- **Technical Assistance & Planning:** NRCS offers engineers and planners to develop designs, practice specifications, conservation plans, and monitoring frameworks; they also perform soil and hydrologic analyses crucial to project design and funding applications.

8.4.3 United States Department Rural Development

The USDA Rural Development (USDA-RD) supports rural communities by financing infrastructure, economic development, and essential services. It can be a partner for watershed projects in the Salt River Watershed when those projects advance public health, water supply reliability, or community resilience. Relevant programs include Water & Environmental Programs (WEP) which provide loans and grants for drinking-water, wastewater, and stormwater infrastructure (including stream/erosion control tied to protecting water systems); Community Facilities and Emergency Community Water Assistance grants for critical community water needs; and technical and grant assistance for rural broadband, housing, and economic development that can be bundled with watershed resilience efforts. USDA-RD funding typically targets publicly owned utilities, nonprofit organizations, and local governments and favors projects with demonstrated community benefits, sound engineering, and sustainable operations plans; many awards require local match and environmental review. Early coordination with the USDA-RD state office and a clear sponsor (municipality, water district, conservation district) improves eligibility and competitiveness. (U.S. Department of Agriculture Rural Development, 2014)

USDA Rural Development's Emergency Community Water Assistance Grants (ECWAG) help rural communities ($\leq 10,000$ population) restore or maintain safe drinking water during emergencies like droughts or contamination, offering up to \$150,000 for waterline repairs and \$1 million for new water sources, with no match required. The Community Facilities Program provides loans, loan guarantees, and grants to rural areas (generally $\leq 20,000$ population) for essential facilities such as healthcare, public safety, education, and community centers, prioritizing low-income communities and critical services. Both programs accept applications year-round through USDA RD Apply or local offices.

8.4.4 Farm Service Agency

The USDA Farm Service Agency (FSA) administers federal programs that support agricultural producers and rural communities and can be a partner or funding source for watershed-related projects that benefit farmland and natural resource conservation.

FSA programs include emergency and disaster assistance, low-cost farm ownership and operating loans, and conservation finance tools that complement NRCS programs. While FSA does not typically fund on-farm conservation practices directly (those are NRCS/EQIP/CRP specialties), FSA can provide financial backing for land acquisitions, easements (in coordination with other agencies), and disaster recovery actions that stabilize farms and watersheds after floods or wildfires. FSA also participates in cost-share collaborations and can help producers access bridge financing or loan guarantees to implement conservation measures tied to farm viability. For project funding and partnership opportunities, contact the local FSA county office to identify applicable programs, eligibility requirements, and potential coordination with NRCS and state partners. (Farm Service Agency, n.d.)

8.4.5 Bureau of Land Management

The Bureau of Land Management manages public lands for multiple uses—including grazing, recreation, energy development, and conservation—and plays a key role in watershed health across millions of acres in Wyoming.

BLM provides technical assistance, permitting, and partnership opportunities for watershed projects (riparian restoration, streambank stabilization, invasive species control, post-fire watershed recovery, and road/stream crossing improvements) and can offer funding or in-kind support through Cooperative Agreements, Challenge Cost Share, and grants administered regionally or via state offices. Projects on or affecting BLM lands typically require coordination on permitting and NEPA compliance. They are more competitive when they include matching funds, leverage other partners (tribes, landowners, conservation districts, state/federal agencies), and deliver measurable resource outcomes and long-term maintenance commitments. Contact the Kemmerer Field Office or High Mountain District Office early to identify program-specific funding, partnership options, and application processes. (Bureau of Land Management, n.d.-a)

Wildland-Urban Interface (WUI) grants provide funding to reduce wildfire risk through fuel reduction, planning, and community preparedness in areas where development meets forested lands. Programs like the Western States WUI Grant, administered by the USDA Forest Service, offer up to \$300,000 per project with a 50/50 match for activities such as hazard fuel removal and Community Wildfire Protection Plan development. Wyoming's state forestry division also administers similar grants, while the Bureau of Land Management's WUI Community Fire Assistance Program supports fuel management and mitigation on public and adjacent lands. These grants prioritize collaborative, landscape-scale projects that enhance fire resilience in vulnerable WUI zones.

8.4.6 Wyoming Landscape Conservation Initiative

The Wyoming Landscape Conservation Initiative (WLCI) is a multi-partner effort—led by federal, state, and local agencies and tribal and private stakeholders—to coordinate landscape-scale conservation, restoration, and research across priority basins in western Wyoming. WLCI supports projects that restore and protect habitats, improve watershed function, reduce erosion and post-fire impacts, and enhance sagebrush-steppe and riparian ecosystems. Funding and support are typically delivered through partner cost-share, cooperative agreements, and targeted project grants that leverage contributions from BLM, DOI, state, and local agencies. For the Salt River Watershed projects, WLCI can assist by providing technical expertise, facilitating interagency collaboration, matching funds or in-kind resources for restoration and watershed resilience work, and helping integrate local projects into broader landscape conservation priorities—applicants should engage regional WLCI coordinators early to identify specific funding opportunities and partnership pathways. (U.S. Geological Survey & Wyoming-Montana Water Science Center, 2021; Wyoming Landscape Conservation Initiative, n.d.)

8.4.7 United States Fish and Wildlife Service

The United States Fish and Wildlife Service partners on conservation and habitat restoration projects that benefit fish, wildlife, and their habitats and offers technical assistance and funding opportunities relevant to watershed work.

USFWS supports riparian and wetland restoration, stream and spawning-habitat improvement, invasive species control, and land protection through programs such as Partners for Fish and Wildlife (voluntary, landowner-driven habitat restoration), competitive grant programs (e.g., Coastal Program equivalents where applicable, and regional/state grant opportunities), and cooperative agreements with state and local partners.

For Salt River projects, USFWS can provide design and biological expertise, cost-share or grant funding for on-the-ground restoration, assistance with threatened/endangered species issues and permitting coordination, and support for monitoring and adaptive management. Early coordination with the USFWS regional or field office increases the likelihood of technical and financial support and helps align projects with regional conservation priorities and funding cycles. (U.S. Fish and Wildlife Service, n.d.-a)

The National Fish Passage Program (NFPP), managed by the U.S. Fish & Wildlife Service, funds and supports projects that remove or bypass barriers like dams and culverts to restore aquatic connectivity and improve fish passage. Backed by annual appropriations and \$200 million from the Bipartisan Infrastructure Law, NFPP typically awards \$75K–\$1 million to governments, tribes, nonprofits, and other partners for activities such as fish screens, culvert replacements, and habitat restoration. While matching funds are not required, projects with cost-share are prioritized. The program also provides technical assistance for planning, design, and permitting. Since 1999, NFPP has removed over 3,500 barriers, reopened 64,000 miles of habitat, and delivered strong ecological and economic benefits.

The U.S. Fish and Wildlife Service Boating Access Program, funded through the Sport Fish Restoration Act, provides grants to state fish and wildlife agencies for acquiring, developing, renovating, and maintaining public boating facilities such as ramps, docks, parking areas, and ADA-accessible amenities. Projects can include planning, design, construction, and maintenance, and facilities must remain open to all recreational boaters. Funding is reimbursable and typically requires a 25% non-federal match, with compliance to federal regulations like NEPA and Buy America. The program aims to enhance safe, sustainable boating access nationwide.

8.4.8 United States Bureau of Reclamation

The United States Bureau of Reclamation (BOR) is a federal agency focused on water resource management in the western U.S., delivering water for agriculture, municipal use, and tribal communities and operating major storage and conveyance infrastructure.

The BOR supports watershed projects through technical assistance, planning, and competitive funding programs, most notably WaterSMART grants (including RCPP partnerships, Drought Response, and Small-Scale Water Efficiency projects) and Title XVI water reuse grants, which finance water conservation, streamflow enhancement, habitat restoration, irrigation efficiency upgrades, and infrastructure rehabilitation. The BOR also provides cooperative agreements, feasibility and design funding, and pre-application support, typically requiring local sponsorship, cost-share, and alignment with regional water management priorities. Projects affecting USBR facilities or using BOR funds must meet federal environmental and engineering standards and often require multi-agency coordination. Contact the regional BOR office for program specifics, current funding opportunities, and application guidance. (U.S. Bureau of Reclamation, n.d.)

8.4.9 Environmental Protection Agency

The U.S. Environmental Protection Agency supports watershed protection projects through national programs delivered locally via state partners and competitive grants. (U.S. Environmental Protection Agency, 2015) Key opportunities and support relevant to Salt River projects include:

- **Clean Water Act Section 319 Nonpoint Source Grants:** Administered by Wyoming DEQ, these funds support riparian restoration, grazing and pasture BMPs, erosion control, and other actions that reduce sediment and nutrient loading to impaired or at-risk waters. Projects must include a monitoring plan and measurable water-quality outcomes.
- **State Revolving Funds (SRF):** Wyoming's SRF program (water quality and drinking-water components) provides low-interest loans and set-aside grants for stormwater, erosion control, and infrastructure projects that protect watershed health; useful for larger capital improvements or culvert/roadwork that reduce sediment delivery.
- **Targeted EPA Competitive Grants and Technical Assistance:** Periodic EPA region or national grants (e.g., environmental justice, resilience, green infrastructure) and EPA technical tools can support planning, community engagement, and implementation when projects demonstrate community benefit, resilience, and leveraged funding.
- **Partnership and Leveraging Priority:** EPA funds favor multi-partner efforts with local sponsors (conservation districts, counties, WGFD, WWDC), matching funds, and clear monitoring/reporting.
- **Clean Water State Revolving Fund (CWSRF):** A federal-state partnership under the Clean Water Act that provides **low-interest loans**, and in many cases principal forgiveness or grants, for a wide range of water-quality infrastructure projects—including wastewater, stormwater, nonpoint source pollution, green infrastructure, and estuary protection. Capitalized with federal funds (with a required 20% state match) and repaid through revolving funds, the program has delivered over \$181 billion in assistance through more than 51,000 agreements since 1988. CWSRF offers flexible financing—typically 30-year loans at or below market interest rates, with additional subsidization (grant-like forgiveness, negative-interest options) available, especially for disadvantaged or small systems. Managed individually by states, eligibility, terms, and funding windows vary, making early coordination with your state's SRF office essential.

For Salt River projects, start by contacting Wyoming DEQ's 319 program manager and the Star Valley Conservation District to align project scopes with state priorities, confirm eligibility, and design monitoring metrics; also, explore combining 319 or SRF funding with state, WGFD, NRCS, and local match sources to maximize chances of support.

8.4.10 United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) is a federal agency that plans, designs, constructs, and manages water resources infrastructure and provides engineering, permitting, and technical assistance for flood risk reduction, ecosystem restoration, navigation, and related water projects. In the Salt River Watershed, USACE roles include regulatory review of work in waters of the U.S. (Section 404/10 permits), technical assistance on hydraulic and geomorphic design, and participation in multi-agency restoration or flood-risk projects. (U.S. Army Corps of Engineers, n.d.-a)

Funding and partnership opportunities relevant to Salt River Watershed projects:

- **Civil Works and Ecosystem Restoration Programs:** USACE may fund or cost-share large restoration, flood risk reduction, or ecosystem projects through Civil Works authorities (subject to congressional authorization and federal cost-share requirements).

- **Continuing Authorities and Small Programs:** Authorities such as Section 206 (Aquatic Ecosystem Restoration) or Section 205 (Flood Risk Reduction) can support modestly sized, locally sponsored projects without separate congressional authorization, typically requiring local sponsor cost-share and a feasibility/design phase.
- **Technical Assistance and Planning Support:** USACE provides non-financial support via hydrologic/hydraulic modeling, geomorphic assessments, and design expertise through interagency agreements or technical support programs.

8.4.11 National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) offers several funding opportunities for watershed projects that can benefit the Salt River watershed. The Transformational Habitat Restoration and Coastal Resilience Grants provide \$750,000 to \$10 million for projects that restore rivers, floodplains, and wetlands and remove barriers to improve ecosystem resilience and water quality. The Restoring Fish Passage through Barrier Removal Grants focus on eliminating or bypassing structures like dams and headgates to enhance fish migration and watershed health, with awards typically ranging from \$750,000 to \$8 million. Additionally, NOAA's Broad Agency Announcement (BAA) supports innovative, ecosystem-based watershed restoration proposals through an open solicitation process. These programs prioritize habitat connectivity, climate resilience, and community benefits, making them well-suited for projects addressing infrastructure upgrades and ecological restoration in the Salt River watershed. (NOAA, n.d.)

8.4.12 Federal Highway Administration

The Federal Highway Administration's (FHA) Culvert Aquatic Organism Passage (AOP) Program, funded through the Bipartisan Infrastructure Law at about \$196 million annually through 2026, provides competitive grants to remove, replace, or retrofit culverts and weirs that block fish passage, improving aquatic connectivity and habitat. Eligible applicants include states, local governments, and Tribes, with up to 80% federal cost share (100% for Tribes). Funding covers design, permitting, and construction, and application windows typically open mid-year. (U.S. Department of Transportation, n.d.)

8.4.13 Federal Emergency Management Agency

FEMA offers multiple funding opportunities that support both watershed resilience and emergency response infrastructure. Through its Hazard Mitigation Assistance programs—such as Flood Mitigation Assistance (FMA), Building Resilient Infrastructure and Communities (BRIC), and the Hazard Mitigation Grant Program (HMGP)—FEMA funds projects that reduce flood risk and enhance community resilience. Eligible activities include floodplain restoration, stream stabilization, and nature-based solutions that improve watershed health and mitigate disaster impacts, making these programs well-suited for initiatives in the Salt River watershed. Additionally, the Assistance to Firefighters Grant (AFG) program provides competitive funding to fire departments and related entities for equipment, training, and infrastructure improvements, including drafting systems and dry hydrants. With annual funding exceeding \$290 million and 1,600–2,000 awards per cycle, AFG strengthens fire suppression and emergency response capabilities.

Applicants must meet eligibility requirements and provide a cost share, with applications submitted during FEMA's fall grant window.

8.5 Non-Profit and Other Organizations

8.5.1 Trout Unlimited

Trout Unlimited is a national conservation nonprofit focused on protecting, reconnecting, and restoring cold water fisheries and their watersheds. TU supports on-the-ground stream and riparian restoration, fish-passage improvements, watershed planning, and landowner outreach—often partnering with agencies, conservation districts, and local groups to design, fund, and implement projects. Funding opportunities come through TU grants and match programs (national and regional chapters), partnership funding administered via local chapters, technical and volunteer support, and by helping projects compete for larger federal or state grants through design assistance and letters of support.

Trout Unlimited is actively engaged in the Salt River Watershed and has implemented multiple watershed-scale restoration projects throughout the basin, providing technical leadership, on-the-ground restoration, and partner coordination. (Trout Unlimited, n.d.)

8.5.2 National Fish and Wildlife Foundation

The National Fish and Wildlife Foundation (NFWF) is a non-profit grant-maker that funds on-the-ground conservation projects nationwide by leveraging federal, state, and private funds. NFWF sponsors competitive grant programs and partnership initiatives that support habitat restoration, watershed resilience, water quality improvement, fish and wildlife conservation, and community-driven stewardship. (National Fish and Wildlife Foundation, n.d.)

Funding opportunities relevant to Salt River Watershed projects

- **Targeted grant programs:** NFWF runs thematic programs (e.g., landscape restoration, water quality, resilience to climate change, aquatic species conservation) that fund riparian and stream restoration, erosion control, fish passage, wetland/riparian enhancement, and invasive species management.
- **Regional and partner initiatives:** NFWF frequently launches regionally focused funding rounds in collaboration with federal or state agencies and private foundations; Salt River projects may qualify when aligned with program priorities or partner objectives.
- **Matching and leveraged funding:** Grants typically require or favor matching funds and multi-partner commitments; NFWF prioritizes projects that leverage local, state, or federal resources and demonstrate measurable ecological outcomes.
- **Capacity building and technical assistance:** Some NFWF programs provide planning grants, implementation support, and monitoring funds, including tools to demonstrate water-quality and habitat benefits.
- **Rapid-response or post-disaster funding:** Periodic opportunities for post-fire or flood recovery projects that address acute watershed damage and sedimentation risks.

8.5.3 The Nature Conservancy

The Nature Conservancy (TNC) is a global conservation nonprofit that works locally to protect land and water, restore natural systems, and advance science-based solutions for resilient ecosystems and communities. In the Salt River Watershed, TNC can provide technical expertise, project design support, partnership facilitation, and potential funding or cost-share for watershed projects—particularly those that protect water quality, restore riparian habitat, reconnect floodplains, improve stream function, or enhance habitat for native fish and wildlife.

Funding and partnership opportunities through TNC typically include collaborative grants or match funding for high-priority, landscape-scale projects, assistance in securing philanthropic or federal funding, and in-kind support such as ecological science, monitoring design, and implementation capacity. TNC prioritizes projects that demonstrate measurable ecological outcomes, leverage additional funding and partners, provide long-term stewardship plans, and align with regional conservation strategies. To pursue TNC support, contact the regional TNC office or local program staff with a concise project summary, expected benefits, partner commitments, and funding needs; early engagement increases the likelihood of technical or financial collaboration. (The Nature Conservancy, n.d.)

9 PERMITS AND AGENCY REVIEW

9.1 Overview

Implementation of any of the projects recommended in the watershed management plan will require a permit, agency review, easement, or the procurement of access consent. Depending on the type of project and the landowner (federal, state, or private), the process can range from low effort to potential roadblocks requiring significant effort and coordination to complete. This chapter provides information for a variety of permitting efforts.

9.2 Property Access, Easements, and Land Procurement

Before conducting any fieldwork within the watershed, obtain permission from the landowner, lessee, or managing agency. Verbal consent is acceptable for initial reconnaissance, but written authorization should be secured before collecting project-specific field data or developing alternatives. Additional agreements may be required to obtain easements, rights-of-way (ROWs), or construction access for planning and implementation.

Use the Enterprise Technology Services' Wyoming Statewide Parcel Viewer to confirm parcel ownership and contact information for affected properties. When projects involve state transportation corridors, utilities, or energy facilities, coordinate early with the Wyoming Department of Transportation (WYDOT) and the relevant utility/energy owners to secure permits or ROW approvals. For state trust lands and surface leases, consult the OSLI mapping resources:

- OSLI Lands & Lease Map Viewer:
 - <https://gis2.statelands.wyo.gov/portal/apps/webappviewer/index.html?id=cc0e524241b04d49bc60c4caa798377f>
- OSLI Maps & Records:
 - <https://lands.wyo.gov/resources/maps-records>

Document all permissions and agreements in the project file and maintain copies of written authorizations before intrusive fieldwork or construction.

9.2.1 Trespassing to Collect Data

In 2015 and 2016, the Wyoming Legislature enacted Senate File 12 (State of Wyoming, 2015) and Senate File 75 (State of Wyoming, 2016), which prohibit trespassing to collect data on private property and authorize criminal charges for such conduct. The laws also bar government agencies from using information obtained by trespass; if illegally collected data are submitted, agencies must expunge them but may retain them as evidence against the trespasser.

Because participation in this watershed study was voluntary, the project team coordinated with the WWDC, local sponsors, and landowners to secure permission before entering private lands. Consistent with W.S. 6-3-414 (trespassing to unlawfully collect resource data), all private-land fieldwork was conducted only with the landowner's or lessee's presence or explicit permission. GPS units with current parcel data and a GPS-enabled camera were used to ensure data collection occurred solely on properties of participating landowners.

9.2.2 Land Procurement, Right-of-Way, or Easement Acquisition

Most projects proposed in this study are located on private property within the participating landowners' parcel boundaries. A limited number of project elements may require temporary access to or use of county road rights-of-way or work on irrigation district infrastructure, for which temporary or conditional use permits from those entities will be required. Projects sited wholly or partly on federal lands, crossing federal land, or receiving federal funding will be subject to additional NEPA and related federal compliance requirements.

9.2.2.1 Utilities

Permits or right-of-way approvals are required from utility and energy owners whenever project construction affects their easements or property. In Wyoming, the Wyoming Underground Facilities Notification Act mandates that all owners of underground facilities be members of One-Call of Wyoming. Excavators must notify One Call at least two business days before beginning any excavation by calling 811 (or 1-800-849-2476 from out of state). For details, visit <http://www.onecallofwyoming.com/>.

9.3 State Permitting

The watershed projects will require coordination with multiple state agencies and permits, depending on the type, location, and scope of work. Typical state-level requirements to consider for the Salt River Watershed projects include:

- **Wyoming Department of Environmental Quality (DEQ):** Section 401/402 water-quality considerations (state 401 certification via WDEQ for federal permits), state Clean Water Act 319 nonpoint source project coordination, stormwater and erosion-control standards during construction, and individual permits for stream alteration or discharge to waters of the state where applicable.
- **Wyoming State Engineer's Office (WSEO):** Approvals for any diversion, change of use, augmentation, or new appropriation of surface water; permitting and change-in-use reviews for irrigation, diversion structures, and groundwater appropriations; and coordination on transfers or temporary water rights needed for construction dewatering or bypass flows.
- **Wyoming Office of State Lands and Investments (OSLI):** Authorization, lease, or easement required for work on state trust lands or use of state land rights-of-way; potential cost-share, access agreements, and review of surface lease conditions.
- **Wyoming Game and Fish Department (WGFD):** Consultation for projects affecting fish and wildlife habitat, fisheries surveys, approvals for in-stream work windows, and potential technical or funding support (e.g., Fish Passage Grants); WGFD review often informs timing and mitigation requirements.
- **Wyoming Department of Transportation (WYDOT) / County Road Authorities:** Permits or encroachment approvals for work affecting state or county road rights-of-way, culvert installations, and temporary traffic control during construction.

- **Wyoming State Historic Preservation Office (SHPO) / Cultural Resources:** Cultural resource surveys and compliance under state historic preservation statutes for ground-disturbing activities; coordination required before permitting or construction on potentially sensitive lands.
- **One-Call / Underground Facilities Notification:** Mandatory pre-excavation utility locates through One-Call of Wyoming (811) for any trenching or subsurface work.
- **Local permitting & conservation districts:** County land-use, grading, septic, or floodplain permits may apply; local conservation districts often provide technical support, and some projects require district approval or partnership to access certain state funds.

In the following sections, the permit requirements of specific types of projects within the watershed management plan are presented, including:

9.3.1 State Engineer's Office

9.3.1.1 Surface Water Permits

The WSEO issues surface-water construction and use permits under a tiered SW permit classification. Below is a concise description of the standard SW permit types (SW-1 through SW-4), their typical purpose, submittal/processing expectations, and key conditions. Confirm the specific application forms, filing fees, and procedural details with the WSEO, as requirements and thresholds can change. (Wyoming State Engineer's Office, n.d.)

SW-1 Ditches, Pipelines, Waterhauls

A SW-1 permit requires detailed information, including the applicant's contact information, the source and purpose of the water appropriation, and its precise location. A map prepared in accordance with the State Engineer's Rules and Regulations must accompany the application. If water is being used for irrigation, the applicant must specify the acreage and ownership (Federal, State, or private) of the land to be irrigated, as well as whether the water provides an original or supplemental supply. The applicant declares that the information provided is accurate and complete, and acknowledges that they may receive communications and notices electronically. (Wyoming State Engineers Office, n.d.-b)

SW-2 Enlargement of Ditches, Pipelines

A SW-2 permit is used to request permission to enlarge an existing permitted water facility (e.g., a ditch, canal, or pipeline). The form requires detailed information about the existing facility, its permitted uses, the proposed enlargement, the location of the enlargement, and the land to be served by the enlarged facility. The applicant must also provide a map prepared in accordance with state regulations and obtain the consent of all landowners affected by the enlargement. The document includes the applicant's contact information, and they must sign to confirm its accuracy and agree to receive communications and notices electronically. (Wyoming State Engineers Office, n.d.-c)

SW-3 Reservoirs

A SW-3 permits the appropriation of surface water specifically for a reservoir with a dam greater than 20 feet high and a capacity of greater than 20 acre-feet. This requires specific information regarding the contact information and the surface water source. Details regarding the reservoir must also be provided,

including the dimensions of the dam to be constructed, the capacity (if this is an enlargement), and so forth. This form notes that this application does not grant permission for construction and that construction may occur only if the State Engineer approves the permit. It is a comprehensive document that requires applicants to adhere to strict guidelines and provide evidence of the project's technical and legal viability. It requires the signing applicant to attest that all the provided information is accurate to the best of their knowledge (Wyoming State Engineers Office, n.d.-d). Any impoundment greater than a one-acre-foot capacity is permitted under a reservoir permit. Any impoundment with a capacity below 1 acre-foot can be recorded on the surface water or groundwater diversion permit (Wyoming State Engineers Office & Tyrrell, 2004).

SW-3A Special Application Reservoirs

A SW-3A is a supplemental permit to be used with the WSEO's application for a reservoir permit (SW-3). It contains specific details on the reservoir's location, size, capacity, and the dam site profile. Special Application Reservoirs include all facilities with a dam less than 20 feet high and a capacity of less than 20 acre-feet. It contains sections for filling in the area at the high-water line, the area at the outlet elevation, the maximum water depth (less freeboard), the depth below the outlet, total capacity, inactive capacity, active capacity, and freeboard above the spillway. There is also space to show the plan view in a sketch, as well as the dam's profile. (Wyoming State Engineers Office, n.d.-e).

SW-4 Stock Reservoirs

The SW-4 permit is used to apply for a permit to appropriate surface water for a stock reservoir (a reservoir primarily used for providing drinking water for livestock). The form requires the applicant to provide detailed information on the reservoir's location, the source of the water, the reservoir's capacity and dimensions, and the dam's construction. A map showing the project and the intended use is required with the application. A consent to enlarge (if applicable) form must be included with the application to complete it. The signing applicant is attesting that the included information is accurate to the best of their knowledge. (Wyoming State Engineers Office, n.d.-a)

SW-4A Stock Reservoir Multiple Points of Storage

The SW-4A permit allows listing multiple locations for livestock's access to water from a stock reservoir and requires that locations be given by 40-acre subdivision and owner. The form must be accompanied by a U.S.G.S. Quadrangle map showing the location of the stock reservoir, the alignment of any pipeline connecting it to the points of use, and the exact location of every stock tank. A signed declaration by the applicant is required to verify that all information is accurate. (Wyoming State Engineers Office, n.d.-f)

9.3.1.2 Groundwater Permits

The WSEO issues groundwater (underground water) permits using a tiered UW classification. Below is a concise summary of typical UW permit categories UW-5 through UW-8, their usual purposes, submittal expectations, review elements, and common conditions. Check with the WSEO for the current regulations, application forms, fees, and thresholds, as requirements can change.

U.W.5 — Permit to Appropriate Groundwater

A U.W.5 is a permit to appropriate groundwater from a well or spring. It requires the applicant to provide their contact information, the proposed use of the water (domestic, stock, irrigation, etc.), the location of the well or spring, estimated depth and water quantity, a description of the area of use, and other relevant details. The form includes sections for the State Engineer's Office to record permit details and states that a Wyoming-licensed well-drilling contractor must drill the well and that a Wyoming-licensed pump installation contractor must install pumps. (Wyoming State Engineers Office, n.d.-g)

U.W.6 — Statement of Completion and Description of Well or Spring

A U.W.6 permit is used to provide details on a completed well or spring. It requires information on the well owner, address, and proposed water use. Detailed well/spring specifics must be provided, such as location, construction method, depth, borehole and casing details, perforation or screening, and development method. The form also requests information about the drilling company, pump details (if applicable), water flow or yield, a well log/description of drill cuttings, and water quality information. The owner or authorized agent must sign the form attesting to its accuracy. (Wyoming State Engineers Office, n.d.-h)

U.W.8 — Proof of Appropriation and Beneficial Use of Ground Water

A U.W.8 application requires the well owner (claimant) to provide details about the groundwater permit, well location, and beneficial use of the water. It is separated into two parts; Part I must be completed by the owner, and Part II requires a certified plat (map) from a professional engineer or land surveyor that clearly shows well location, irrigated acreage (if applicable), conveyance systems, and other relevant details depending on the water use (irrigation, industrial, municipal, or miscellaneous). A Certificate of Ownership (either from the County Clerk or a property deed) must also accompany the form. (Wyoming State Engineers Office, n.d.-i)

9.4 Federal Permitting

9.4.1 National Environmental Policy Act Compliance

NEPA compliance is typically triggered when a project included in the Watershed Management Plan is located on or crosses federal lands, receives full or partial federal funding, or requires a federal permit. The NEPA process helps project sponsors and agencies evaluate potential environmental effects and incorporate public input to make informed decisions regarding the project's environmental consequences. When a proposed project occurs on BLM or USFS lands or is funded through a USDA Farm Bill program, the BLM, USFS, or NRCS will likely serve as the lead or action agency for NEPA compliance.

The NEPA process for watershed projects involves project initiation, screening, and a determination of the appropriate level of review: Categorical Exclusion (CE) for actions with negligible impacts, Environmental Assessment (EA) for actions with potential for more-than-minor effects, or Environmental Impact Statement (EIS) for actions likely to cause significant effects. The CE process involves documentation, while the EA/EIS processes include public scoping, alternatives development, environmental analysis, and public review. The EA process culminates in a Finding of No Significant Impact (FONSI), whereas the EIS process results in a Record of Decision (ROD). All projects typically

incorporate mitigation measures and post-project monitoring. Early coordination with federal agencies and proactive engagement with stakeholders is crucial for navigating NEPA efficiently and effectively. (U.S. Environmental Protection Agency, 2013)

9.4.2 Federally Listed Species

Addressing federally listed species in watershed projects requires a multi-step process: begin by screening for potential species presence and preparing a Biological Assessment/Evaluation to determine project effects. A "No Effect" determination requires documentation, while a "May Affect, Not Likely to Adversely Affect" determination requires USFWS concurrence. If a "May Affect, Likely to Adversely Affect" determination is made, formal consultation with USFWS is needed, potentially resulting in a Biological Opinion that authorizes incidental take with Reasonable and Prudent Measures for mitigation. Implement all mitigation, conduct monitoring, and, if needed, obtain an Incidental Take Permit by developing a Habitat Conservation Plan; throughout the process, coordinate early with USFWS, gather accurate data, implement BMPs, and maintain careful documentation to ensure ESA compliance. (U.S. Fish and Wildlife Service, n.d.-c)

In many areas of Wyoming—particularly in western portions of the state—project planning and implementation require coordination with the WGFD to ensure compliance with sage-grouse conservation requirements. For projects that occur within or adjacent to designated Greater Sage-Grouse Core Areas, project proponents are typically required to evaluate surface disturbance using the Density Disturbance Calculation Tool (DDCT). The DDCT is used to quantify existing and proposed disturbances within defined analysis areas and to determine whether a project complies with thresholds established under the Wyoming Greater Sage-Grouse Executive Order and applicable BLM land use plan guidance.

For projects subject to these requirements, coordination with WGFD and federal land management agencies is necessary to confirm DDCT results, demonstrate consistency with disturbance caps, and identify avoidance or minimization measures where thresholds may be approached or exceeded. This process often influences project siting, design, and implementation timing to ensure continued protection of sage-grouse habitat and compliance with state and federal policy.

The Salt River Watershed, however, contains no mapped Greater Sage-Grouse Core Areas. As a result, projects proposed within the watershed are not subject to DDCT analysis or core area disturbance thresholds. While general wildlife considerations and best management practices may still apply, sage-grouse-specific compliance measures associated with the Executive Order and BLM core area guidance are not required for disturbance projects within the Salt River Watershed. This distinction allows for greater flexibility in project design and implementation while still maintaining appropriate coordination and environmental stewardship.

9.4.3 U.S. Army Corps of Engineers Permitting

9.4.3.1 Nationwide Permits

The USACE Nationwide Permit (NWP) program streamlines the permitting process for specific categories of projects that have minimal individual and cumulative adverse effects on the aquatic environment. For watershed projects, NWPs can often authorize activities such as stream restoration, minor bank

stabilization, culvert replacements, and wetland creation/enhancement, provided the projects meet specific terms and conditions.

For watershed projects seeking USACE authorization under NWPs, the process begins by determining if the project qualifies for a specific NWP (such as those for bank stabilization, habitat restoration, or stormwater facilities), understanding that all NWPs are subject to General Conditions addressing environmental protection and USACE districts may also impose Regional Conditions. Some projects require submitting a Pre-Construction Notification (PCN) to the USACE with detailed project information, including mitigation measures and compliance with NWP conditions, which triggers agency coordination. The USACE then reviews the PCN to verify authorization under the NWP, potentially requesting modifications or requiring an Individual Permit for projects not in compliance, while authorized projects require adherence to permit conditions and may involve reporting. Ultimately, projects ineligible for NWPs must pursue the more detailed Individual Permit process.

A PCN is a detailed submission to the USACE for certain projects seeking authorization under an NWP. It provides the USACE with comprehensive information about the project's purpose, location, design, and potential impacts to aquatic resources, enabling them to verify that the project meets the terms and conditions of the NWP. The PCN typically includes a project description, site plans, drawings, details on affected wetlands or streams, proposed mitigation measures, and documentation of compliance with other environmental requirements. A wetland delineation and associated report are typically needed for PCN completion. (U.S. Army Corps of Engineers, n.d.-b)

9.4.3.2 Individual Permits

The Individual Permit process is required when impacts to waters of the U.S. exceed minimal thresholds. The process involves pre-application consultation with the USACE, submission of a detailed application (including alternatives analysis and mitigation plans), public notice, agency coordination (USFWS, EPA, WDEQ, SHPO), environmental and public interest reviews, Section 401 water quality certification from WDEQ, and permit issuance with specific conditions for mitigation and compliance. This rigorous process, which can take months or years, requires early engagement with regulatory agencies, thorough impact assessments, and demonstration that the project minimizes environmental harm, with the USACE ultimately ensuring compliance through monitoring and enforcement. (U.S. Army Corps of Engineers, n.d.-b)

9.4.3.3 Mitigation

Mitigation for USACE permits aims to offset unavoidable impacts to aquatic resources, following a hierarchy of avoidance, minimization, and compensatory mitigation. Compensatory mitigation can involve purchasing credits from mitigation banks or in-lieu fee programs, or permittee-responsible mitigation with a detailed plan including site selection, baseline data, clear goals, performance standards, a work plan, monitoring, and long-term management, all subject to USACE approval, specified mitigation ratios, adaptive management, and legal protection of the mitigation site to ensure no net loss of aquatic function and value. (U.S. Army Corps of Engineers, n.d.-b)

10 CONCLUSION AND RECOMMENDATION

10.1 Conclusion

In summary, this Salt River Watershed Level I Study delivers a comprehensive, multidisciplinary inventory that identifies critical resource issues and evaluates watershed function. The resulting watershed management plan provides stakeholders with a prioritized, practical project list designed to enhance watershed health, water quality, and sustainable resource management. By assessing current conditions, addressing key concerns, and highlighting project opportunities, this study serves as a valuable resource and roadmap to guide future investments, foster collaborative partnerships, and promote proactive, community-driven stewardship within this vital Wyoming watershed.

10.2 Recommendations

Based on the Salt River Watershed Level I Study, the following recommendations are offered to promote effective watershed management:

1. Prioritize Small Water Project Program Implementation:

- Capitalize on the SWPP eligibility of irrigation rehabilitation and livestock/wildlife watering projects for near-term implementation.
- It is recommended that the larger projects provided in the Watershed Management and Rehabilitation Plan be split into phases to use funding sources more effectively. For example, the pipeline projects could be split into smaller segments, or improvements at different levels could occur at different times with varying sources of funding.
- Promote SWPP benefits (direct improvements, watershed plan awareness) via SVCD communication channels.
- Encourage landowners and managers to consult with the SVCD (eligible SWPP sponsor) and NRCS for design and guidance.

2. Leverage Multi-Source Funding & Partnerships:

- Explore funding opportunities, combining SWPP with resources from WGFD, TU, and other sources to address multiple benefits (e.g., fish passage and irrigation upgrades).
- Recommend the continued partnership between SVCD and TU. Leverage the RCPP funding that was awarded in 2025 for watershed projects listed in the Watershed Management and Rehabilitation plan, and for future watershed projects that come up.
- Investigate innovative financing strategies for local, collaborative projects addressing multiple watershed issues.

3. Use and Maintain Existing Analytical Tools:

- Utilize the project GIS and digital library as tools for planning and development.
- Maintain the SVCD standalone GIS platform using the Lincoln County GIS platform to provide watershed information to landowners to assist in planning future potential watershed projects.

- Update resources as information changes. Recommend updating the information on the County GIS platform being developed every 2-3 years at a minimum.

4. Promote Community Involvement in Stream Restoration:

- Foster community-sponsored stream channel and habitat improvement projects (e.g., bank stabilization using willow plantings) for their direct and ancillary benefits.

5. Maintain Communication & Outreach:

- Continue communication between the SVCD and stakeholders regarding irrigation system improvements.
- Recommend that SVCD continue its annual meeting with Lincoln County Weed and Pest to discuss watershed projects and discuss potential future projects.
- Recommend that SVCD have an annual meeting with all the irrigation districts in the watershed to discuss future projects and priorities for the irrigation districts.
- Partner with the Salt River Watershed Group (led by Trout Unlimited) to communicate the SWPP and discuss upcoming and potential watershed projects.

6. Facilitate Application for all Interested Parties:

- Assure new individuals or parties who express interest after the study that they remain eligible for SWPP, even if they have not met with the study's project team.

7. Pond Inventory Assessment and Enhancement

- Develop a centralized database of all ponds within the watershed. This inventory should include location, size, ownership, and primary uses (e.g., irrigation, livestock, recreation, wildlife habitat).
- Conduct periodic evaluations of pond health, including water quality, structural integrity, sedimentation levels, and surrounding land use impacts. Review current management practices to identify areas for improvement in nutrient control, erosion prevention, and habitat enhancement.
- Utilize high-resolution GIS (EagleView Pictometry), remote sensing technologies, and ground truthing to create accurate maps of pond boundaries. This will support better planning, monitoring, and compliance with any future regulatory requirements.
- Establish a refined, detailed record of all permits associated with existing ponds, including construction, modification, and water rights. This log will improve transparency, facilitate regulatory compliance, and streamline future permitting processes.
- Recommend initiating discussions with Lincoln County Commissioners and the Planning Department to explore the development and implementation of regulations governing pond construction and management.

These recommendations seek to translate the findings of this Salt River Watershed Level I Study into actionable next steps for stakeholders within the watershed. By implementing these recommendations, it is possible to improve habitat and watershed function for generations to come.

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APPENDIX A: PUBLIC MEETING MATERIALS

PUBLIC MEETING

TO DISCUSS THE SALT RIVER WATERSHED LEVEL I STUDY

June 11 | 5:30-7:30 PM | Town of Afton Civic Center, Afton

June 12 | 5:30-7:30 PM | Star Valley Community Center, Etna

Plan to join the Star Valley Conservation District, Wyoming Water Development Commission, community members, and Y2 Consultants/Sunrise Engineering to discuss the Salt River Watershed Level I Study.

For more information on the study, scan the QR code below.

PROJECT CONTACTS

Star Valley Conservation District: Kay Lynn Nield; knield@starvalleycd.org

WY Water Development Office: Mabel Jones; mabel.jones1@wyo.gov

Y2 Consultants: Bree Burton, bree@y2consultants.com



<https://bit.ly/saltriverwatershed>



WYOMING WATER
DEVELOPMENT OFFICE

PRESS RELEASE

FOR IMMEDIATE RELEASE

Contact: Bree Burton
Y2 Consultants
Phone: (307) 733 – 2999
Email: bree@y2consultants.com

May 24, 2024

Salt River Watershed Level I Study – Public Scoping Meetings

The Wyoming Water Development Office (WWDO) in partnership with the Star Valley Conservation District is conducting a Level I Watershed Study for the Salt River Watershed. Y2 Consultants/Sunrise Engineering are conducting the study on behalf of the WWDO and Conservation District.

This Level I watershed study will evaluate the current watershed function, irrigation conveyance systems, stream health, vulnerability of water systems to wildfire, and rehabilitation opportunities. An important part of this project is for the team to understand the current water projects occurring throughout the valley and look at potential future small water projects. To do this, several outreach events will be scheduled to interact with the public on thoughts for potential new projects and get the best understanding of what is going on in the watershed from those who experience it every day.

The first outreach event of the Salt River Watershed Level I Study will take place in Afton on Tuesday, June 11, 2024 and in Etna on Wednesday, June 12, 2024 from 5:30-7:30 PM. A short presentation giving background on the project, background on small water projects, and introducing the team will be provided at 6:00 PM. More information on the open houses can be found below.

For any questions regarding the Salt River Watershed Level I study or the public scoping meetings please email the project manager Bree Burton at bree@y2consultants.com; WWDO project manager Mabel Jones at mabel.jones1@wyo.gov; or Star Valley Conservation District Manager, Kay Lynn Nield at kiel@starvalleycd.org. A project website with additional information will be forthcoming and shared through many platforms once available.

Tuesday, June 11, 2024

5:30 – 7:30 PM

Town of Afton Civic Center
150 Washington Street
Afton, WY 83110

Wednesday, June 12, 2024

5:30 – 7:30 PM

Star Valley Community Center
107736 US-89 Suite 109
Etna, WY 83118

Salt River Watershed Level I Study – Scoping Meeting Sign In Sheet

Name	Phone	Email
Afton Meeting 6/11/2024		
Sarah Hale	307-248-1736	Sarah_hale@lummis.senate.gov
Joe Heward	307-887-4509	Wyjoe41e@gmail.com
Holden Reinert	307-249-5518	Holden.reinert@wyo.gov
Steve Cook	307-248-1897	Cook99@silverstar.com
Trevor Aitken	307-883-8696	admin@starvalleyranchwy.org
Etna Meeting 6/12/2024		
Taylor Ellis	307-883-8696	Jellis@starvalleyranchwy.org
Terry Crook	307-880-3353	tcrookfarm@gmail.com
Stephen Allen	307-800-2142	Stephen.allen@lincolncountywy.gov
Mary Crosby	307-877-2046	Mary.brosby@lincolncountywy.gov
Trevor Aitken	307-883-8696	admin@starvalleyranchwy.org
Steven Crandall	307-883-0291	scrans@msn.com
Larry Green	801-678-2724	nottaranch@flylmail.net
Peggy Gwin	301-385-2418	peggygwin@silverstar.com
Jullie Olenslager	307-880-6534	peggygwin@silverstar.com
Jason Mary	307-226-4097	jason@starvalleywater.com
Lisa Anselmi	307-389-4496	lisaanselmi@me.com
Deanna Clark	307-880-1215	mdmclark@silverstar.com
Marc Clark	307-880-4387	mdmclark@silverstar.com
Boyd Siddo..	307-883-1449	None provided
Lee Hansen	307-248-1519	None provided
Bob Choma		rchoma@wyboards.gov

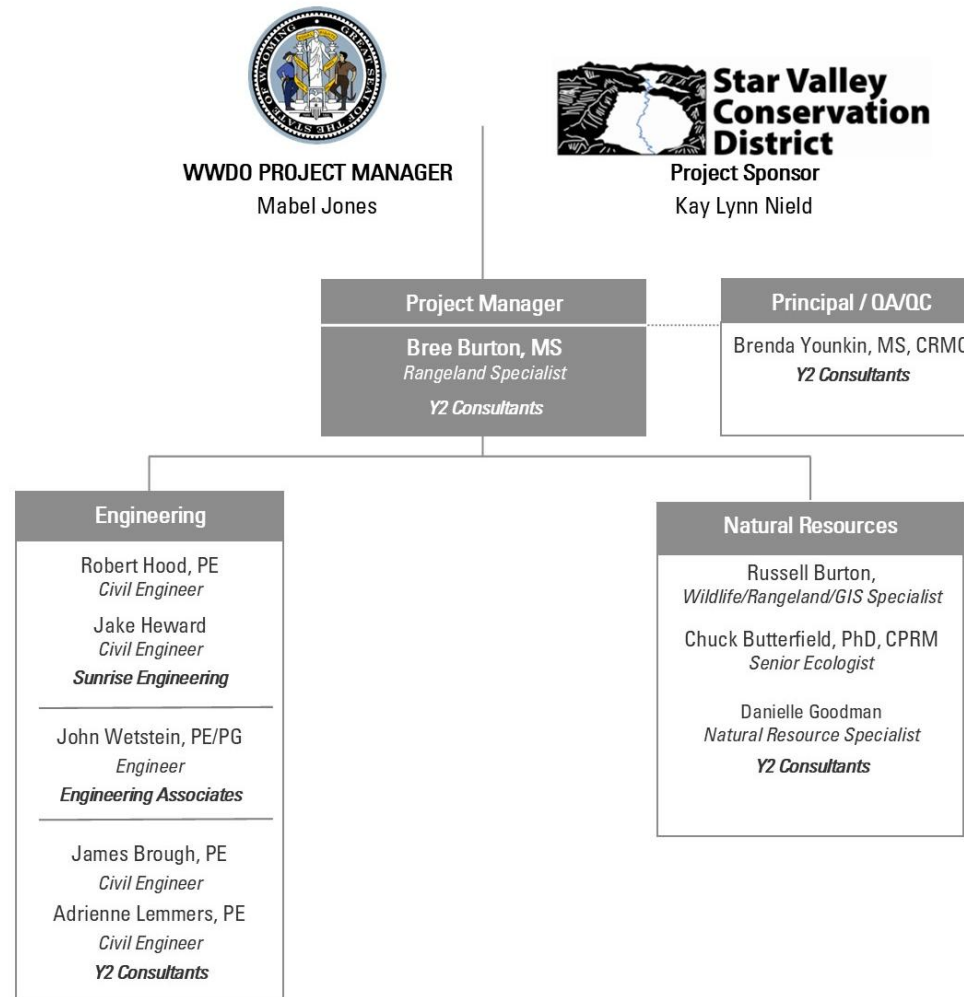


SALT RIVER WATERSHED LEVEL I STUDY



PREPARED FOR THE
WYOMING WATER DEVELOPMENT OFFICE

KEY PROJECT STAFF



SALT RIVER WATERSHED LEVEL I STUDY



Wyoming Water Development Office Program



- Support to Wyoming's Municipal and Agricultural Water Managers
 - From Planning to Construction
- Established in 1975



Wyoming Water Development Office - Project Development Levels

Level I

Reconnaissance

Preliminary analyses and comparison of development alternatives

Level II

Rehabilitation

Project feasibility, project design, anticipated permitting, land acquisition, construction engineering, and cost estimates.

Level III

Construction

New Construction

Rehabilitation



SALT RIVER WATERSHED LEVEL I STUDY



Wyoming Water Development Office – Level I Study Outcomes

Level I

Reconnaissance

Preliminary analyses and comparison of development alternatives

Examples of recommendations in a Level I Watershed Study could include:

- Small Water Project Proposals and Conceptual Designs
- Recommendation for Level II study on certain elements of the system whether it would be for new construction or rehabilitation
- Recommendations for Level III new construction or rehabilitation for projects where project designs, permitting and construction engineering are available... these are referred to as JUMPERS from Level I to Level III (pretty uncommon in a Watershed Study).
- Recommendations regarding opportunities for funding



Wyoming Water Development Office – Level II Study Outcomes

Level II Rehabilitation

Project feasibility, project design, anticipated permitting, land acquisition, construction engineering, and cost estimates.

Outcomes of a Level II Rehabilitation Master Plan:

- Evaluation of water conservation opportunities
- Rehabilitation options
- Concept level design
- Cost estimates for construction, consultant services, operations and maintenance
- Operations plan
- Environmental Analysis
- Economic Analysis and Project Financing



Wyoming Water Development Office – Level III Projects

Level III Construction

New Construction

Rehabilitation

- Maximum grant/loan 75%/25% (Typically 50%/50%)
 - May seek other funding for loan portion
 - > 25% match will increase likelihood of funding
- Priority Projects
- Ineligible Projects
- Applications for WWDO funding due Sept 1



Wyoming Water Development Office – Operating Criteria

- WWDO OPERATING CRITERIA

- <https://wwdc.state.wy.us/opcrit/WWDPopCriteria.html>

- ATTACHMENT I Levels of Project Development
- ATTACHMENT III Program Priorities
- Page 19 Ineligible projects
- Application Deadlines
 - Level I and II March 1
 - Level III Small Water November 15
 - Level III Capital Construction September 1

- SMALL WATER GUIDANCE

- https://wwdc.state.wy.us/small_water_projects/SmallWaterProjectsProgramGuidanceDocument.html

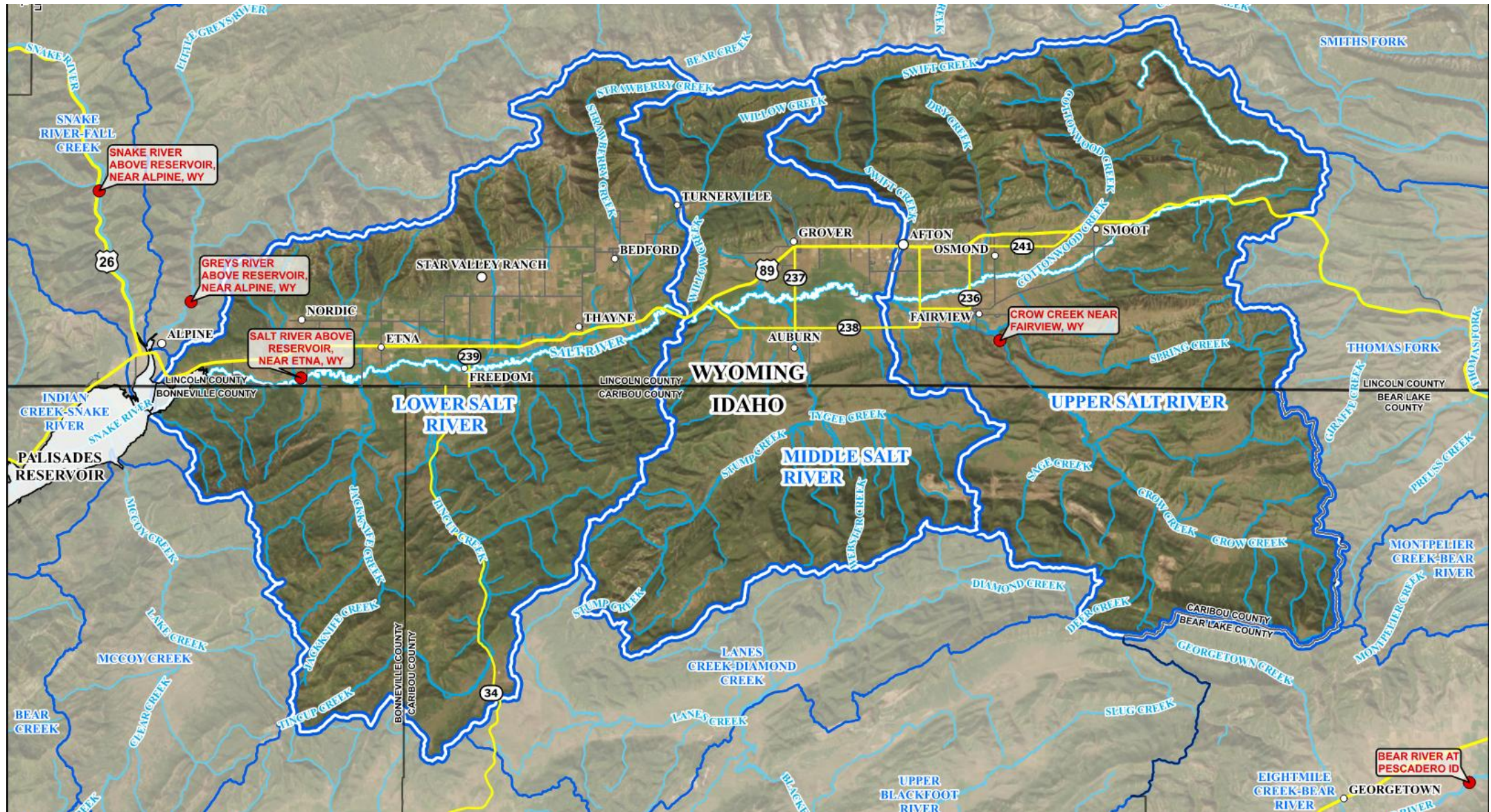


PROJECT OVERVIEW



- The Salt River Level I Watershed Study will evaluate current watershed function, irrigation conveyance systems, stream health, vulnerability of water systems to wildfire, and rehabilitation opportunities within the watershed.





PROJECT APPROACH



Inventory existing and potential projects



Get input from the constituents



Conduct streamflow hydrology



Develop Watershed Management and Rehabilitation Plans



Provide Cost Estimates



Permit



Present Final Report



SALT RIVER WATERSHED LEVEL I STUDY



COMMUNITY INVOLVEMENT

- Public scoping meetings paired with Social Pinpoint
 - Enable involvement in multiple ways to increase overall input



Surveys



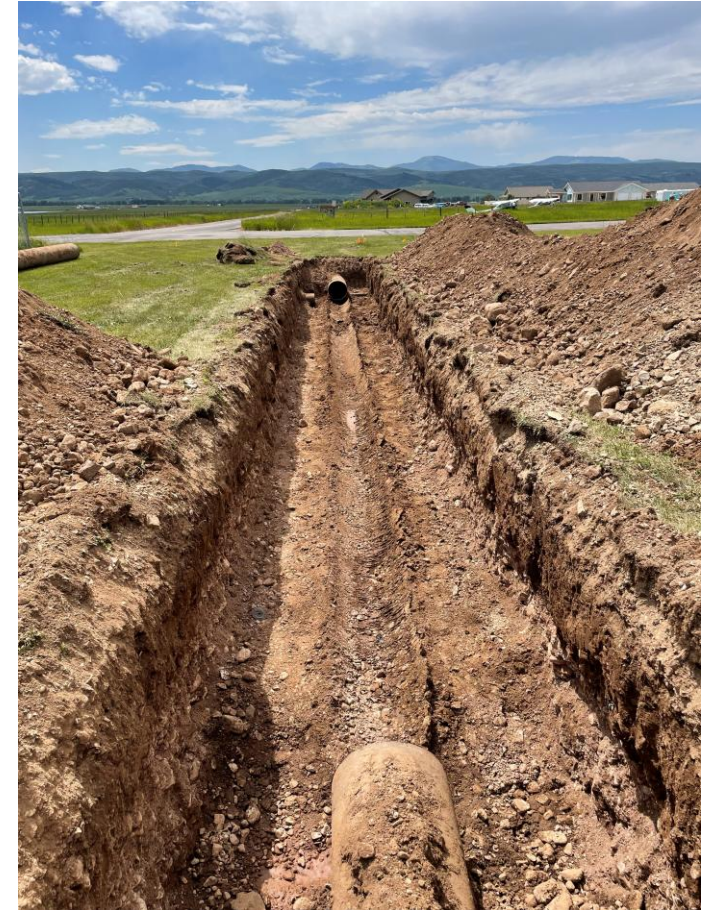
Interactive Map



Idea Wall



Nield String Pipeline Replacement Project



SALT RIVER WATERSHED LEVEL I STUDY



Example Project - Swift Creek Restoration

- 1 mile restoration project on lower Swift Creek, downstream of Afton
- Approximately 250 dump trucks of sediment eroding into the Salt River annually
- Stabilized eroding banks and reconnected to floodplain



Example Project - Swift Creek Restoration



SALT RIVER WATERSHED LEVEL I STUDY



Salt River Watershed Group

- Public collaborative with agencies, stakeholder groups, and members of the public
- Drafting Watershed Restoration Plan
- Working on:
 - Aquatic and Riparian Habitat
 - Water Quality
 - Development Concerns
 - Community outreach and education



Project Ideas/Discussion



Watershed Maps

Alpine to Etna
Etna to Thayne
Thayne to Grover
Grover to Fairview
Fairview to top of watershed



Discuss potential project ideas/any challenges or opportunities within the watershed



SALT RIVER WATERSHED LEVEL I STUDY





QUESTIONS



DEFINE.



DESIGN.



DELIVER.



SALT RIVER WATERSHED PROJECT REVIEW MEETING

Join us for the fall outreach meeting for the Salt River Watershed Level I Study! Bring your water project ideas to incorporate into the study. Learn more about funding opportunities through the Wyoming Water Development Office Small Water Project Program.



Wednesday
November 13, 2024



6:30 - 8:00 PM



WYOMING WATER
DEVELOPMENT OFFICE

TOWN OF AFTON CIVIC CENTER

VIRTUAL OPTION - REGISTRATION LINK
[HTTPS://BIT.LY/SALTRIVERMEETING](https://bit.ly/saltrivermeeting)

MORE INFORMATION ON PROJECT WEBSITE

<https://y2consultants.mysocialpinpoint.com/salt-river-watershed-level-i-study>

Project Contacts:

Star Valley Conservation District: Kay Lynn Nield; knield@starvalleycd.org

WY Water Development Office: Mabel Jones; mabel.jones1@wyo.gov

Y2 Consultants: Bree Burton, bree@y2consultants.com



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Y2 Consultants: Bree Burton, bree@y2consultants.com

PRESS RELEASE

FOR IMMEDIATE RELEASE

Contact: Bree Burton
Y2 Consultants
Phone: (307) 733 – 2999
Email: bree@y2consultants.com

October 28, 2024

Salt River Watershed Level I Study – Public Scoping Meetings

The Wyoming Water Development Office (WWDO) in partnership with the Star Valley Conservation District is conducting a Level I Watershed Study for the Salt River Watershed. Y2 Consultants/Sunrise Engineering are conducting the study on behalf of the WWDO and the Conservation District.

The Level I watershed study will evaluate the current watershed function, irrigation conveyance systems, stream health, vulnerability of water systems to wildfire, and rehabilitation opportunities. An important part of this project is for the team to understand the current water projects occurring throughout the valley and look at potential future small water projects. To do this, several outreach events will be scheduled to interact with the public on thoughts for potential new projects and get the best understanding of what is happening in the watershed from those who experience it daily.

The fall outreach event for the Salt River Watershed Level I Study will be in Afton on Wednesday, November 13, 2024 at 6:30 PM. A virtual option will be available via Zoom, a registration link can be found below. This meeting will include a presentation on WWDO's Small Water Project Program funding opportunities and requirements. Attendees will also be updated on the watershed study project progress and next steps. The remainder of the time will be discussing potential projects with attendees.

For questions regarding the Salt River Watershed Level I study or the public scoping meetings please email the Y2 project manager Bree Burton at bree@y2consultants.com; WWDO project manager Mabel Jones at mabel.jones1@wyo.gov; or Star Valley Conservation District Manager, Kay Lynn Nield at kield@starvalleycd.org.

The following link is for the project webpage that has further information about the project along with an online form to fill out regarding potential projects.

<https://y2consultants.mysocialpinpoint.com/salt-river-watershed-level-i-study>

Registration link for virtual option (Zoom) - https://us06web.zoom.us/meeting/register/tZUod--oqTkVH91K_HhA1sLgxQlhbFE5RBqH

Wednesday, November 13, 2024

6:30 – 8:00 PM

Town of Afton Civic Center
150 Washington Street
Afton, WY 83110

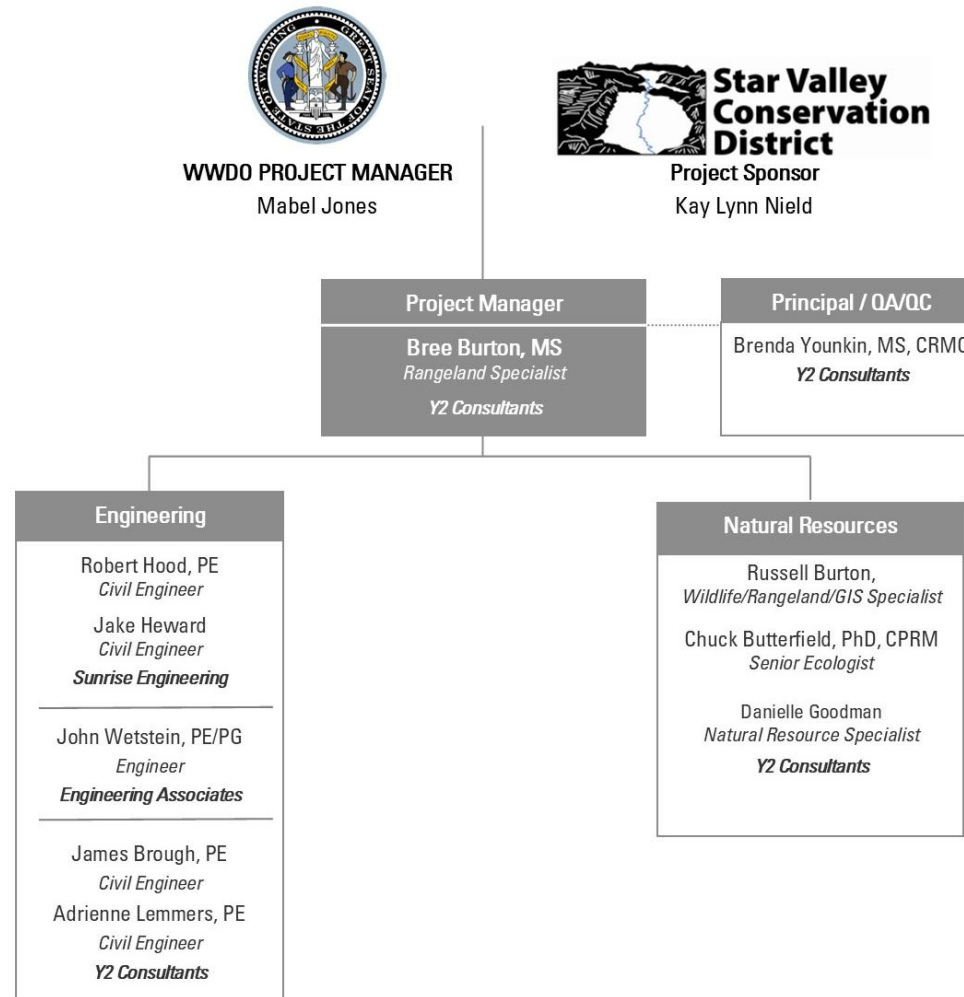


SALT RIVER WATERSHED LEVEL I STUDY



PREPARED FOR THE
WYOMING WATER DEVELOPMENT OFFICE

KEY PROJECT STAFF



SALT RIVER WATERSHED LEVEL I STUDY

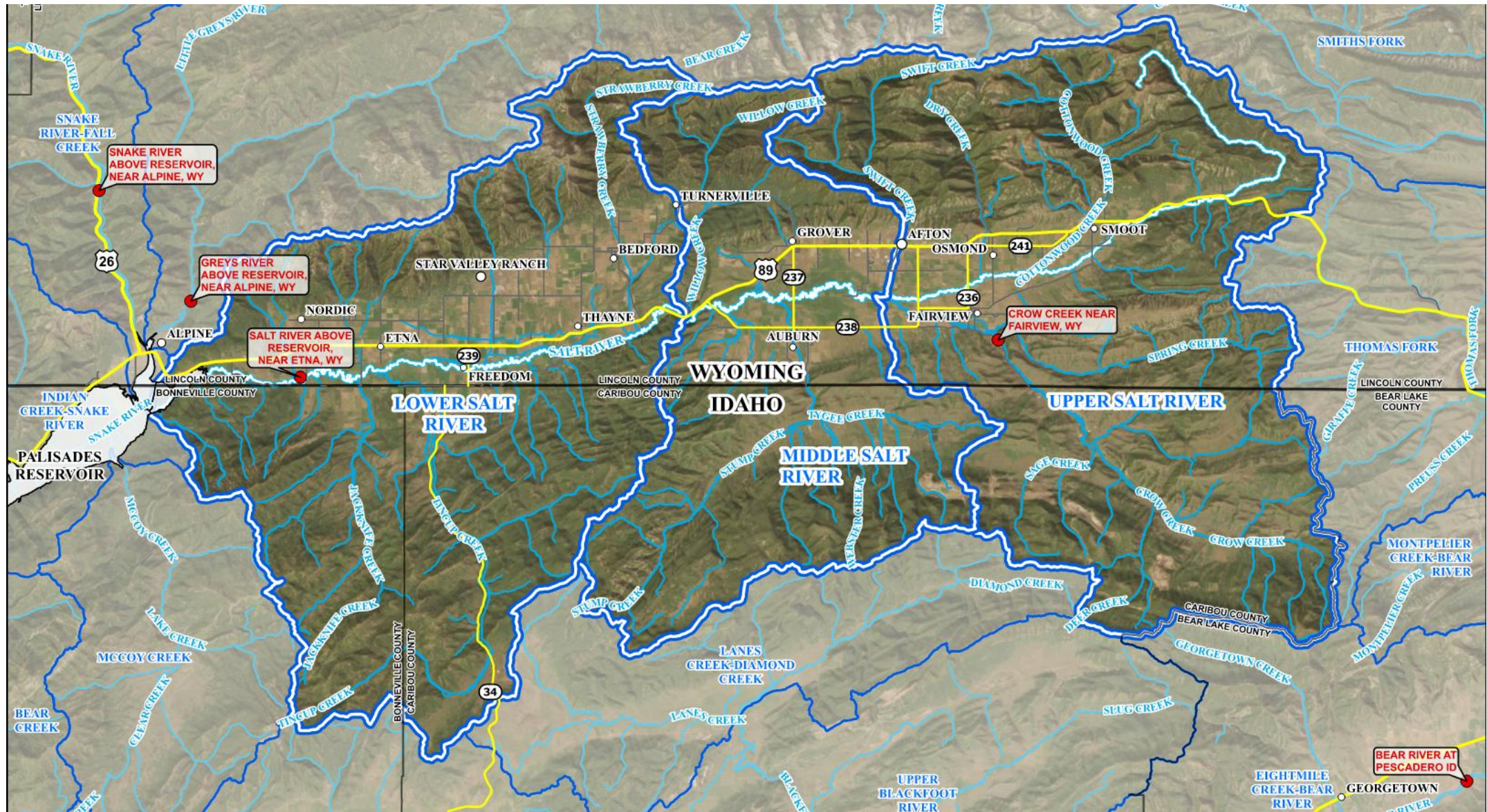


PROJECT OVERVIEW



- The Salt River Level I Watershed Study will evaluate current watershed function, irrigation conveyance systems, stream health, vulnerability of water systems to wildfire, and rehabilitation opportunities within the watershed.





Water

transmission

improvement

planning

watershed

irrigation

district

supply

basin

municipal

rehabilitation

stock

pond

ditch

plan

well

study

check

pasture

replacement

allotment

pipeline

-

Wyoming Water Development Office - Project Development Levels

Level I

Reconnaissance

Preliminary analyses and comparison of development alternatives

Level II

Rehabilitation

Project feasibility, project design, anticipated permitting, land acquisition, construction engineering, and cost estimates.

Level III

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New Construction

Rehabilitation



SALT RIVER WATERSHED LEVEL I STUDY



Wyoming Water Development Office – Level I Study Outcomes

Level I

Reconnaissance

Preliminary analyses and comparison of development alternatives

Examples of recommendations in a Level I Watershed Study could include:

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Wyoming Water Development Office – Level II Study Outcomes

Level II Rehabilitation

Project feasibility, project design, anticipated permitting, land acquisition, construction engineering, and cost estimates.

Outcomes of a Level II Rehabilitation Master Plan:

- Evaluation of water conservation opportunities
- Rehabilitation options
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- Cost estimates for construction, consultant services, operations and maintenance
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- Economic Analysis and Project Financing



Wyoming Water Development Office – Level III Projects

Level III Construction

New Construction

Rehabilitation

- Maximum grant/loan 75%/25% (Typically 67%/33%)
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- Ineligible Projects
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- SMALL WATER GUIDANCE

- https://wwdc.state.wy.us/small_water_projects/SmallWaterProjectsProgramGuidanceDocument.html



PROJECT APPROACH



Inventory existing and potential projects



Get input from the constituents



Conduct streamflow hydrology



Develop Watershed Management and Rehabilitation Plans



Provide Cost Estimates



Permit



Present Final Report



SALT RIVER WATERSHED LEVEL I STUDY



PROJECT STATUS



Inventory existing and potential projects - current through spring 2025



Reviewing and developing background information – current through winter 2025



Summarizing Streamflow Hydrology – current through spring 2025



Develop Watershed Management and Rehabilitation Plans – winter 2025 – early summer 2025



Present Final Report – Fall 2025



Project Ideas/Discussion



Watershed Maps

Alpine to Etna
Etna to Thayne
Thayne to Grover
Grover to Fairview
Fairview to top of
watershed



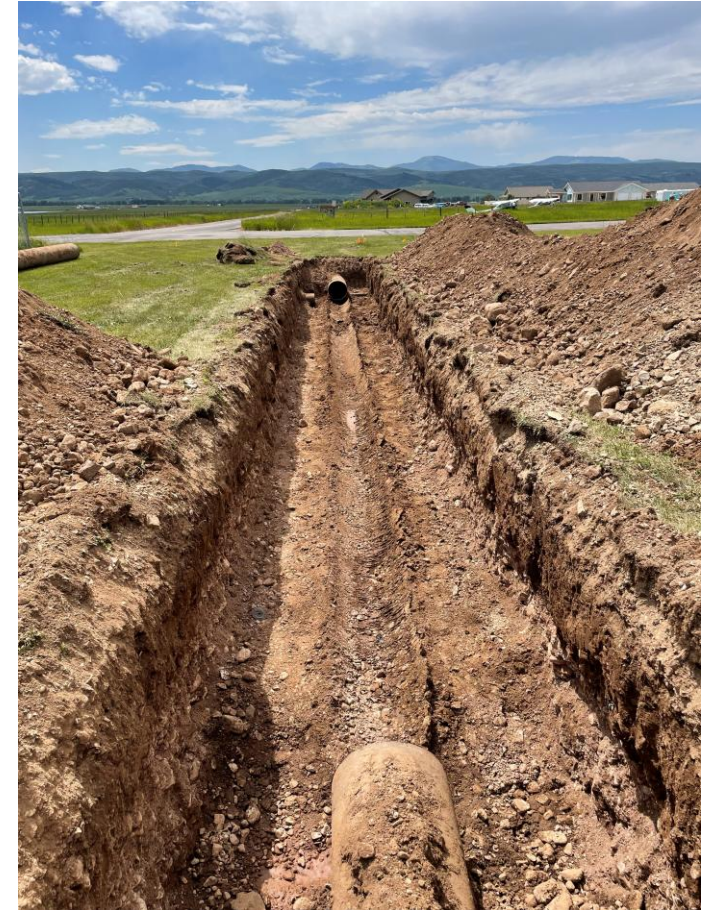
Discuss potential project ideas/any
challenges or opportunities within
the watershed



SALT RIVER WATERSHED LEVEL I STUDY



Nield String Pipeline Replacement Project

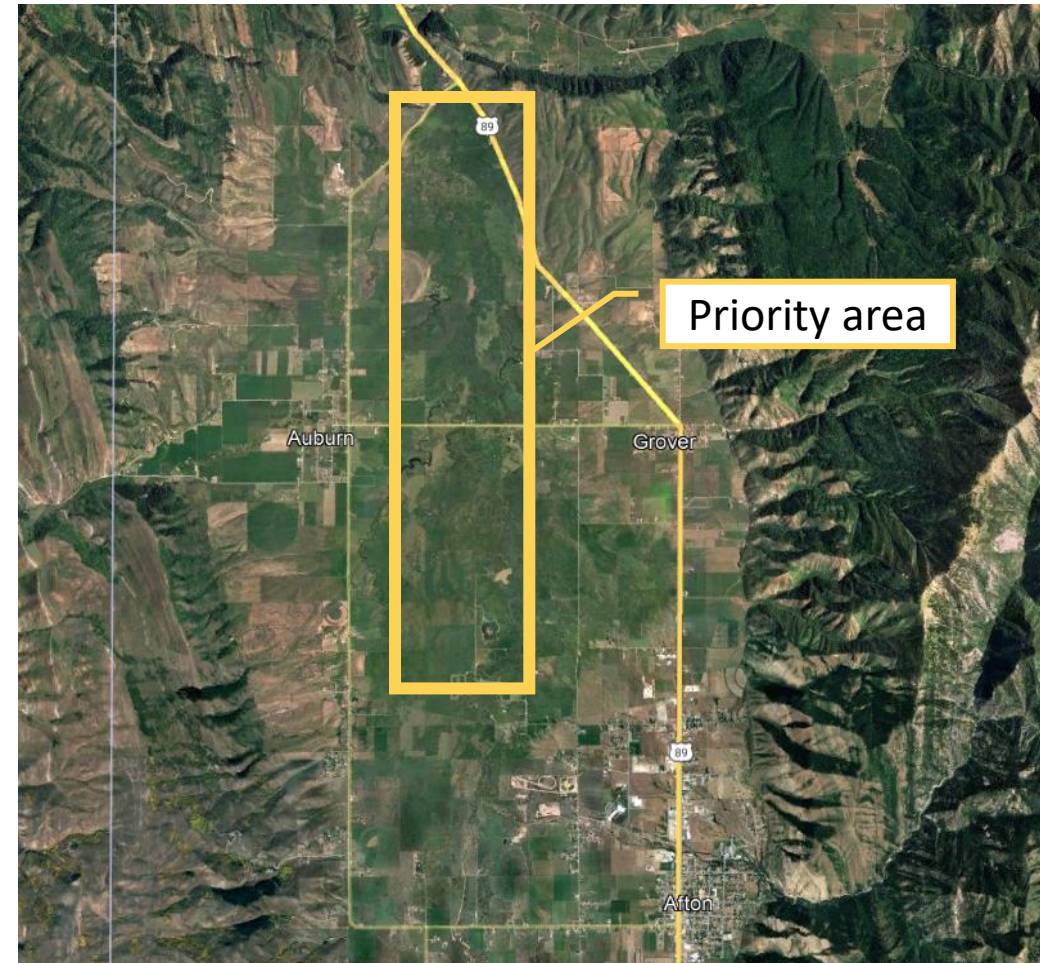


SALT RIVER WATERSHED LEVEL I STUDY

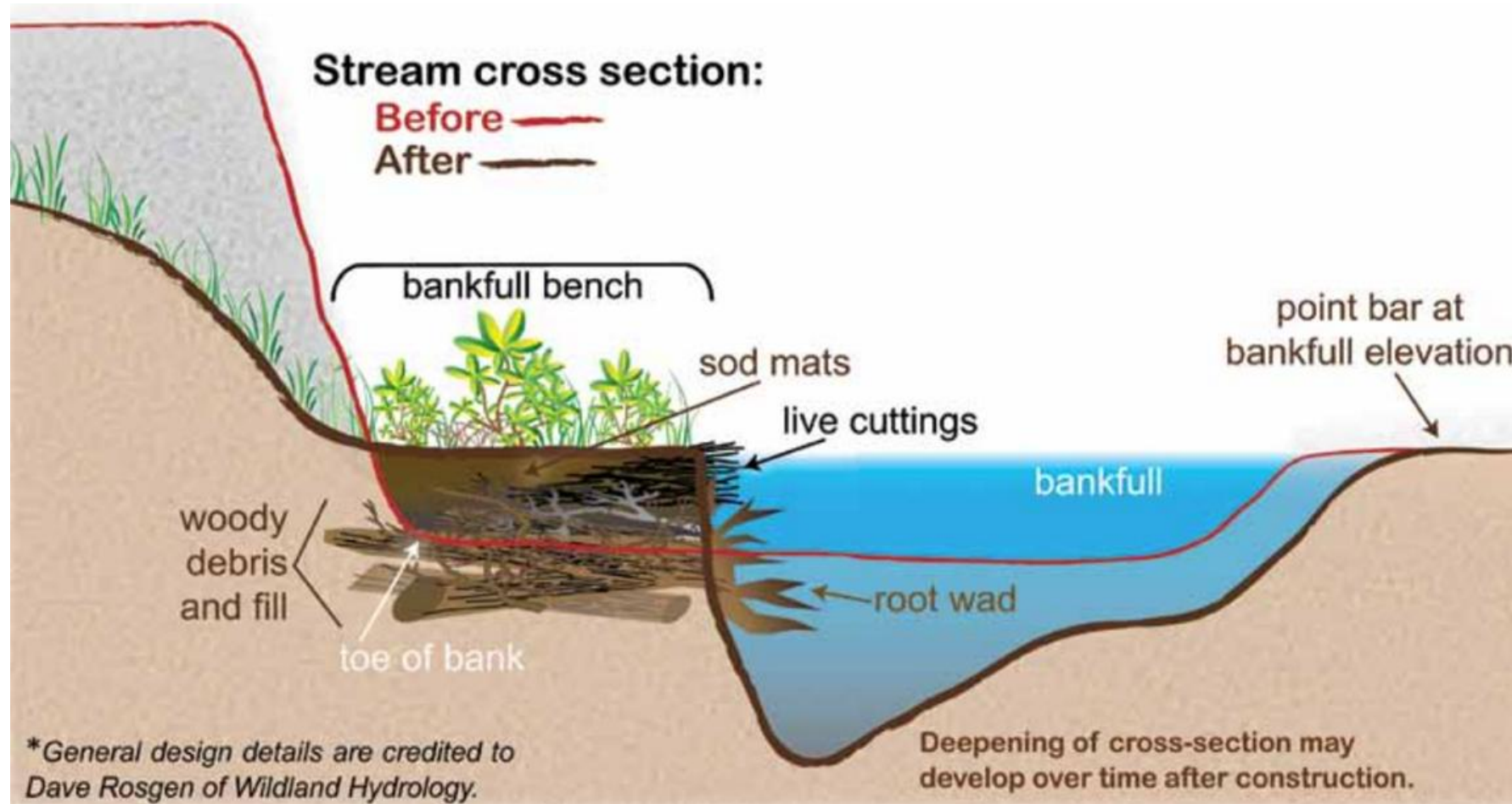


SALT RIVER RCPP (TROUT UNLIMITED)

- \$14 million award towards stream restoration, riparian fencing, off-site water, and diversion replacements
- Prioritizing Clarks Barn to Hwy 238
- 1-2 projects from Smoot upstream
- 1 project in the Narrows
- 1 project at Creamery Rd



SALT RIVER RCPP (TROUT UNLIMITED)



SALT RIVER WATERSHED LEVEL I STUDY

SALT RIVER RCPP (TROUT UNLIMITED)



SALT RIVER WATERSHED LEVEL I STUDY



SALT RIVER RCPP (TROUT UNLIMITED)



SALT RIVER WATERSHED LEVEL I STUDY

SALT RIVER RCPP (TROUT UNLIMITED)



SALT RIVER WATERSHED LEVEL I STUDY



COMMUNITY INVOLVEMENT

- Public scoping meetings paired with Social Pinpoint
 - Enable involvement in multiple ways to increase overall input



Surveys



Interactive Map



Idea Wall





QUESTIONS



DEFINE.



DESIGN.



DELIVER.



WYOMING WATER
DEVELOPMENT OFFICE



PUBLIC MEETING NOTICE

Salt River Watershed – Level I Study (Draft)

 February 2, 2026 • 6:00 PM

Video Room

 Afton Civic Center|150 Washington St.| Afton, WY

Virtual Option: <https://bit.ly/SaltRiverVirtual>

Meeting Overview

The public is invited to attend a meeting to review the Draft Salt River Watershed Level I Study. This session will feature a presentation of key findings, an overview of next steps, and an opportunity for questions and comments.

The Salt River Watershed Study was sponsored by the Star Valley Conservation District, which secured funding from the Wyoming Water Development Office (WWDO) to assess watershed conditions and functions. The study also identifies potential projects for future funding through the WWDO and other programs.

Agenda

- Brief Presentation – Overview of findings
- Discussion of Next Steps – Watershed project planning
- Q&A / Public Comment Session

Study Document Availability

A hard copy is available at the Star Valley Conservation District Office for review.

Online version: <https://bit.ly/SaltRiverWatershedStudy>

Submit Written Comments

Comments accepted until February 9, 2026.

Submit to:

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Wyoming Water Development Office

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APPENDIX B: SGCN WILDLIFE AND PLANTS

Table 0-1. Wildlife species listed as endangered, threatened, or Wyoming species of conservation need with known or suspected occurrence within the Salt River Watershed. (Wyoming Natural Diversity Database & University of Wyoming, n.d.)

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Amphibians								
Amphibians	<i>Ambystoma mavortium</i>	Western Tiger Salamander	G5	S4				Tier III
Amphibians	<i>Anaxyrus boreas</i>	Western Toad	G4	S1	NW	R2 & R4 Sensitive	Sensitive	Tier I
Amphibians	<i>Lithobates pipiens</i>	Northern Leopard Frog	G5	S3	NW	R2 Sensitive R2 & R4	Sensitive	Tier II
Amphibians	<i>Rana luteiventris</i>	Columbia Spotted Frog	G4	S3		Sensitive	Sensitive	Tier II
Amphibians	<i>Spea intermontana</i>	Great Basin Spadefoot	G5	S3			Sensitive	Tier II
Birds								
Birds	<i>Accipiter atricapillus</i>	American Goshawk	G5	S2S3BS3N	NW	R2 & R4 Sensitive	Sensitive	Tier I
Birds	<i>Aechmophorus clarkii</i>	Clark's Grebe	G5	S2S3B				Tier II
Birds	<i>Aechmophorus occidentalis</i>	Western Grebe	G5	S3S4B				Tier II
Birds	<i>Aegolius funereus</i>	Boreal Owl	G5	S2		R2 & R4 Sensitive		Tier II
Birds	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	G5	S4		R2 Sensitive		Tier II
Birds	<i>Anarhynchus montanus</i>	Mountain Plover	G3	S3BS3N	NW	R2 Sensitive	Sensitive	Tier I
Birds	<i>Anthus rubescens</i>	American Pipit	G5	S2B				Tier III
Birds	<i>Antigone canadensis</i>	Sandhill Crane	G5	S3BS5N				
Birds	<i>Aphelocoma woodhouseii</i>	Woodhouse's Scrub-Jay	G5	S1				Tier II
Birds	<i>Aquila chrysaetos</i>	Golden Eagle	G5	S5BS4S5N				Tier II
Birds	<i>Archilochus alexandri</i>	Black-chinned Hummingbird	G5	S2B				Tier II
Birds	<i>Ardea herodias</i>	Great Blue Heron	G5	S4B				Tier II
Birds	<i>Ardea ibis</i>	Western Cattle-Egret	G5	S1S2B				Tier II
Birds	<i>Artemisiospiza nevadensis</i>	Sagebrush Sparrow	G5	S3S4B		R2 Sensitive	Sensitive	Tier II
Birds	<i>Asio flammeus</i>	Short-eared Owl	G5	S1S2		R2 Sensitive		Tier II
Birds	<i>Athene cunicularia</i>	Burrowing Owl	G4	S3B		R2 Sensitive	Sensitive	Tier I
Birds	<i>Aythya collaris</i>	Ring-necked Duck	G5	S4B				
Birds	<i>Baeolophus ridgwayi</i>	Juniper Titmouse	G5	S1S3				Tier II

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Birds	<i>Botaurus exilis</i>	Least Bittern	G4	SNA				
Birds	<i>Botaurus lentiginosus</i>	American Bittern	G5	S2S3B				Tier II
Birds	<i>Bucephala albeola</i>	Bufflehead	G5	S2B				
Birds	<i>Bucephala clangula</i>	Common Goldeneye	G5	S3B				
Birds	<i>Buteo regalis</i>	Ferruginous Hawk	G4	S4S5BS3N	NW	R2 Sensitive	Sensitive	Tier II
Birds	<i>Buteo swainsoni</i>	Swainson's Hawk	G5	S5B				Tier II
Birds	<i>Calamospiza melanocorys</i>	Lark Bunting	G5	S4B		R2 Sensitive		
Birds	<i>Catherpes mexicanus</i>	Canyon Wren	G5	S4				Tier III
Birds	<i>Centrocercus urophasianus</i>	Greater Sage-Grouse	G3G4	S4	NW	R2 & R4 Sensitive	Sensitive	Tier II
Birds	<i>Chlidonias niger</i>	Black Tern	G4G5	S1		R2 Sensitive		Tier II
Birds	<i>Chordeiles minor</i>	Common Nighthawk	G5	S5BS5N				Tier III
Birds	<i>Cinclus mexicanus</i>	American Dipper	G5	S4	NW (Black Hills)			
Birds	<i>Circus hudsonius</i>	Northern Harrier	G5	S4BS5N		R2 Sensitive		
Birds	<i>Contopus cooperi</i>	Olive-sided Flycatcher	G4	S3S4B		R2 Sensitive R2 & R4 Sensitive		
Birds	<i>Cygnus buccinator</i>	Trumpeter Swan	G4	S3BS3N	NW		Sensitive	Tier II
Birds	<i>Cygnus columbianus</i>	Tundra Swan	G5	S2N				
Birds	<i>Dolichonyx oryzivorus</i>	Bobolink	G5	S2S3B				Tier II
Birds	<i>Egretta thula</i>	Snowy Egret	G5	S1S2B				Tier II
Birds	<i>Empidonax hammondi</i>	Hammond's Flycatcher	G5	S4				
Birds	<i>Empidonax traillii</i>	Willow Flycatcher	G5	S5B				Tier III
Birds	<i>Falco columbarius</i>	Merlin	G5	S4BS4N				Tier III
Birds	<i>Falco peregrinus</i>	Peregrine Falcon	G4	S2BS2S3N	DM	R4 Sensitive	Sensitive	Tier II
Birds	<i>Falco sparverius</i>	American Kestrel	G5	S5B				Tier III
Birds	<i>Gavia immer</i>	Common Loon	G5	S1BS3N		R4 Sensitive		Tier I
Birds	<i>Geothlypis tolmiei</i>	MacGillivray's Warbler	G5	S4BS4N				Tier II
Birds	<i>Geothlypis trichas</i>	Common Yellowthroat	G5	S5BS5N				Tier III
Birds	<i>Glaucidium gnoma</i>	Northern Pygmy-Owl	G4G5	S1S2 S2S3BS2S				Tier II
Birds	<i>Gymnorhinus cyanocephalus</i>	Pinyon Jay	G3	3N	UR	R2 Sensitive		

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Birds	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S4BS5N	DM	R4 Sensitive	Sensitive	Tier II
Birds	<i>Himantopus mexicanus</i>	Black-necked Stilt	G5	S3B				
Birds	<i>Histrionicus histrionicus</i>	Harlequin Duck	G4	S1B		R4 Sensitive		Tier II
Birds	<i>Hydroprogne caspia</i>	Caspian Tern	G5	S1				Tier II
Birds	<i>Icterus parisorum</i>	Scott's Oriole	G5	S1				Tier II
Birds	<i>Junco hyemalis</i>	Dark-eyed Junco	G5	S5BS5N				
Birds	<i>Junco hyemalis caniceps</i>	Gray-headed Junco	G5T5	S5BS5N				
Birds	<i>Junco hyemalis mearnsi</i>	Pink-sided Junco	G5T5	S5BS5N				
Birds	<i>Junco hyemalis oreganus</i>	Oregon Junco	G5T5	S5BS5N				
Birds	<i>Lanius ludovicianus</i>	Loggerhead Shrike	G4	S4S5B		R2 Sensitive	Sensitive	Tier II
Birds	<i>Larus argentatus</i>	Herring Gull	G5	SNA				
Birds	<i>Larus californicus</i>	California Gull	G5	S2B				
Birds	<i>Larus delawarensis</i>	Ring-billed Gull	G5	S2				
Birds	<i>Leiothlypis virginiae</i>	Virginia's Warbler	G5	S1B		R2 Sensitive		Tier II
Birds	<i>Leucophaeus pipixcan</i>	Franklin's Gull	G5	S1B				Tier II
Birds	<i>Leucosticte atrata</i>	Black Rosy-Finch	G4	S1BS2N				Tier II
Birds	<i>Loxia curvirostra</i>	Red Crossbill	G5	S5BS5N				Tier II
Birds	<i>Loxia leucoptera</i>	White-winged Crossbill	G5	S2				
Birds	<i>Megascops kennicottii</i>	Western Screech-Owl	G4G5	S2				
Birds	<i>Melanerpes lewis</i>	Lewis's Woodpecker	G4	S3B		R2 Sensitive		Tier II
Birds	<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	G5	S1S2B				Tier II
Birds	<i>Nucifraga columbiana</i>	Clark's Nutcracker	G5	S3S4				Tier II
Birds	<i>Numenius americanus</i>	Long-billed Curlew	G4	S3S4B		R2 Sensitive	Sensitive	Tier II
Birds	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	G5	S2S3B				Tier II
Birds	<i>Oreoscoptes montanus</i>	Sage Thrasher	G4	S5			Sensitive	Tier II
Birds	<i>Pandion haliaetus</i>	Osprey	G5	S3B				
Birds	<i>Passerina caerulea</i>	Blue Grosbeak	G5	S1B				Tier III
Birds	<i>Pelecanus erythrorhynchos</i>	American White Pelican	G4	S3S4B				Tier II
Birds	<i>Phalaropus lobatus</i>	Red-necked Phalarope	G4G5	S3N				
Birds	<i>Phalaropus tricolor</i>	Wilson's Phalarope	G5	S3BS3N	UR			

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Birds	<i>Picoides arcticus</i>	Black-backed Woodpecker	G5	S2	NW (BlackHills)	R2 Sensitive		Tier II
Birds	<i>Picoides dorsalis</i>	American Three-toed Woodpecker	G5	S3		R4 Sensitive		
Birds	<i>Plegadis chihi</i>	White-faced Ibis	G5	S1B			Sensitive	Tier II
Birds	<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	G5	S3S4B				Tier III
Birds	<i>Psaltiriparus minimus</i>	Bushtit	G5	S2S3				Tier II
Birds	<i>Psiloscoops flammeolus</i>	Flammulated Owl	G4	S1B		R2 & R4 Sensitive		Tier III
Birds	<i>Rallus limicola</i>	Virginia Rail	G5	S2S4B				Tier III
Birds	<i>Recurvirostra americana</i>	American Avocet	G5	S3B				
Birds	<i>Regulus satrapa</i>	Golden-crowned Kinglet	G5	S3BS4N				
Birds	<i>Selasphorus calliope</i>	Calliope Hummingbird	G5	S2B				Tier II
Birds	<i>Selasphorus rufus</i>	Rufous Hummingbird	G4	S3B				Tier II
Birds	<i>Setophaga nigrescens</i>	Black-throated Gray Warbler	G5	S2				Tier II
Birds	<i>Setophaga townsendi</i>	Townsend's Warbler	G5	SNA				
Birds	<i>Sitta pygmaea</i>	Pygmy Nuthatch	G5	S2S3				Tier II
Birds	<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker	G5	S3S4B				Tier II
Birds	<i>Spizella breweri</i>	Brewer's Sparrow	G5	S5		R2 Sensitive	Sensitive	Tier II
Birds	<i>Spizella pallida</i>	Clay-colored Sparrow	G5	S3B				
Birds	<i>Sterna forsteri</i>	Forster's Tern	G5	S1				Tier II
Birds	<i>Sterna hirundo</i>	Common Tern	G5	S1				
Birds	<i>Strix nebulosa</i>	Great Gray Owl	G5	S2		R4 Sensitive		Tier II
Birds	<i>Thryomanes bewickii</i>	Bewick's Wren	G5	S2B				Tier III
Birds	<i>Tyto furcata</i>	American Barn Owl	G5	S2				
Birds	<i>Vireo olivaceus</i>	Red-eyed Vireo	G5	S2B				Tier II
Bivalvia (Mussels and Clams)								
Bivalvia	<i>Anodonta californiensis</i>	California Floater	G3	S2				Tier II
Bivalvia	<i>Margaritifera falcata</i>	Western Pearlshell	G3G4	S3				
Branchiopoda (Fairy Shrimp, Clam Shrimp, Water Fleas, and Tadpole Shrimp)								
Branchiopoda	<i>Branchinecta lindahli</i>	Versatile Fairy Shrimp	G5	S4				Tier III
Branchiopoda	<i>Lepidurus couesii</i>	Couse Tadpole Shrimp	G4	S3				Tier III

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Fish								
Fish	<i>Catostomus discobolus</i>	Bluehead Sucker	G4	S3		R2 Sensitive	Sensitive	Tier I
Fish	<i>Catostomus latipinnis</i>	Flannelmouth Sucker	G3G4	S3		R2 Sensitive	Sensitive	Tier I
Fish	<i>Catostomus platyrhynchus</i>	Mountain Sucker	G5	S5		R2 Sensitive		
Fish	<i>Gila robusta</i>	Roundtail Chub	G3	S3		R2 Sensitive	Sensitive	Tier I
Fish	<i>Lepidomeda copei</i>	Northern Leatherside Chub	G3	S1	NW	R4 Sensitive	Sensitive	Tier II
Fish	<i>Oncorhynchus clarkii</i>	Cutthroat Trout	GNR	S2S3				
		Snake River Fine-spotted Cutthroat Trout	GNRT1T					
Fish	<i>Oncorhynchus clarkii behnkei</i>	Trout	2Q	S1			Sensitive	Tier II
	<i>Oncorhynchus clarkii pleuriticus</i>	Colorado River Cutthroat Trout	GNRT3	S1	NW	R2 & R4 Sensitive	Sensitive	Tier II
Fish	<i>Oncorhynchus clarkii utah</i>	Bonneville Cutthroat Trout	GNRT3	S1	NW	R4 Sensitive	Sensitive	Tier II
Fish	<i>Prosopium williamsoni</i>	Mountain Whitefish	G5	S5				
Fish	<i>Rhinichthys osculus</i>	Speckled Dace	G5	S4				
Gastropoda (Snails and Slugs)								
Gastropoda	<i>Colligyrus greggi</i>	Rocky Mountain Dusksnail	G4	SU				Tier II
Gastropoda	<i>Discus whitneyi</i>	Forest Disc Snail	G5	SNR				Tier III
Gastropoda	<i>Ferrissia californica</i>	Fragile Ancyliid	G5	SNR				Tier II
Gastropoda	<i>Fluminicola coloradoensis</i>	Green River Pebblesnail	G3G4	S4				Tier I
Gastropoda	<i>Galba bulimoides</i>	Prairie Fossaria	G5	SNR				Tier II
Gastropoda	<i>Galba dalli</i>	Dusky Fossaria	G5	S3				Tier II
Gastropoda	<i>Galba parva</i>	Pygmy Fossaria	G5	S3				Tier II
Gastropoda	<i>Gyraulus circumstriatus</i>	Disc Gyro	G5	S3				Tier II
Gastropoda	<i>Gyraulus parvus</i>	Ash Gyro	G5	S4				Tier III
Gastropoda	<i>Ladislavella catascopium</i>	Woodland Pondsnaill	G5	S3				Tier II
Gastropoda	<i>Ladislavella elodes</i>	Marsh Pondsnaill	G5	S3				Tier II
Gastropoda	<i>Lymnaea stagnalis</i>	Swamp Lymnaea	G5	S3				Tier II
Gastropoda	<i>Physa jennessi</i>	Obtuse Physa	G5	SNR				Tier II
Gastropoda	<i>Physella acuta</i>	Pewter Physa	G5	S4				Tier III
Gastropoda	<i>Physella columbiana</i>	Rotund Physa	G3	S3				Tier II
Gastropoda	<i>Physella gyrina</i>	Tadpole Physa	G5	S4				Tier III

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Gastropoda	<i>Planorbella trivolvis</i>	Marsh Ramshorn	G5	S4				Tier III
Gastropoda	<i>Promenetus exacuous</i>	Sharp Sprite	G5	S3				Tier II
Gastropoda	<i>Pseudosuccinea columella</i>	Mimic Lymnaea Snail	G5	SNA				Tier II
Gastropoda	<i>Pyrgulopsis pilsbryana</i>	Bear Lake Springsnail	G3G4	SNR				Tier II
Gastropoda	<i>Valvata sincera</i>	Mossy Valvata	G5	S3				Tier II
Malacostraca (Crayfish, Scuds and Sow Bugs)								
Malacostraca	<i>Pacifastacus gambelii</i>	Pilose Crayfish	G4G5	S3				Tier II
Mammals								
Mammals	<i>Alces alces</i>	Moose	G5	S4				Tier II
Mammals	<i>Antrozous pallidus</i>	Pallid Bat	G4	S2S3B				Tier II
Mammals	<i>Bassariscus astutus</i>	Ringtail	G5	S1S2				Tier III
Mammals	<i>Canis lupus</i>	Gray Wolf	G5	S1	NW	R4 Sensitive		
Mammals	<i>Cervus canadensis</i>	Elk	G5	S5				
Mammals	<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	G4	S2BS1N		R2 & R4 Sensitive	Sensitive	Tier II
Mammals	<i>Cynomys leucurus</i>	White-tailed Prairie Dog	G4	S2S3	NW	R2 Sensitive R2 & R4 Sensitive	Sensitive	Tier II
Mammals	<i>Euderma maculatum</i>	Spotted Bat	G4	S1S2B			Sensitive	Tier III
Mammals	<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	G5	S3S4				Tier II
Mammals	<i>Gulo gulo</i>	Wolverine	G4	S1S2	LT			Tier II
Mammals	<i>Ictidomys tridecemlineatus</i>	Thirteen-lined Ground Squirrel	G5	S5				
Mammals	<i>Lasionycteris noctivagans</i>	Silver-haired Bat	G3G4	S3B				
Mammals	<i>Lasiurus cinereus</i>	Northern Hoary Bat	G3G4	S4B	UR	R2 Sensitive		
Mammals	<i>Lemmys curtatus</i>	Sagebrush Vole	G5	S4				Tier II
Mammals	<i>Lontra canadensis</i>	Northern River Otter	G5	S3S4	NW	R2 Sensitive		Tier II
Mammals	<i>Lynx canadensis</i>	Canada Lynx	G5	S1	LT			Tier I
Mammals	<i>Lynx rufus</i>	Bobcat	G5	S5	NW			
Mammals	<i>Martes caurina</i>	Pacific Marten	G4G5	S3	NW	R2 Sensitive		
Mammals	<i>Microtus richardsoni</i>	North American Water Vole	G5	S1		R2 Sensitive		Tier II
Mammals	<i>Myotis ciliolabrum</i>	Western Small-footed Myotis	G5	S4B				Tier II
Mammals	<i>Myotis evotis</i>	Long-eared Myotis	G5	S4S5B			Sensitive	Tier III

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Mammals	<i>Myotis lucifugus</i>	Little Brown Myotis	G3G4	S5	UR			Tier II
Mammals	<i>Myotis thysanodes</i>	Fringed Myotis	G4	S2S3B		R2 Sensitive	Sensitive	Tier II
Mammals	<i>Myotis volans</i>	Long-legged Myotis	G4G5	S4S5B				Tier III
Mammals	<i>Myotis yumanensis</i>	Yuma Myotis	G5	S1				Tier III
Mammals	<i>Neotamias amoenus</i>	Yellow-pine Chipmunk	G5	S3S4				Tier III
Mammals	<i>Neotamias umbrinus</i>	Uinta Chipmunk	G5	S2S5				Tier III
Mammals	<i>Ochotona princeps</i>	American Pika	G5	S2	NW			Tier II
Mammals	<i>Ochotona princeps princeps</i>	Northern Rocky Mountain Pika	G5T5	S2	NW			Tier II
Mammals	<i>Odocoileus hemionus</i>	Mule Deer	G5	S5				
Mammals	<i>Ovis canadensis</i>	Bighorn Sheep	G4	S2S3		R2 & R4 Sensitive		Tier II
Mammals	<i>Perognathus fasciatus</i>	Olive-backed Pocket Mouse	G5	S3S5				Tier III
Mammals	<i>Perognathus mollipilosus</i>	Great Basin Pocket Mouse	GNR	S3S4				Tier III
Mammals	<i>Peromyscus crinitus</i>	Canyon Deermouse	G5	S1				Tier II
Mammals	<i>Sorex nanus</i>	Dwarf Shrew	G4	S4S5				Tier II
Mammals	<i>Sorex preblei</i>	Preble's Shrew	G4	S2S3				Tier III
Mammals	<i>Spilogale gracilis</i>	Western Spotted Skunk	G5	S3S4				Tier III
Mammals	<i>Sylvilagus idahoensis</i>	Pygmy Rabbit	G4	S2	UR	R4 Sensitive	Sensitive	Tier II
Mammals	<i>Thomomys idahoensis</i>	Idaho Pocket Gopher	G4	S1S2			Sensitive	Tier II
Mammals	<i>Urocitellus armatus</i>	Uinta Ground Squirrel	G5	S3S4				
Mammals	<i>Urocitellus elegans</i>	Wyoming Ground Squirrel	G5	S3S4				
Mammals	<i>Ursus arctos</i>	Grizzly Bear	G4	S1	LT			
Mammals	<i>Vulpes velox</i>	Swift Fox	G3	S2	NW	R2 Sensitive	Sensitive	Tier II
Mammals	<i>Zapus princeps</i>	South-western Jumping Mouse	GNR	S3S4				
Reptile								
Reptile	<i>Charina bottae</i>	Northern Rubber Boa	G5	S2				Tier II
Reptile	<i>Crotalus oreganus concolor</i>	Midget Faded Rattlesnake	G5T3	S1			Sensitive	Tier I
Reptile	<i>Phrynosoma hernandesi</i>	Greater Short-horned Lizard	G5	S4				Tier II
Reptile	<i>Phrynosoma hernandesi brevirostris</i>	Plains Short-horned Lizard	G5TNR	SNR				Tier II
Reptile	<i>Pituophis catenifer</i>	Gophersnake	G5	S4				

Class	Scientific Name	Common Name	G Rank	S Rank	USFWS	USFS	BLM	WGFD
Reptile	<i>Pituophis catenifer deserticola</i> <i>Plestiodon skiltonianus</i>	Great Basin Gophersnake	G5T5	S3				Tier II
Reptile	<i>utahensis</i>	Great Basin Skink	G5T5	S1				Tier III
Reptile	<i>Sceloporus tristichus</i>	Plateau Fence Lizard	G5	S1				Tier III
Reptile	<i>Thamnophis sirtalis</i>	Common Gartersnake	G5	S5				Tier III
Reptile	<i>Thamnophis sirtalis fitchi</i>	Valley Gartersnake	G5TNR	S2				Tier III

G = Global rank: range-wide probability of extinction assigned by NatureServe (1 = critically imperiled, 2 = imperiled, 3 = vulnerable, 4 = apparently secure, 5 = secure)

S = State rank: range-wide probability of extinction assigned by WYNDD (1 = critically imperiled, 2 = imperiled, 3 = vulnerable, 4 = apparently secure, 5 = secure)

T = Trinomial rank: refers to the range-wide probability of extinction for a subspecies or variety

Rank modifiers: B = Breeding rank: status of migratory species during breeding season, N = Non-breeding rank: indicates the status of a migratory species during the nonbreeding season, H = possibly extinct or extirpated, Q = questions exist regarding taxonomic validity of species or subspecies, NR = not ranked, U = unrankable, X = presumed extirpated, ? = questions exist regarding assigned numerical score.

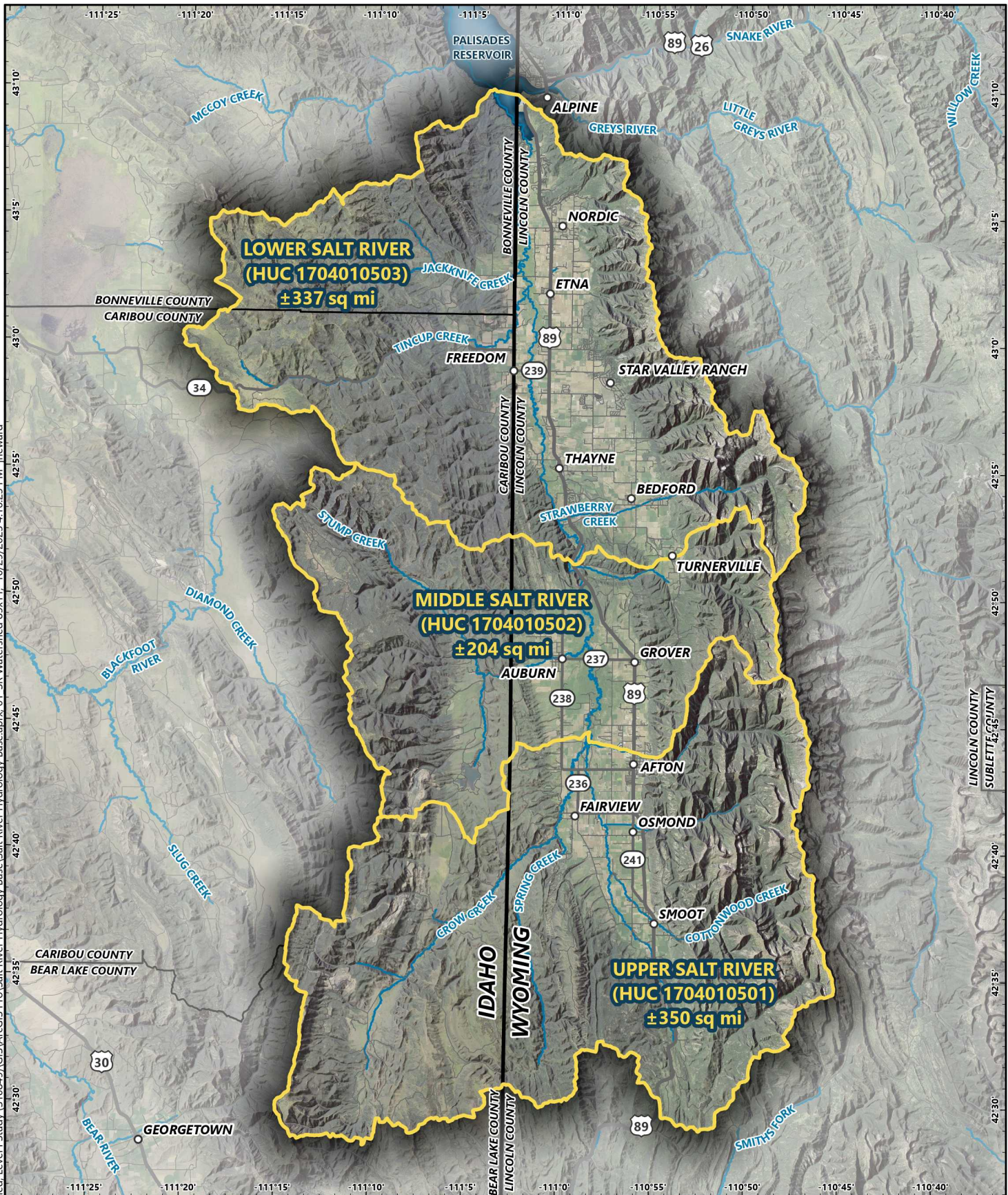
USFWS: DM = delisted/formally monitored, LE = Listed Endangered, LT = Listed threatened, NW = not warranted, PT = proposed threatened, UR = petition under review

USFS: R2 = region 2, R4 = region 4

WGFD: Tier I = highest priority, Tier II = moderate priority, Tier III = lowest

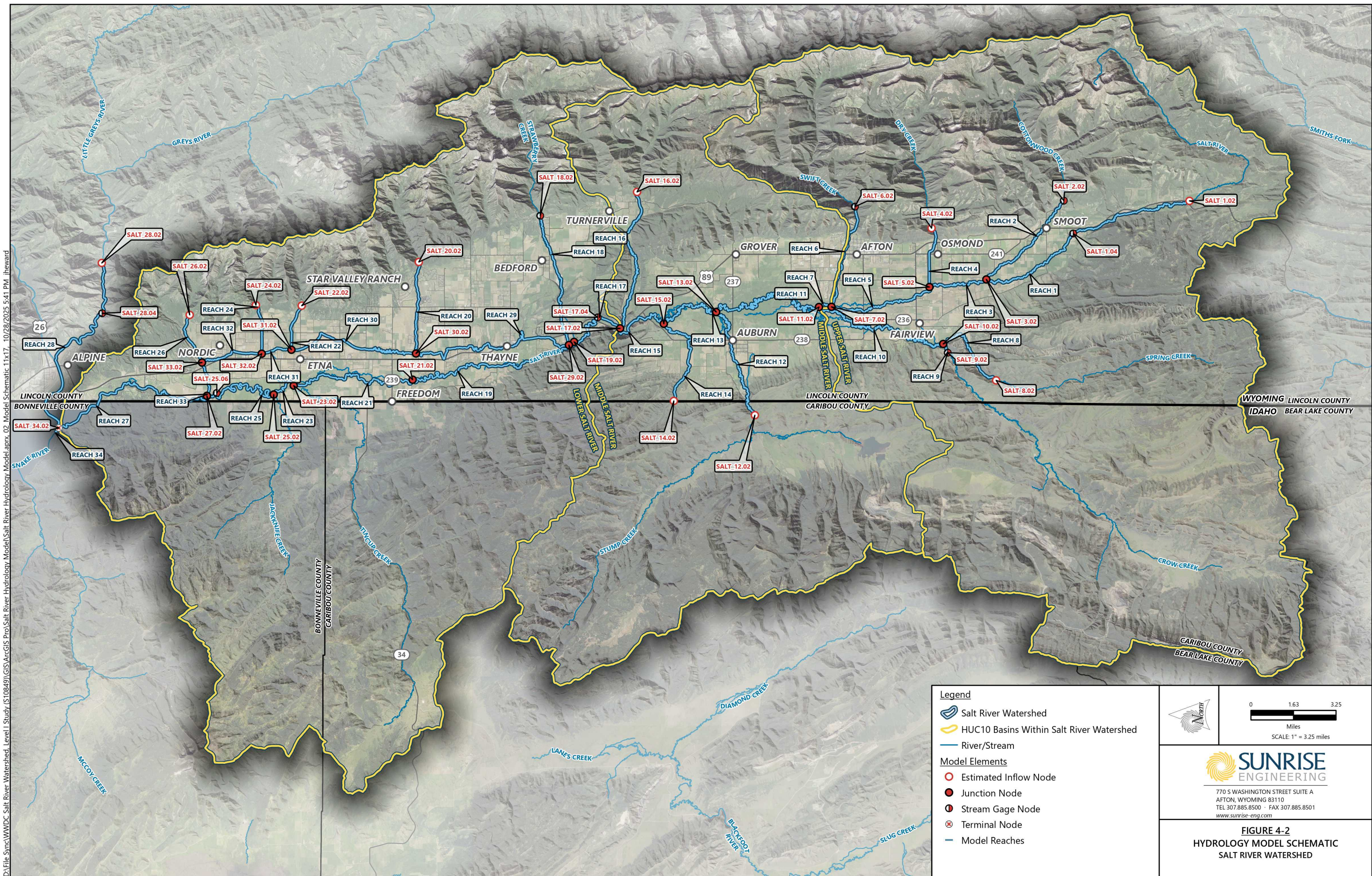
APPENDIX C: HYDROLOGY REPORT EXHIBITS

D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Base.aprx, 01 SR Watershed 85x11, 10/29/2025 4:16:23 PM, jhevard

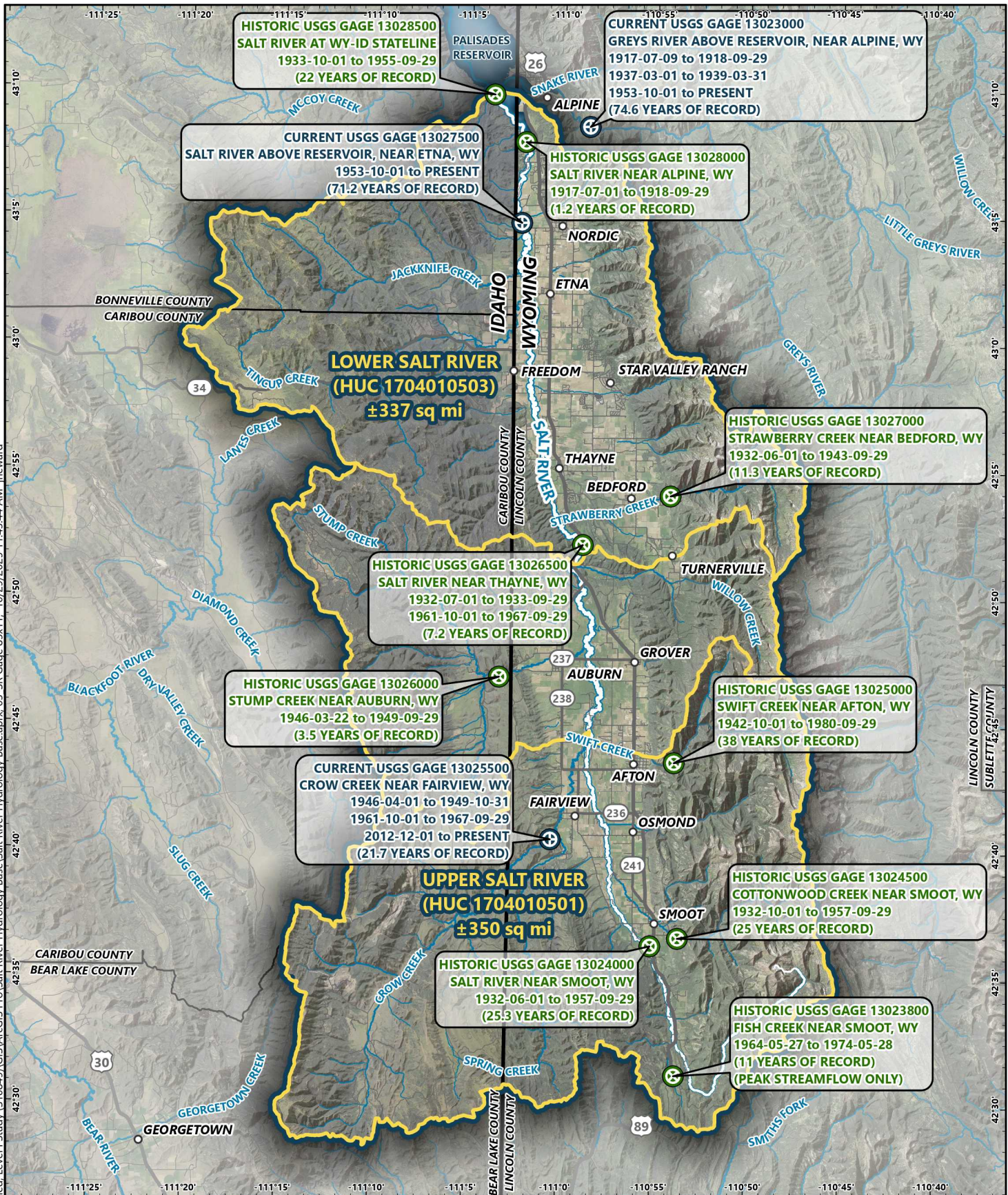


Legend HUC10 Basins Within Salt River Watershed River/Stream	0 1.5 3 6 Miles SCALE: 1" = 6' SUNRISE ENGINEERING 770 S WASHINGTON STREET SUITE A AFTON, WYOMING 83110 TEL 307.885.8500 · FAX 307.885.8501 www.sunrise-eng.com	FIGURE 4-1 SALT RIVER WATERSHED VICINITY OF STAR VALLEY, WYOMING
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D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Model\Salt River Hydrology Model.aprx, 02 Model Schematic 11x17, 10/28/2025 5:41 PM iheward



D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Base.aprx, 03 SR Gage 85x11, 10/29/2025 11:43:44 AM jheward



Legend

- HUC10 Basins Within Salt River Watershed
- Historic USGS Stream Gage
- Current USGS Stream Gage

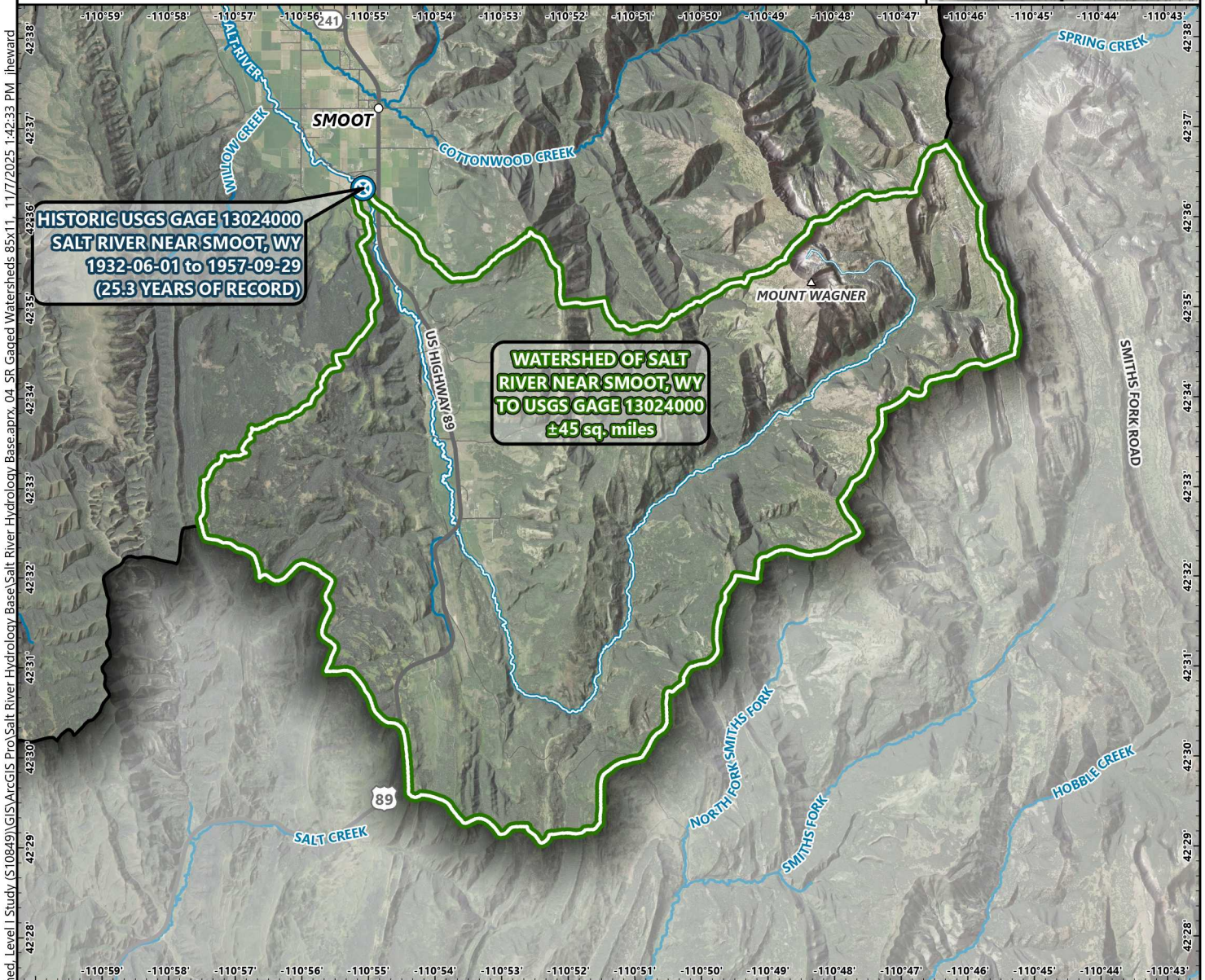
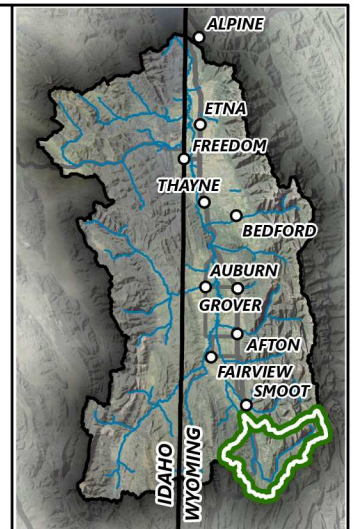
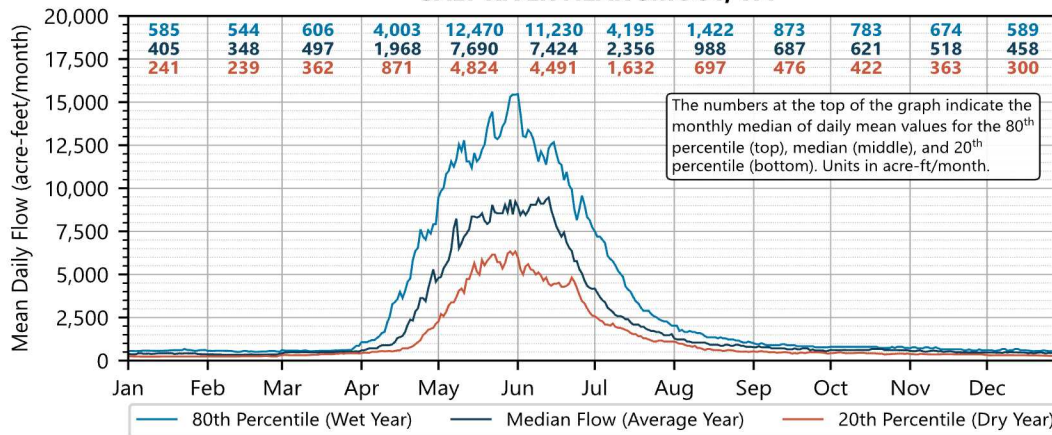
0 1.5 3 6
Miles

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FIGURE 4-3
CURRENT & HISTORICAL USGS GAGE STATIONS
SALT RIVER WATERSHED

MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13024000 SALT RIVER NEAR SMOOT, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 1 2
Miles
SCALE: 1" = 2 miles

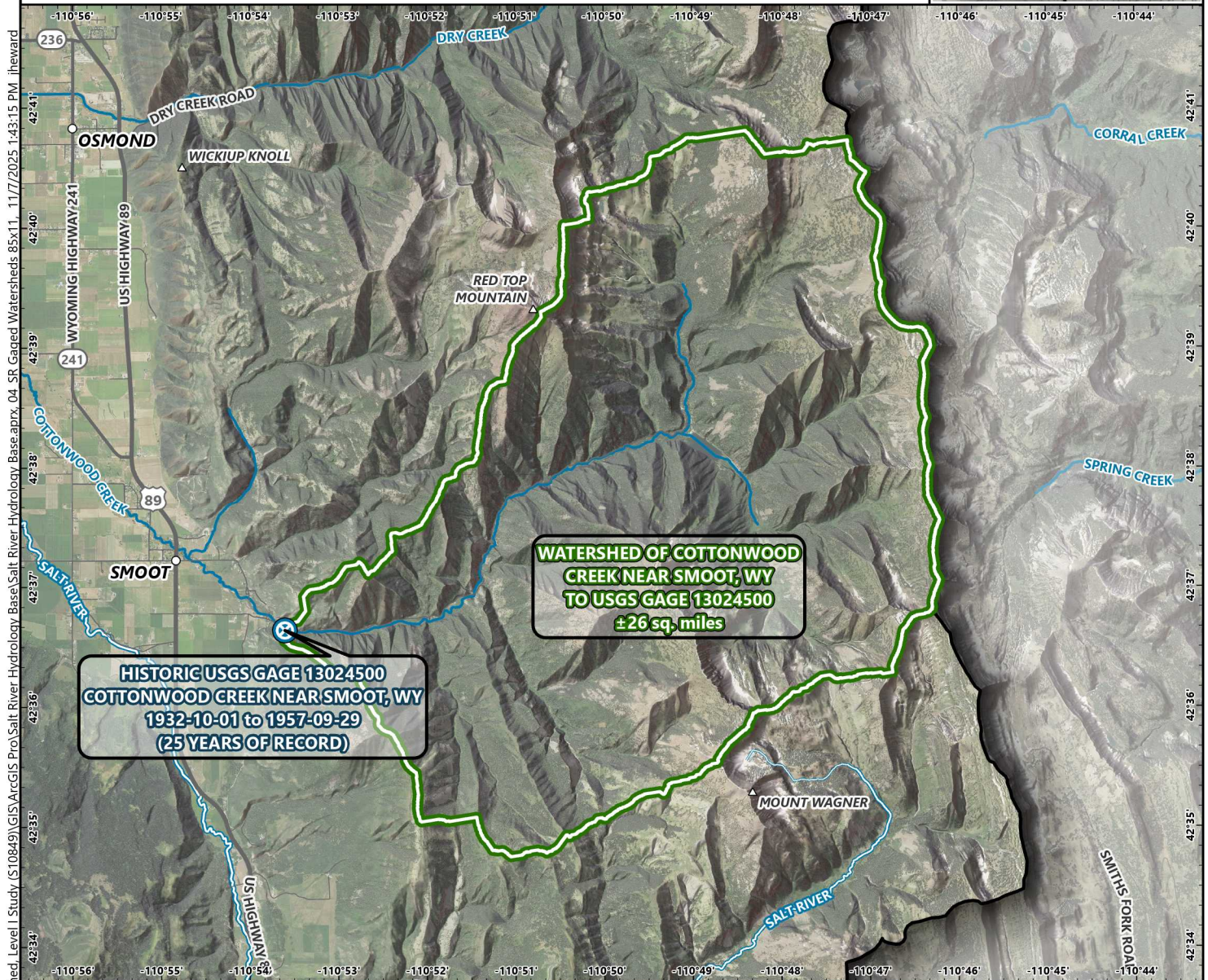
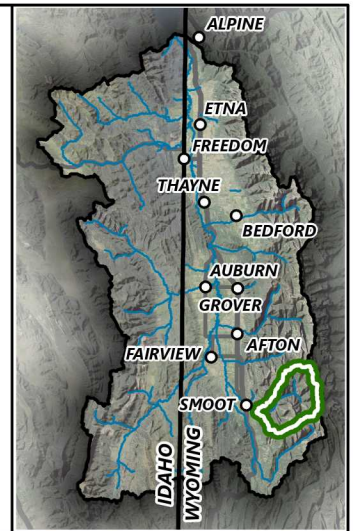
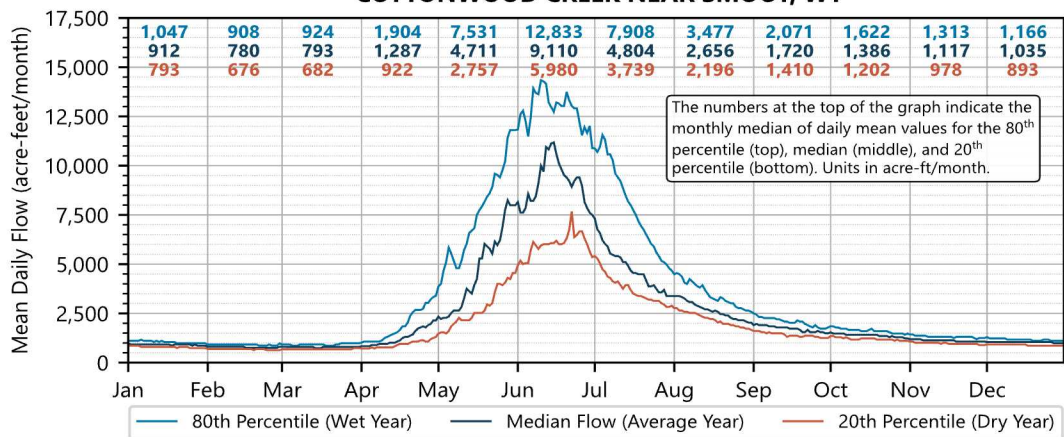
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FIGURE 4-4
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13024000
SALT RIVER NEAR SMOOT, WY

MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13024500 COTTONWOOD CREEK NEAR SMOOT, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 0.75 1.5
Miles
SCALE: 1" = 1.5 miles



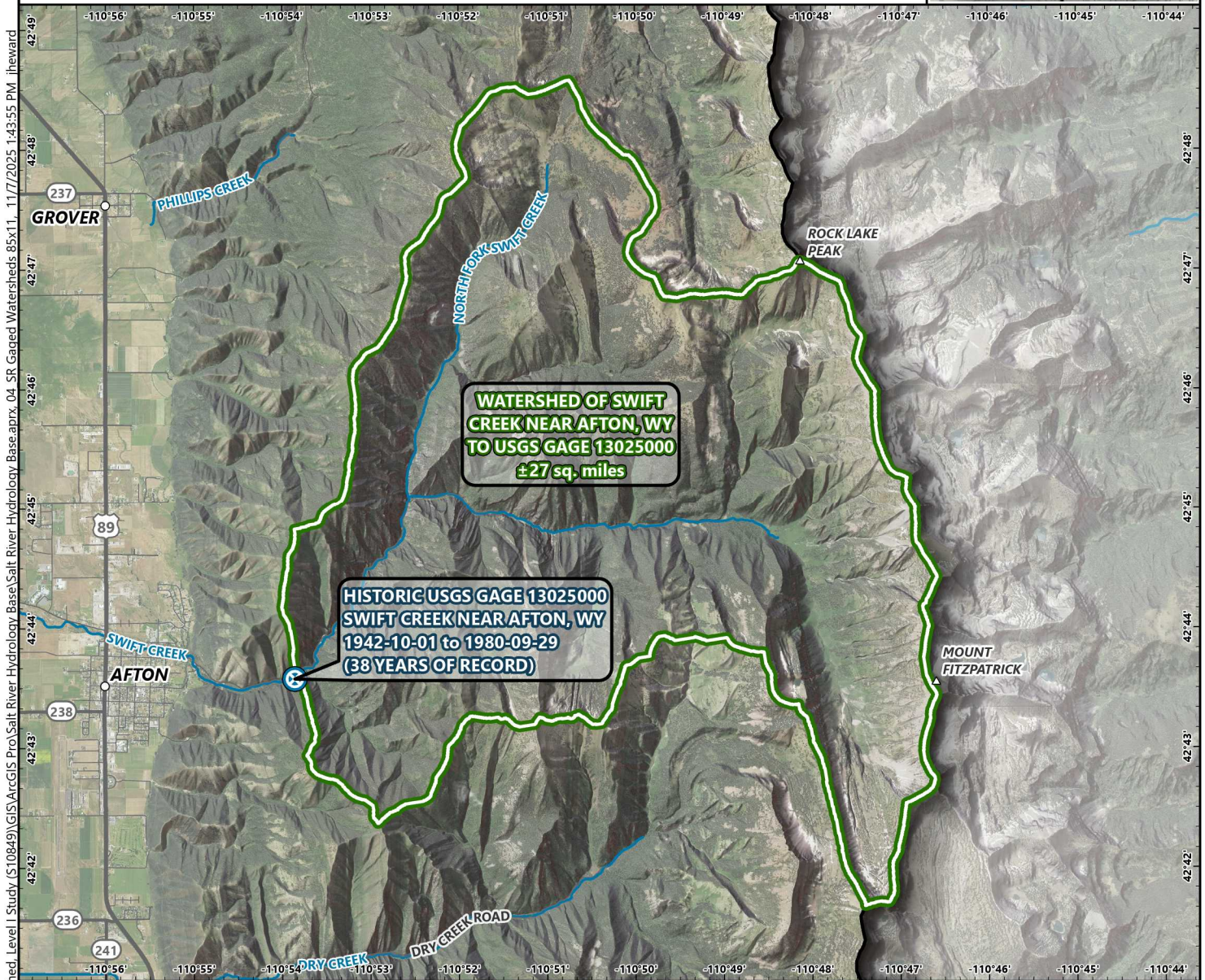
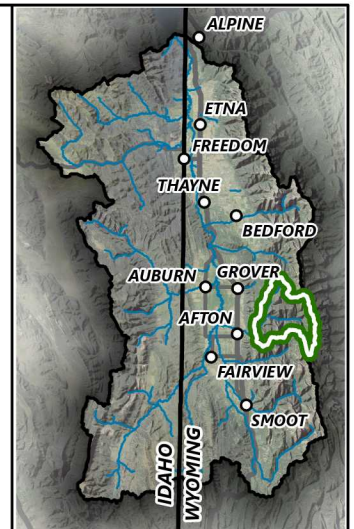
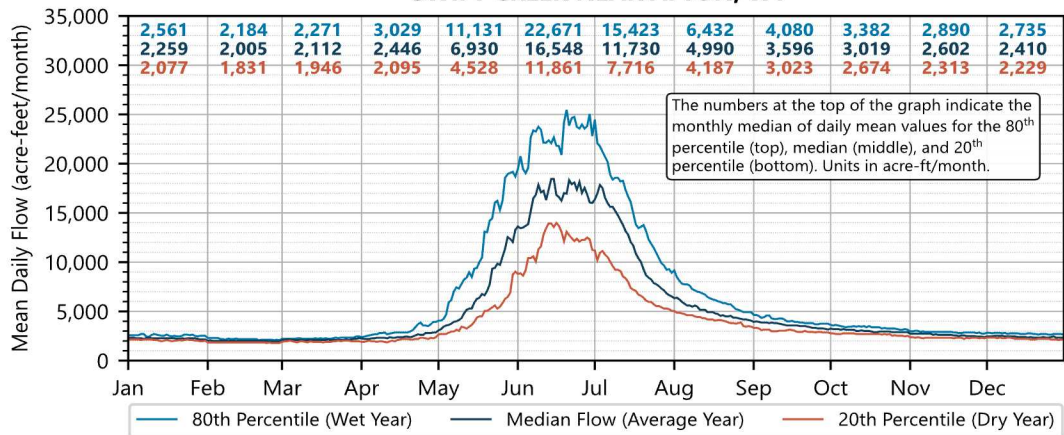
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FIGURE 4-5
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13024500
COTTONWOOD CREEK NEAR SMOOT, WY

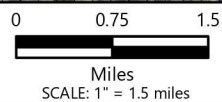
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MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13025000 SWIFT CREEK NEAR AFTON, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage



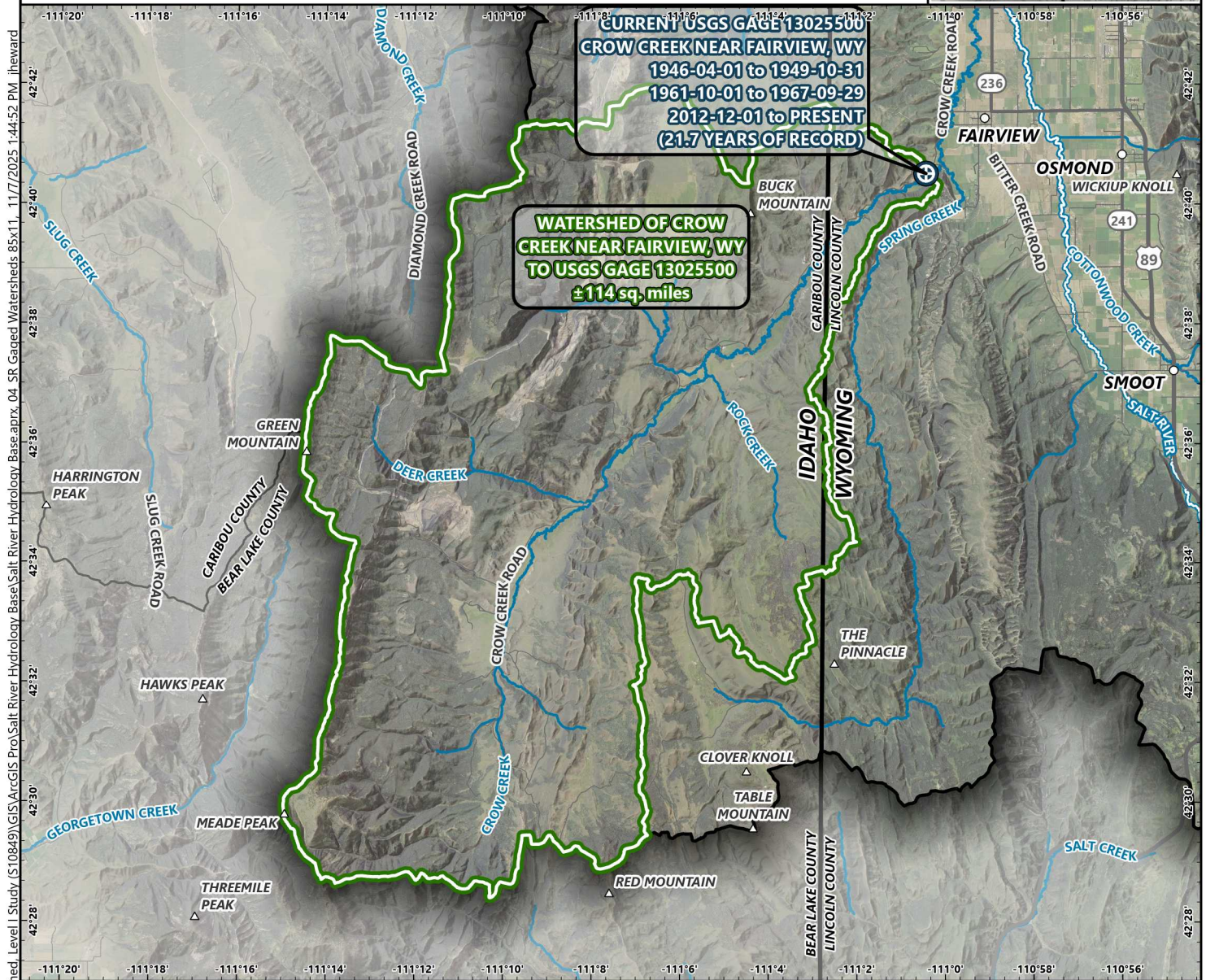
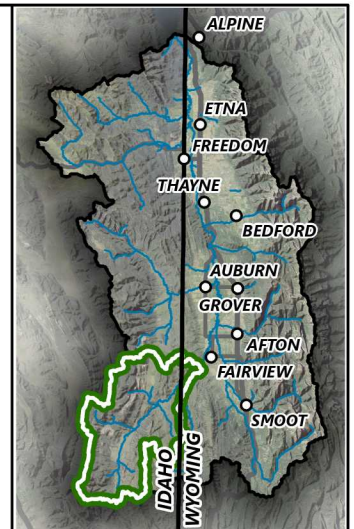
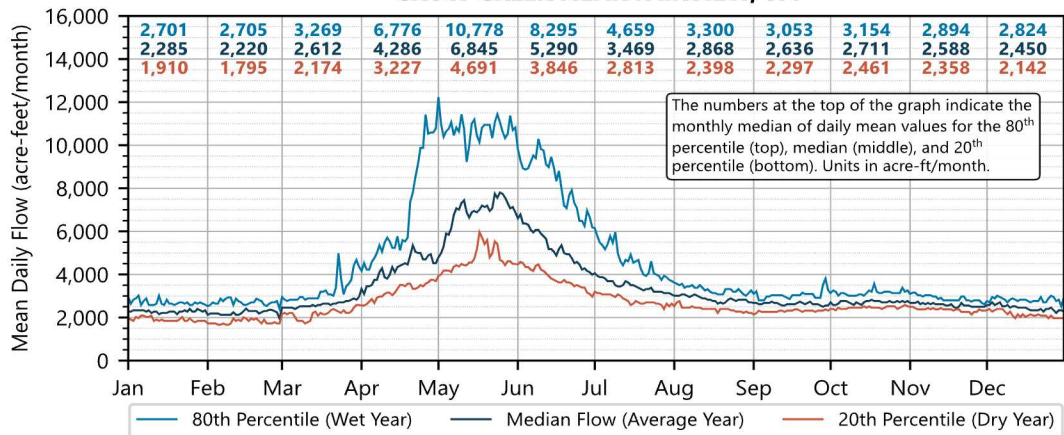
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FIGURE 4-6
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13025000
SWIFT CREEK NEAR AFTON, WY

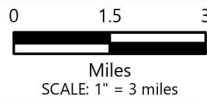
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MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13025500 CROW CREEK NEAR FAIRVIEW, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Current USGS Stream Gage



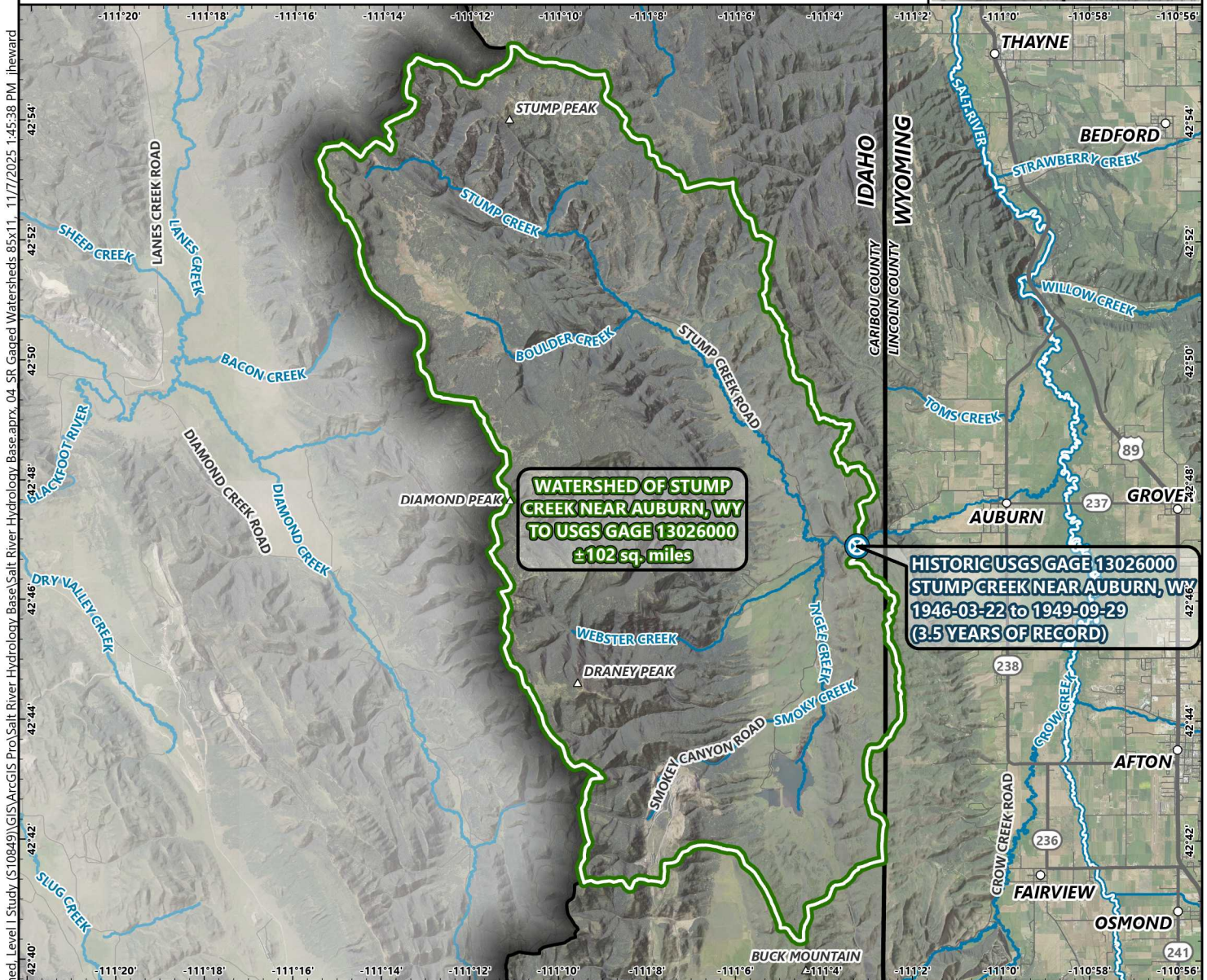
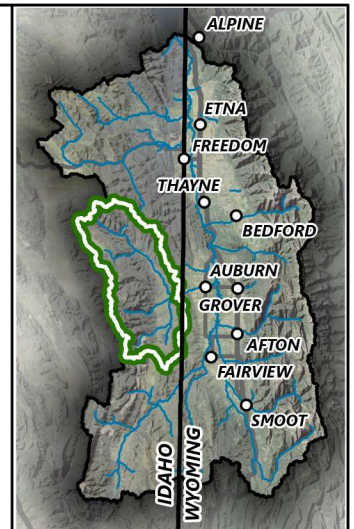
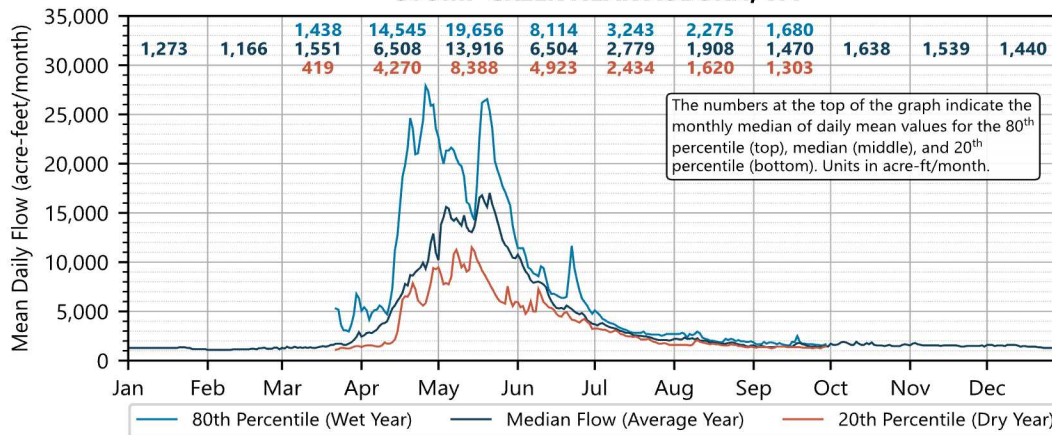
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FIGURE 4-7
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13025500
CROW CREEK NEAR FAIRVIEW, WY

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MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13026000 STUMP CREEK NEAR AUBURN, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 1.5 3
Miles
SCALE: 1" = 3 miles

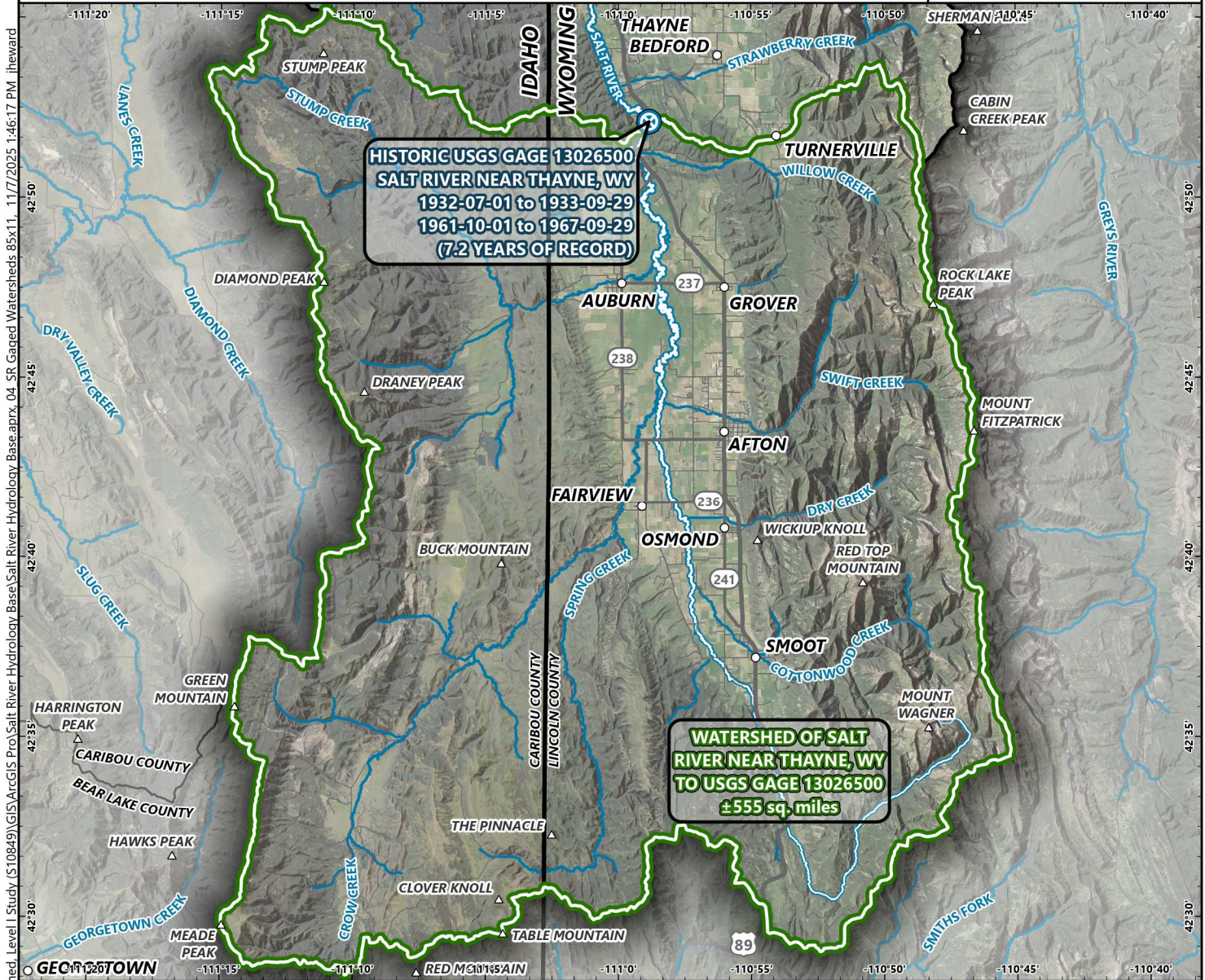
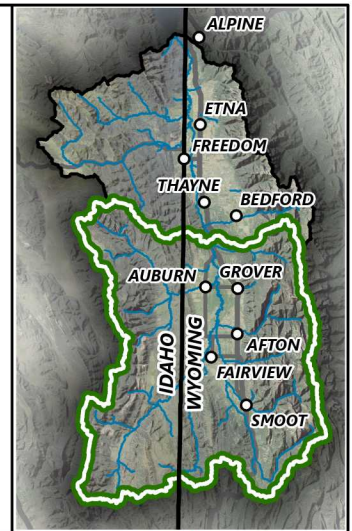
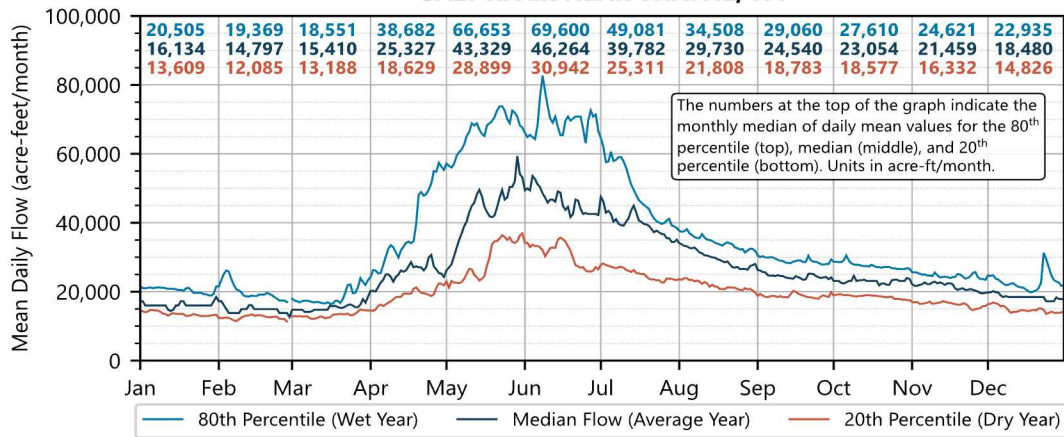


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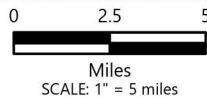
FIGURE 4-8
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13026000
STUMP CREEK NEAR AUBURN, WY

MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13026500 SALT RIVER NEAR THAYNE, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

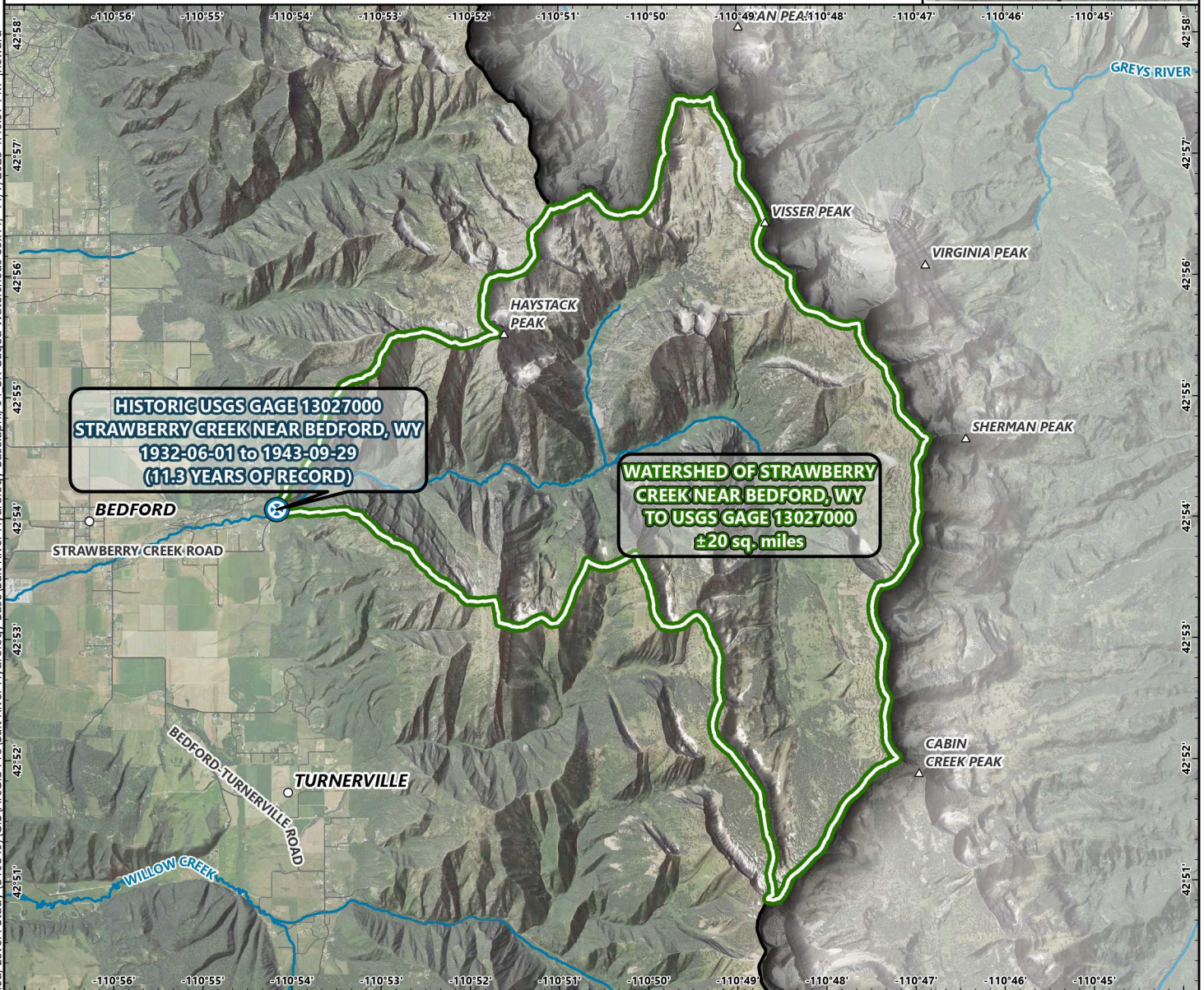
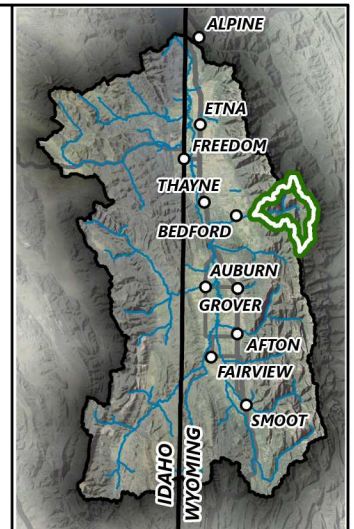
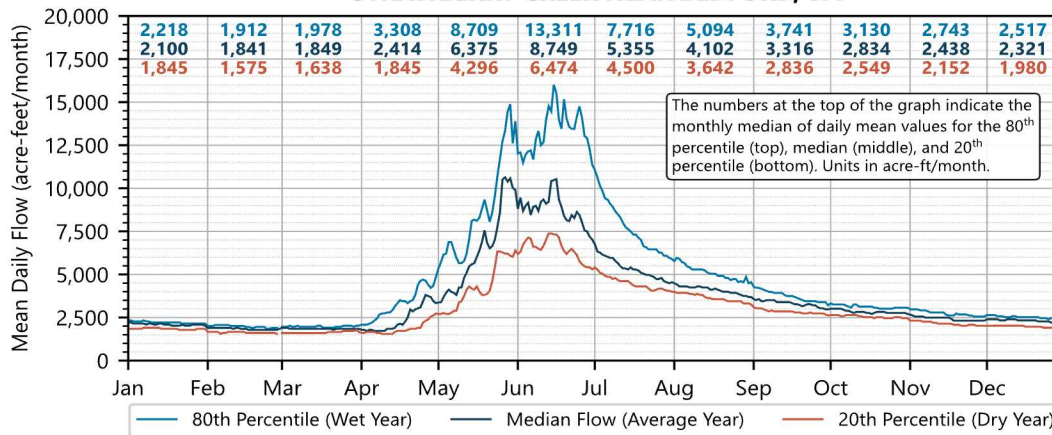


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FIGURE 4-9
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13026500
SALT RIVER NEAR THAYNE, WY

MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13027000 STRAWBERRY CREEK NEAR BEDFORD, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 0.75 1.5
Miles
SCALE: 1" = 1.5 miles

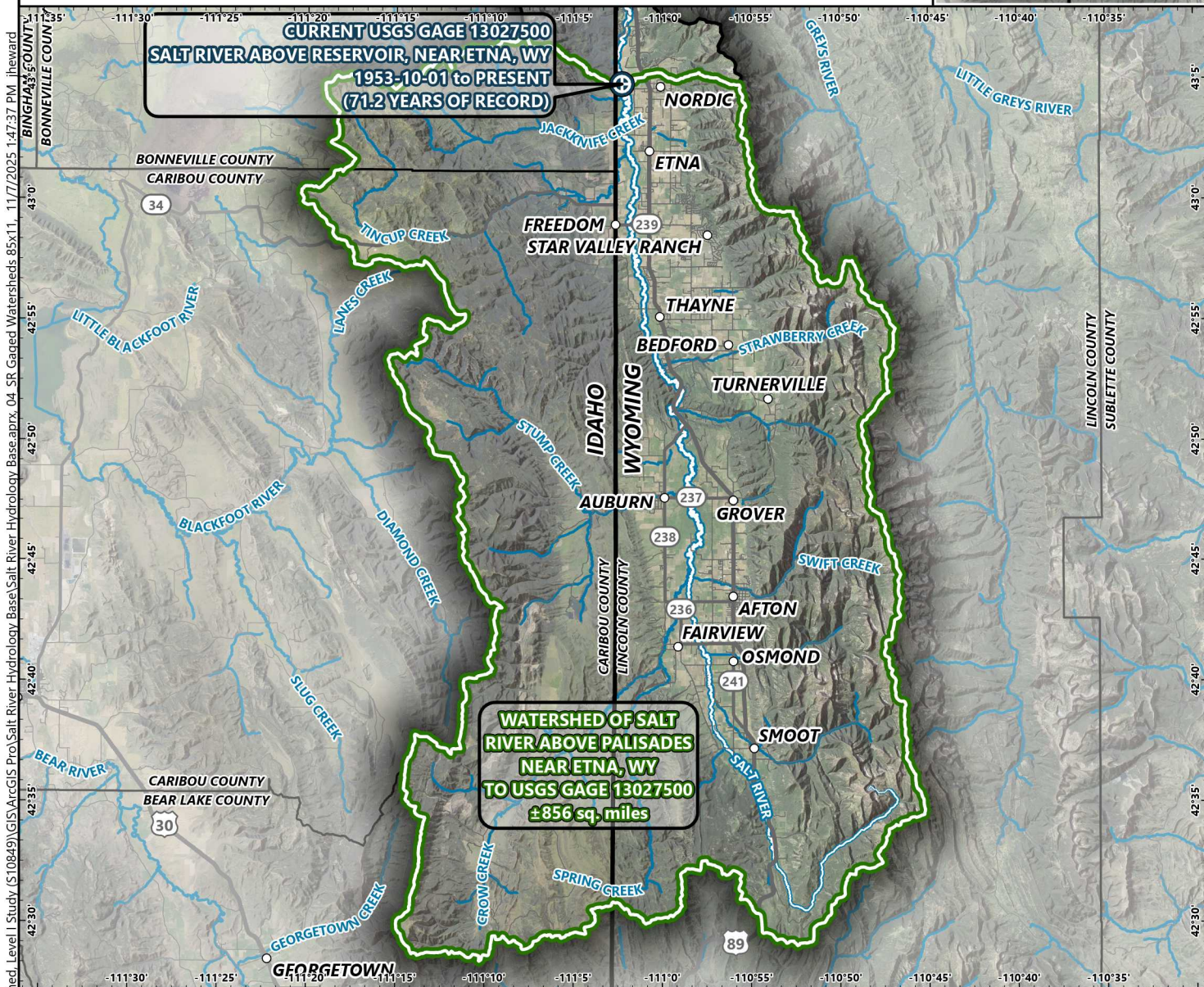
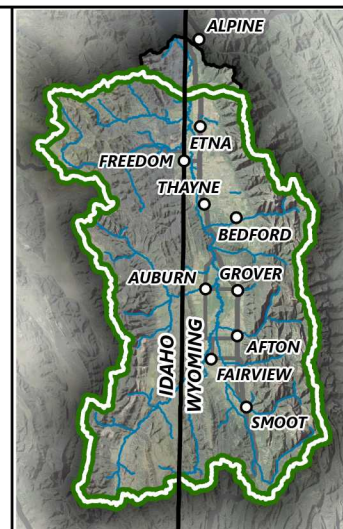
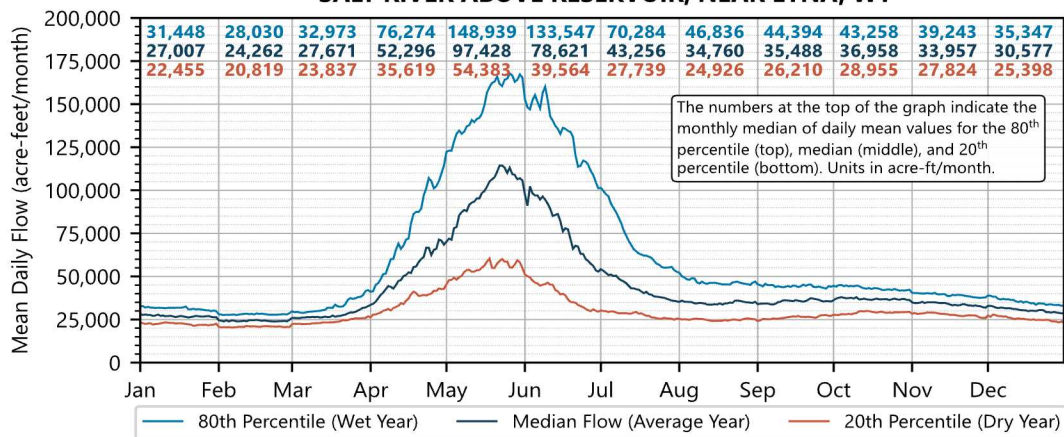


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FIGURE 4-10
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13027000
STRAWBERRY CREEK NEAR BEDFORD, WY

MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13027500 SALT RIVER ABOVE RESERVOIR, NEAR ETNA, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Current USGS Stream Gage

0 3.75 7.5
Miles
SCALE: 1" = 7.5 miles



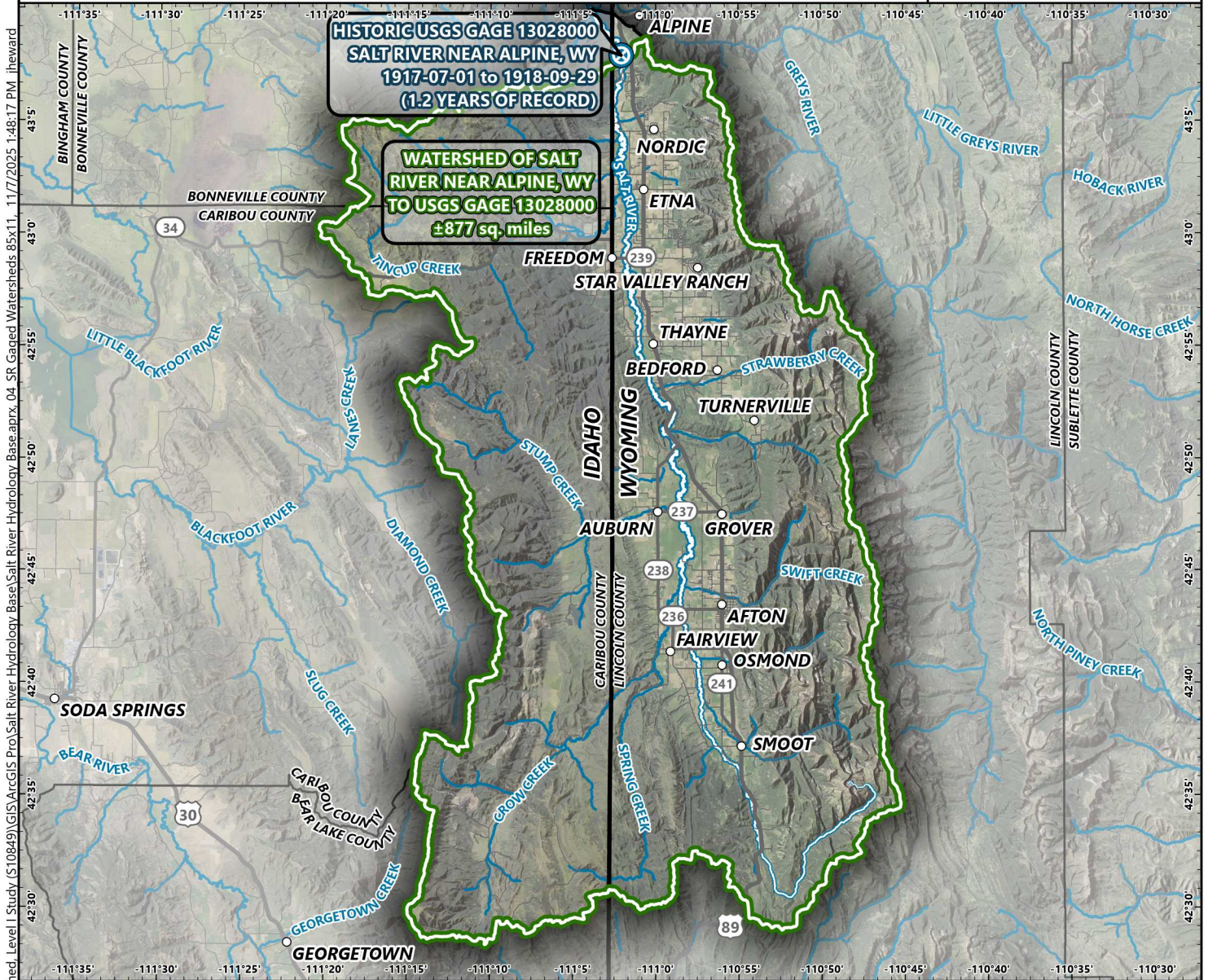
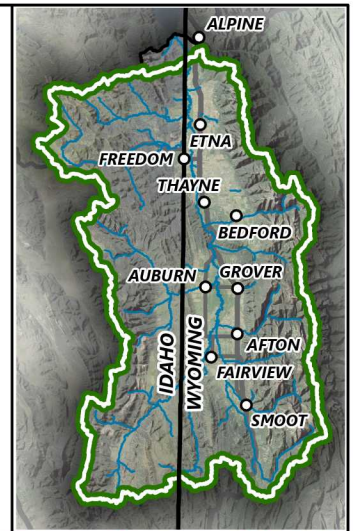
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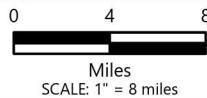
FIGURE 4-11
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13027500
SALT RIVER ABOVE PALISADES NEAR ETNA, WY

Due to short record of measured data, there is insufficient data for daily statistics graph.



Legend

-  Salt River Watershed
-  Watershed at Stream Gage Shown
-  Historic USGS Stream Gage

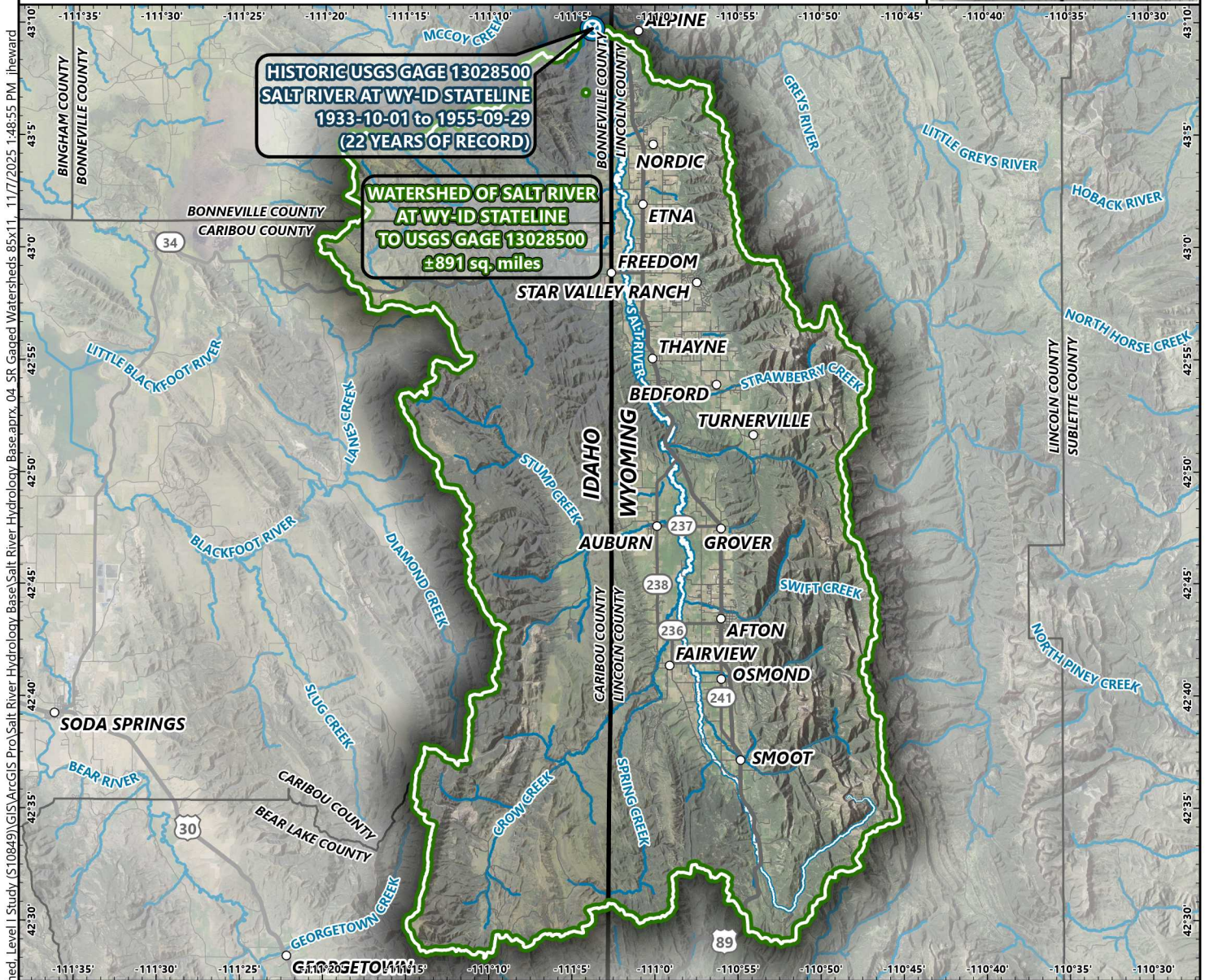
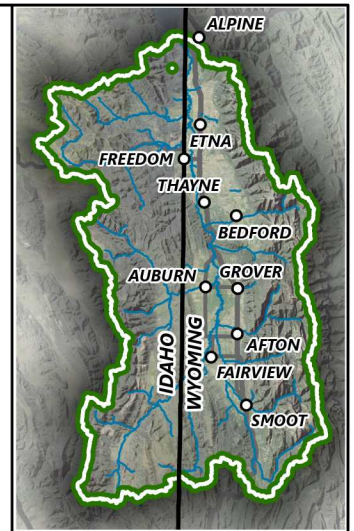
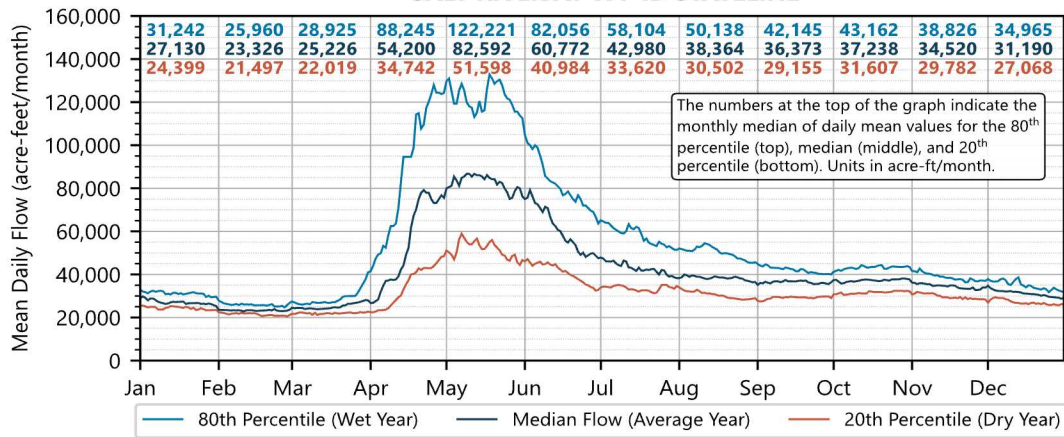


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FIGURE 4-12
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13028000
SALT RIVER NEAR ALPINE, WY

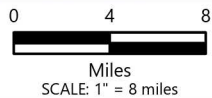
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MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13028500 SALT RIVER AT WY-ID STATELINE



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage



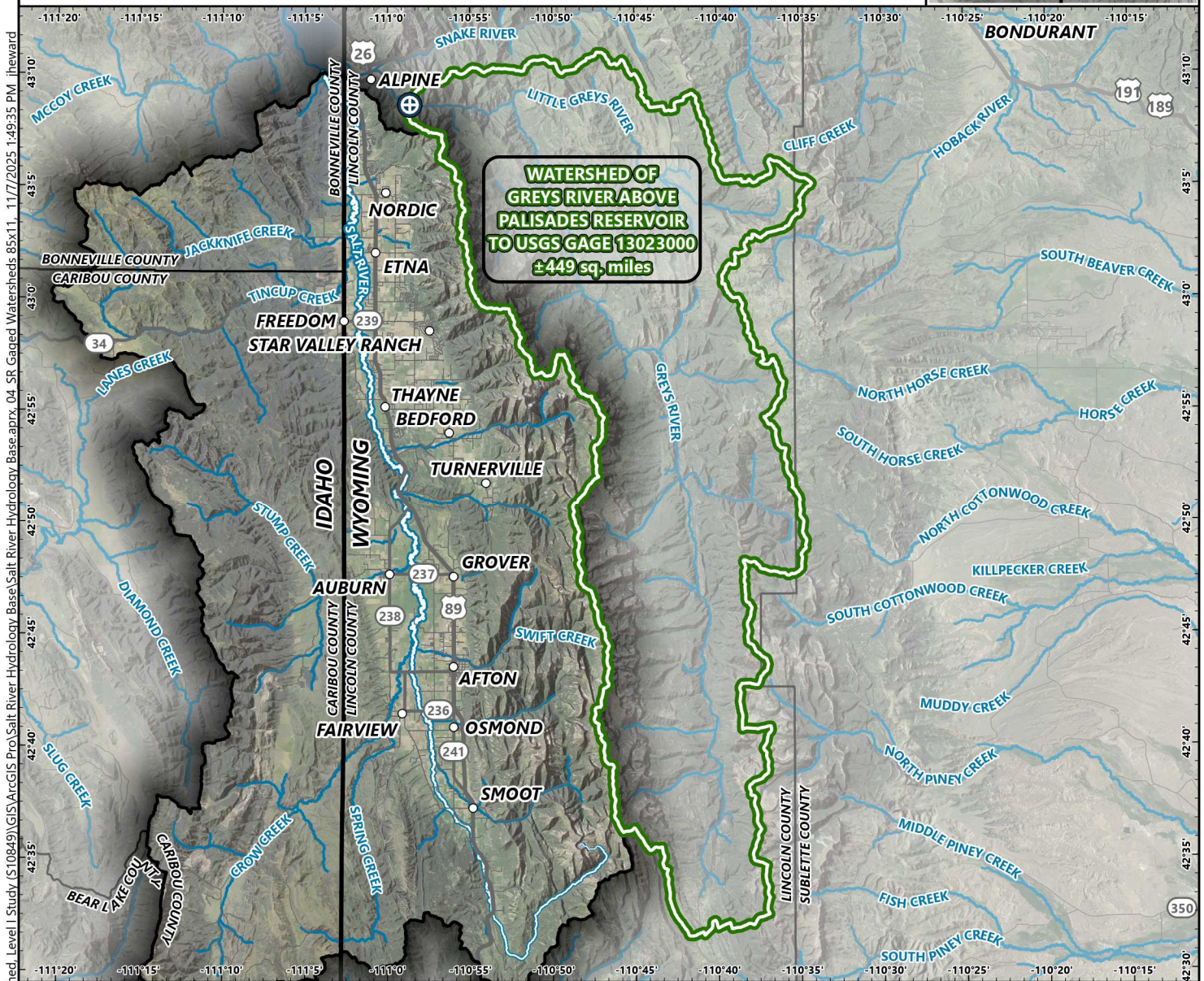
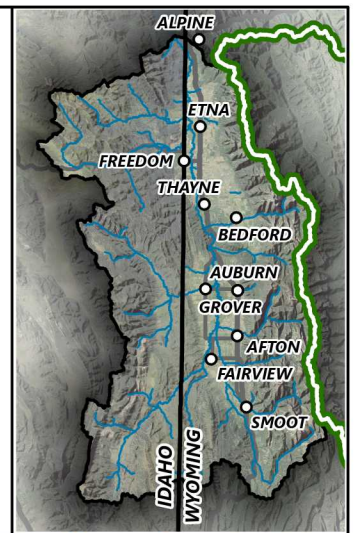
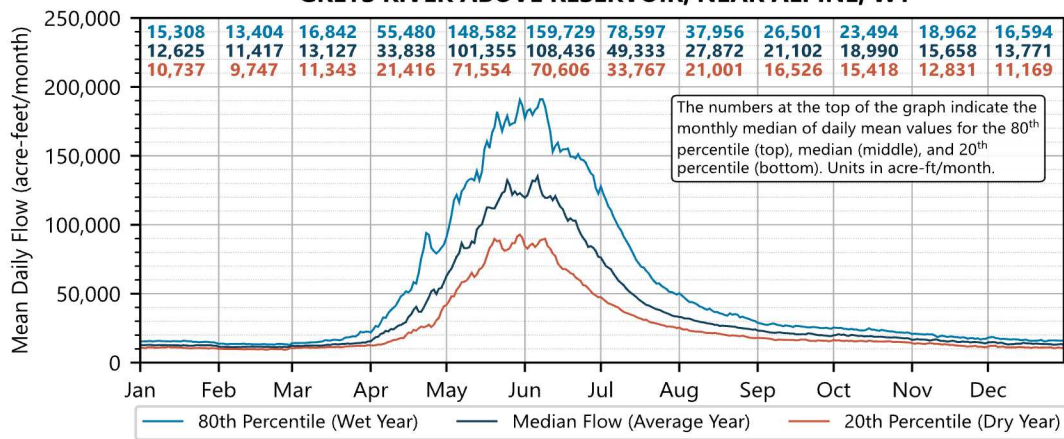
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FIGURE 4-13

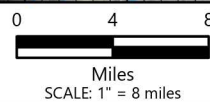
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13028500
SALT RIVER AT WY-ID STATELINE

MEAN DAILY FLOW GRAPH AT USGS GAGE STATION 13023000 GREYS RIVER ABOVE RESERVOIR, NEAR ALPINE, WY



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Current USGS Stream Gage



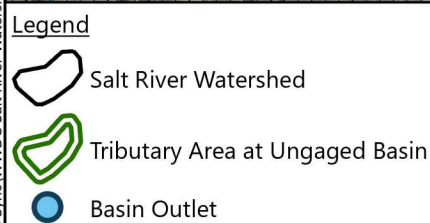
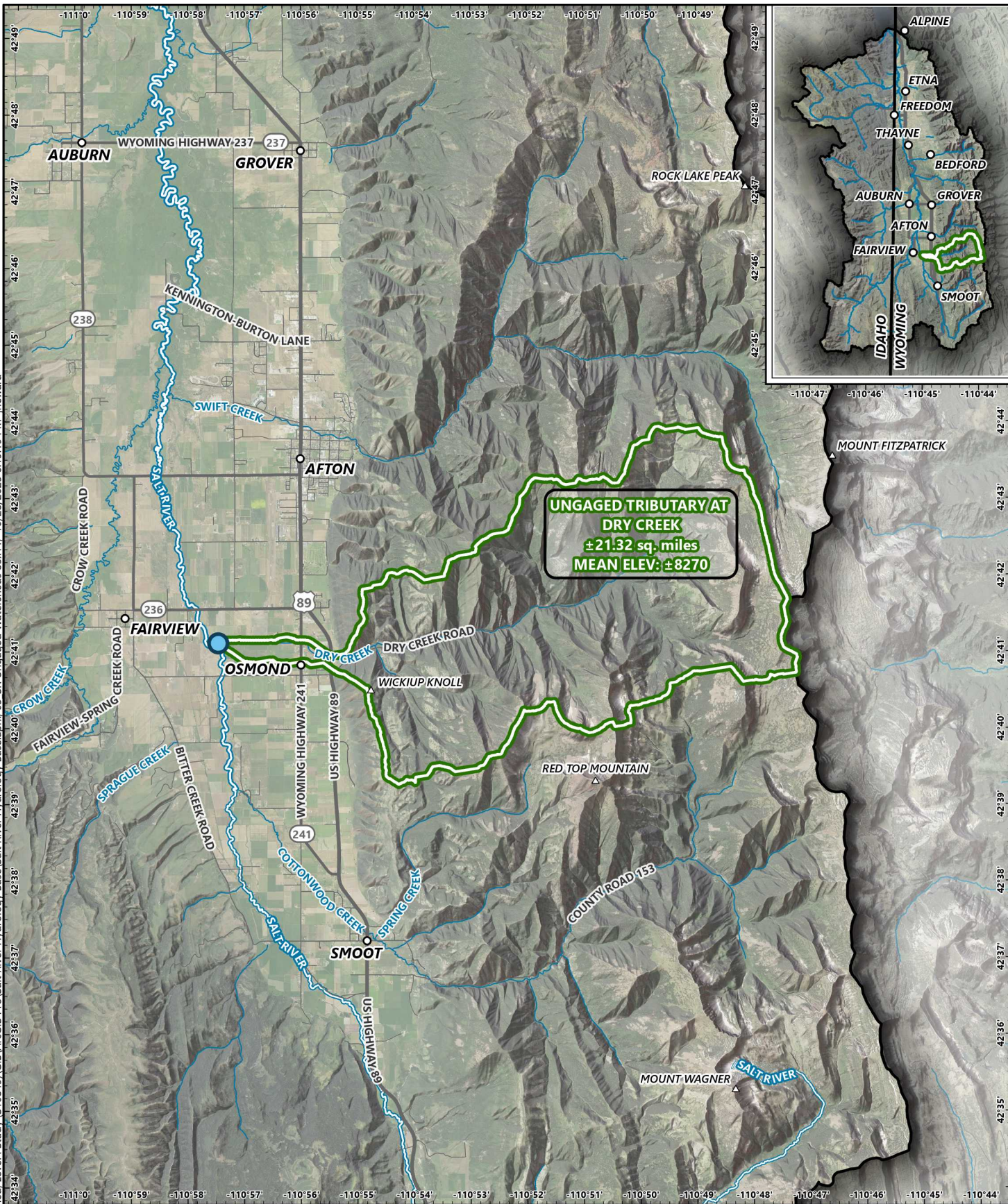
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FIGURE 4-14
DRAINAGE AREA AND MEAN DAILY FLOW
AT USGS GAGE STATION 13023000
GREYS RIVER ABOVE PALISADES RESERVOIR

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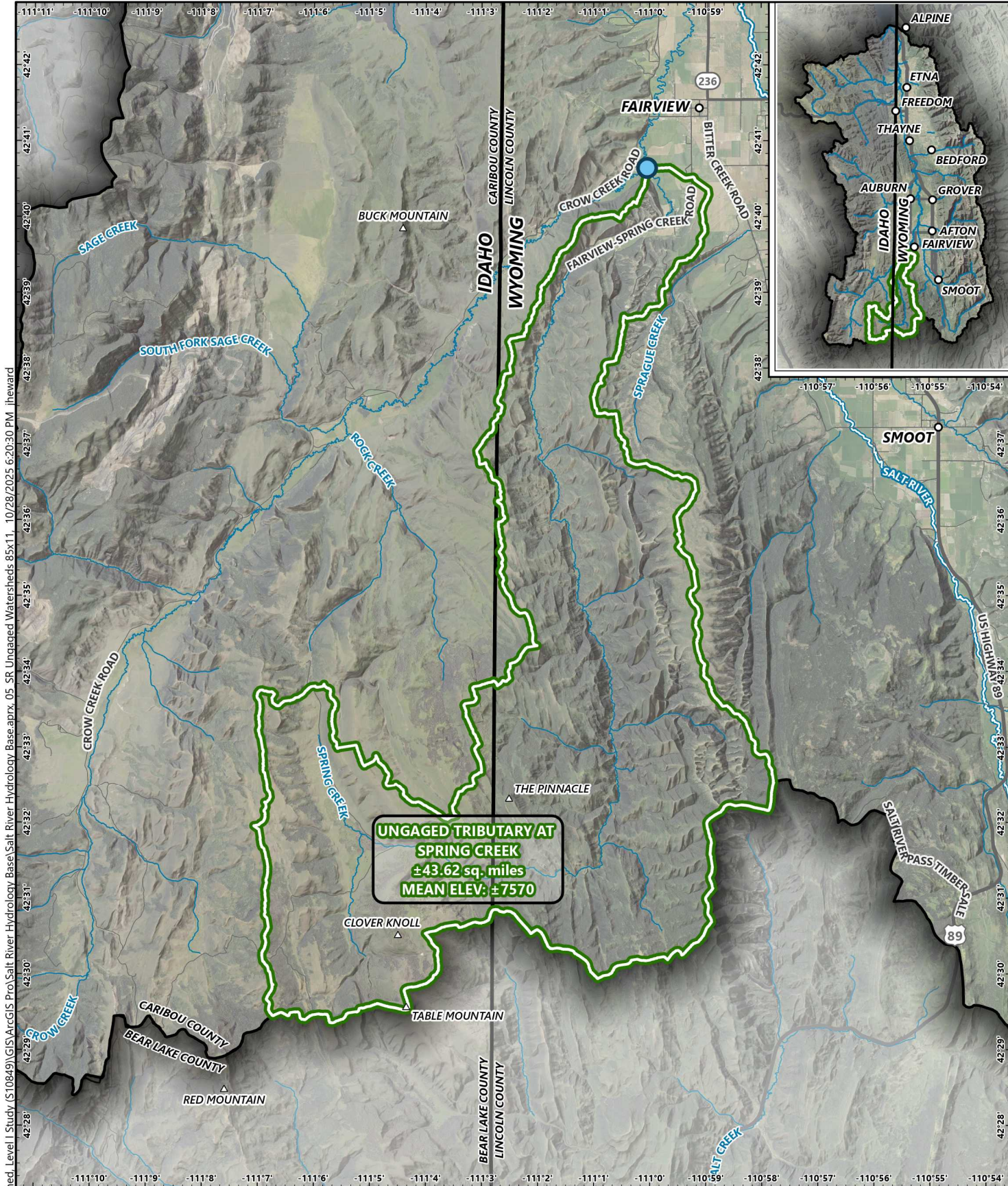
Miles
SCALE: 1" = 2 miles

NORTH

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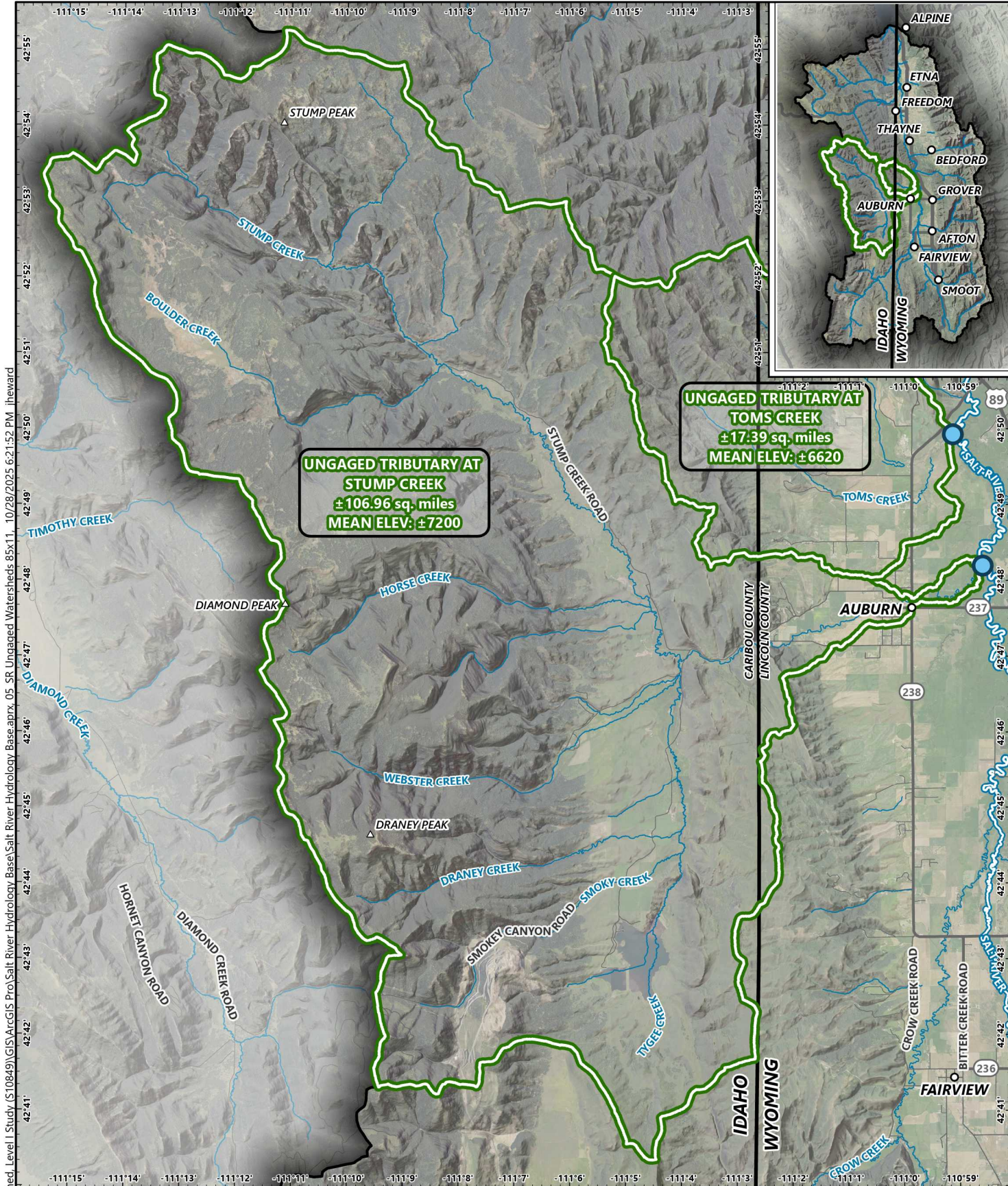
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FIGURE 4-15
UNGAGED TRIBUTARY BASIN AT
DRY CREEK



Legend - Salt River Watershed - Tributary Area at Ungaged Basin - Basin Outlet	0 1 2 Miles SCALE: 1" = 2 miles SUNRISE ENGINEERING 770 S WASHINGTON STREET SUITE A AFTON, WYOMING 83110 TEL 307.885.8500 · FAX 307.885.8501 www.sunrise-eng.com	FIGURE 4-16 UNGAGED TRIBUTARY BASIN AT SPRING CREEK
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Legend

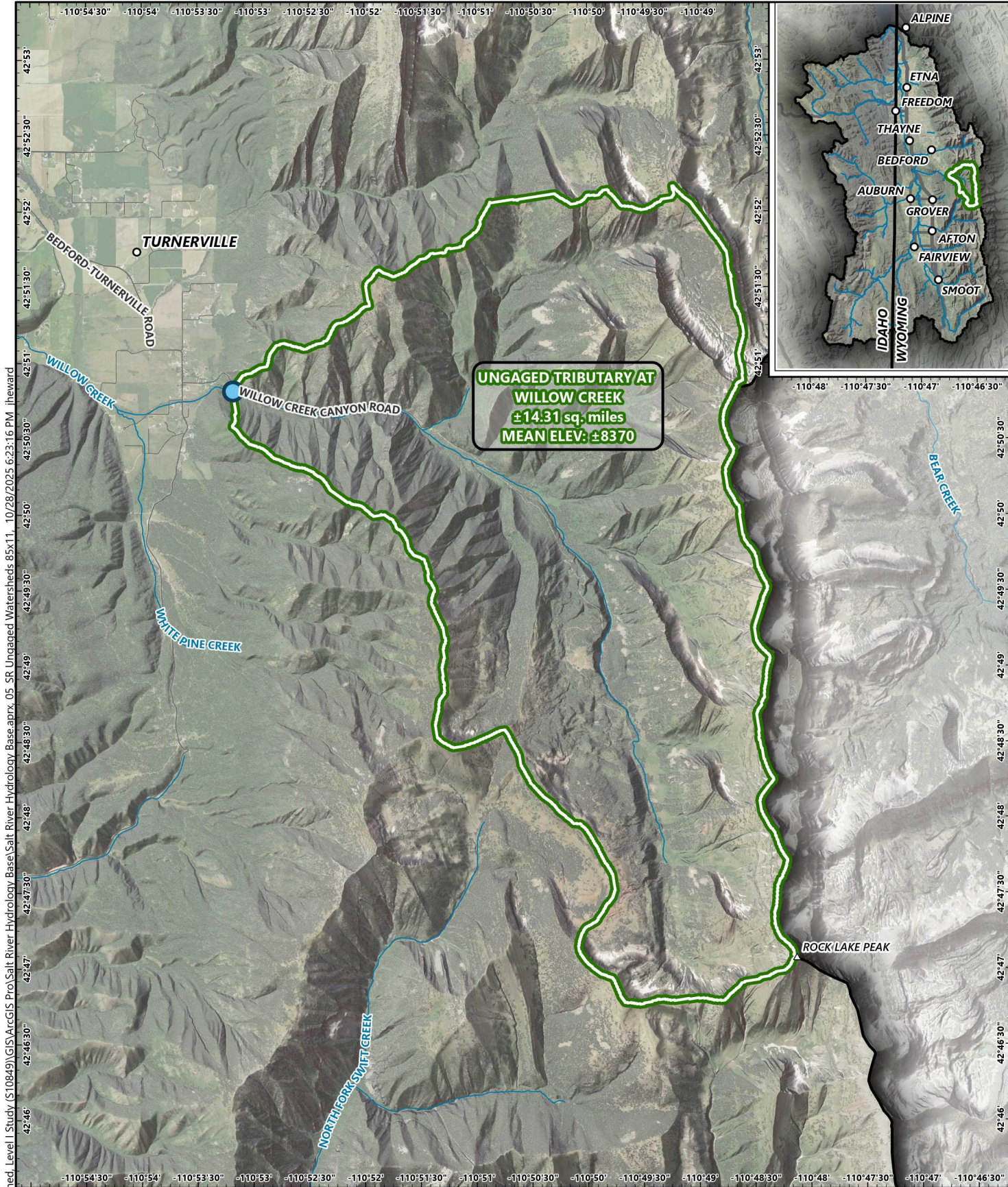
-  Salt River Watershed
-  Tributary Area at Ungaged Basin
-  Basin Outlet



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FIGURE 4-17
UNGAGED TRIBUTARY BASIN AT
STUMP CREEK

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Legend

-  Salt River Watershed
-  Tributary Area at Ungaged Basin
-  Basin Outlet

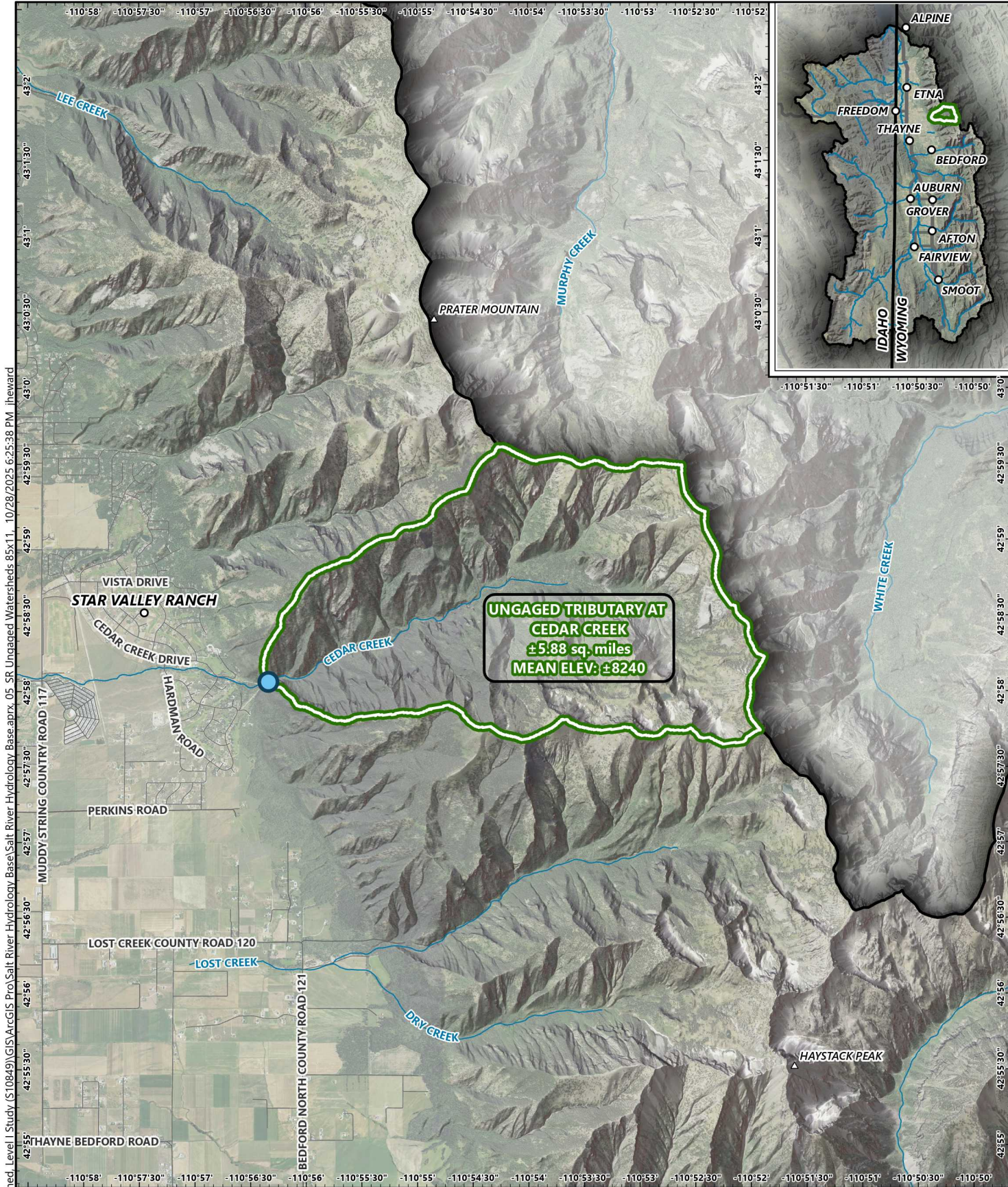
0 0.5 1
Miles
SCALE: 1" = 1 miles



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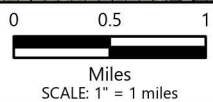
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FIGURE 4-18
UNAGED TRIBUTARY BASIN AT
WILLOW CREEK



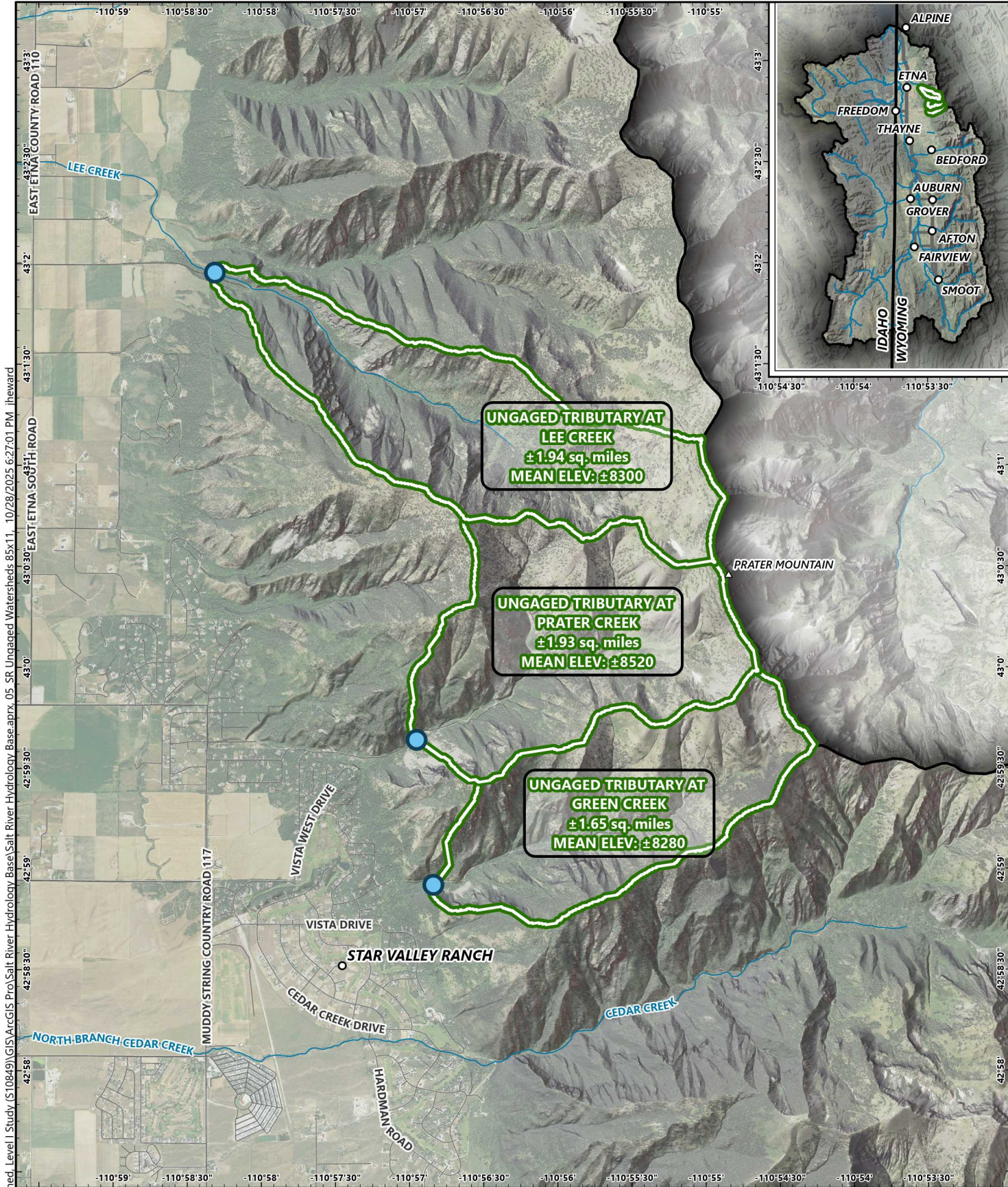
Legend

-  Salt River Watershed
-  Tributary Area at Ungaged Basin
-  Basin Outlet



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FIGURE 4-19
UNGAGED TRIBUTARY BASIN AT
CEDAR CREEK



Legend

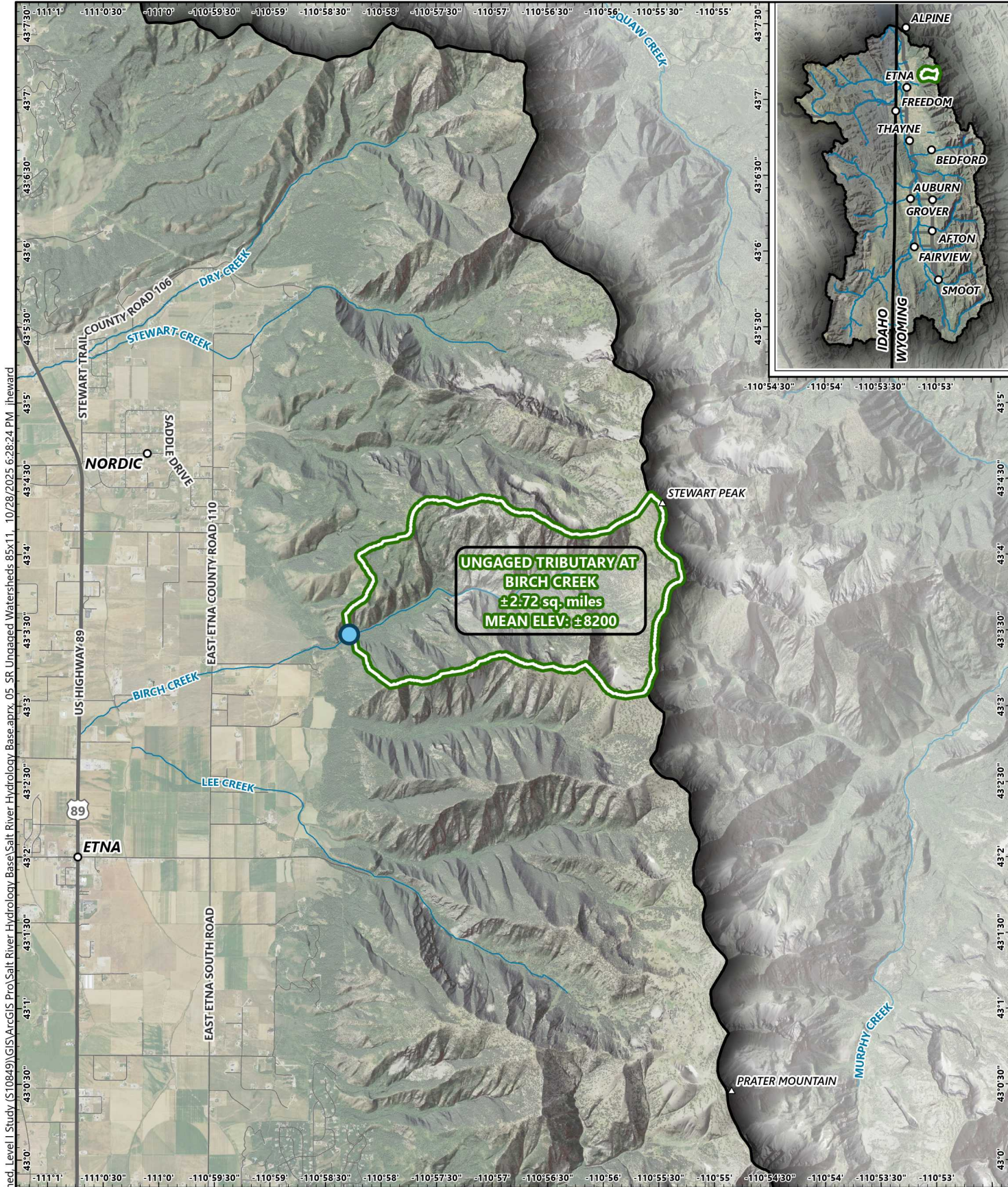
-  Salt River Watershed
-  Tributary Area at Ungaged Basin
-  Basin Outlet

0 0.375 0.75
Miles
SCALE: 1" = 0.75 miles



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FIGURE 4-20
UNGAGED TRIBUTARY BASIN AT
PRATER, GREEN, AND LEE CREEKS



Legend

-  Salt River Watershed
-  Tributary Area at Ungaged Basin
-  Basin Outlet

0 0.5 1
Miles
SCALE: 1" = 1 miles

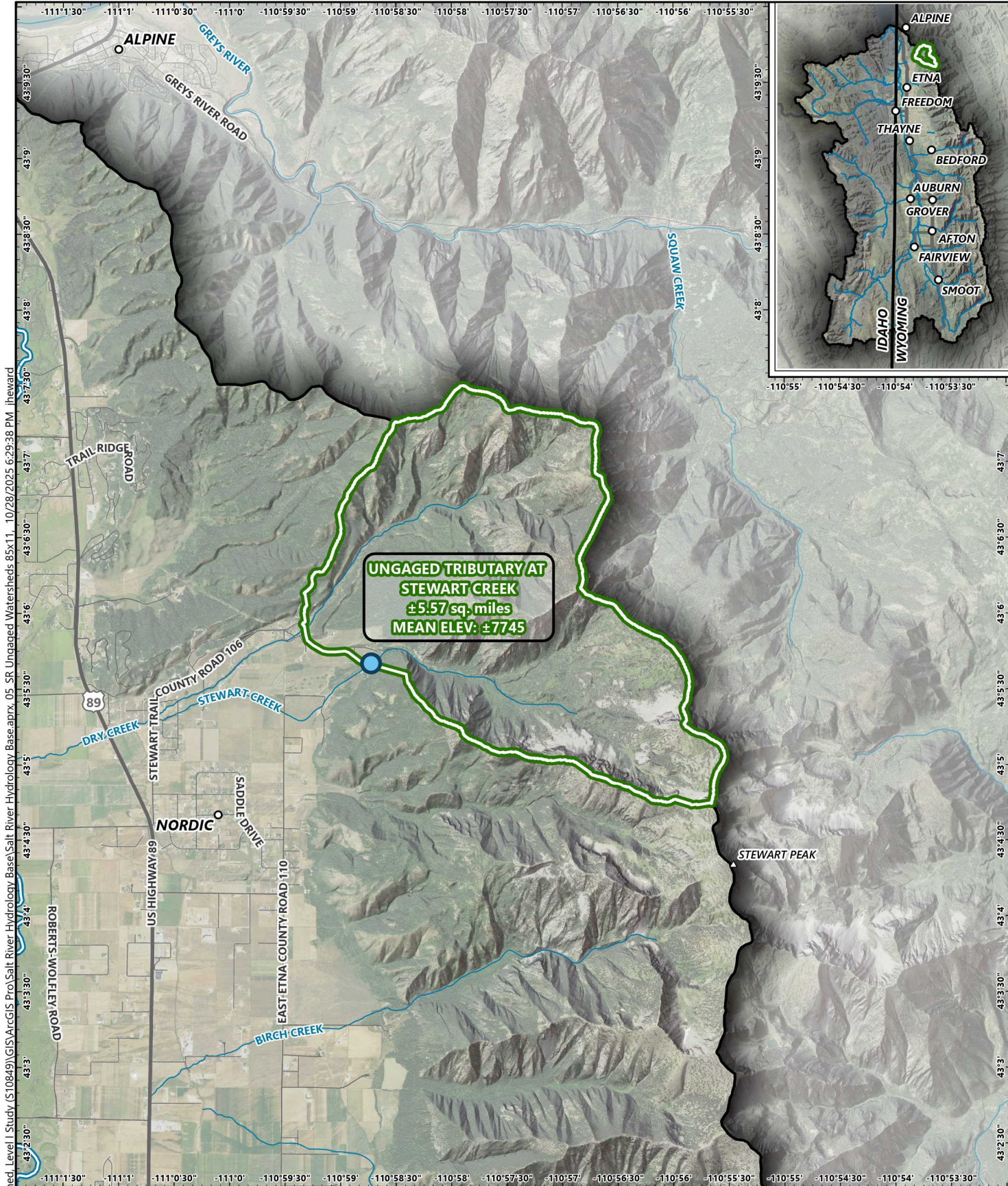


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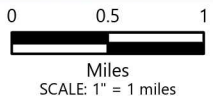
FIGURE 4-21
UNGAGED TRIBUTARY BASIN AT
BIRCH CREEK

UNGAGED TRIBUTARY AT
BIRCH CREEK
±2.72 sq. miles
MEAN ELEV: ±8200



Legend

-  Salt River Watershed
-  Tributary Area at Ungaged Basin
-  Basin Outlet

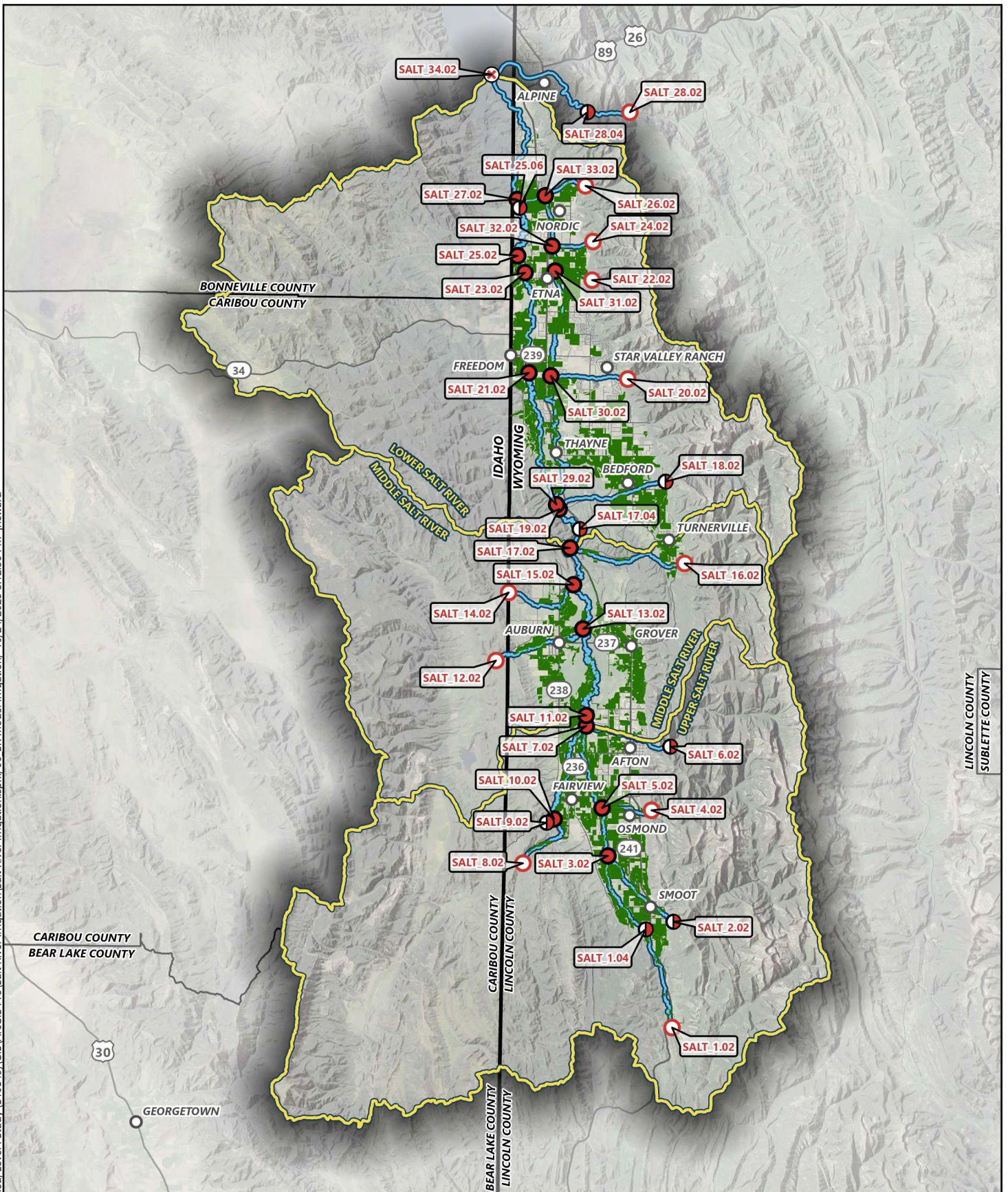


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FIGURE 4-22
UNENGAGED TRIBUTARY BASIN AT STEWART CREEK

D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Base.aprx, 05 SR Ungaged Watersheds 85x11, 10/28/2025 6:29:38 PM, ihevard

D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Irrigation.aprx, 10/24/2025 3:12:36 PM jheward

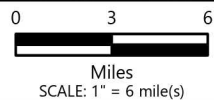


Legend

- HUC10 Basins Within Salt River Watershed
- Modeled Irrigated Area
- Model Reaches

Model Elements

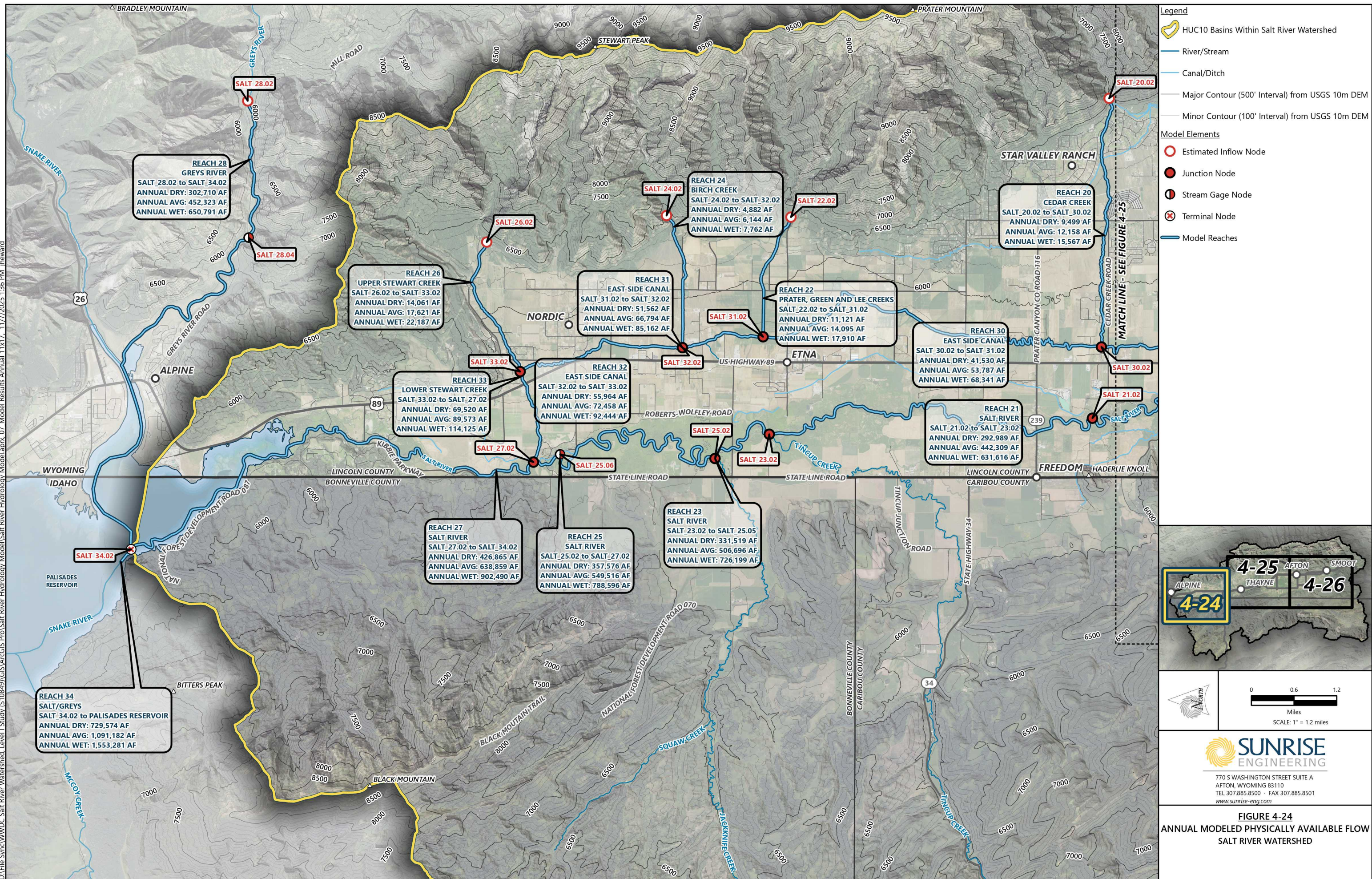
- Estimated Inflow
- Junction Node
- Stream Gage Node
- Terminal Node

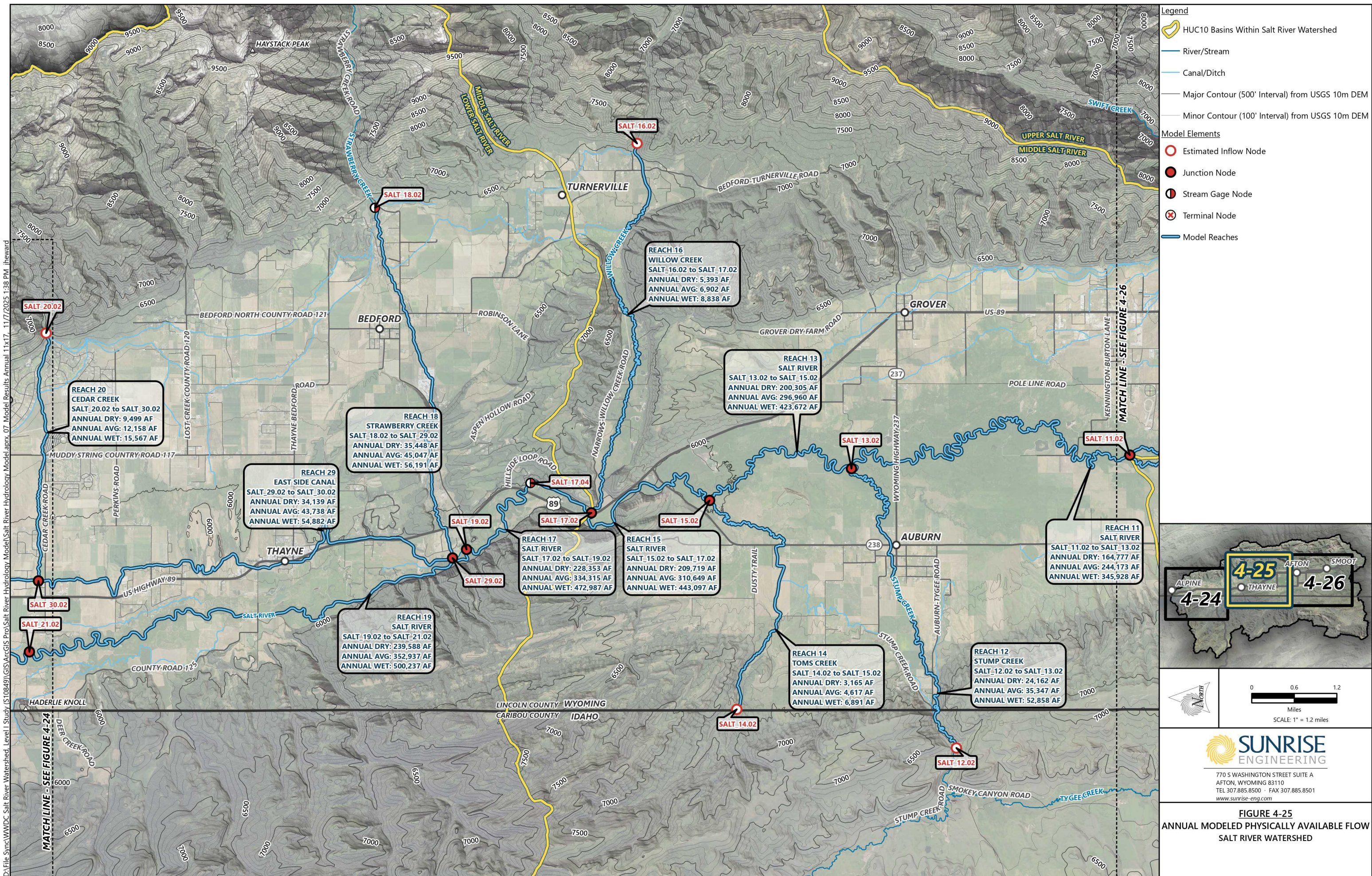


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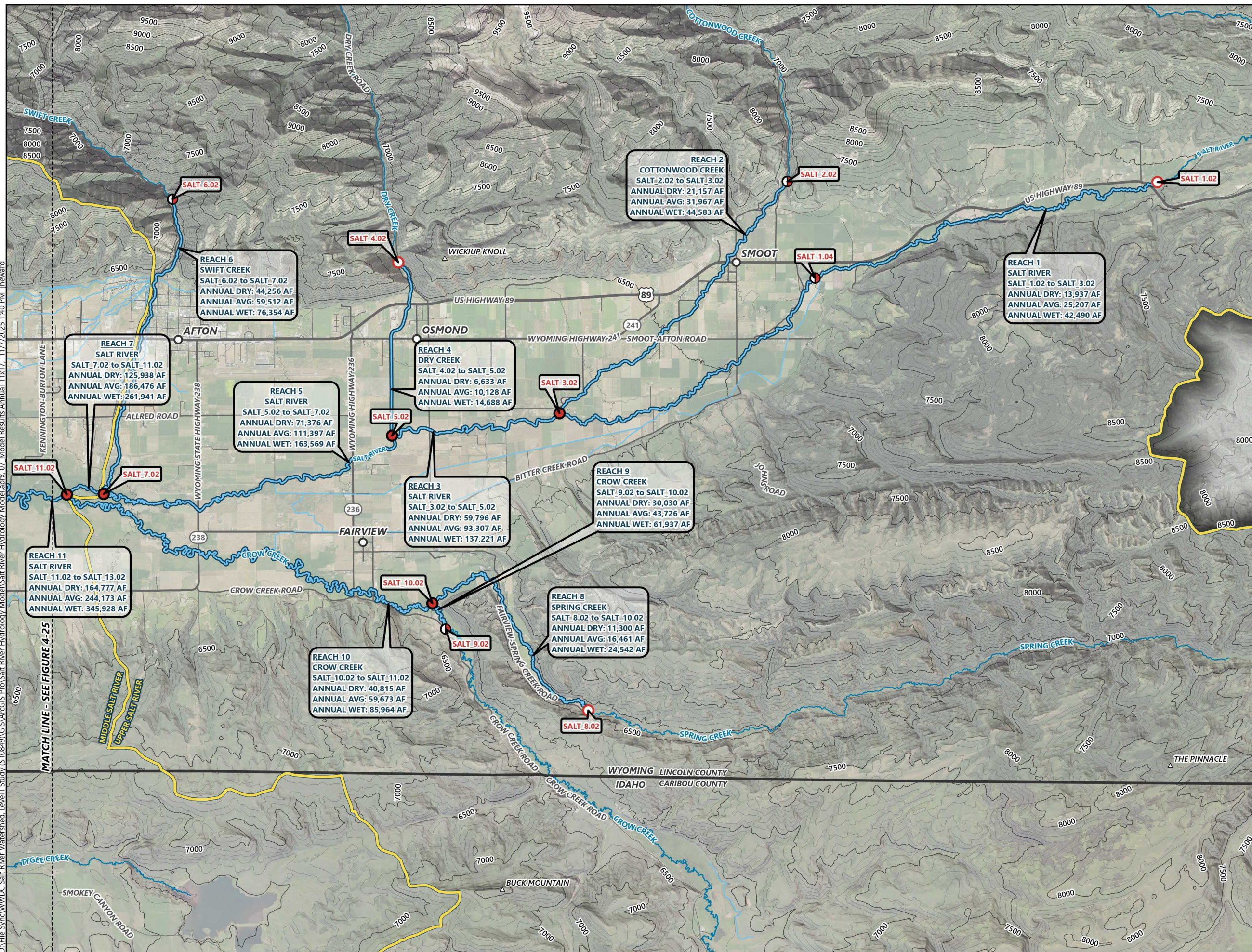
FIGURE 4-23
MODELED IRRIGATION AREA
SALT RIVER WATERSHED

D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Model.aprx, 07 Model Results Annual 11x17, 11/7/2025 1:36 PM jheward

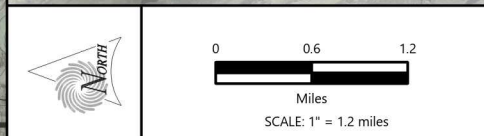
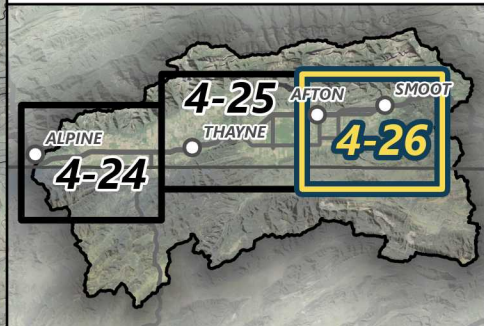




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- Legend**
- HUC10 Basins Within Salt River Watershed
 - River/Stream
 - Canal/Ditch
 - Major Contour (500' Interval) from USGS 10m DEM
 - Minor Contour (100' Interval) from USGS 10m DEM
- Model Elements**
- Estimated Inflow Node
 - Junction Node
 - Stream Gage Node
 - Terminal Node
 - Model Reaches



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FIGURE 4-26
ANNUAL MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER WATERSHED

D:\File Sync\WWDC Salt River Watershed, Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Model.aprx.08 Reach Hydrographs 85x11, 11/7/2025 1:37:33 PM jhevard

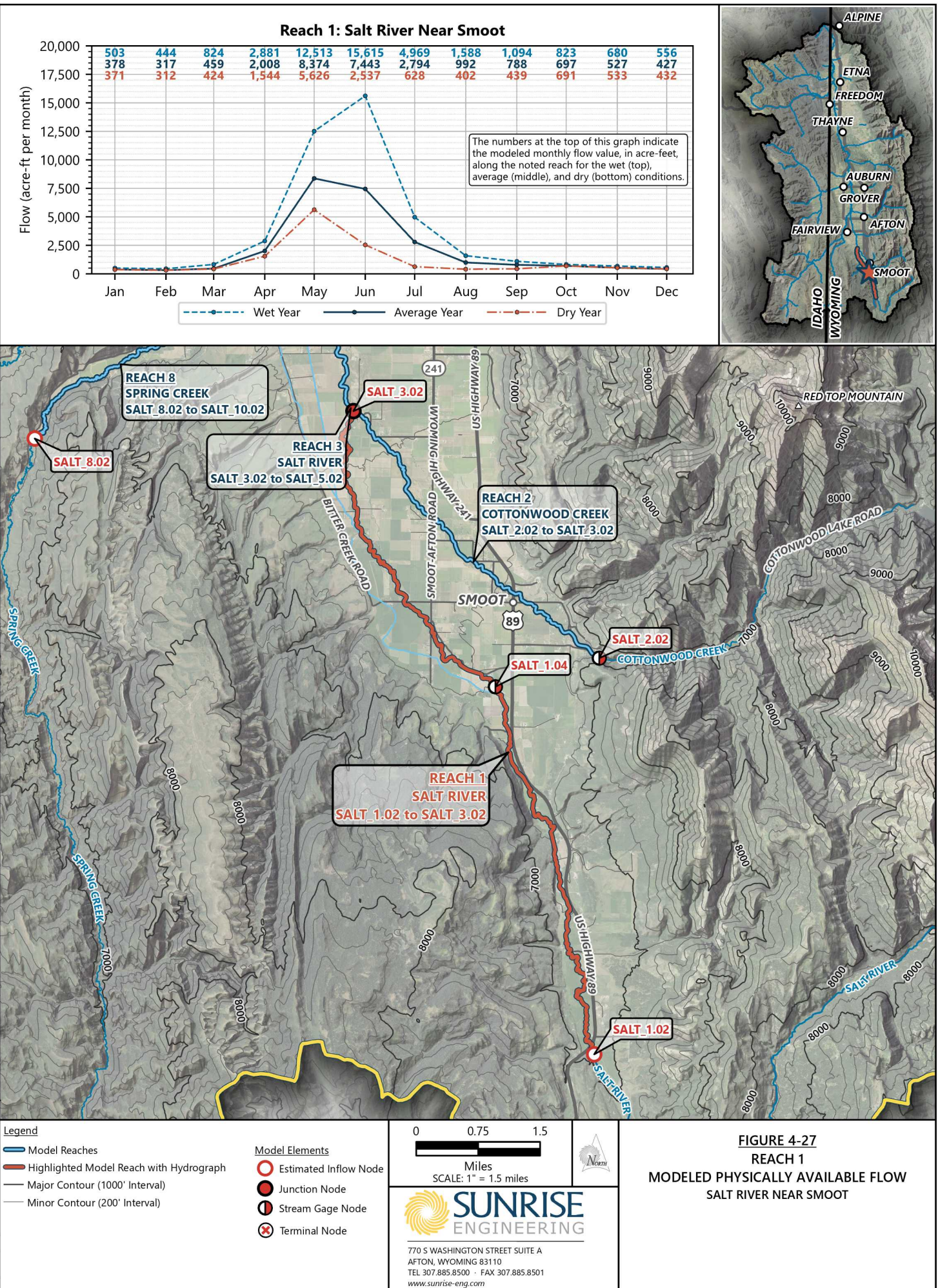
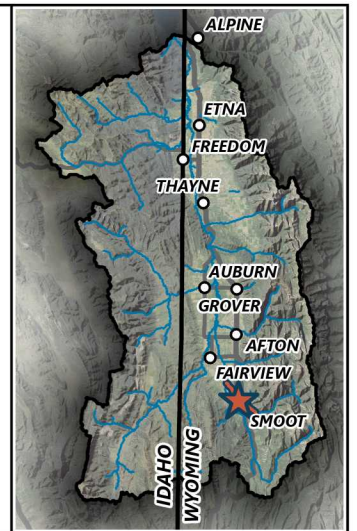
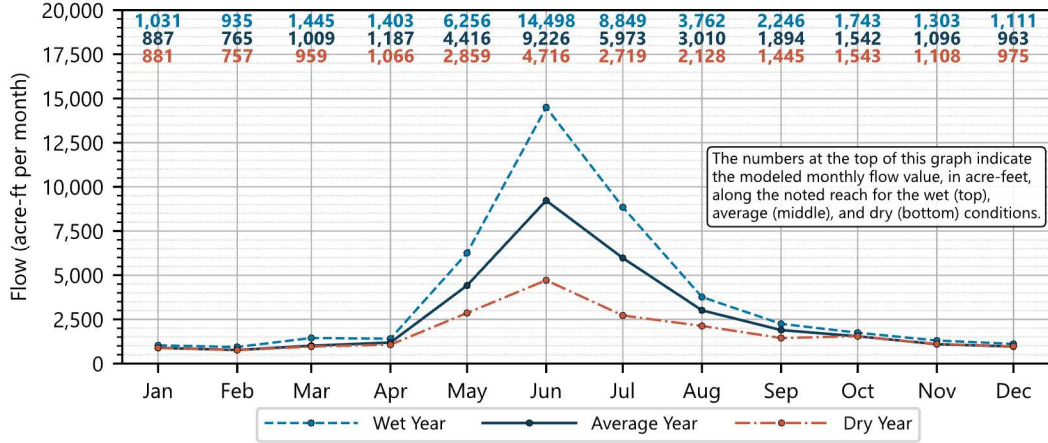


FIGURE 4-27
REACH 1
MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER NEAR SMOOT

Reach 2: Cottonwood Creek Near Smoot

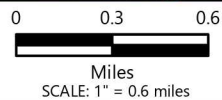


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



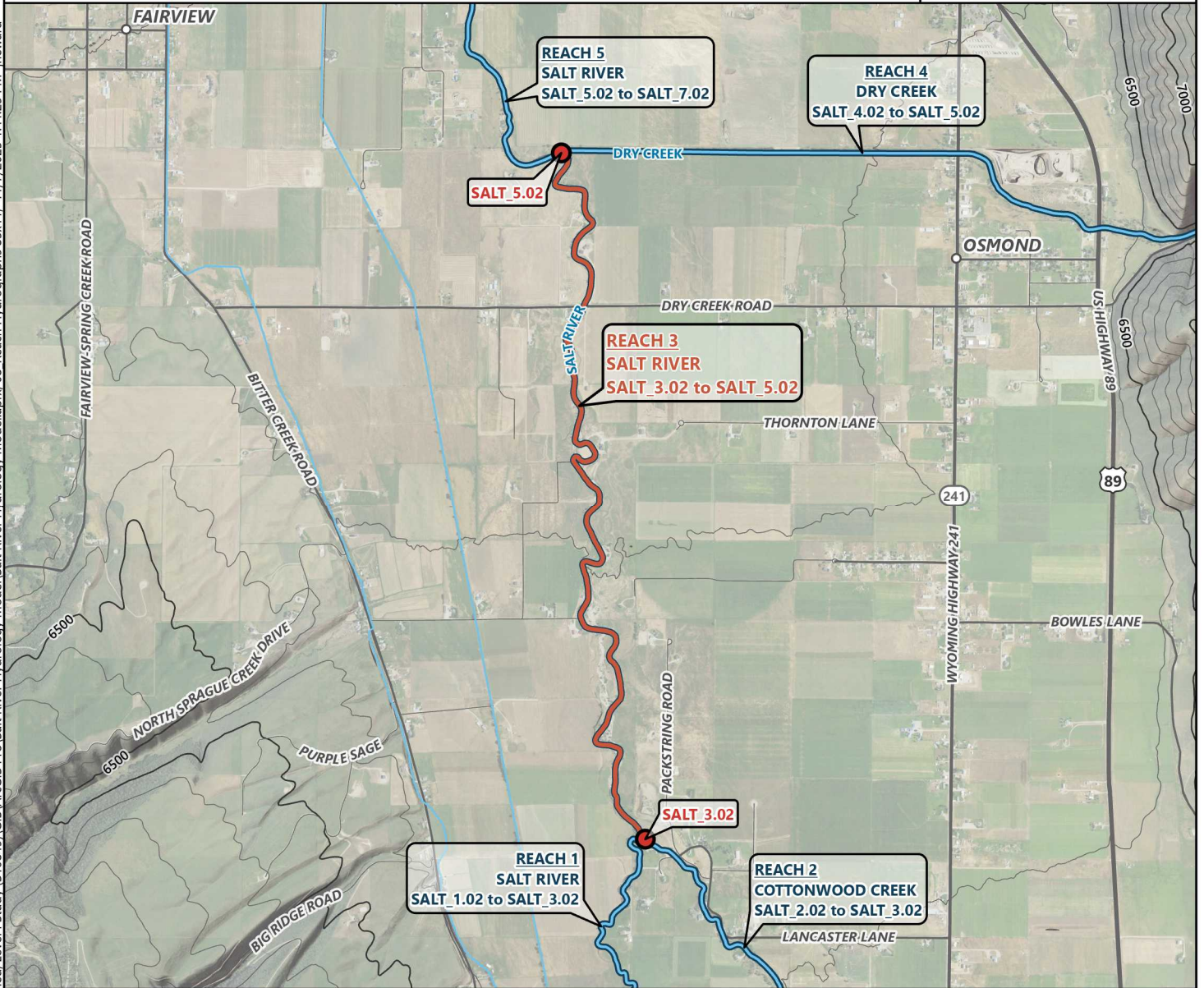
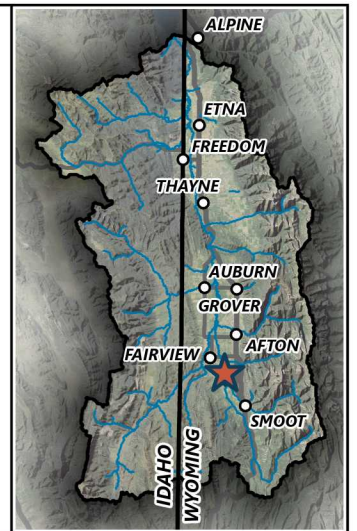
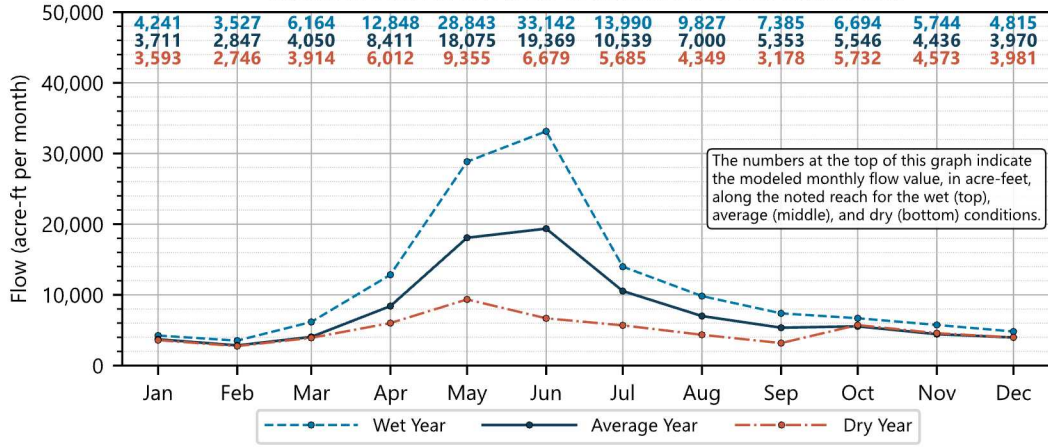
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FIGURE 4-28

REACH 2
MODELED PHYSICALLY AVAILABLE FLOW
COTTONWOOD CREEK NEAR SMOOT

Reach 3: Salt River Below Cottonwood Creek Confluence



Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

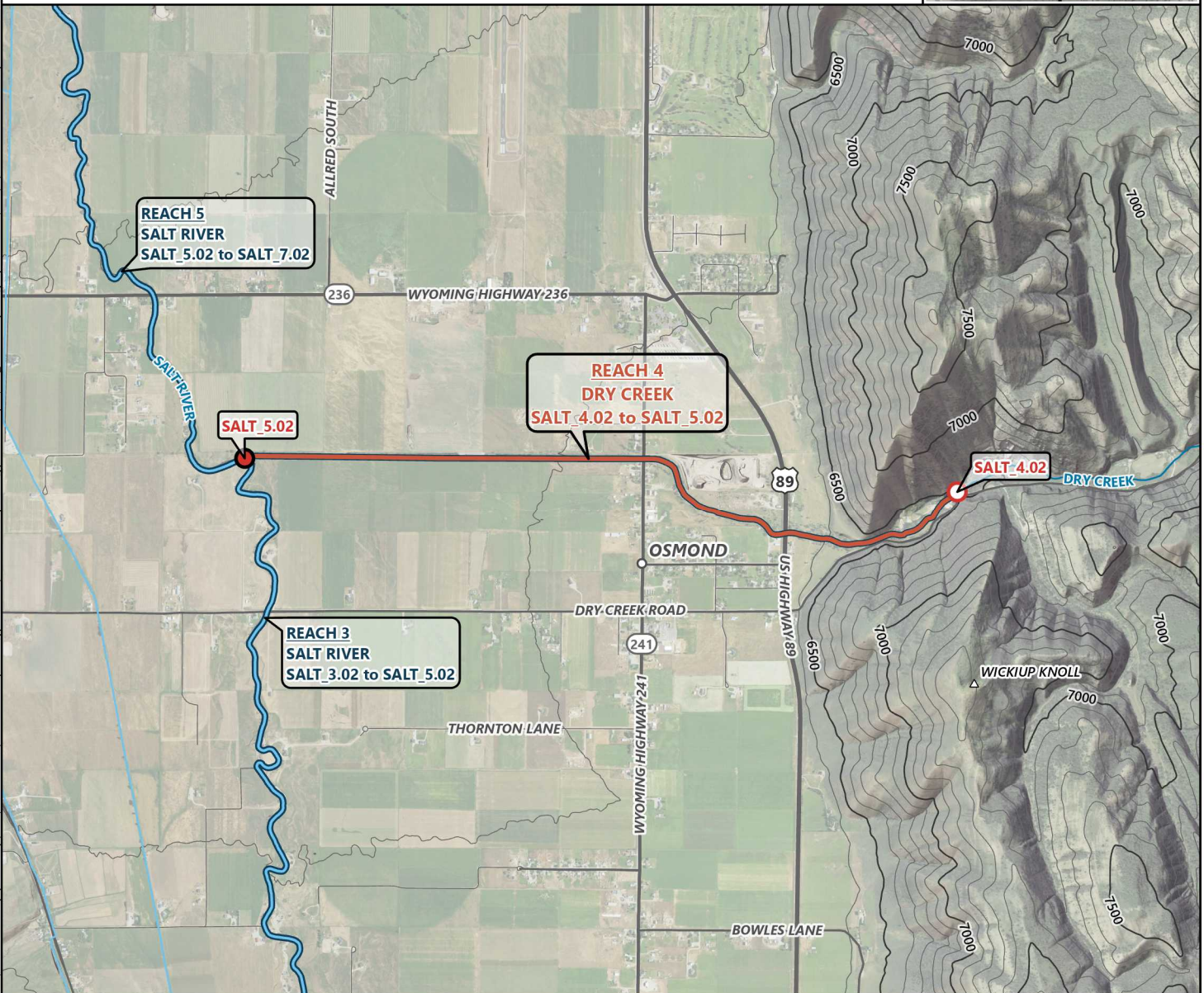
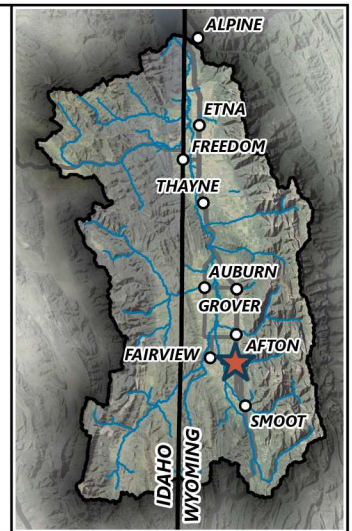
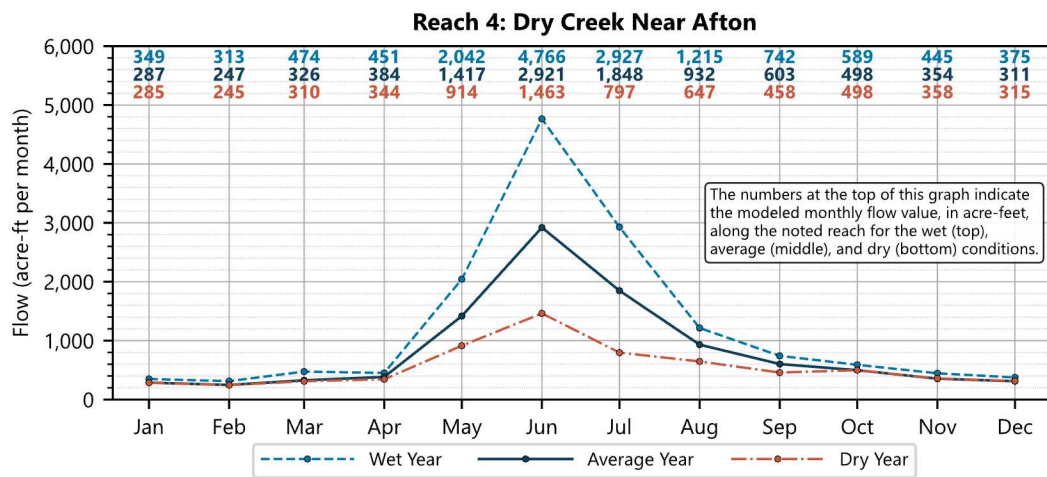


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FIGURE 4-29

REACH 3
MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW COTTONWOOD CREEK
CONFLUENCE

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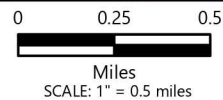


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

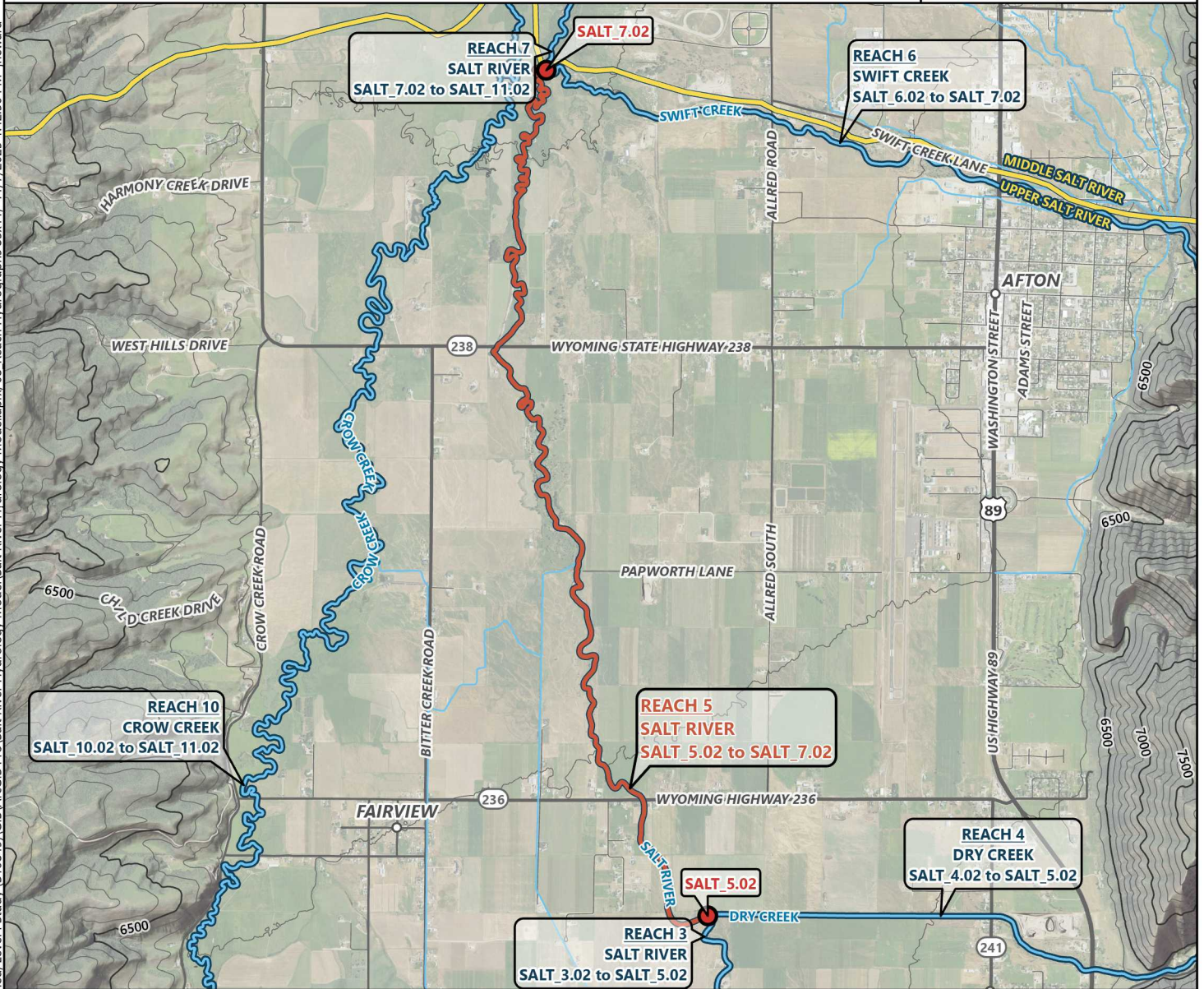
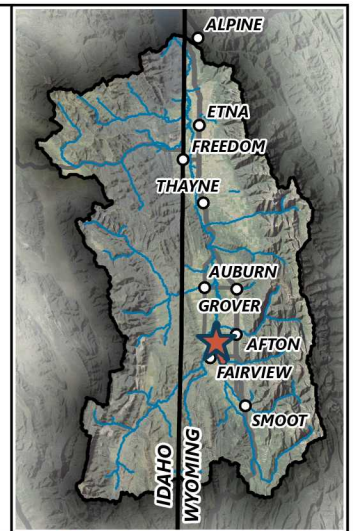
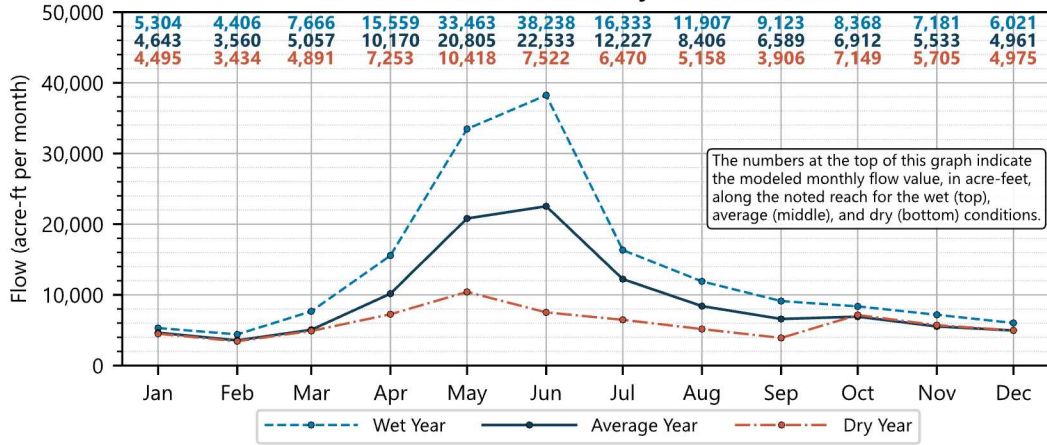


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FIGURE 4-30
REACH 4
MODELED PHYSICALLY AVAILABLE FLOW
DRY CREEK NEAR AFTON

Reach 5: Salt River Below Dry Creek Confluence

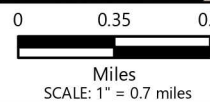


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



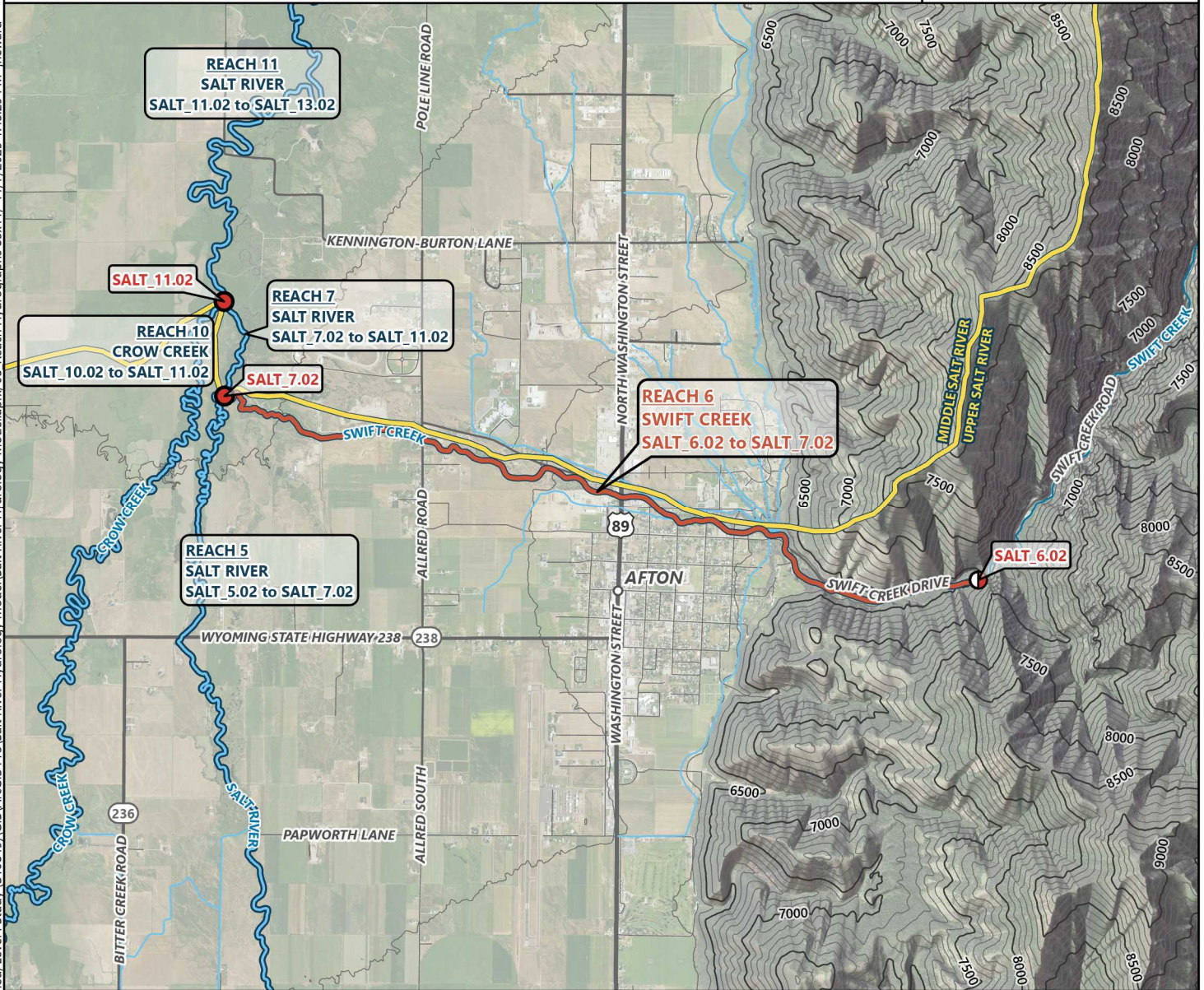
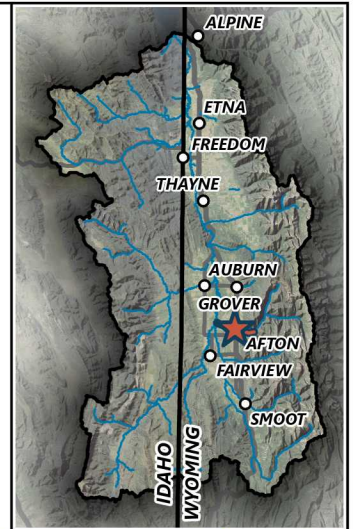
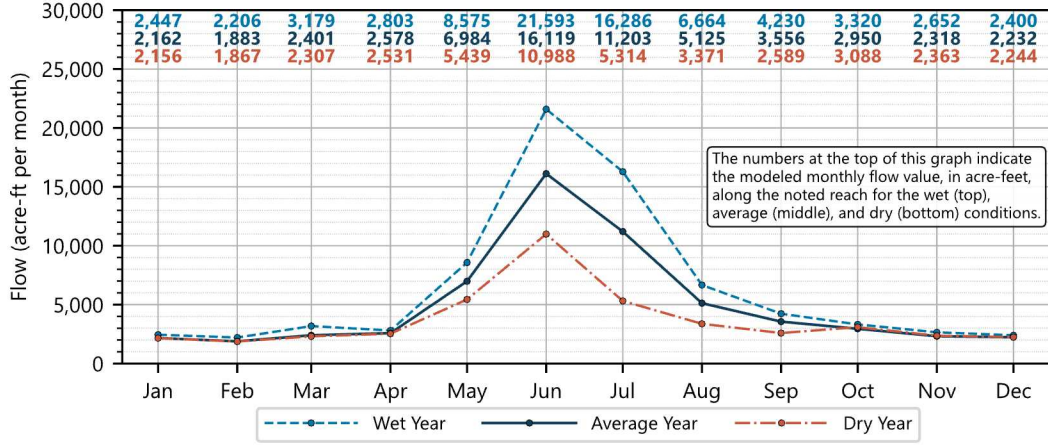
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FIGURE 4-31

REACH 5

MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW DRY CREEK CONFLUENCE

Reach 6: Swift Creek Near Afton

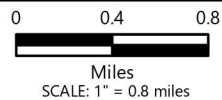


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



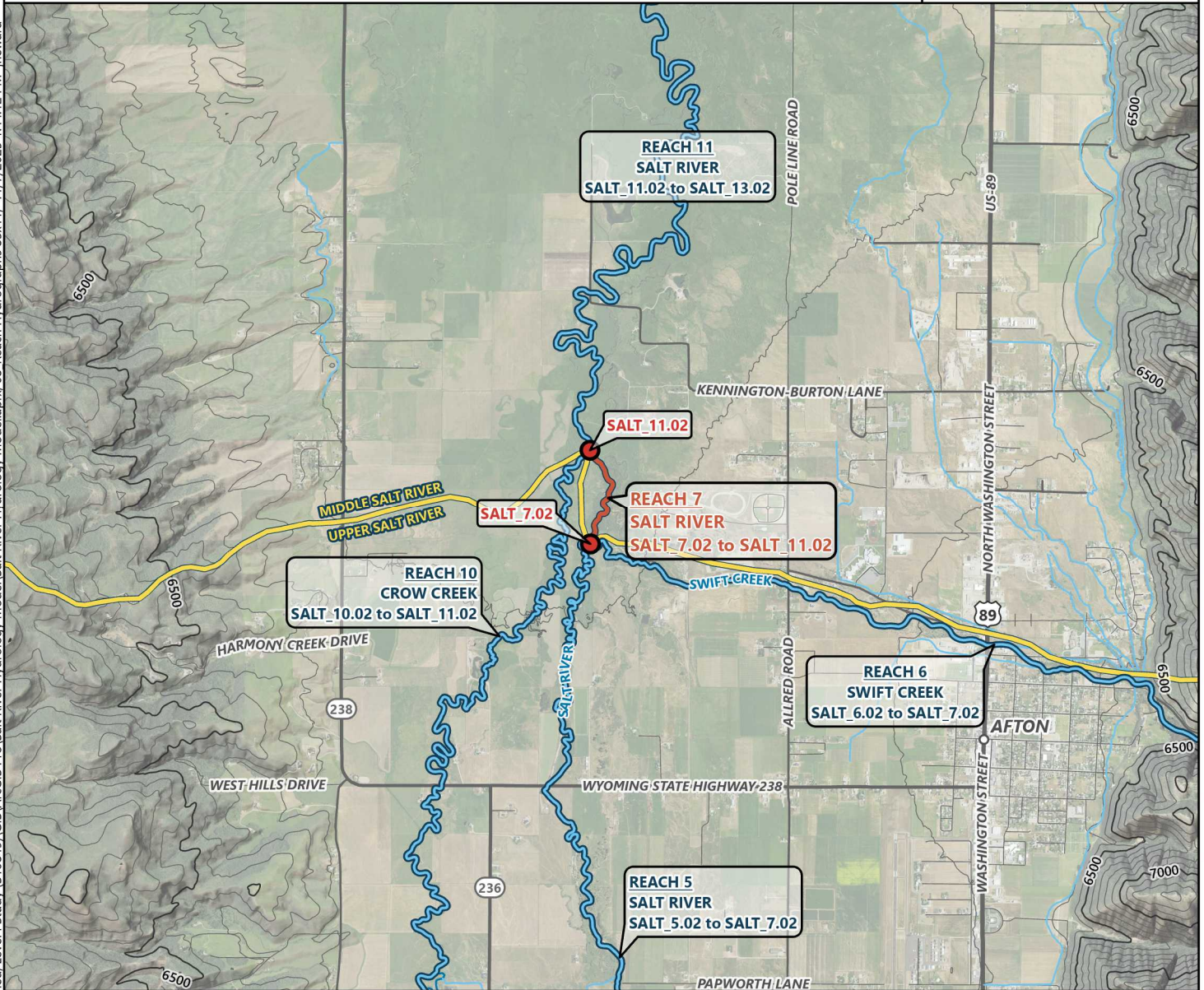
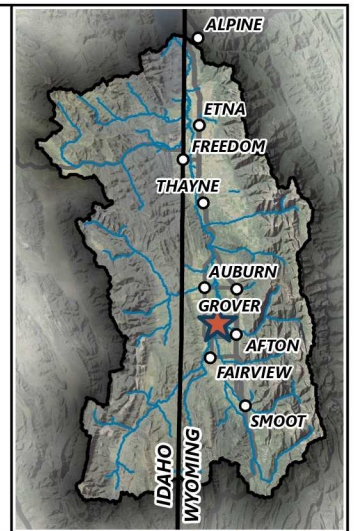
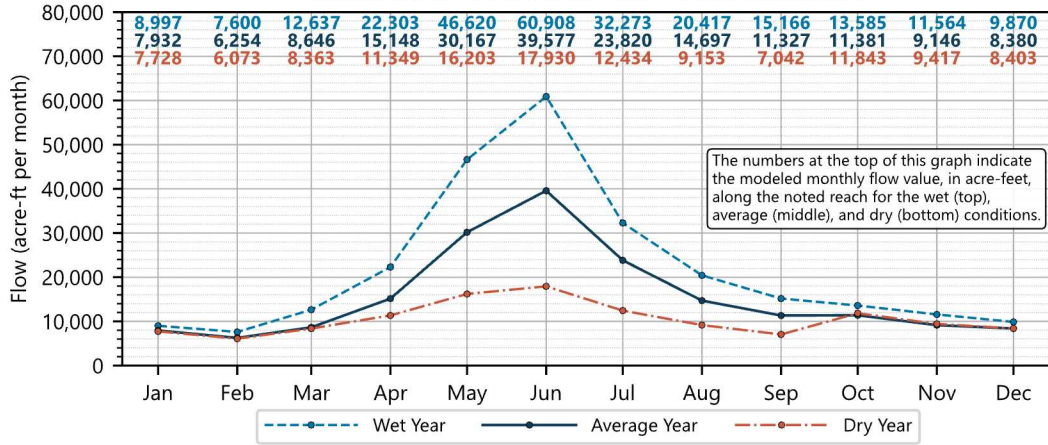
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FIGURE 4-32

REACH 6
MODELED PHYSICALLY AVAILABLE FLOW
SWIFT CREEK NEAR AFTON

Reach 7: Salt River Below Swift Creek Confluence

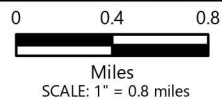


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

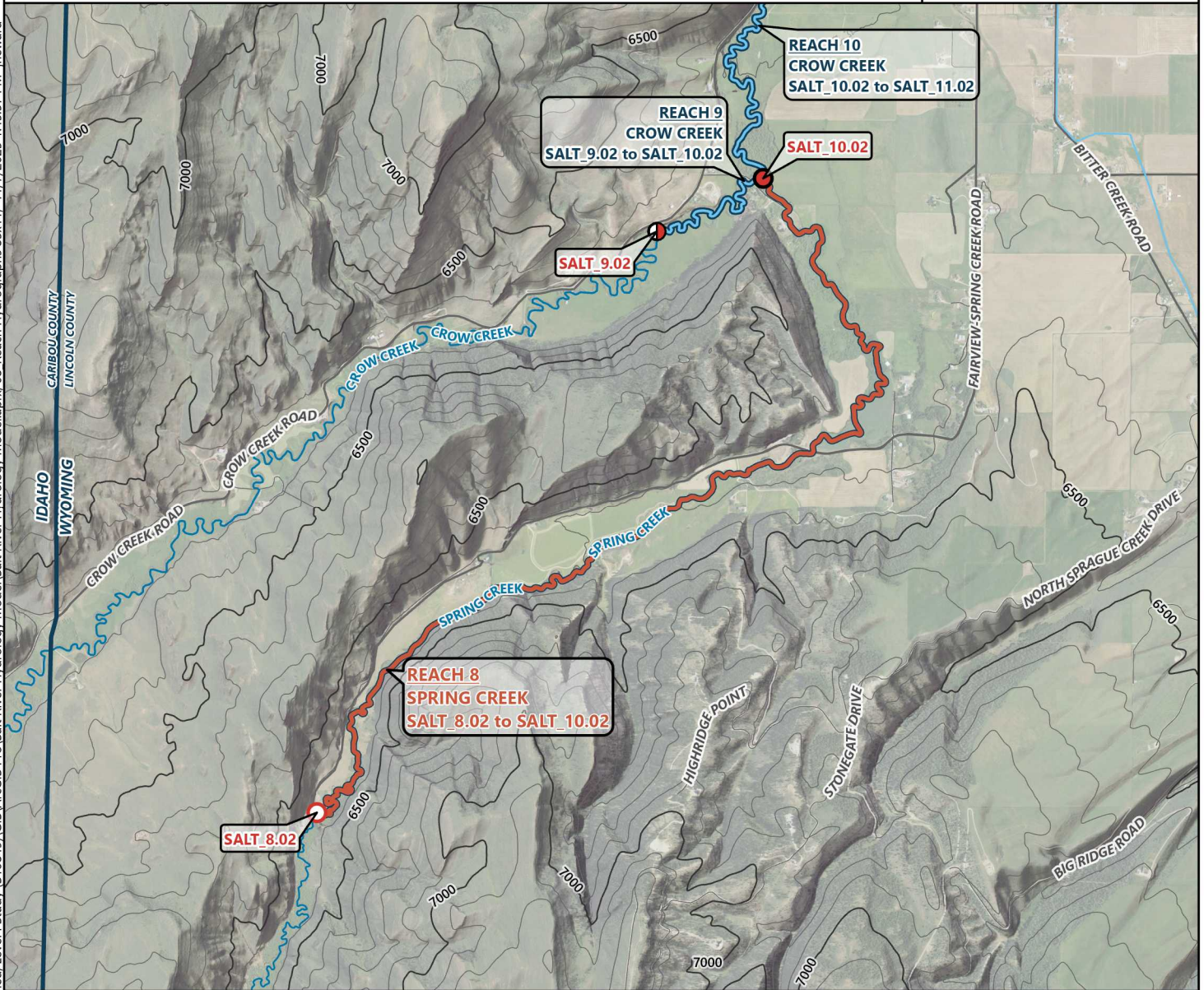
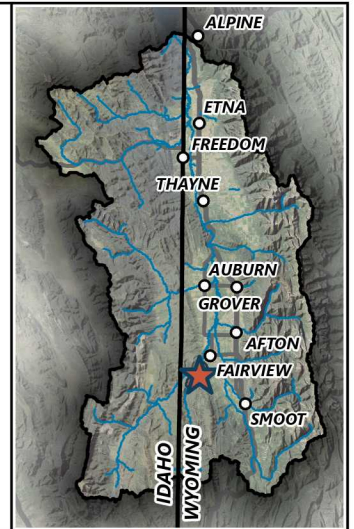
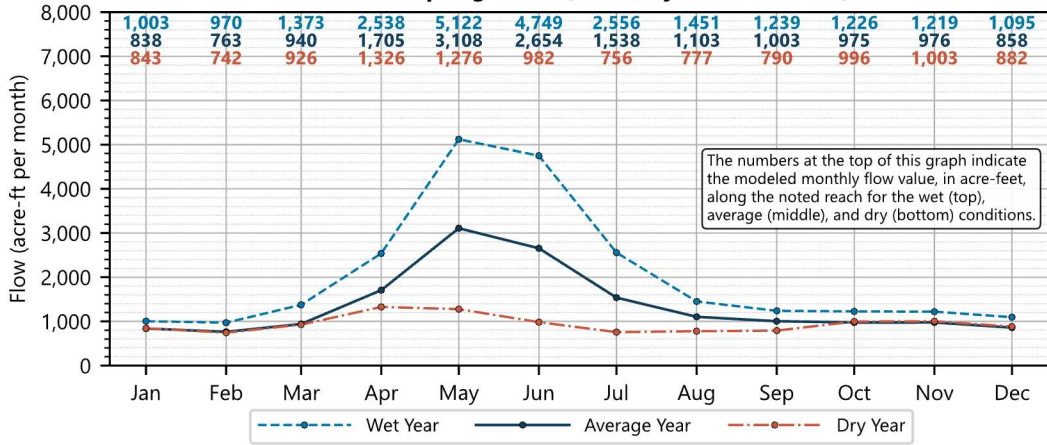


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FIGURE 4-33

REACH 7
MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW SWIFT CREEK CONFLUENCE

Reach 8: Spring Creek (Tributary to Crow Creek)

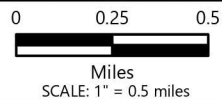


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



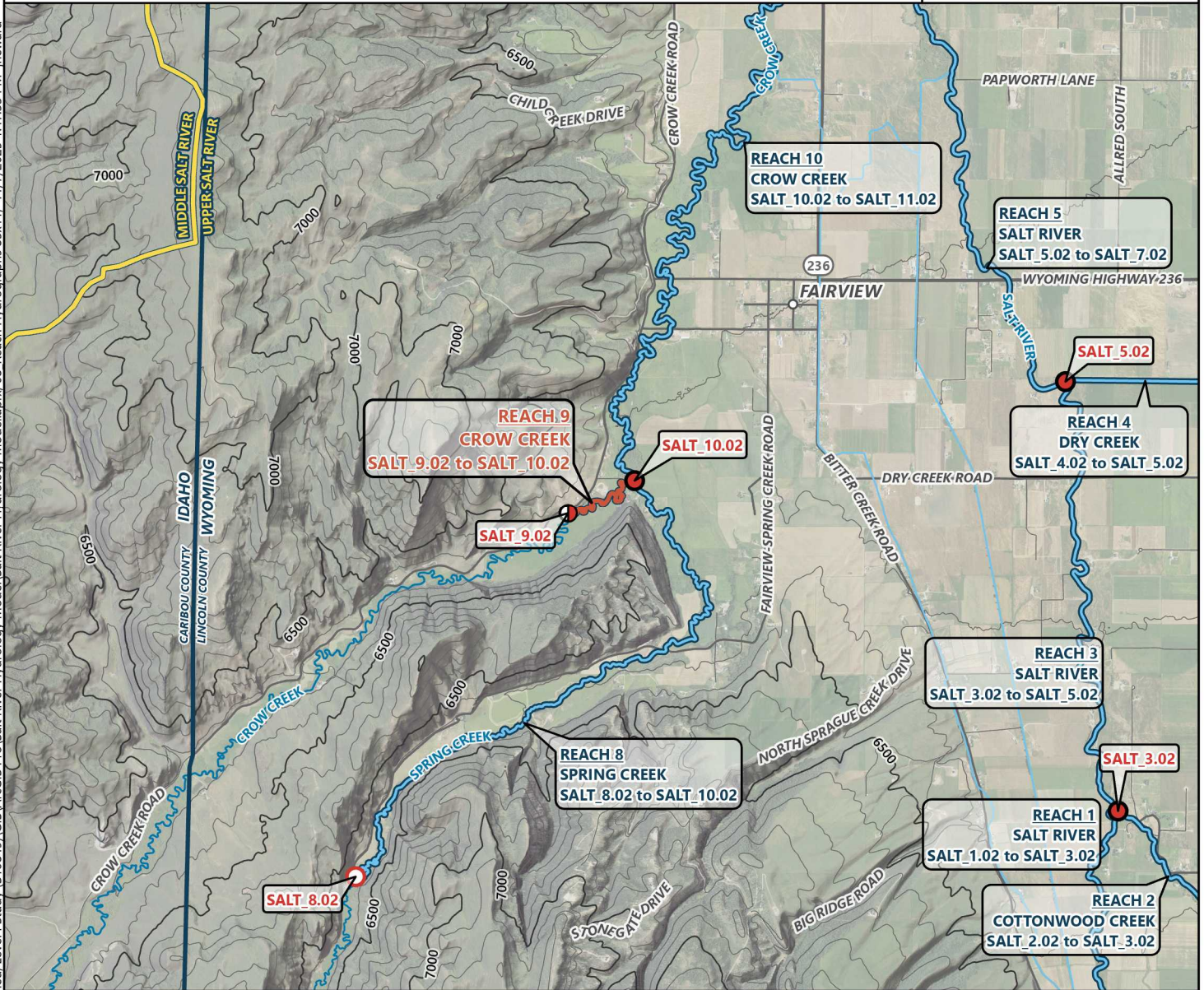
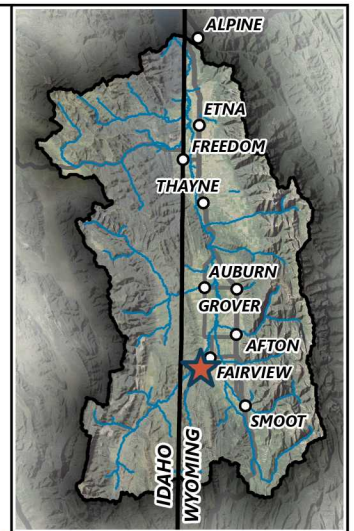
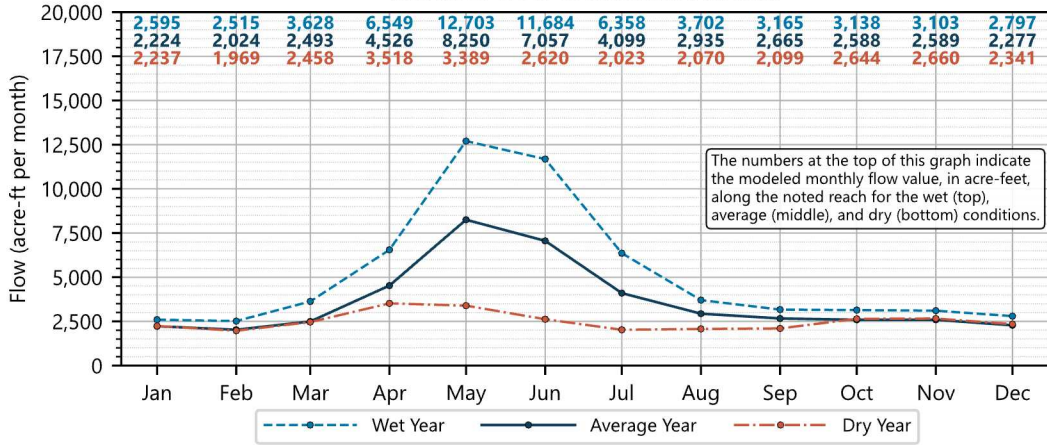
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FIGURE 4-34

REACH 8

MODELED PHYSICALLY AVAILABLE FLOW
SPRING CREEK (TRIBUTARY TO CROW CREEK)

Reach 9: Crow Creek Near Fairview

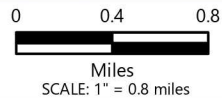


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



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FIGURE 4-35

REACH 9

MODELED PHYSICALLY AVAILABLE FLOW
CROW CREEK NEAR FAIRVIEW

Reach 10: Crow Creek Below Spring Creek Confluence

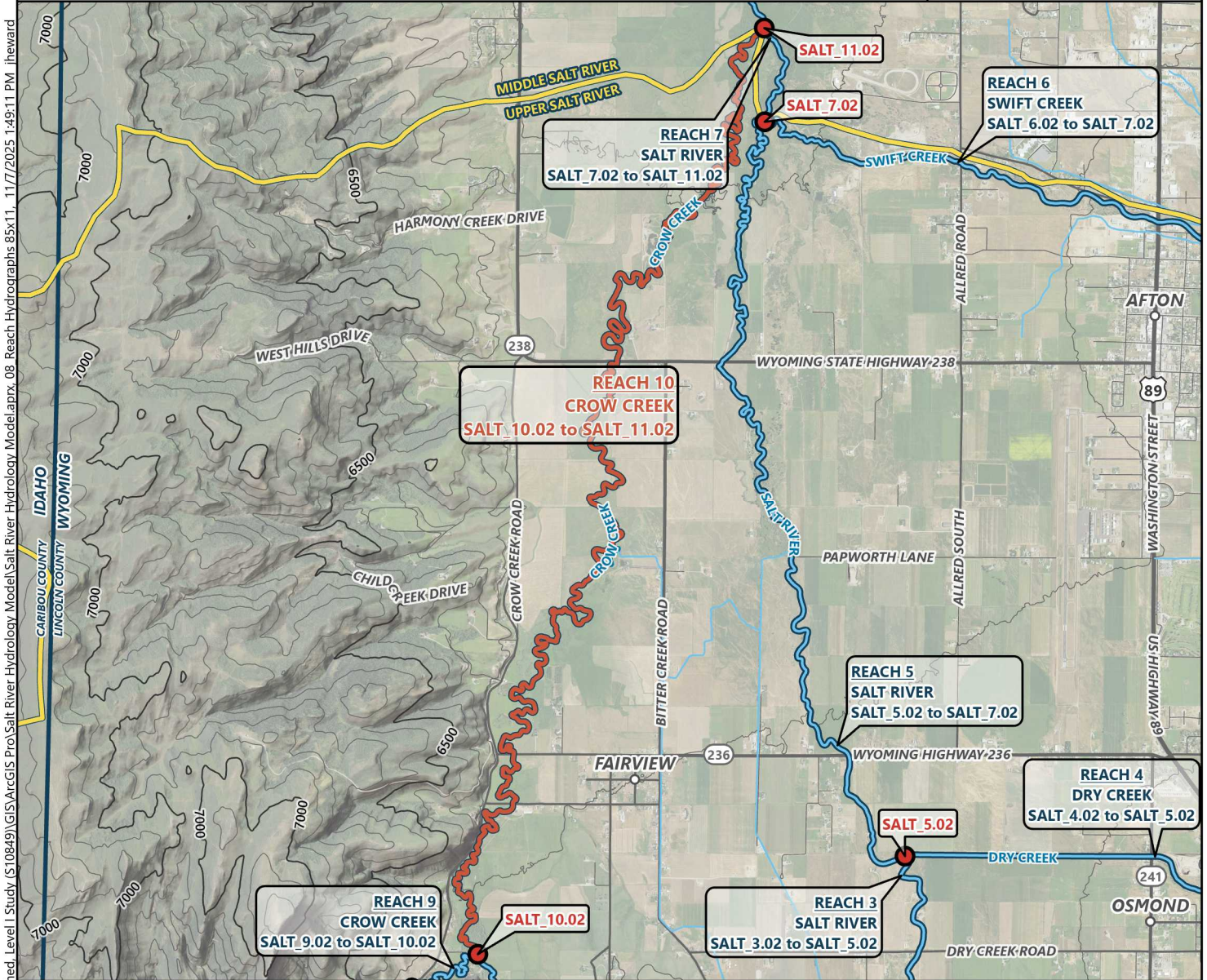
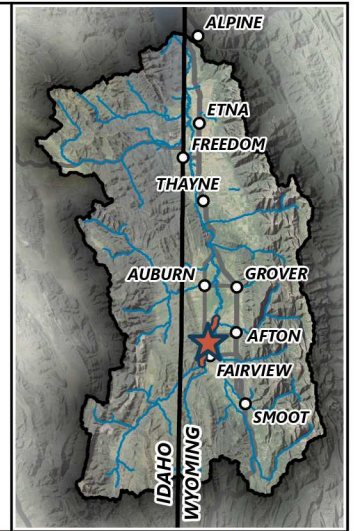
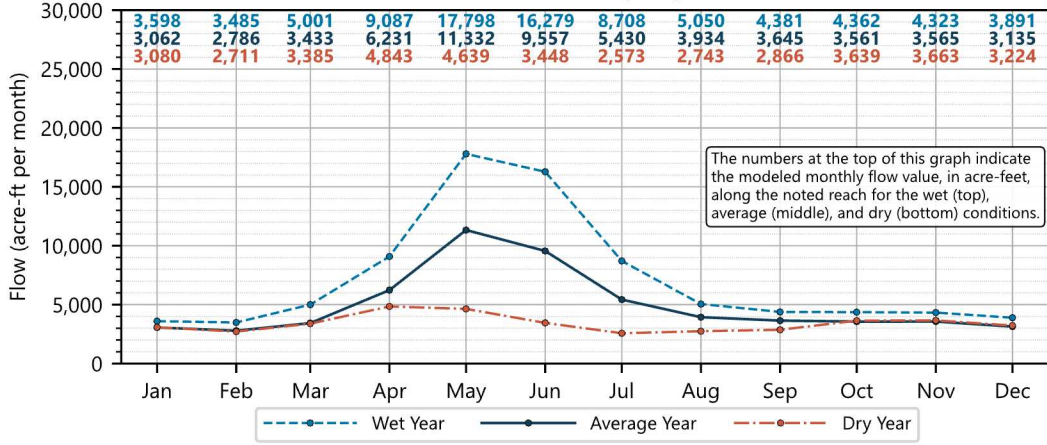


FIGURE 4-36

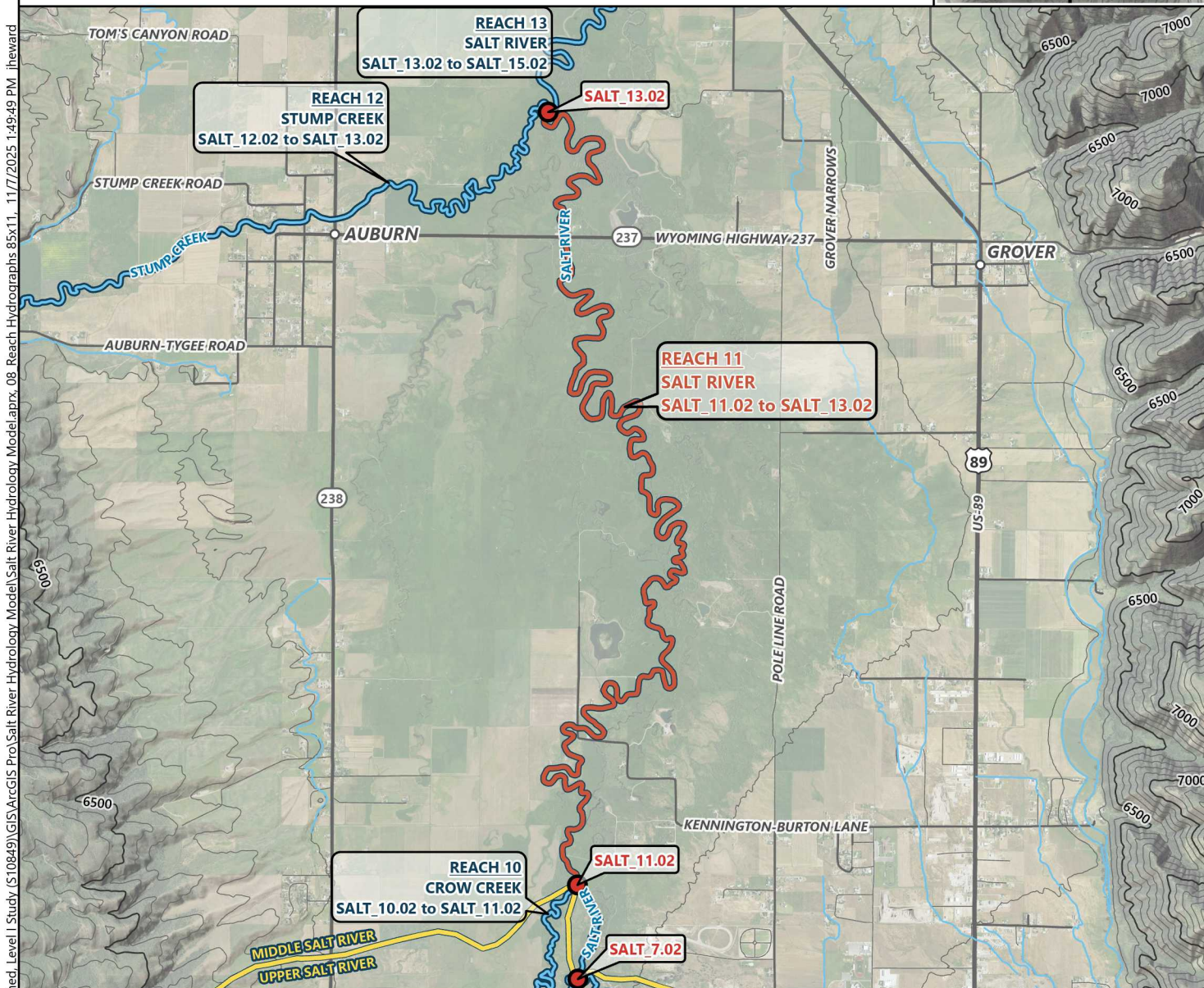
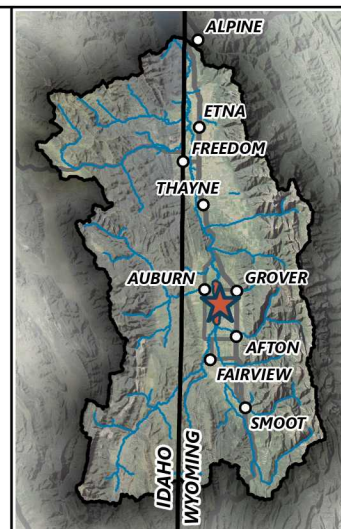
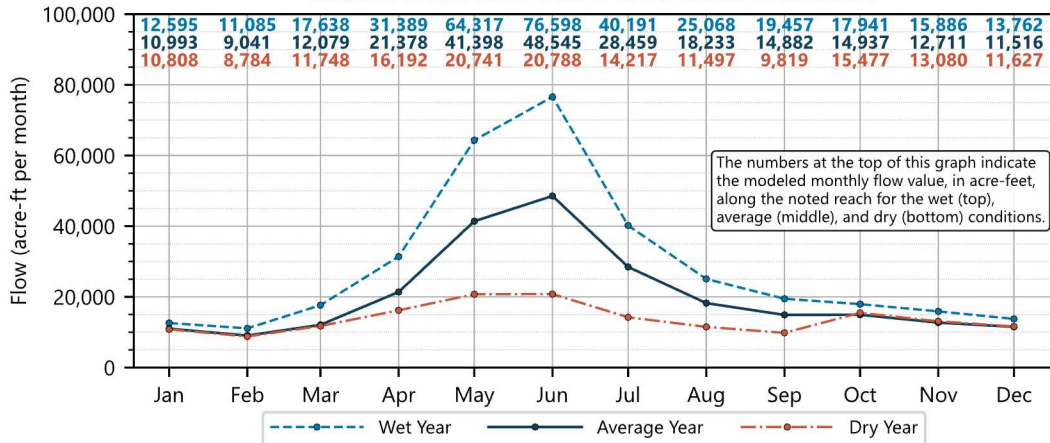
REACH 10

MODELED PHYSICALLY AVAILABLE FLOW
CROW CREEK BELOW SPRING CREEK CONFLUENCE



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Reach 11: Salt River Below Crow Creek Confluence

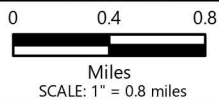


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



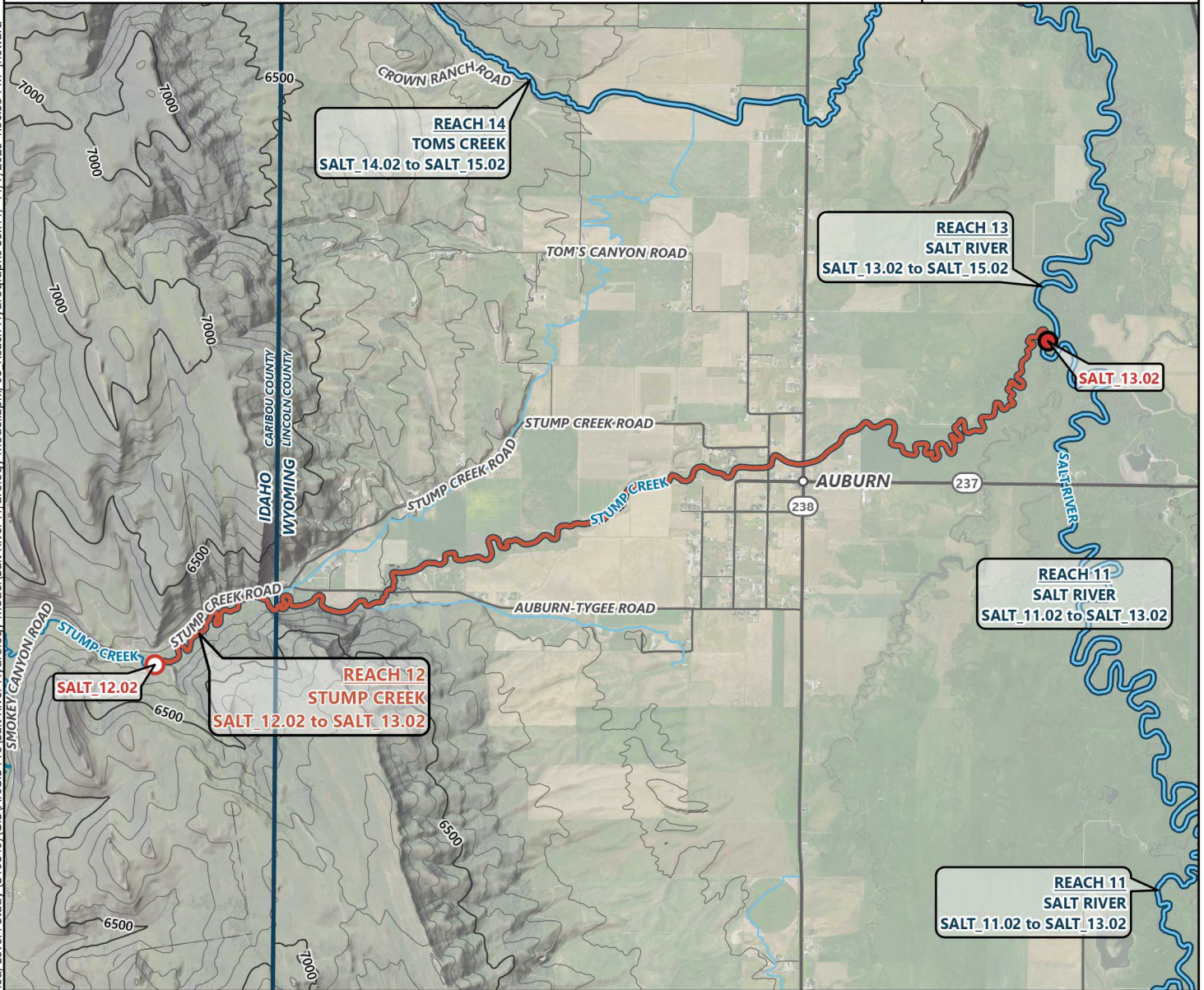
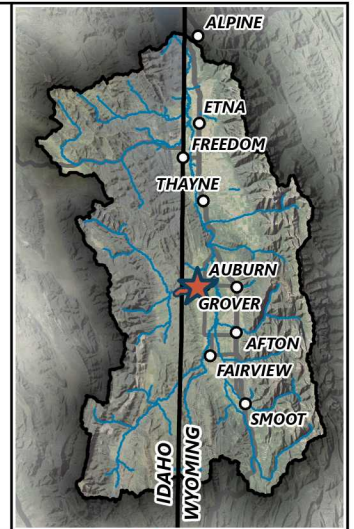
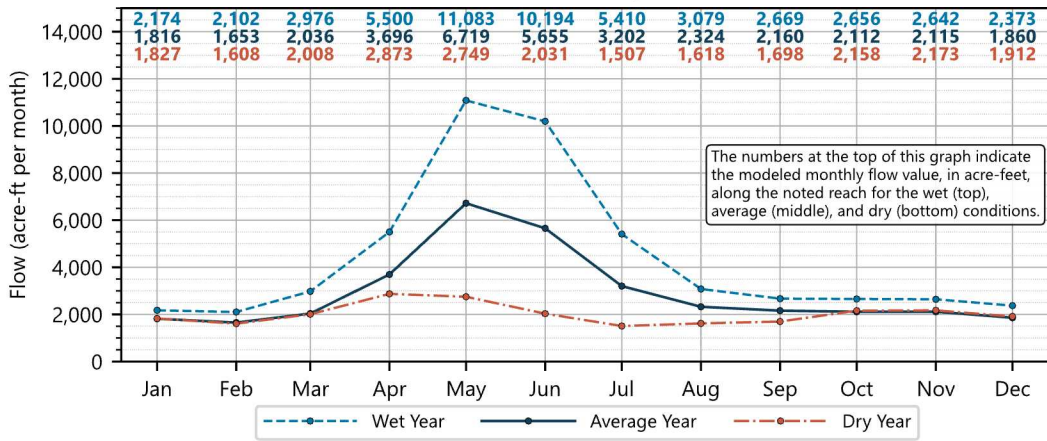
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FIGURE 4-37

REACH 11

MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW CROW CREEK CONFLUENCE

Reach 12: Stump Creek

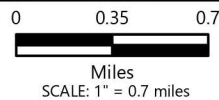


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



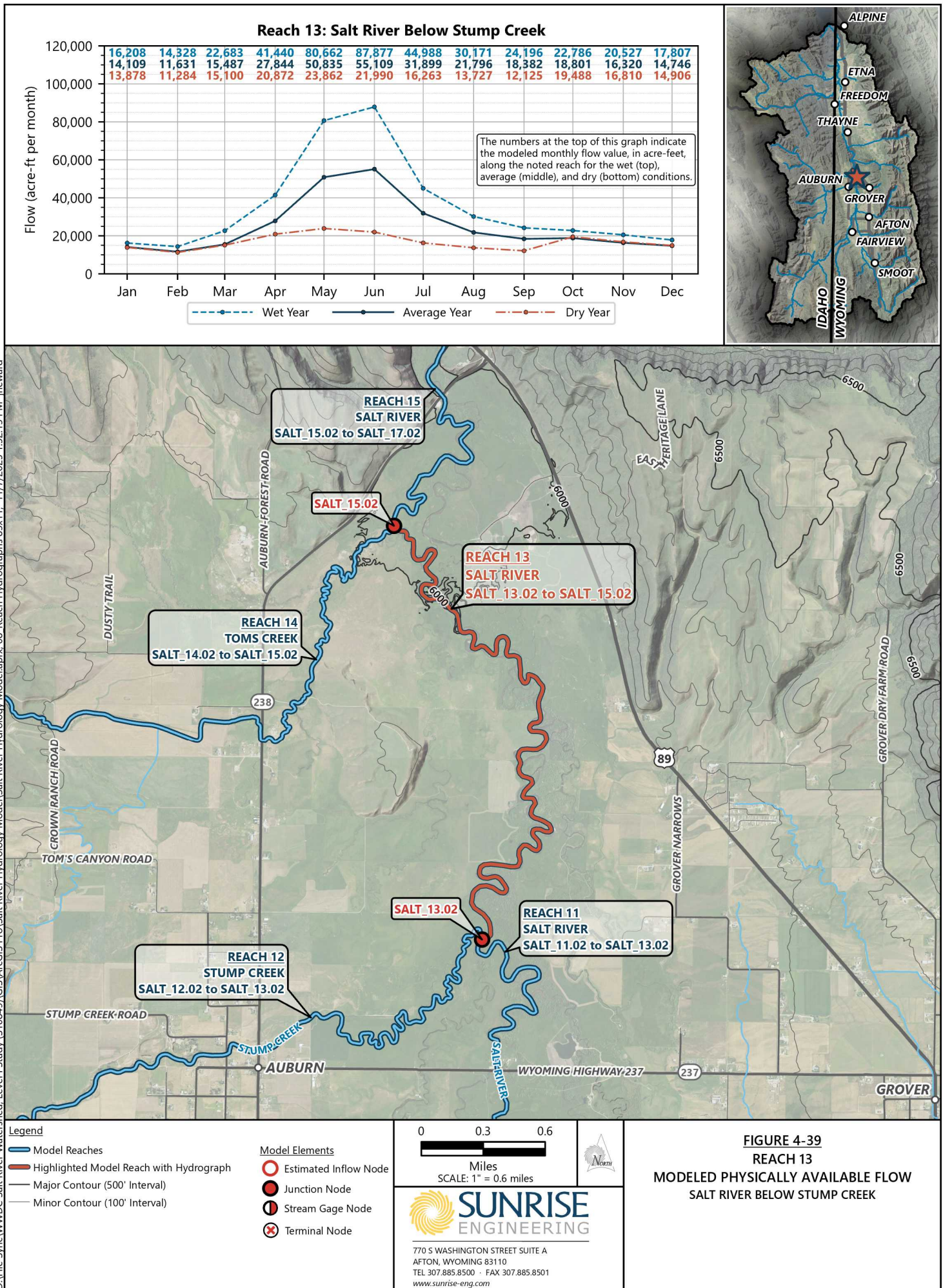
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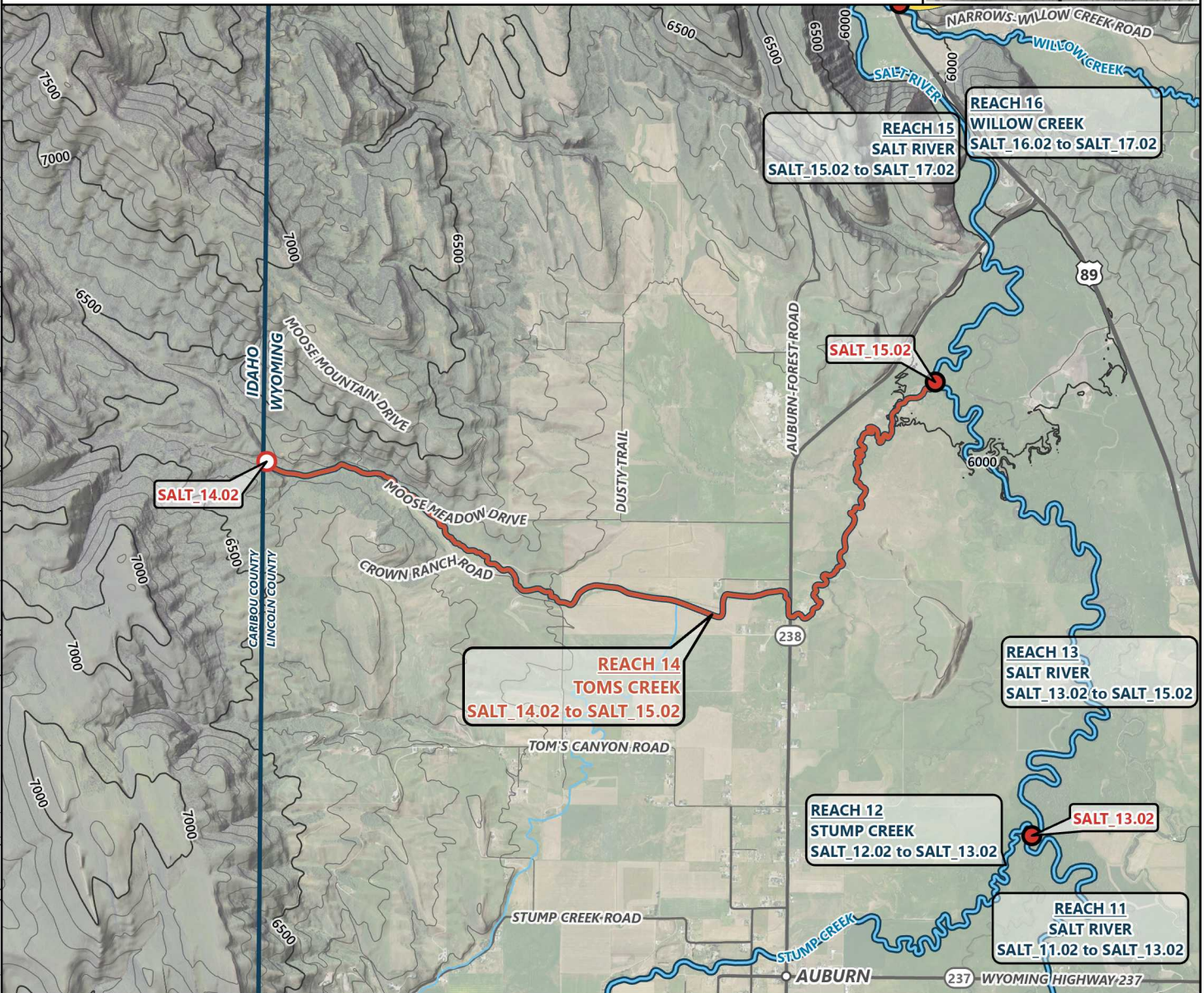
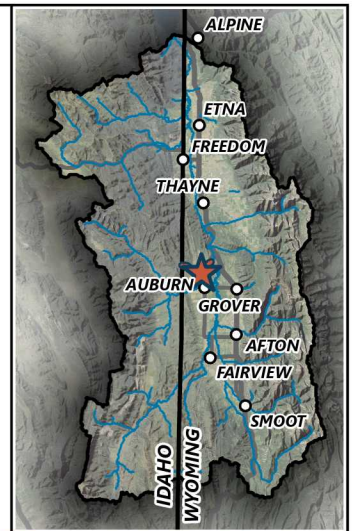
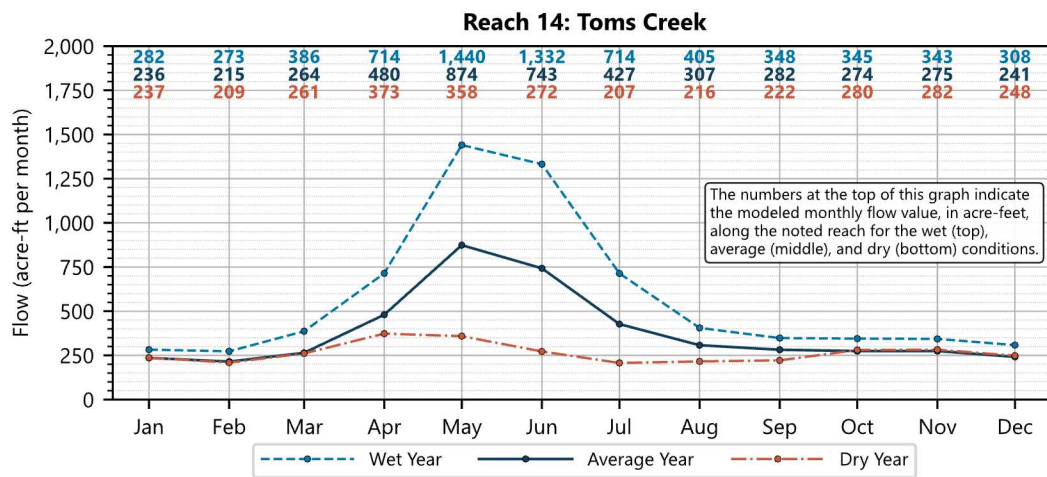
FIGURE 4-38

REACH 12
MODELED PHYSICALLY AVAILABLE FLOW
STUMP CREEK

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- Legend**
- Model Reaches
 - Highlighted Model Reach with Hydrograph
 - Major Contour (500' Interval)
 - Minor Contour (100' Interval)
- Model Elements**
- Estimated Inflow Node
 - Junction Node
 - Stream Gage Node
 - Terminal Node

0 0.35 0.7
Miles
SCALE: 1" = 0.7 miles



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FIGURE 4-40
REACH 14
MODELED PHYSICALLY AVAILABLE FLOW
TOMS CREEK

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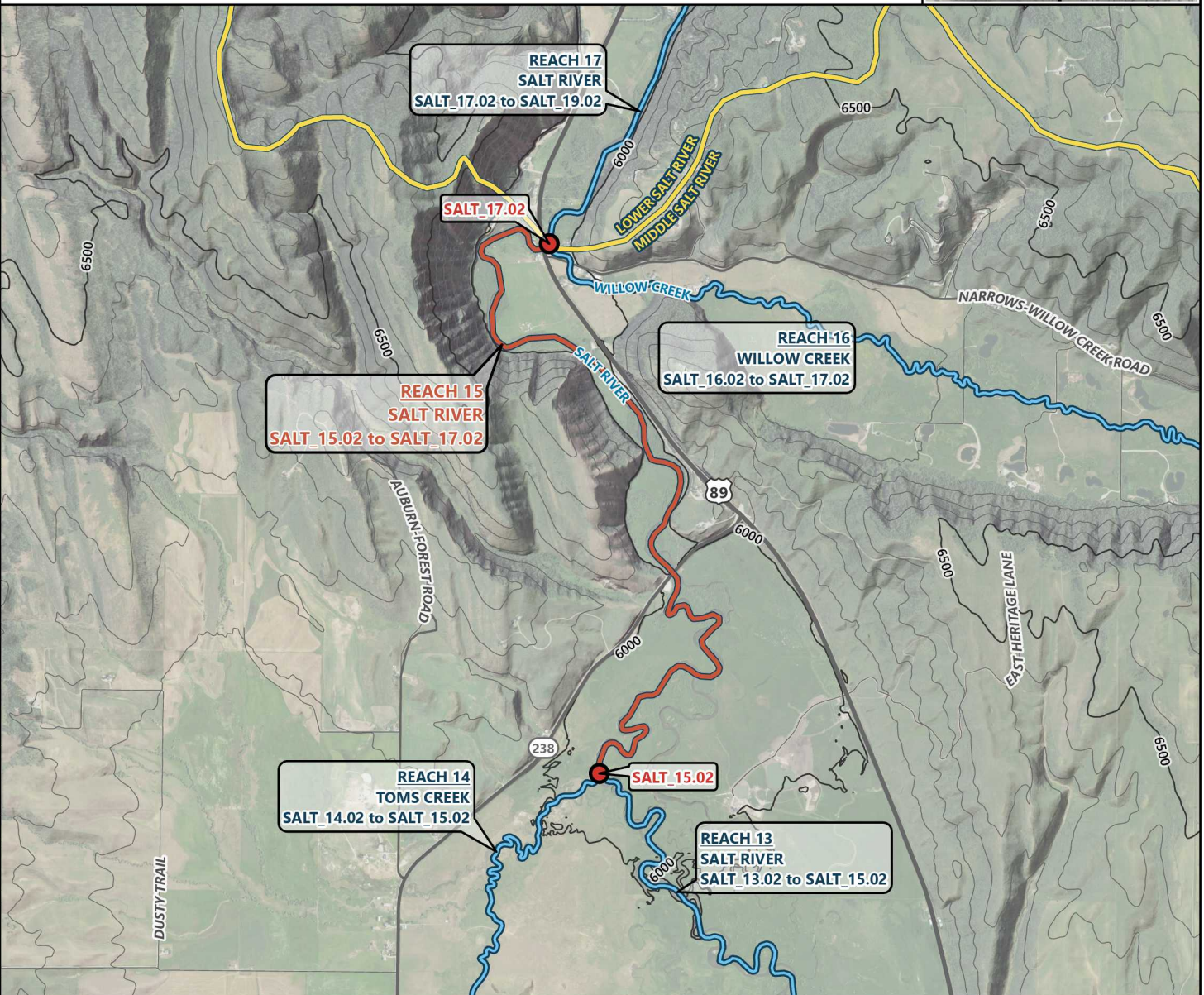
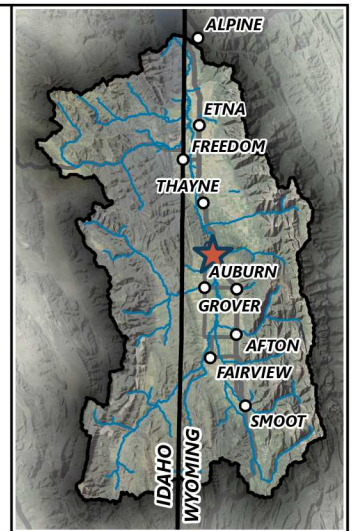
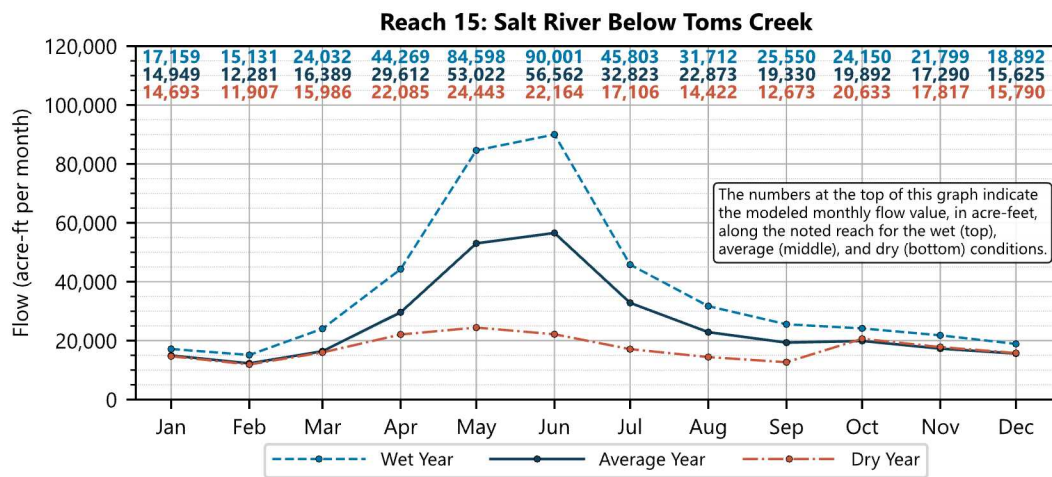
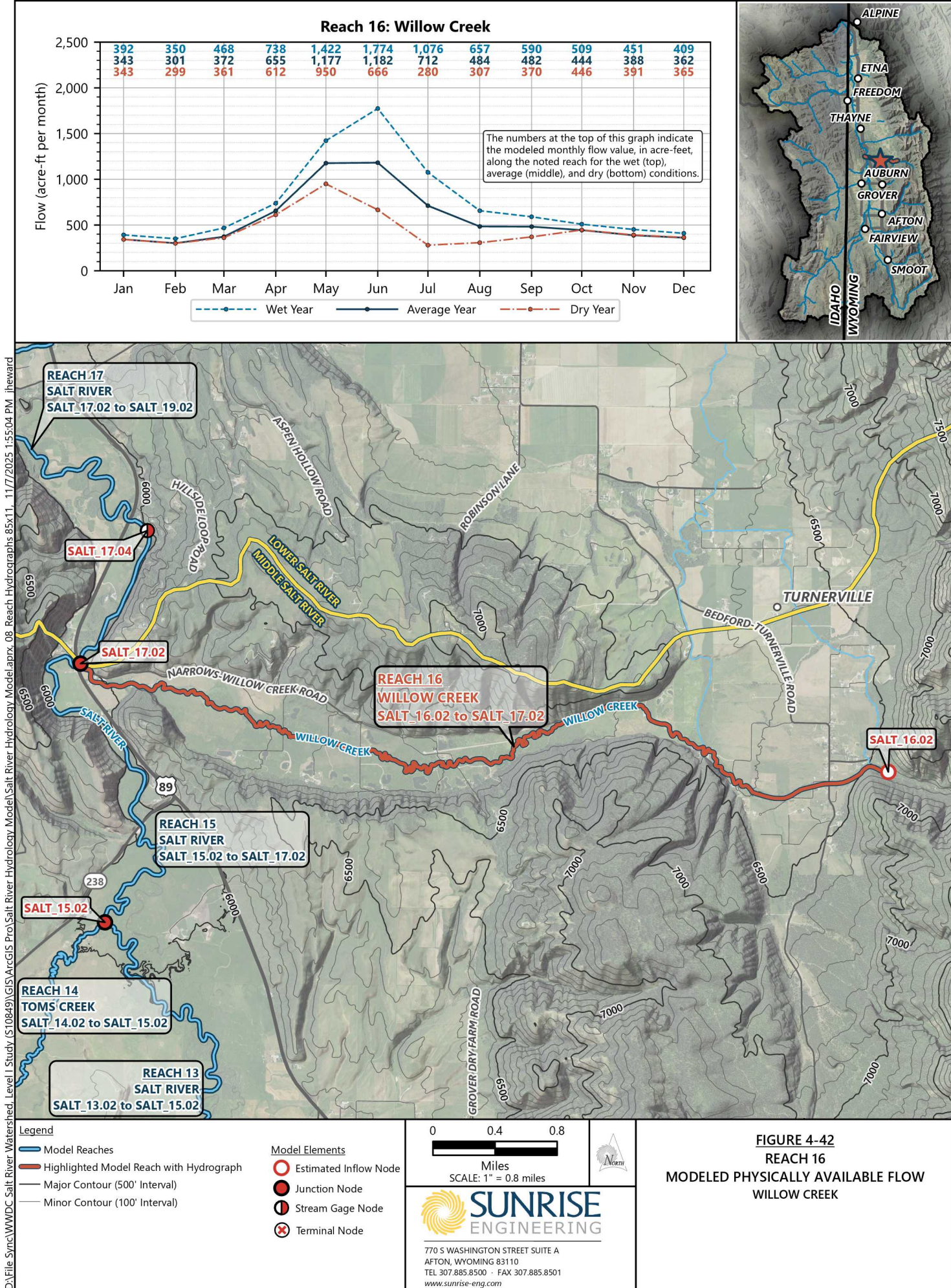


FIGURE 4-41
REACH 15
MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW TOMS CREEK

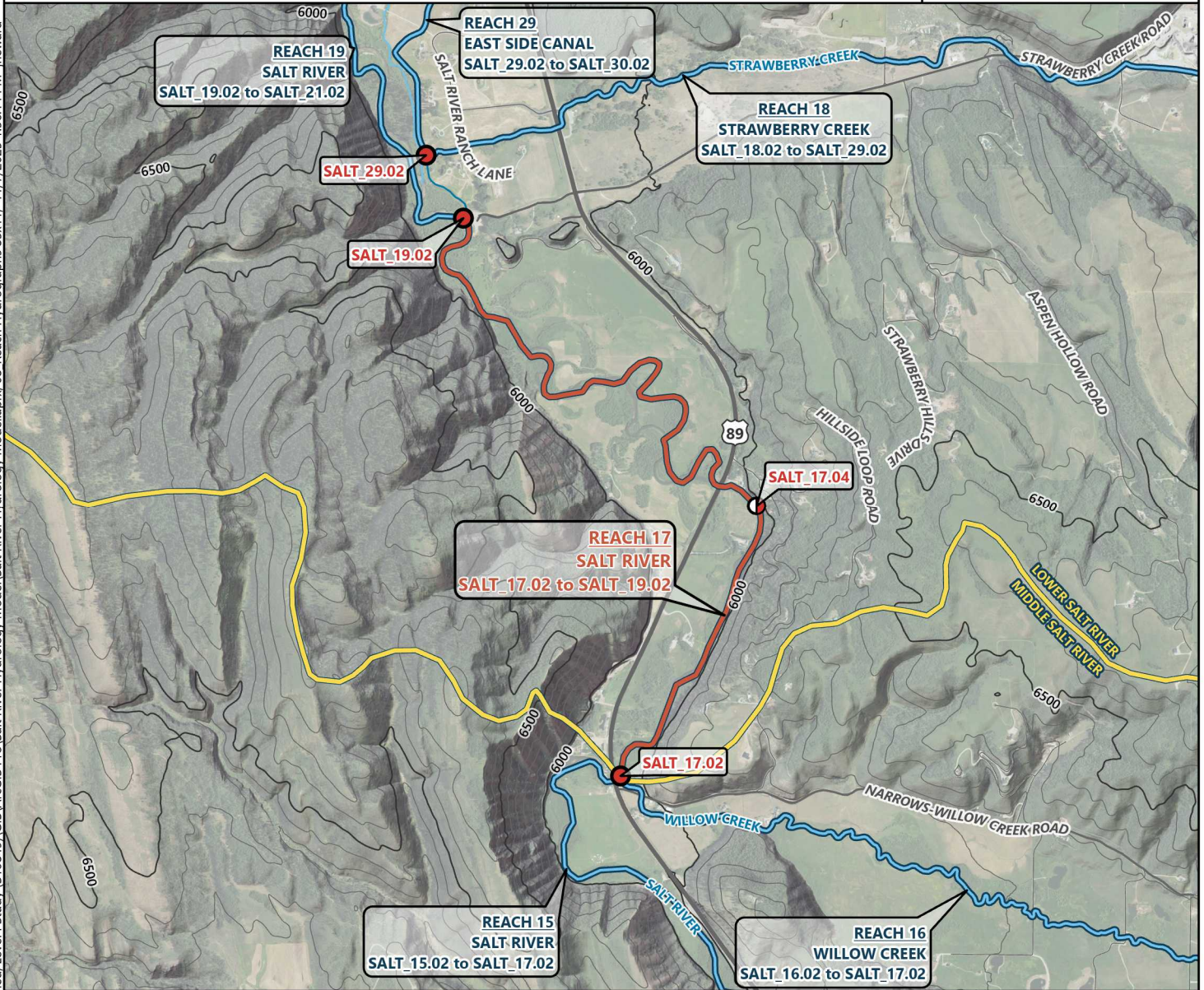
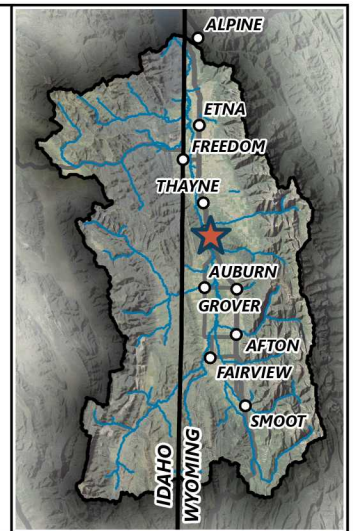
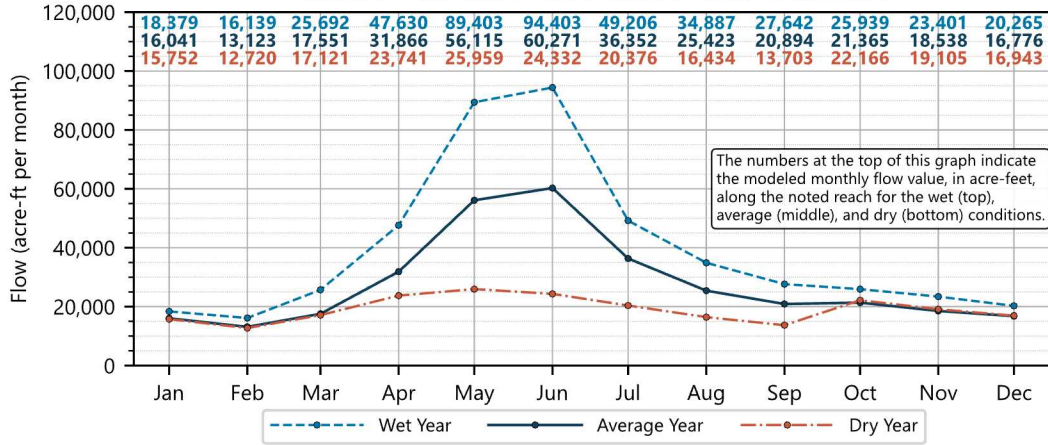


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Reach 17: Salt River Below Willow Creek Confluence

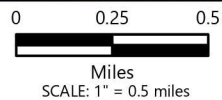


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



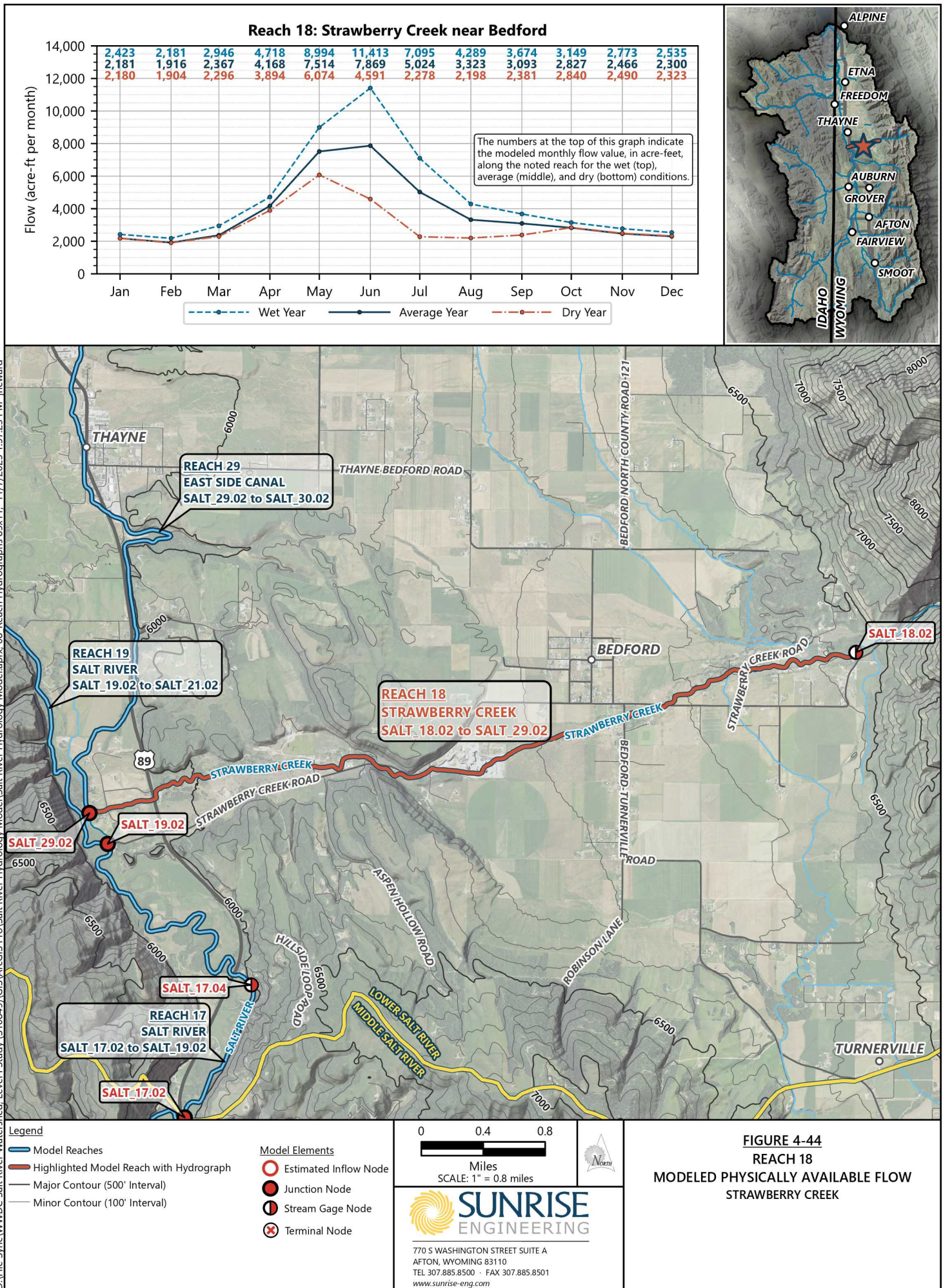
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FIGURE 4-43

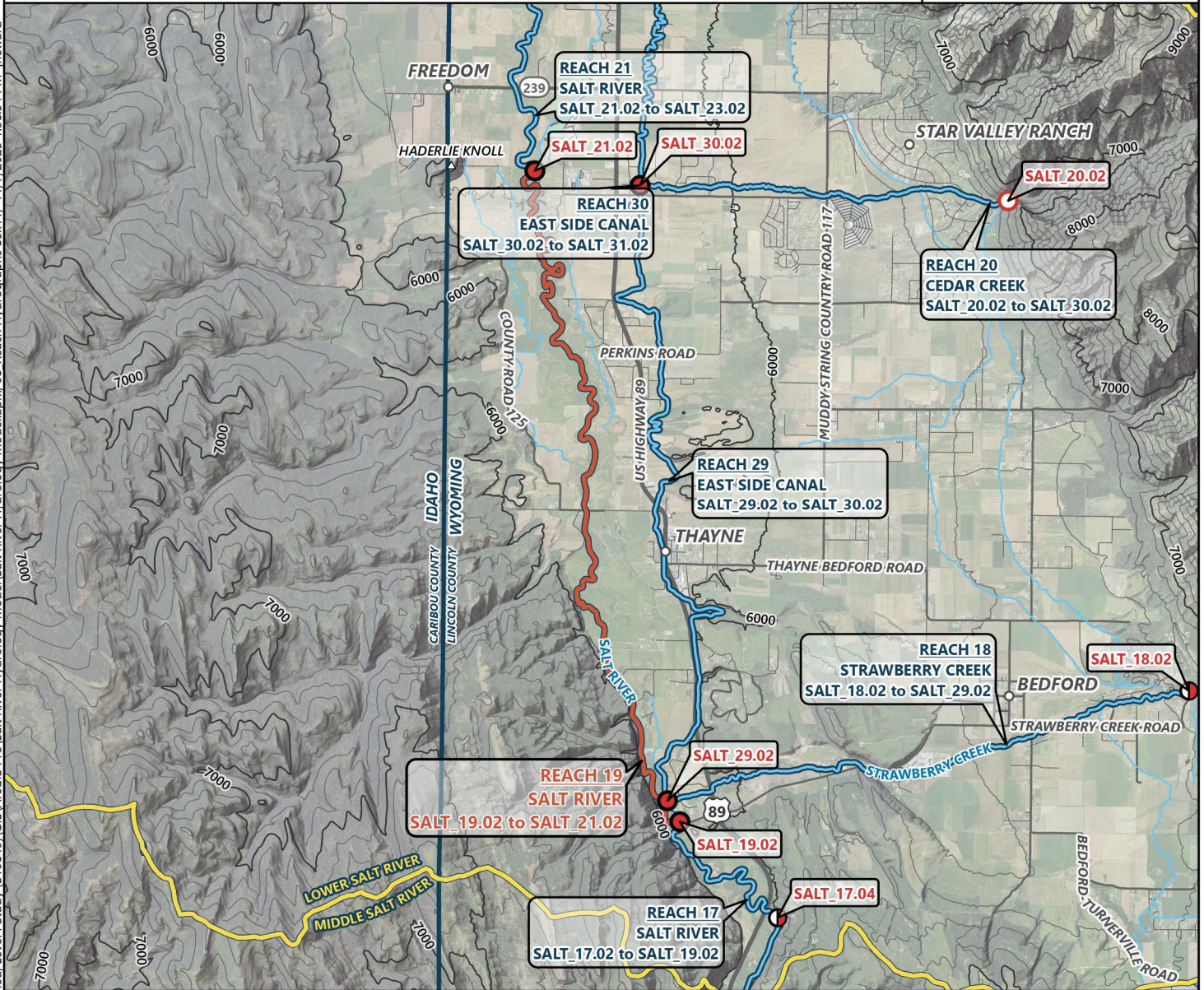
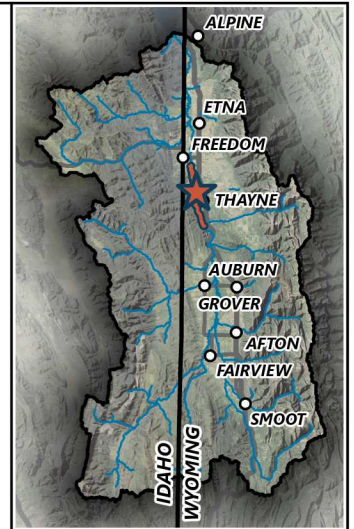
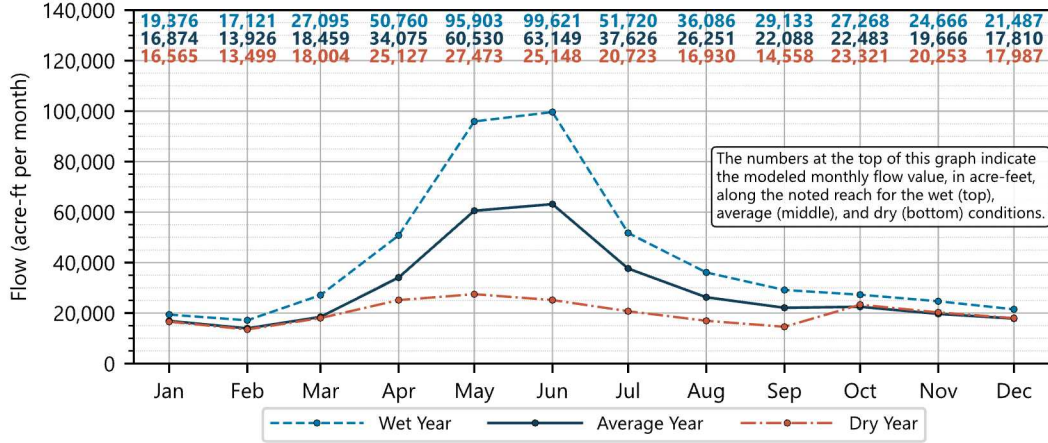
REACH 17

MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW WILLOW CREEK CONFLUENCE

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Reach 19: Salt River below East Side Canal Diversion

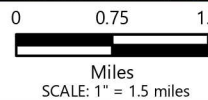


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (1000' Interval)
- Minor Contour (200' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



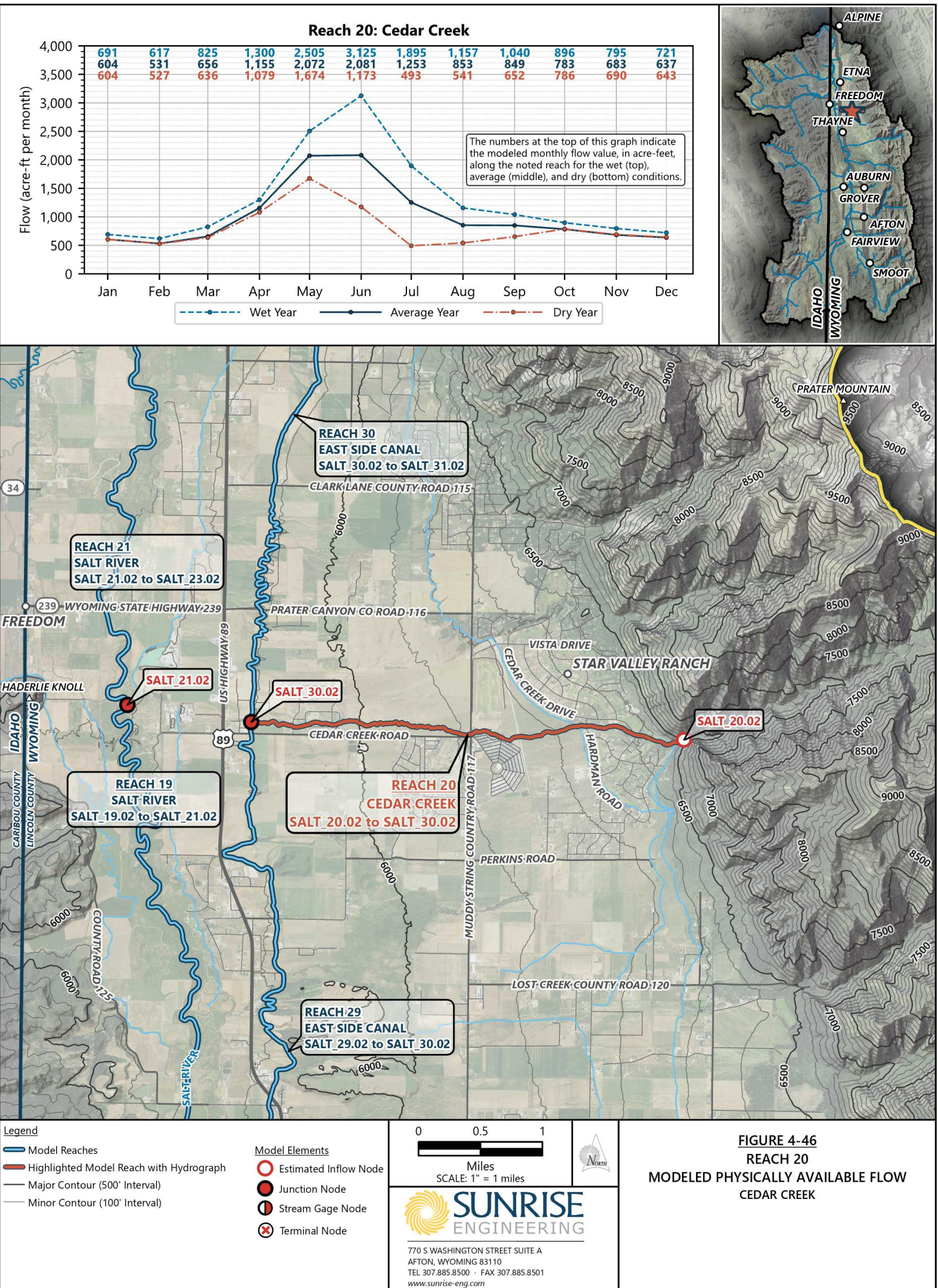
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FIGURE 4-45

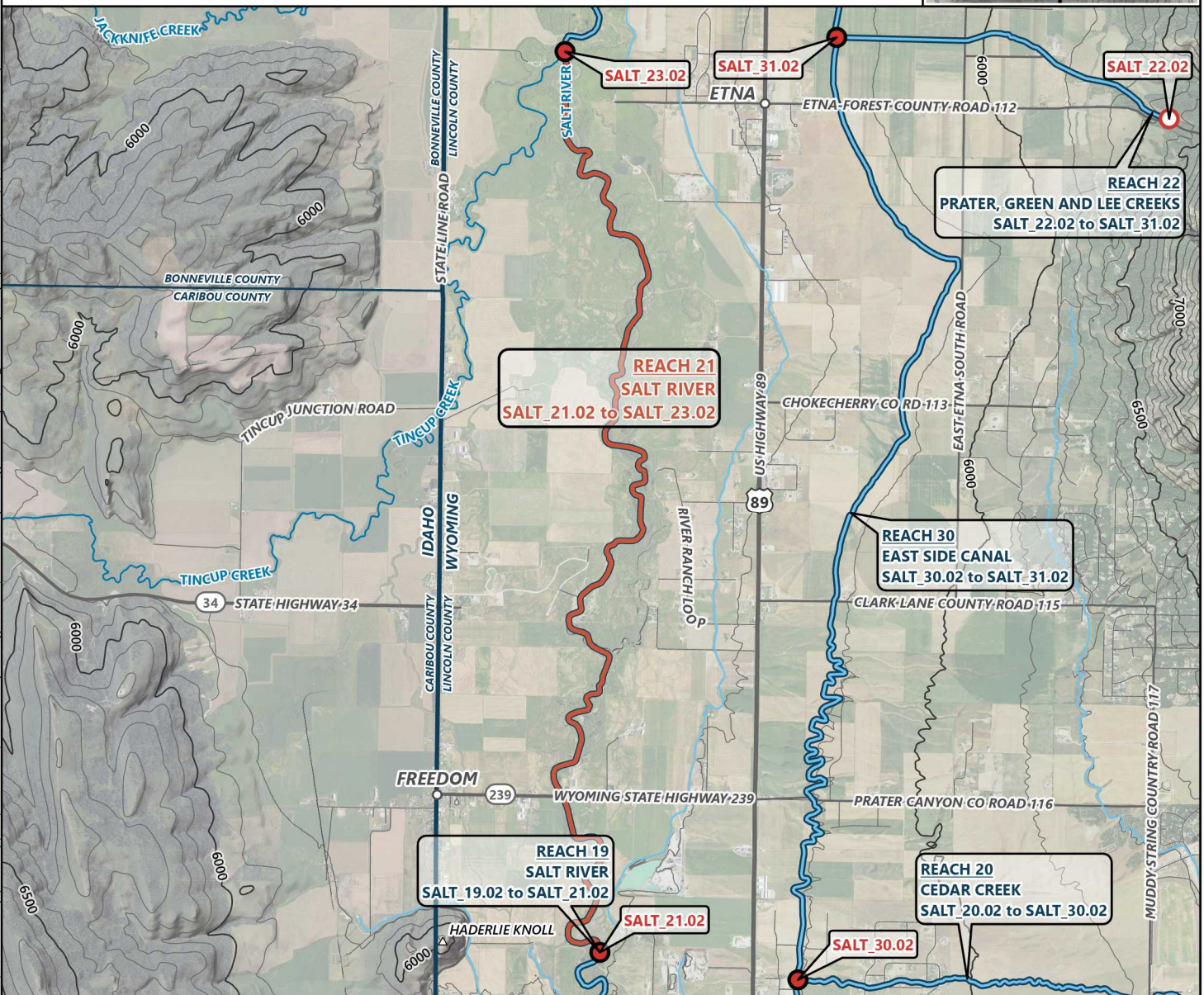
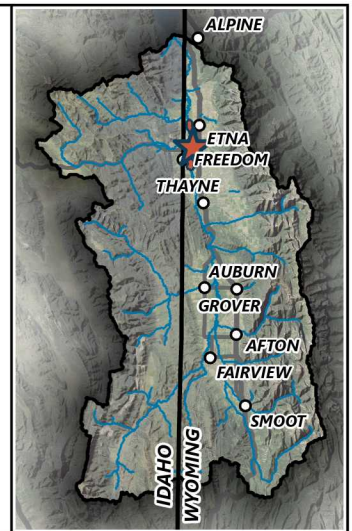
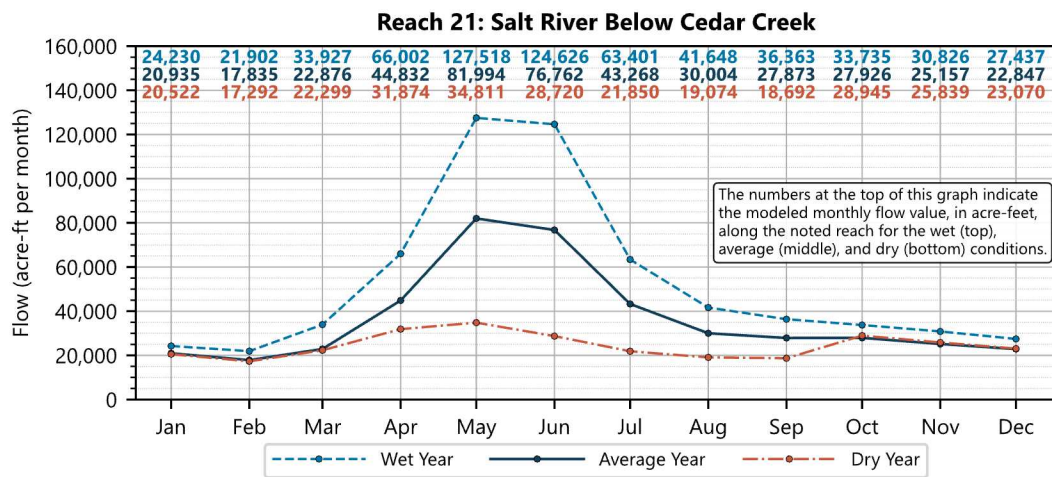
REACH 19

MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW EAST SIDE CANAL DIVERSION

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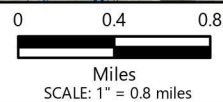


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

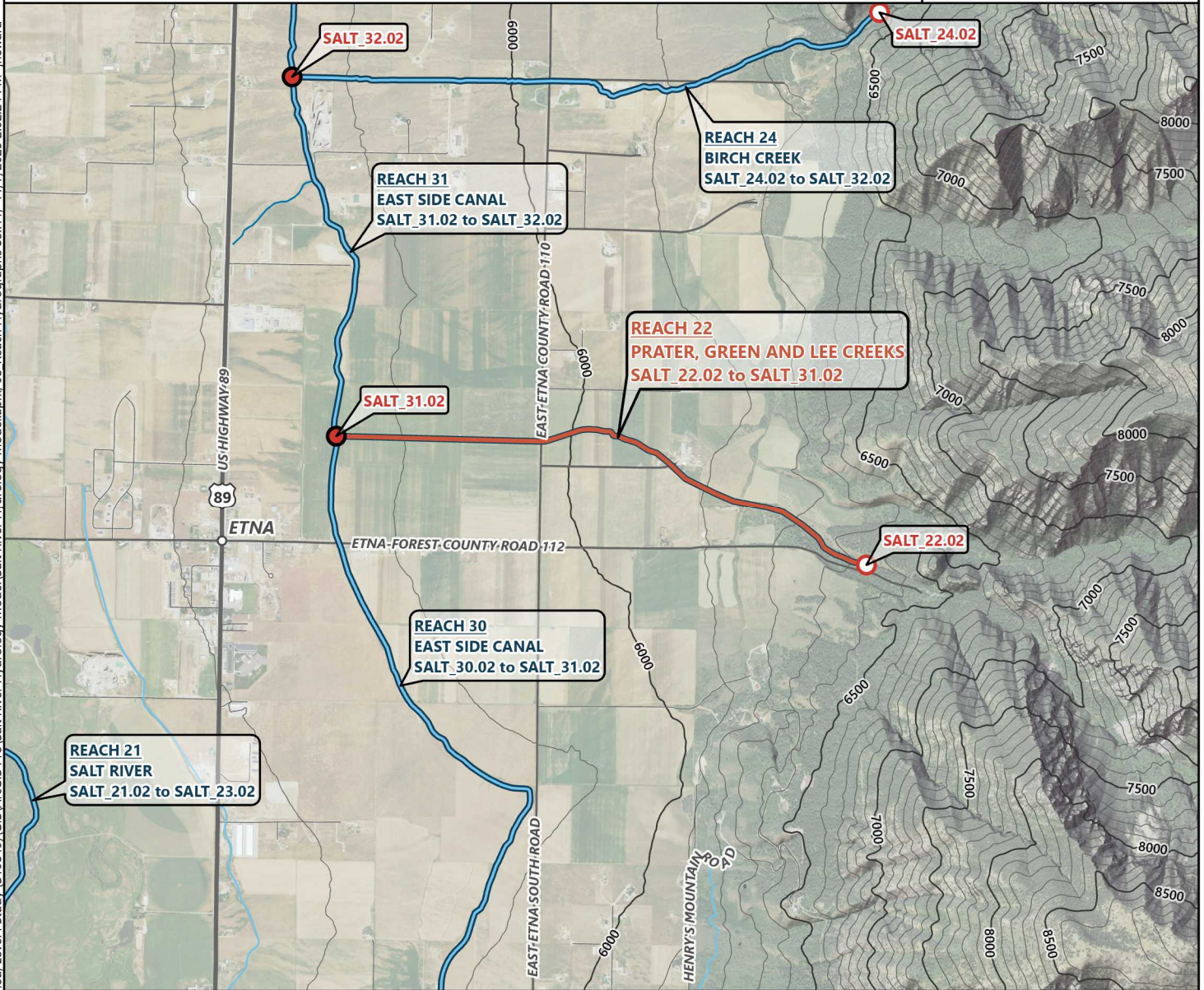
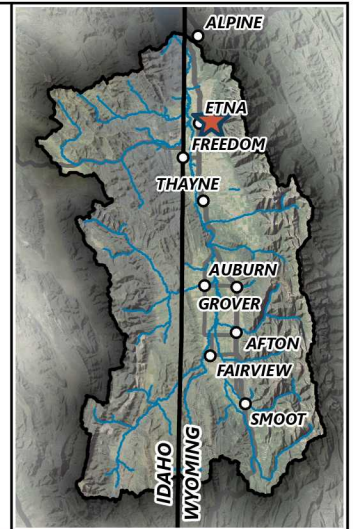
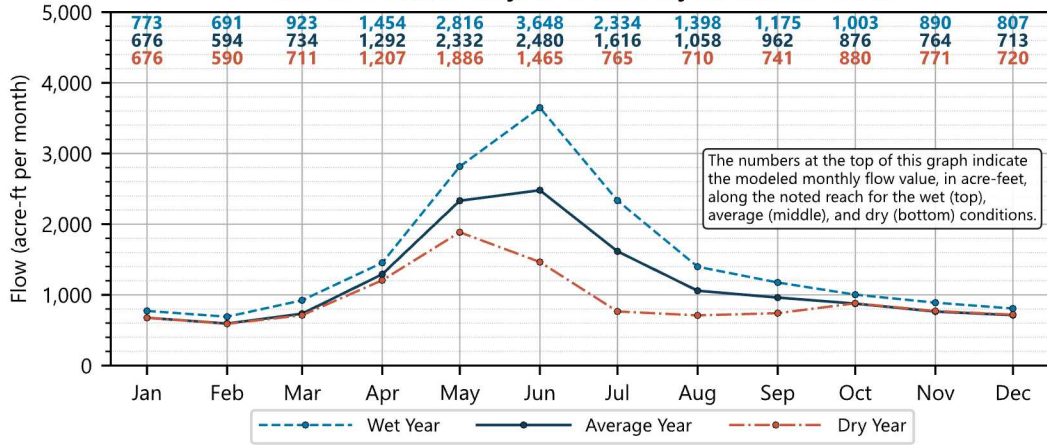


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FIGURE 4-47
REACH 21
MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW CEDAR CREEK

Reach 22: Prater Canyon, Green Canyon, and Lee Creek

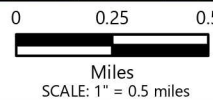


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



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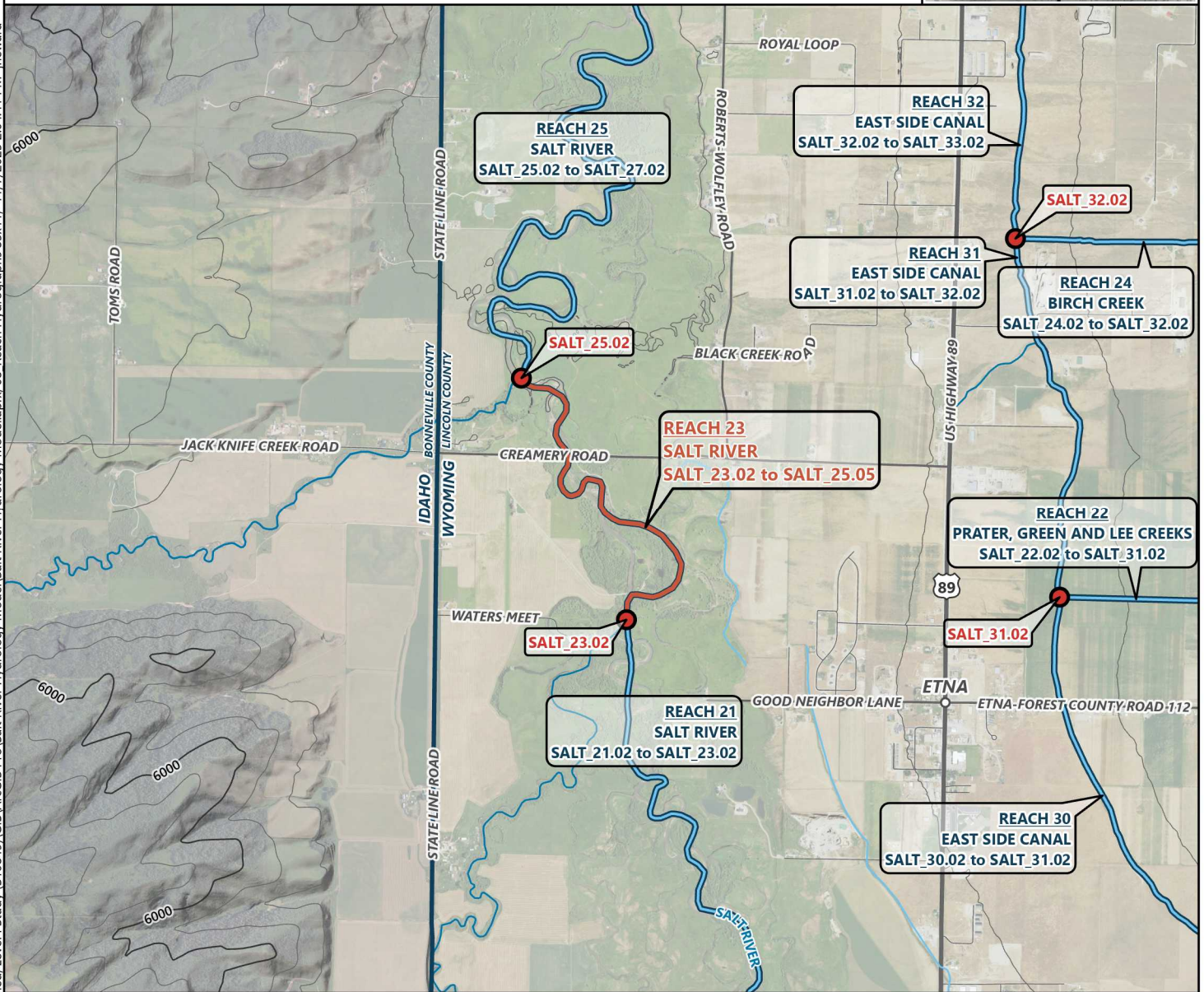
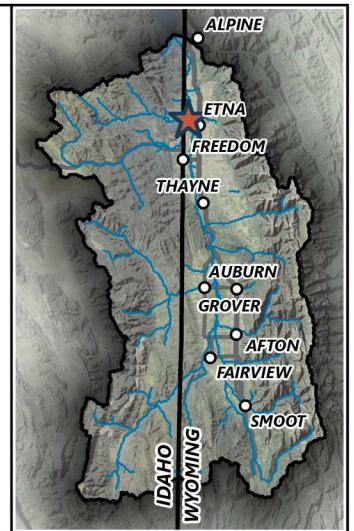
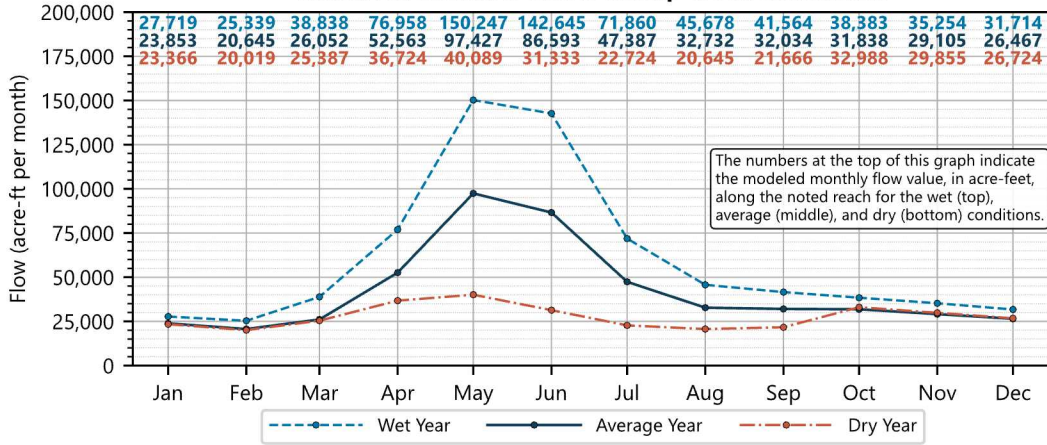


FIGURE 4-48

REACH 22

MODELED PHYSICALLY AVAILABLE FLOW
PRATER CANYON, GREEN CANYON AND LEE CREEK

Reach 23: Salt River Below Tincup Creek Confluence

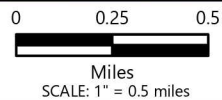


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



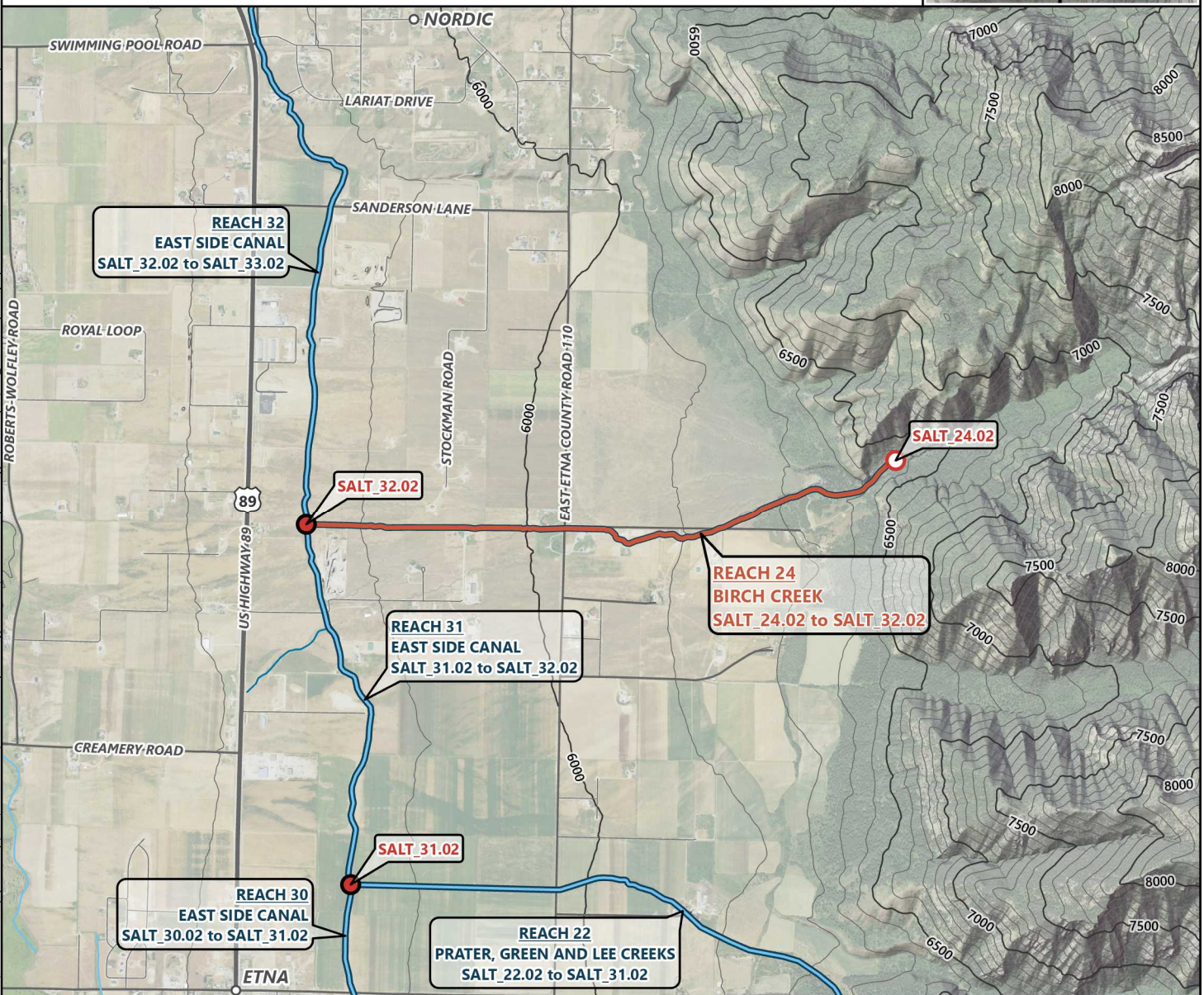
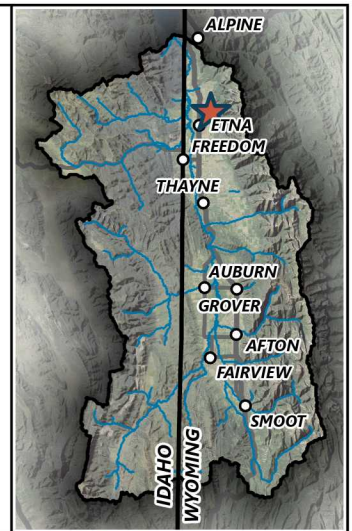
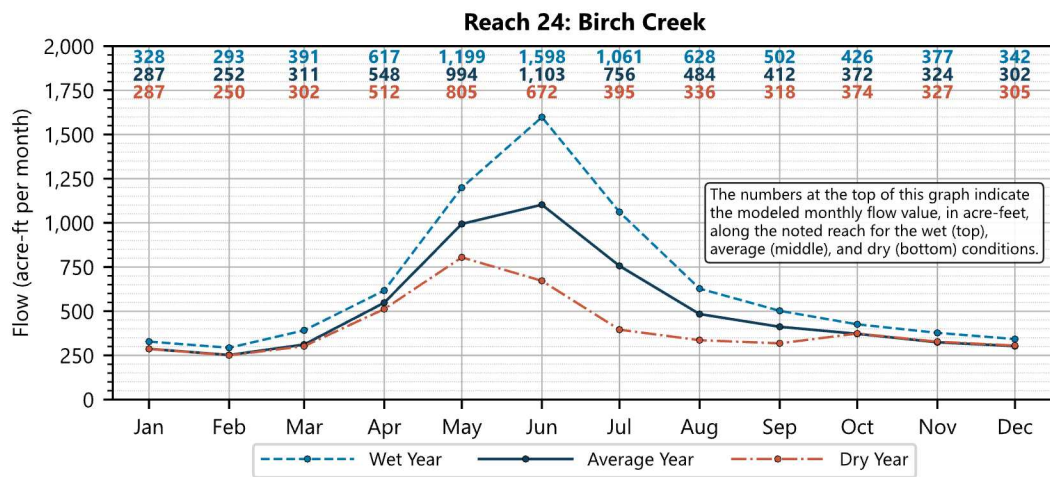
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FIGURE 4-49

REACH 23

MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW TINCUP CREEK CONFLUENCE

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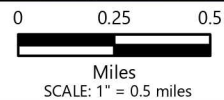


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

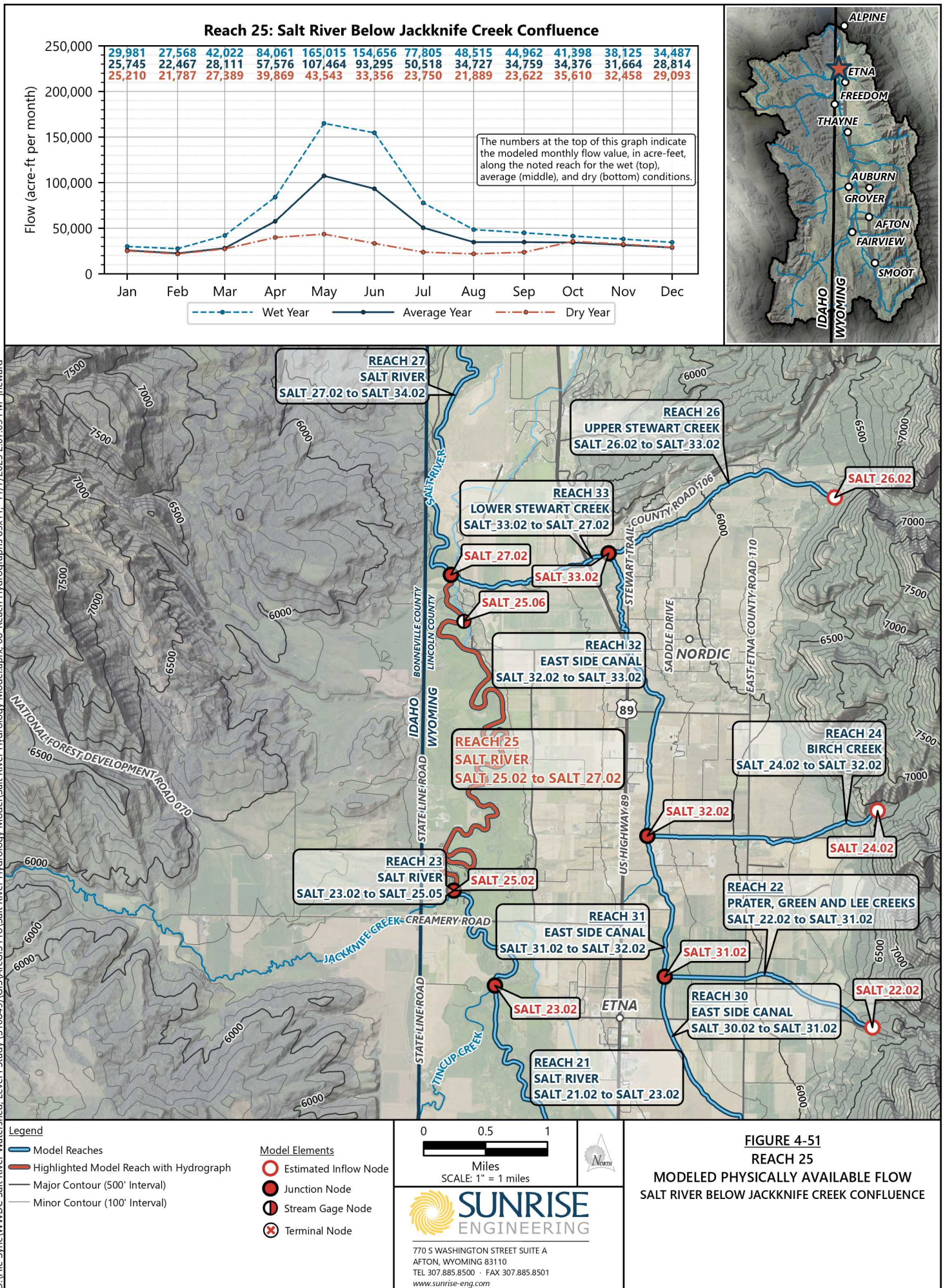


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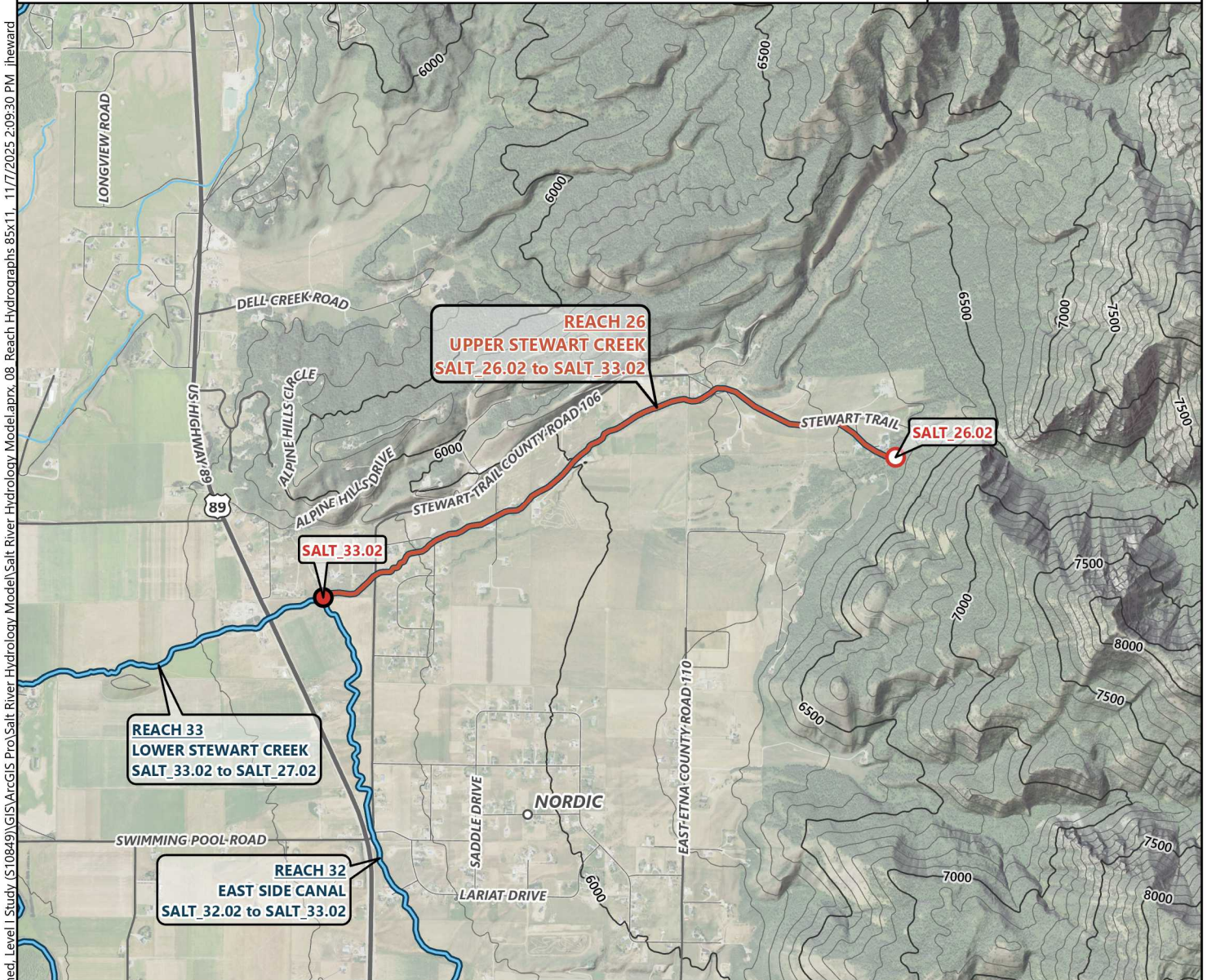
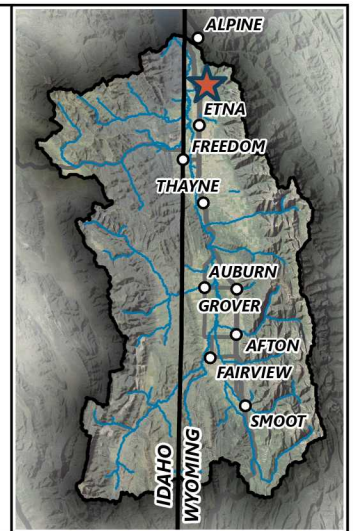
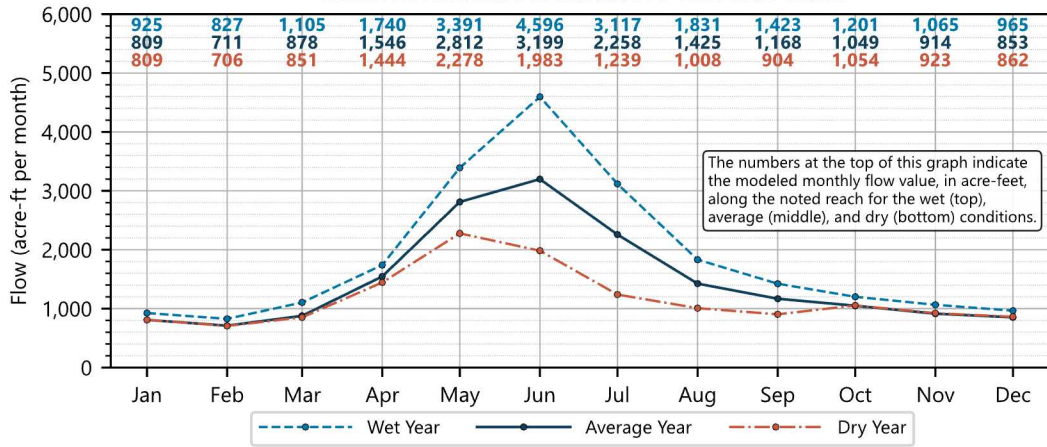


FIGURE 4-50
REACH 24
MODELED PHYSICALLY AVAILABLE FLOW
BIRCH CREEK

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Reach 26: Stewart Creek Above East Side Canal

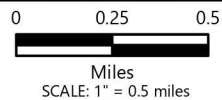


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

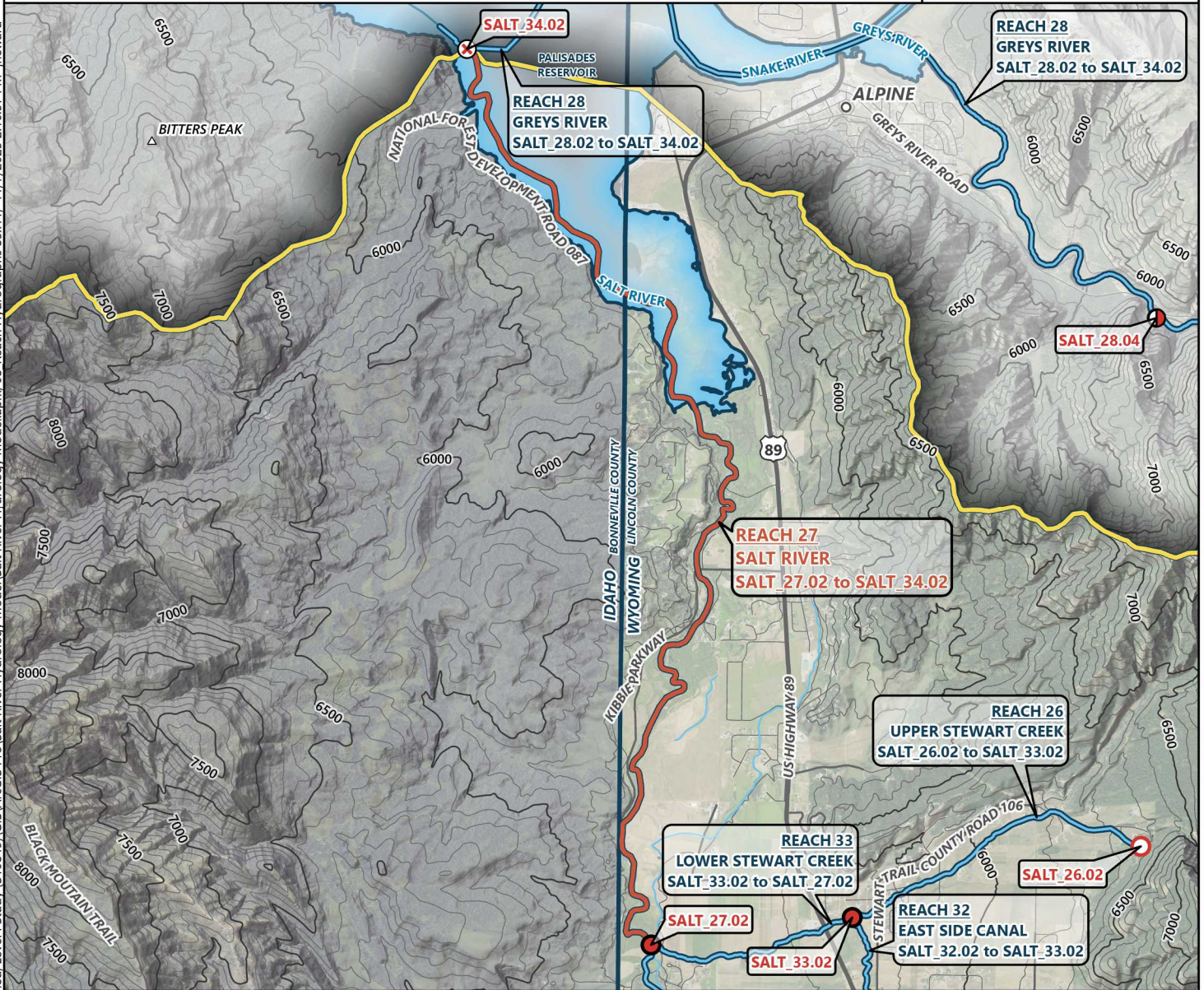
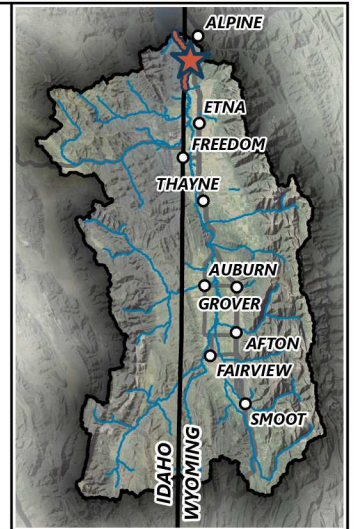
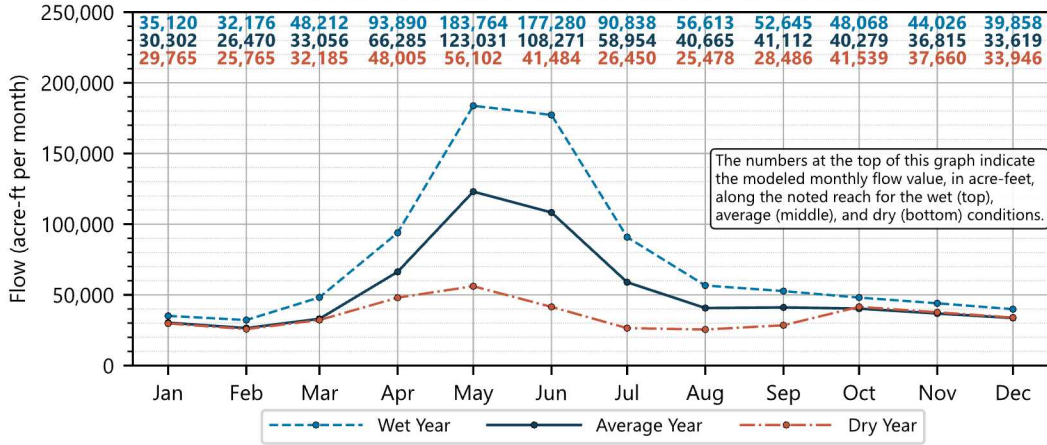


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FIGURE 4-52

REACH 26
MODELED PHYSICALLY AVAILABLE FLOW
STEWART CREEK ABOVE EAST SIDE CANAL

Reach 27: Salt River Below Stewart Creek Confluence

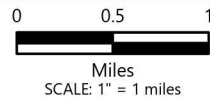


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

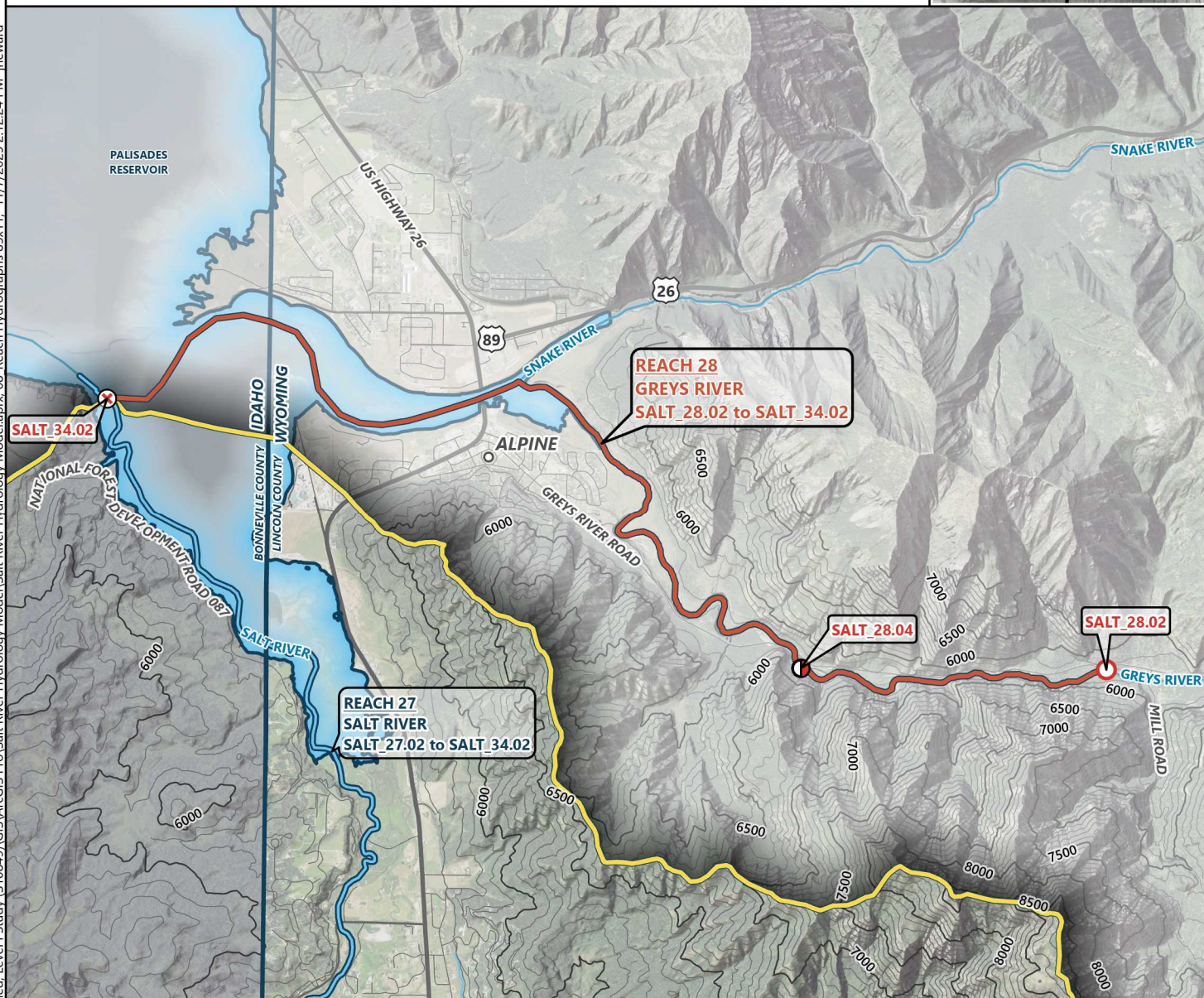
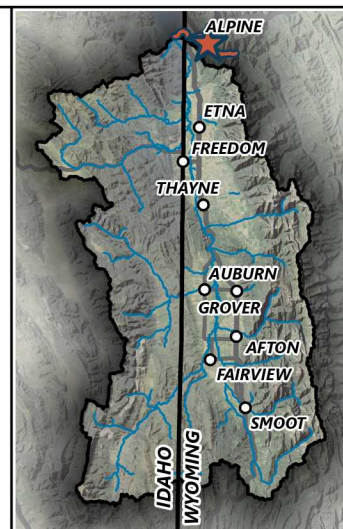
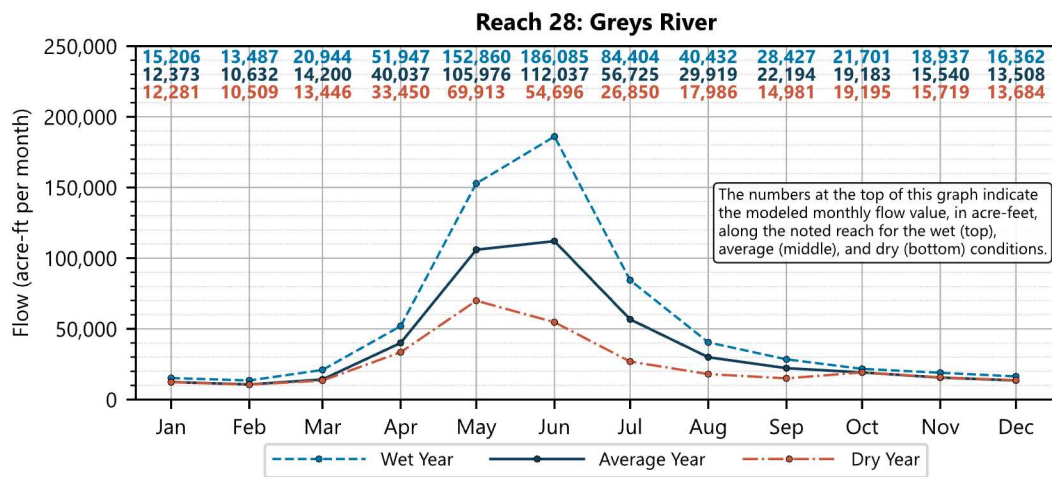


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FIGURE 4-53

REACH 27

MODELED PHYSICALLY AVAILABLE FLOW
SALT RIVER BELOW STEWART CREEK CONFLUENCE



Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

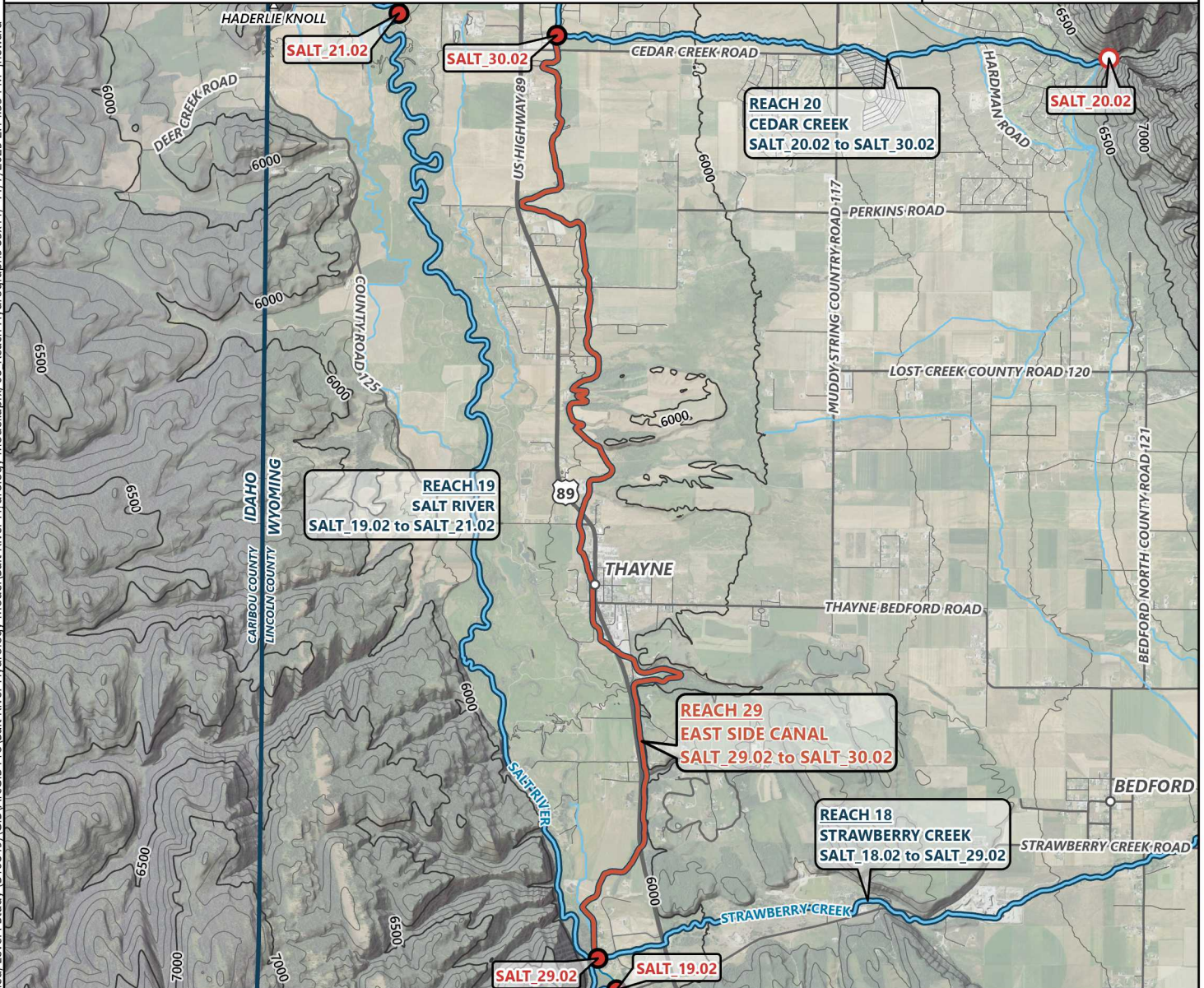
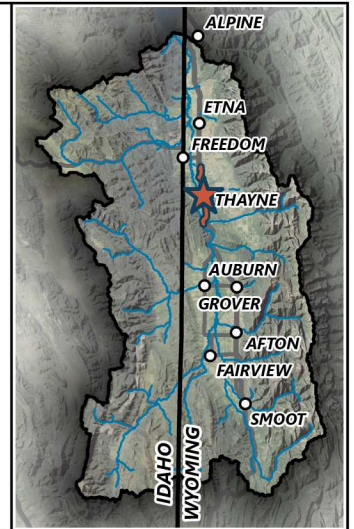
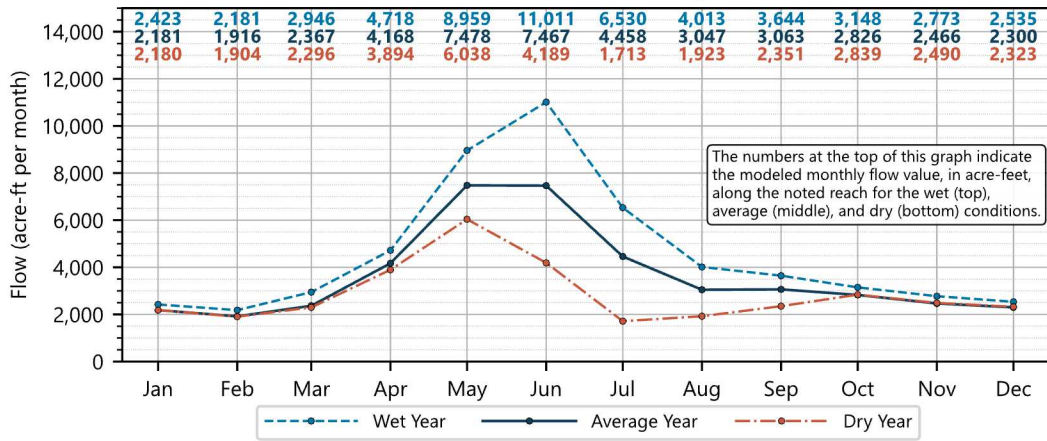
0 0.5 1 Miles
SCALE: 1" = 1 miles

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FIGURE 4-54
REACH 28
MODELED PHYSICALLY AVAILABLE FLOW
GREYS RIVER

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Reach 29: East Side Canal From Strawberry Creek to Cedar Creek



Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

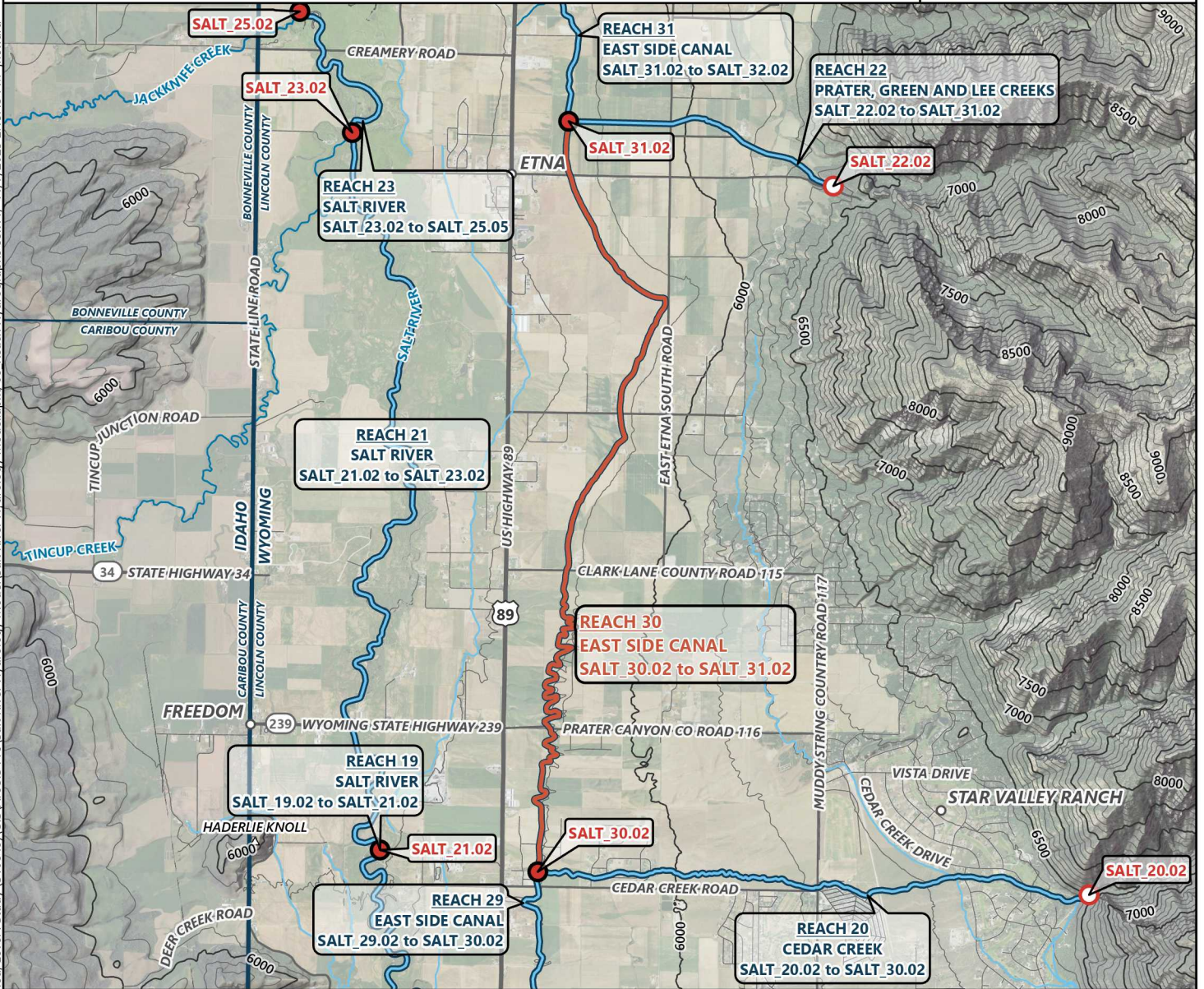
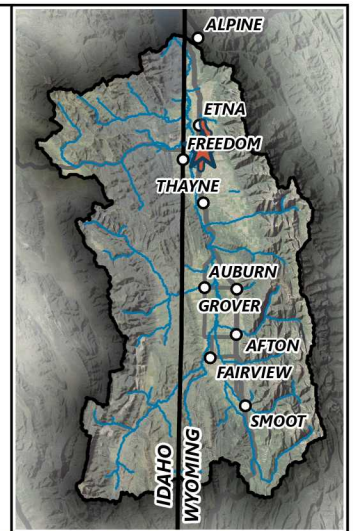
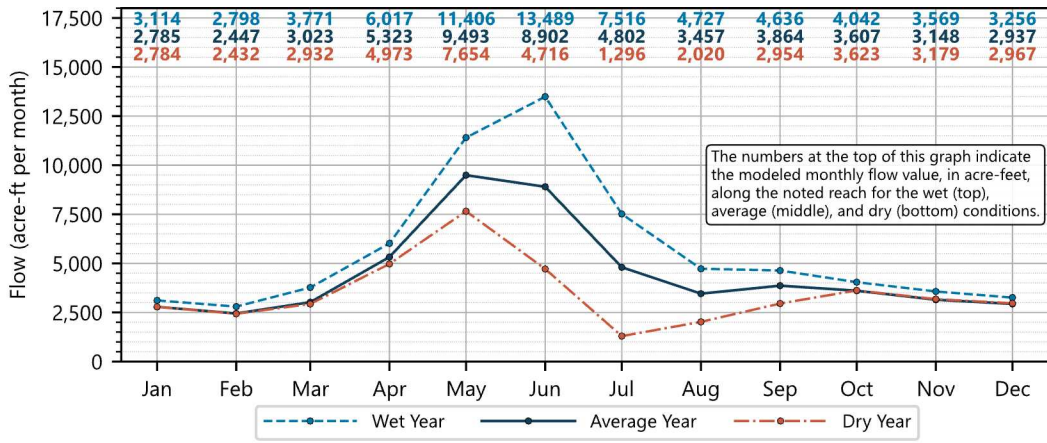
0 0.5 1 Miles
SCALE: 1" = 1 miles

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FIGURE 4-55
REACH 29
MODELED PHYSICALLY AVAILABLE FLOW
EAST SIDE CANAL FROM STRAWBERRY CREEK TO
CEDAR CREEK

Reach 30: East Side Canal From Cedar Creek to Prater, Green and Lee Creeks



- Legend**
- Model Reaches
 - Highlighted Model Reach with Hydrograph
 - Major Contour (500' Interval)
 - Minor Contour (100' Interval)
- Model Elements**
- Estimated Inflow Node
 - Junction Node
 - Stream Gage Node
 - Terminal Node

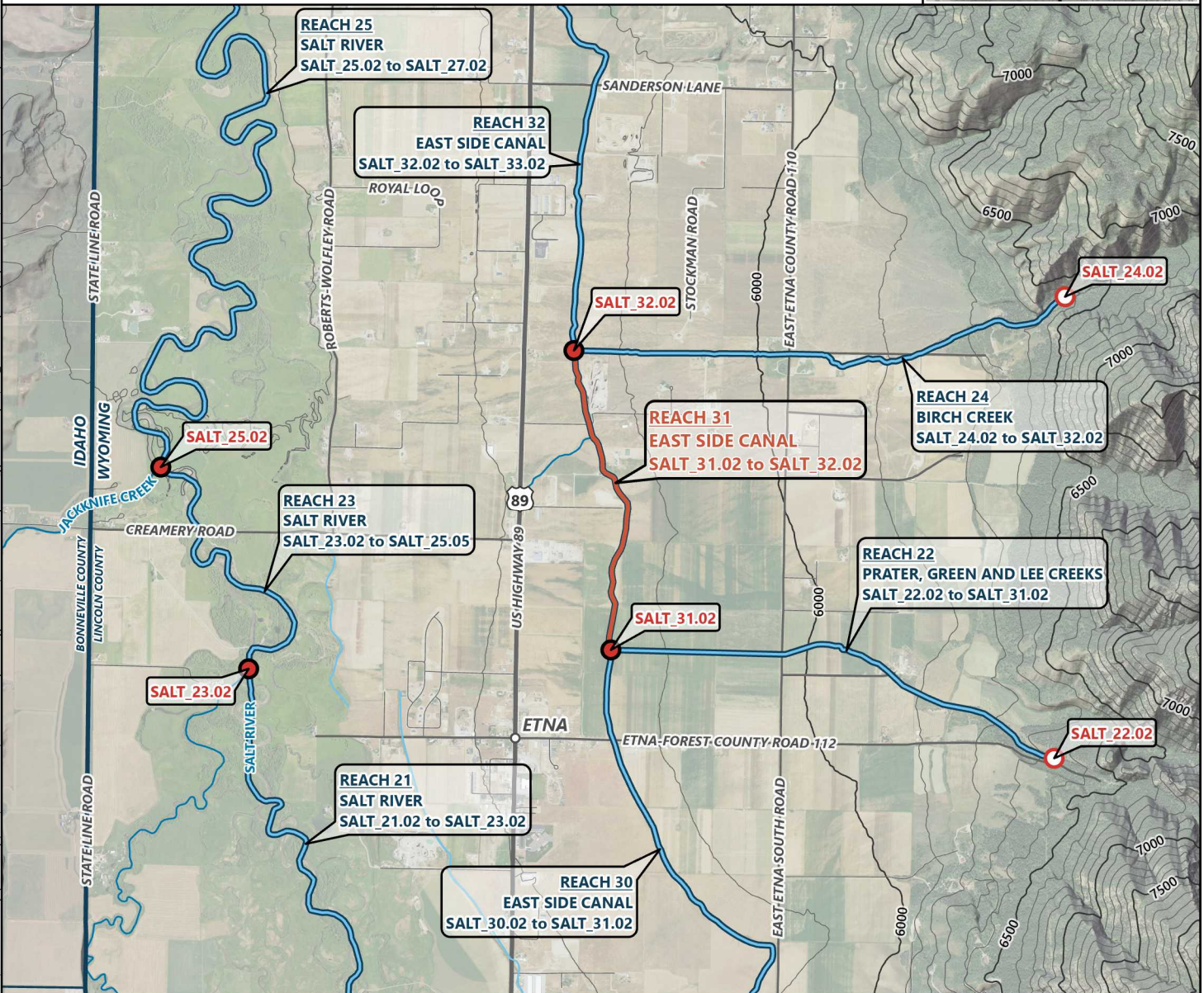
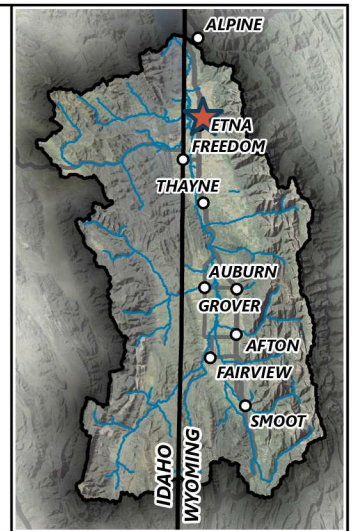
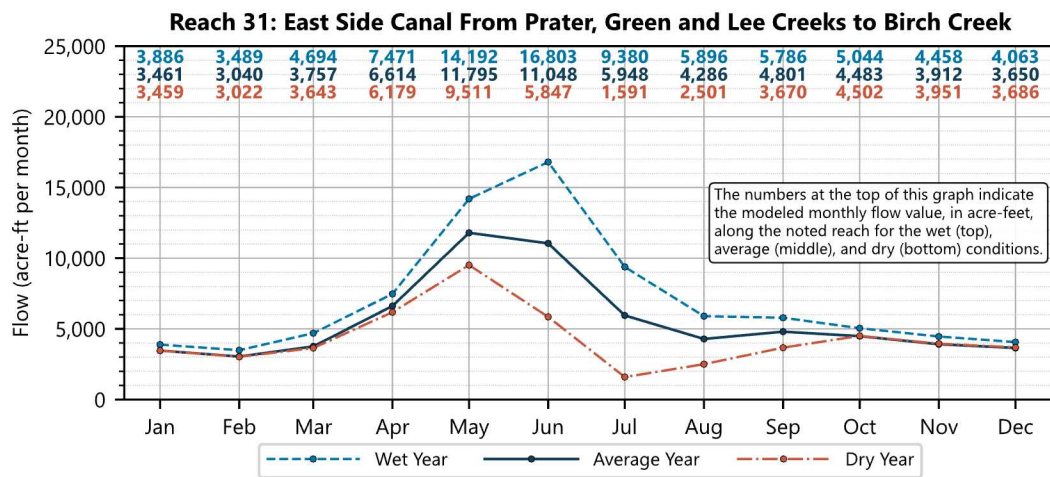
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Miles
SCALE: 1" = 1 miles



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FIGURE 4-56
REACH 30
MODELED PHYSICALLY AVAILABLE FLOW
EAST SIDE CANAL FROM CEDAR CREEK TO PRATER,
GREEN AND LEE CREEKS

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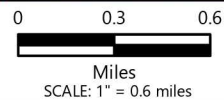


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



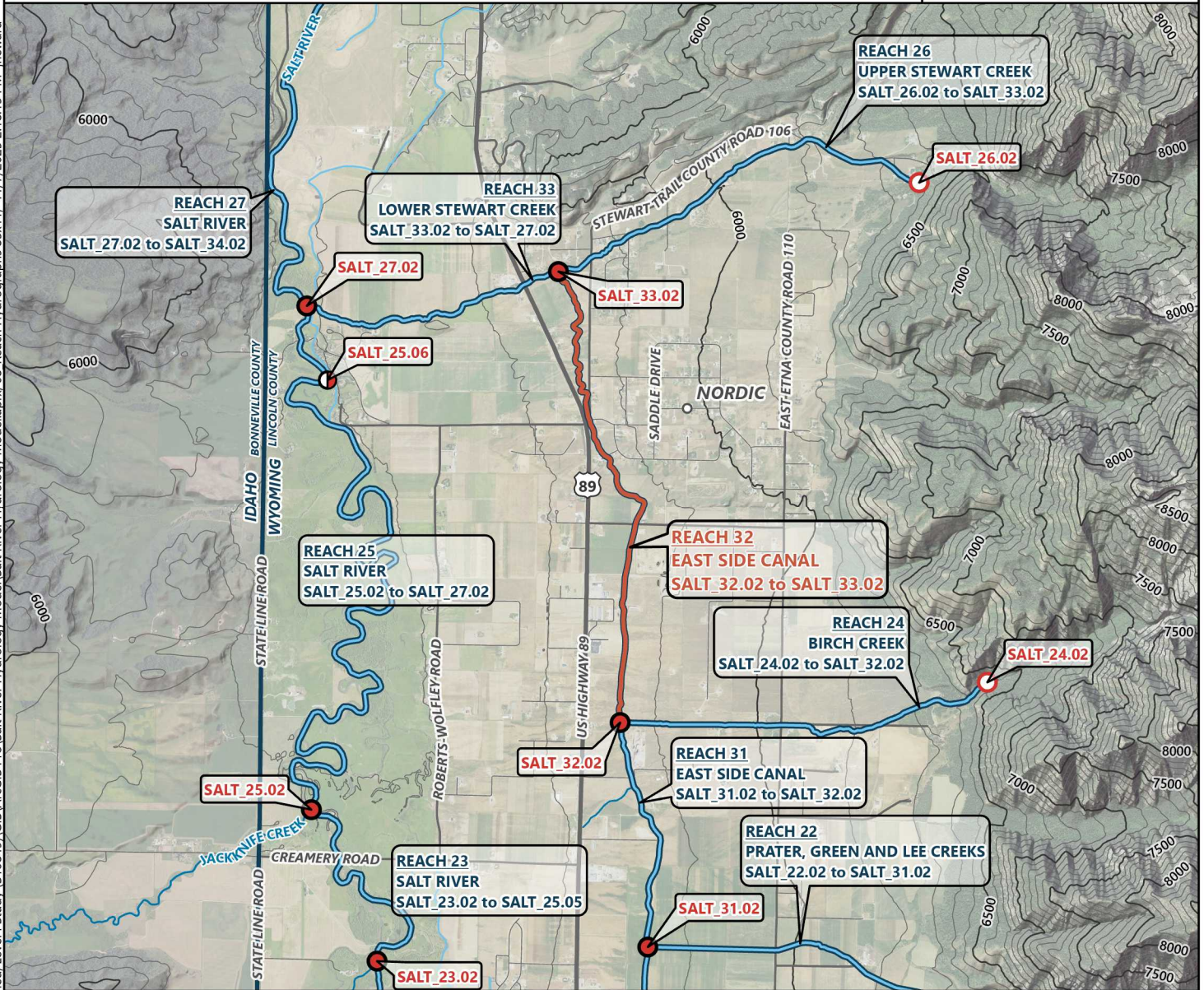
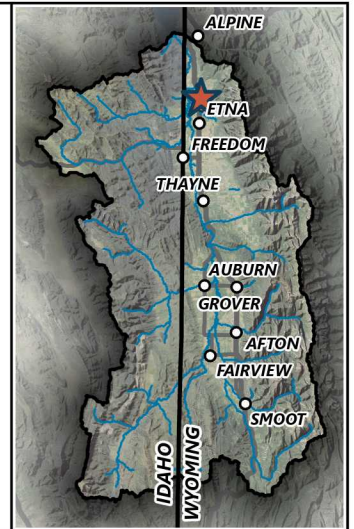
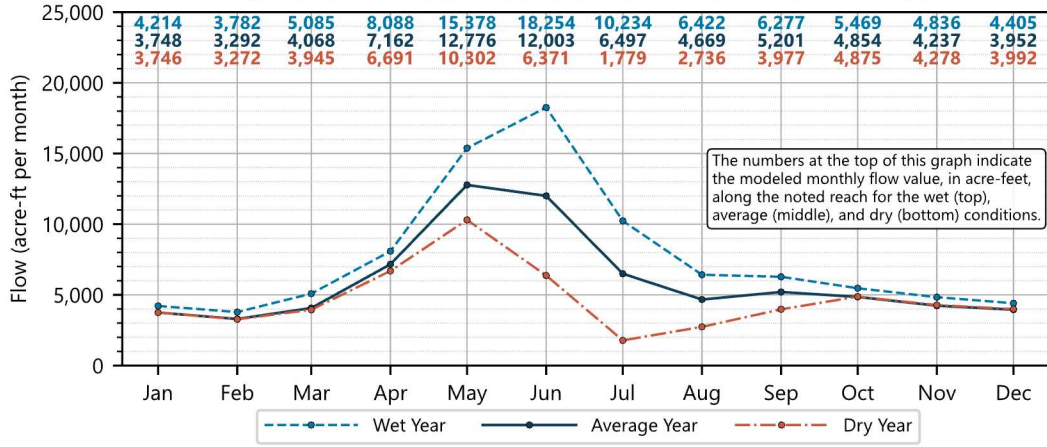
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FIGURE 4-57

REACH 31
MODELED PHYSICALLY AVAILABLE FLOW
EAST SIDE CANAL FROM PRATER, CREE, AND LEE
CREEKS TO BIRCH CREEK

Reach 32: East Side Canal From Birch Creek to Stewart Creek

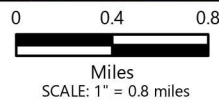


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



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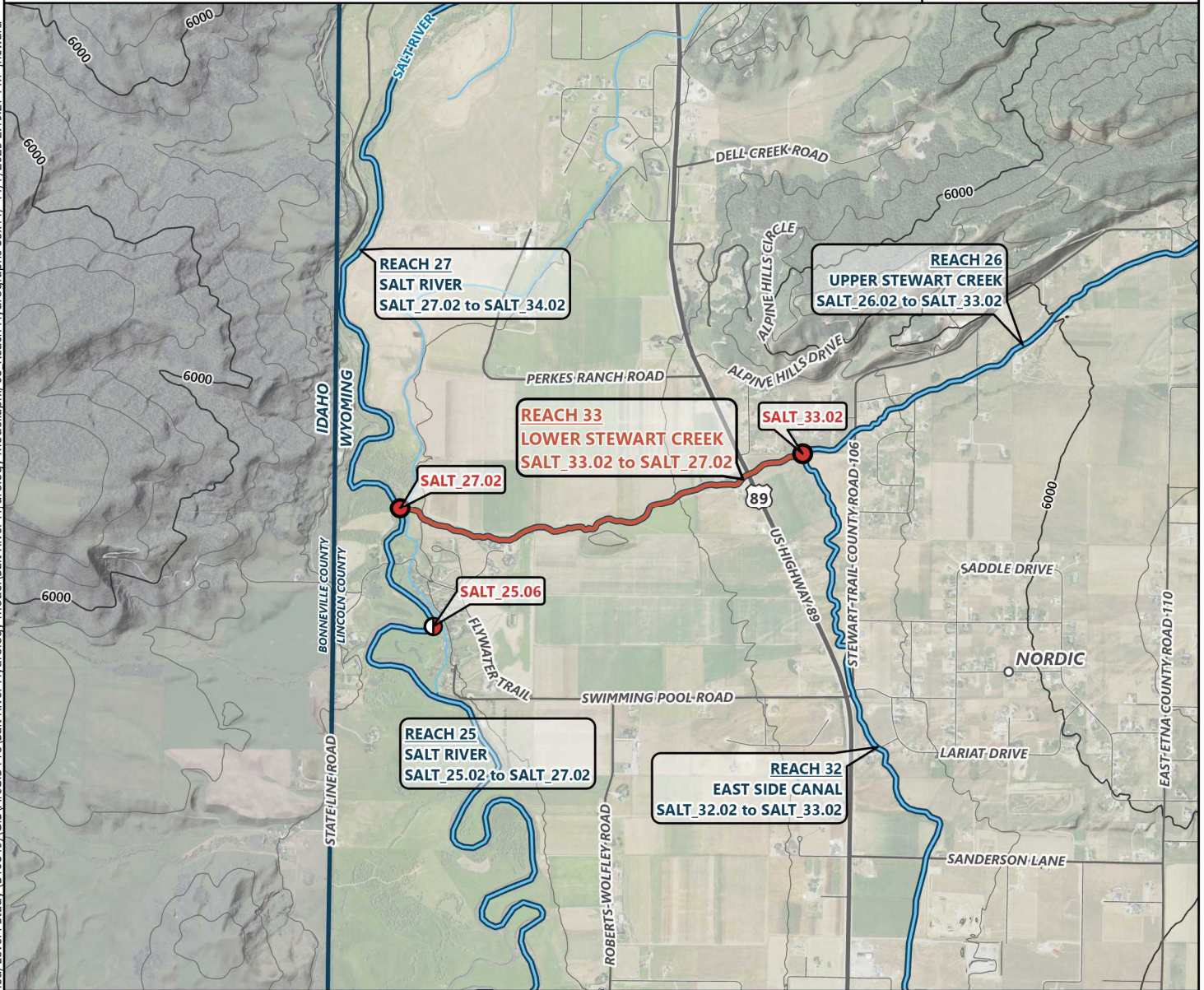
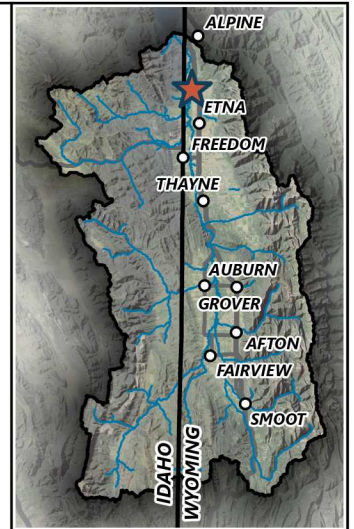
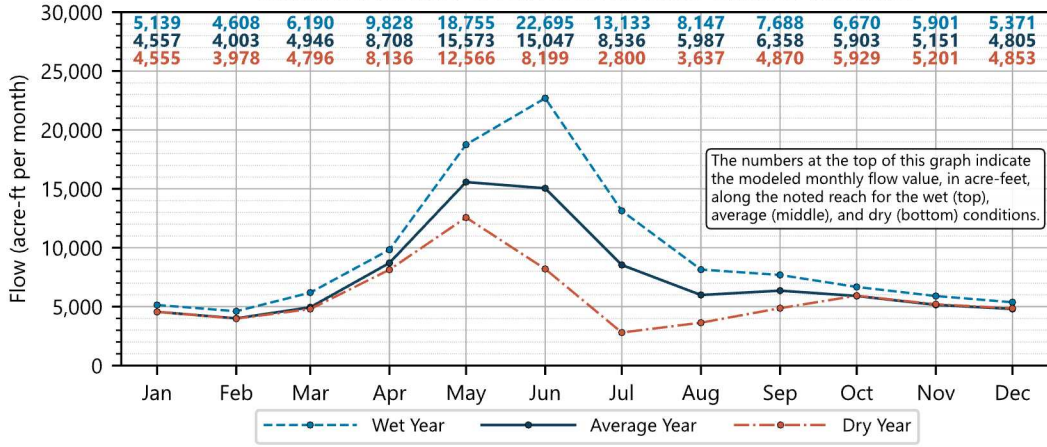


FIGURE 4-58

REACH 32

MODELED PHYSICALLY AVAILABLE FLOW
EAST SIDE CANAL FROM BIRCH CREEK TO STEWART CREEK

Reach 33: Stewart Creek From East Side Canal to Salt River

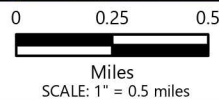


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

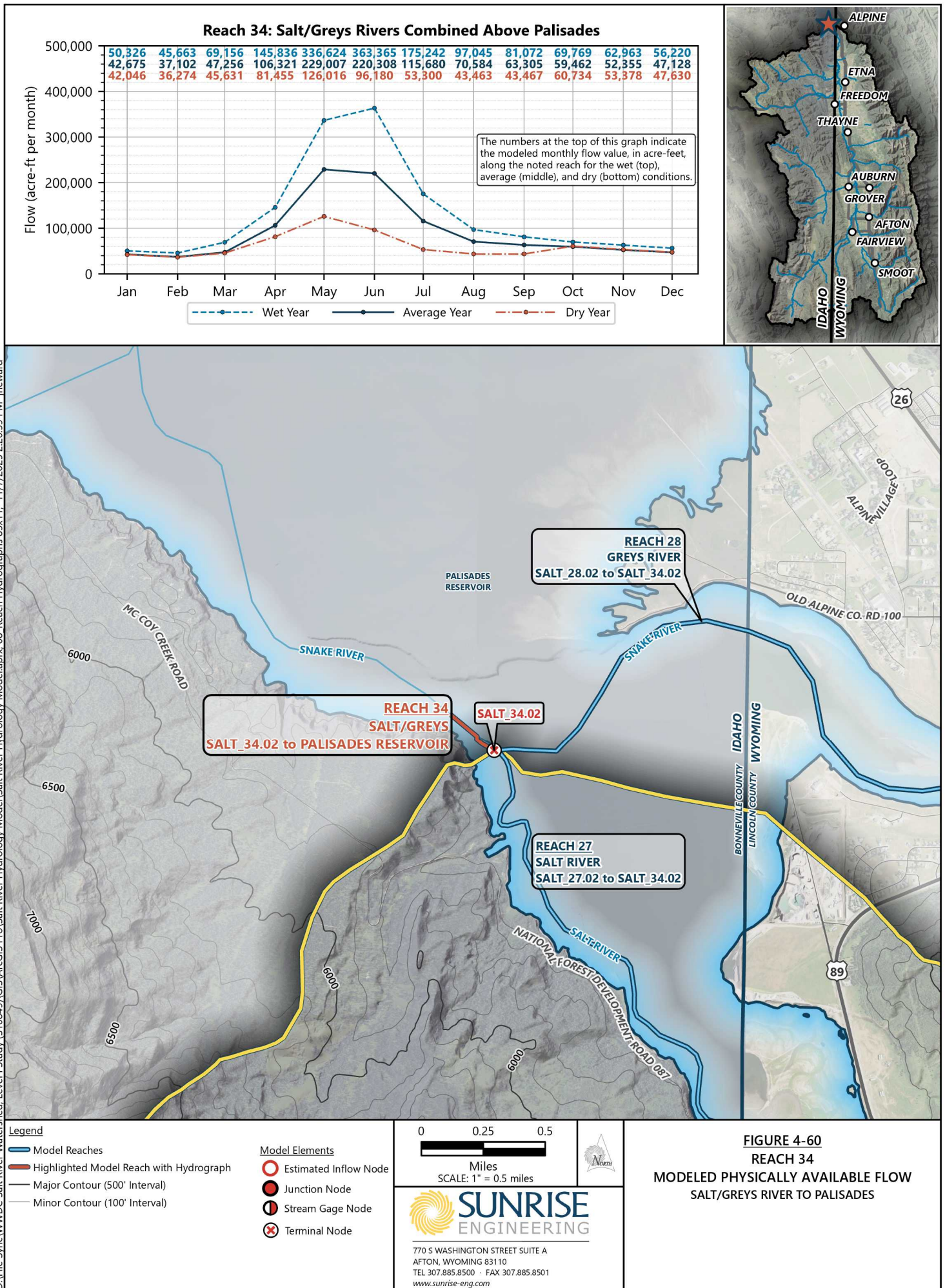


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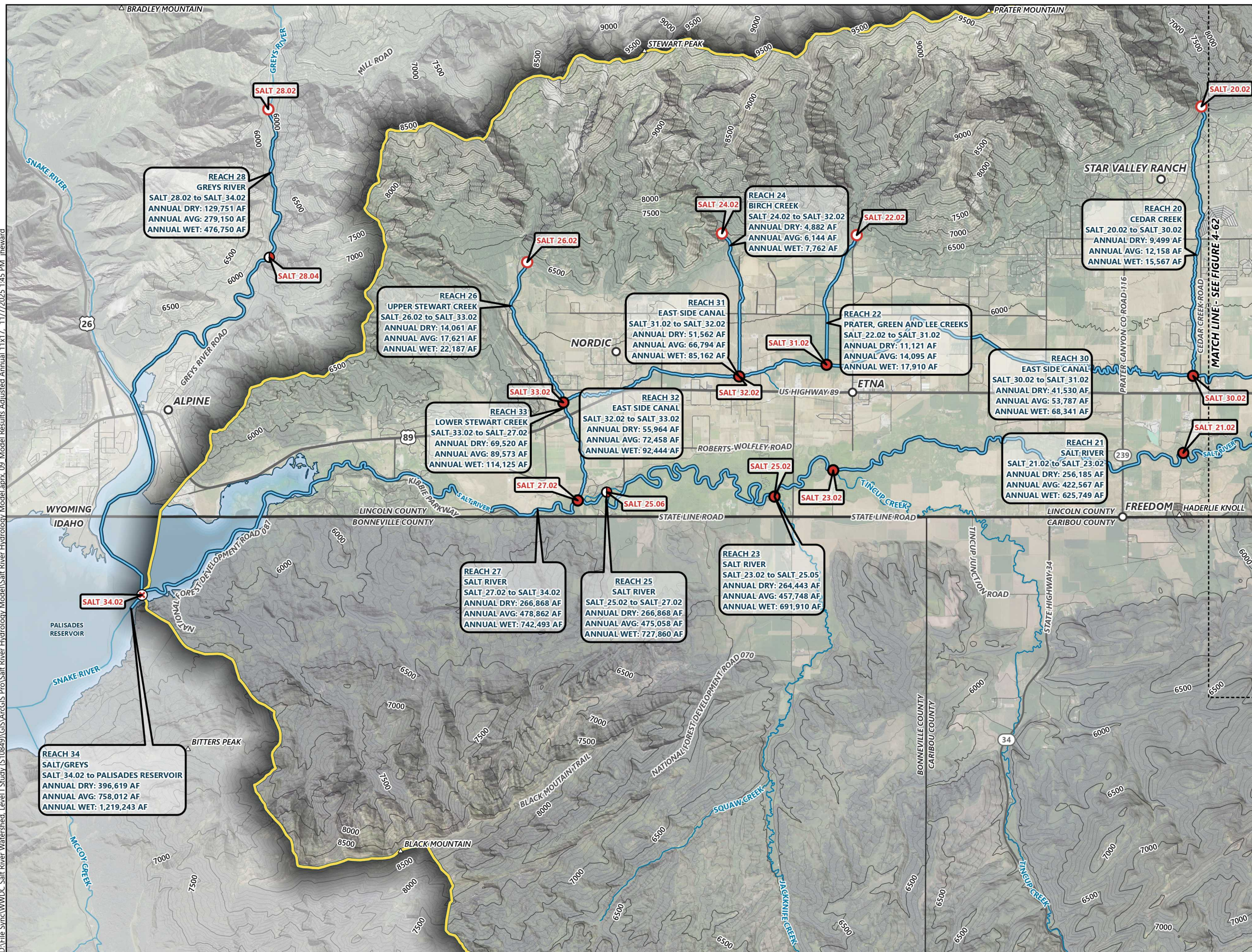
FIGURE 4-59

REACH 33
MODELED PHYSICALLY AVAILABLE FLOW
STEWART CREEK FROM EAST SIDE CANAL TO SALT
RIVER

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Legend

- HUC10 Basins Within Salt River Watershed
- River/Stream
- Canal/Ditch
- Major Contour (500' Interval) from USGS 10m DEM
- Minor Contour (100' Interval) from USGS 10m DEM

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node
- Model Reaches

4-62

ALPINE 4-61

THAYNE

SMOOT

4-63

North

0 2,500 5,000

Feet

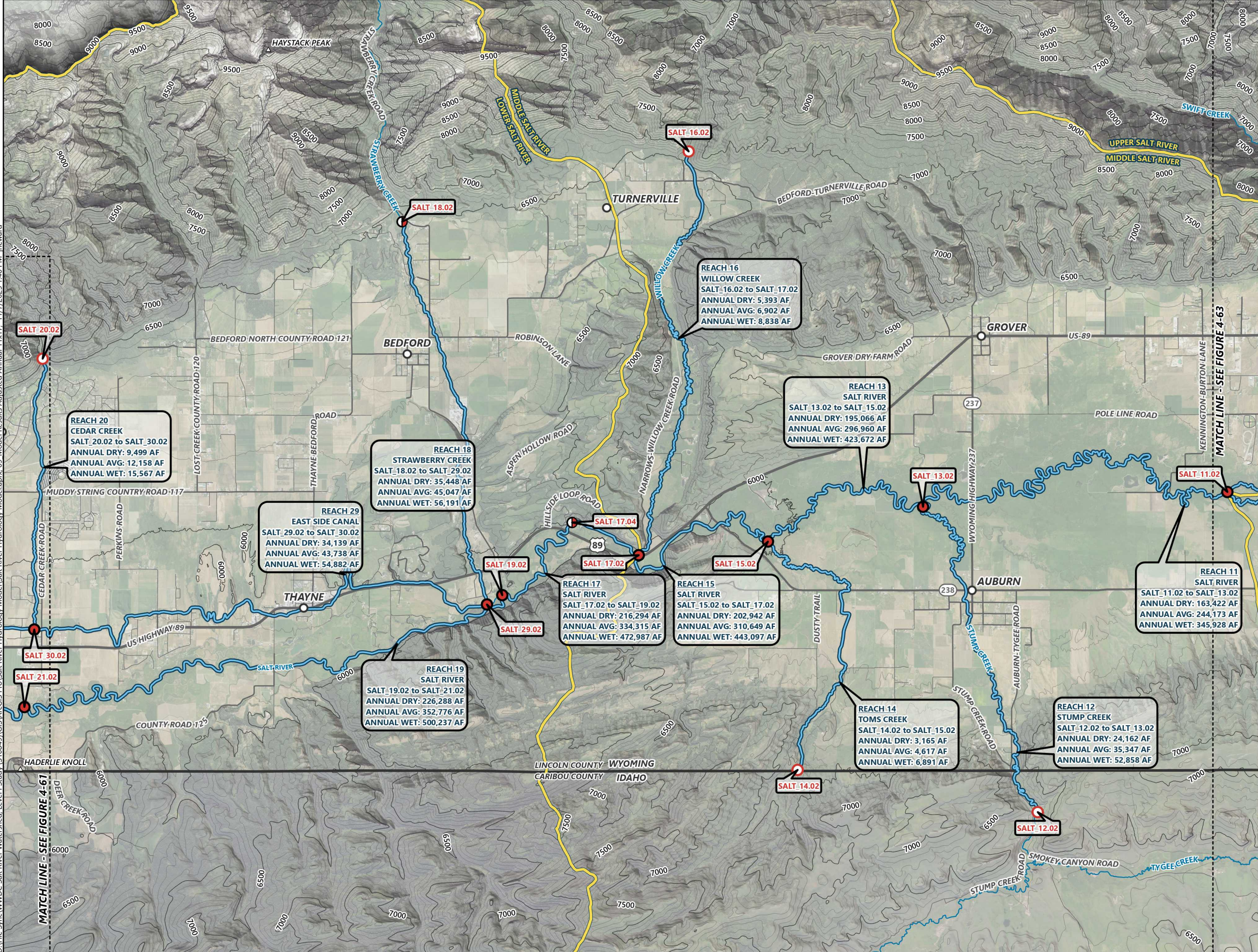
SCALE: 1" = 6,336 feet

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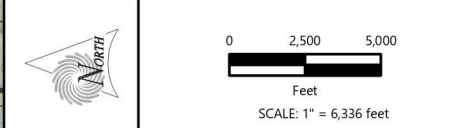
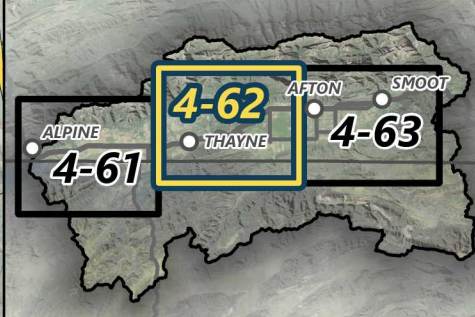
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FIGURE 4-61
ANNUAL MODELED PHYSICALLY
AVAILABLE FLOW
SALT RIVER WATERSHED

D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Model.aprx, 09 Model Results Adjusted Annual 11x17, 11/7/2025 1:46 PM jheward



- Legend**
- HUC10 Basins Within Salt River Watershed
 - River/Stream
 - Canal/Ditch
 - Major Contour (500' Interval) from USGS 10m DEM
 - Minor Contour (100' Interval) from USGS 10m DEM
- Model Elements**
- Estimated Inflow Node
 - Junction Node
 - Stream Gage Node
 - Terminal Node
 - Model Reaches

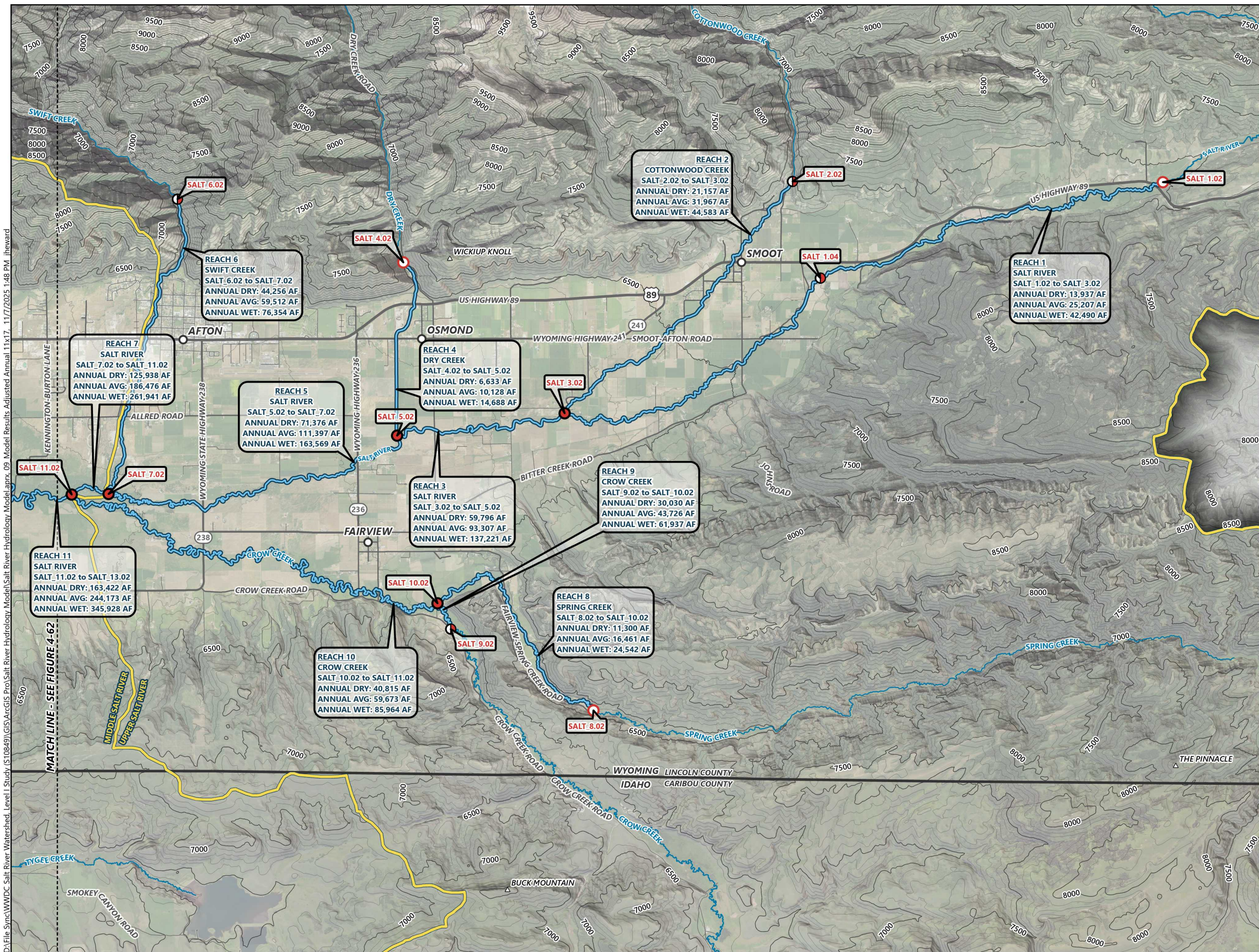


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FIGURE 4-62
ANNUAL MODELED PHYSICALLY
AVAILABLE FLOW
SALT RIVER WATERSHED

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Legend

- HUC10 Basins Within Salt River Watershed
- River/Stream
- Canal/Ditch
- Major Contour (500' Interval) from USGS 10m DEM
- Minor Contour (100' Interval) from USGS 10m DEM

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node
- Model Reaches

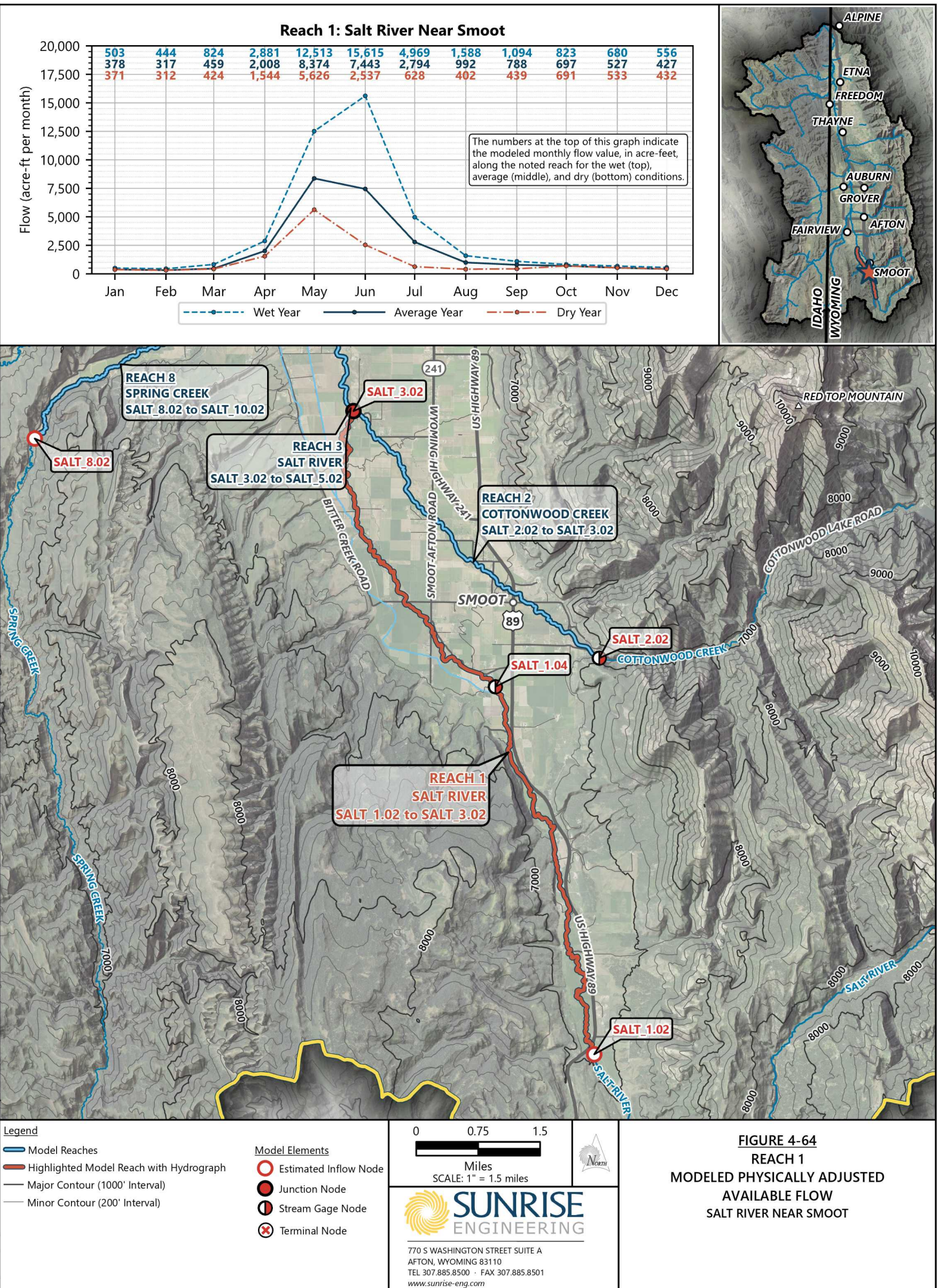
0 2,500 5,000
Feet
SCALE: 1" = 6,336 feet

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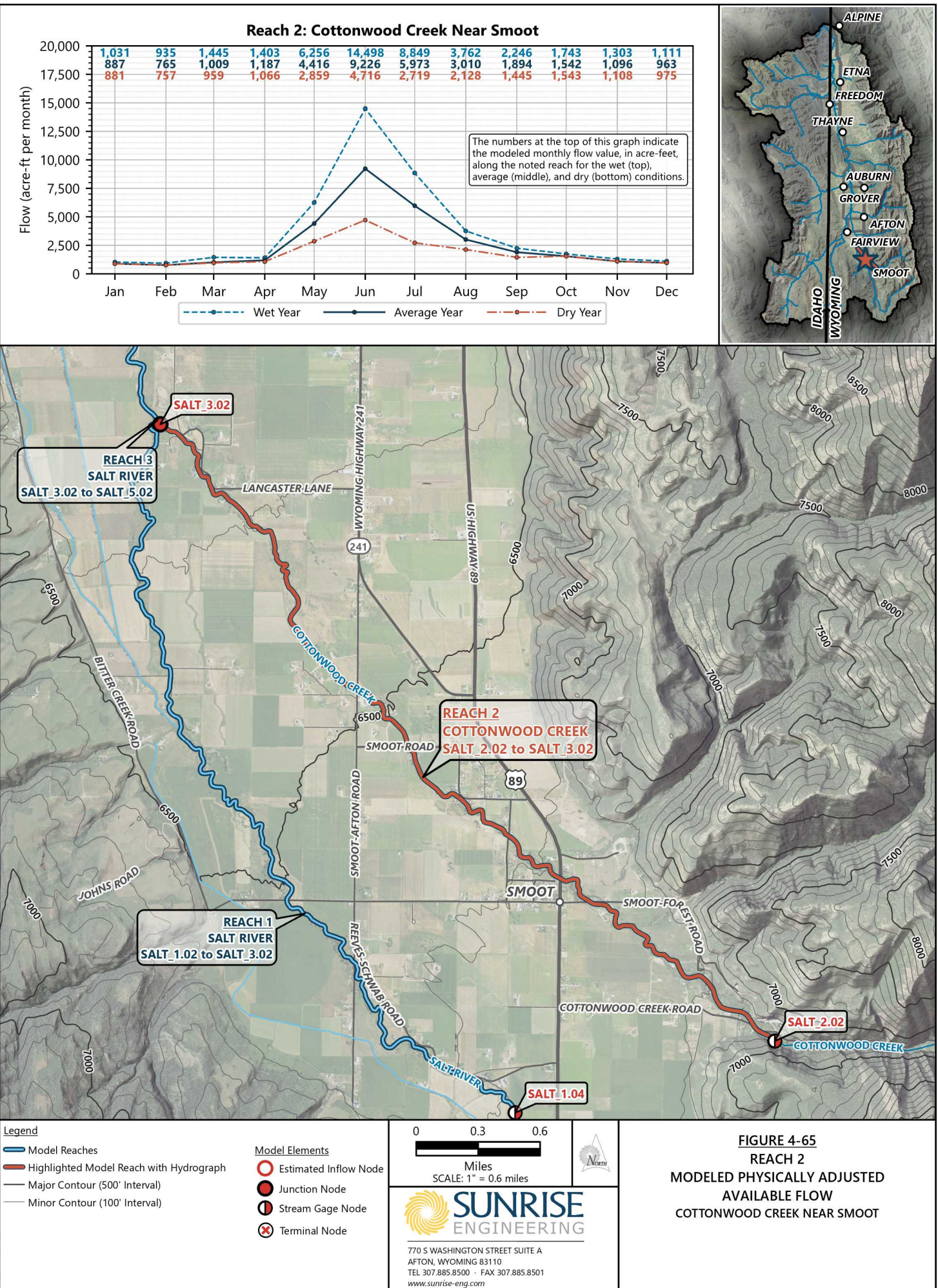
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FIGURE 4-63
ANNUAL MODELED PHYSICALLY
AVAILABLE FLOW
SALT RIVER WATERSHED

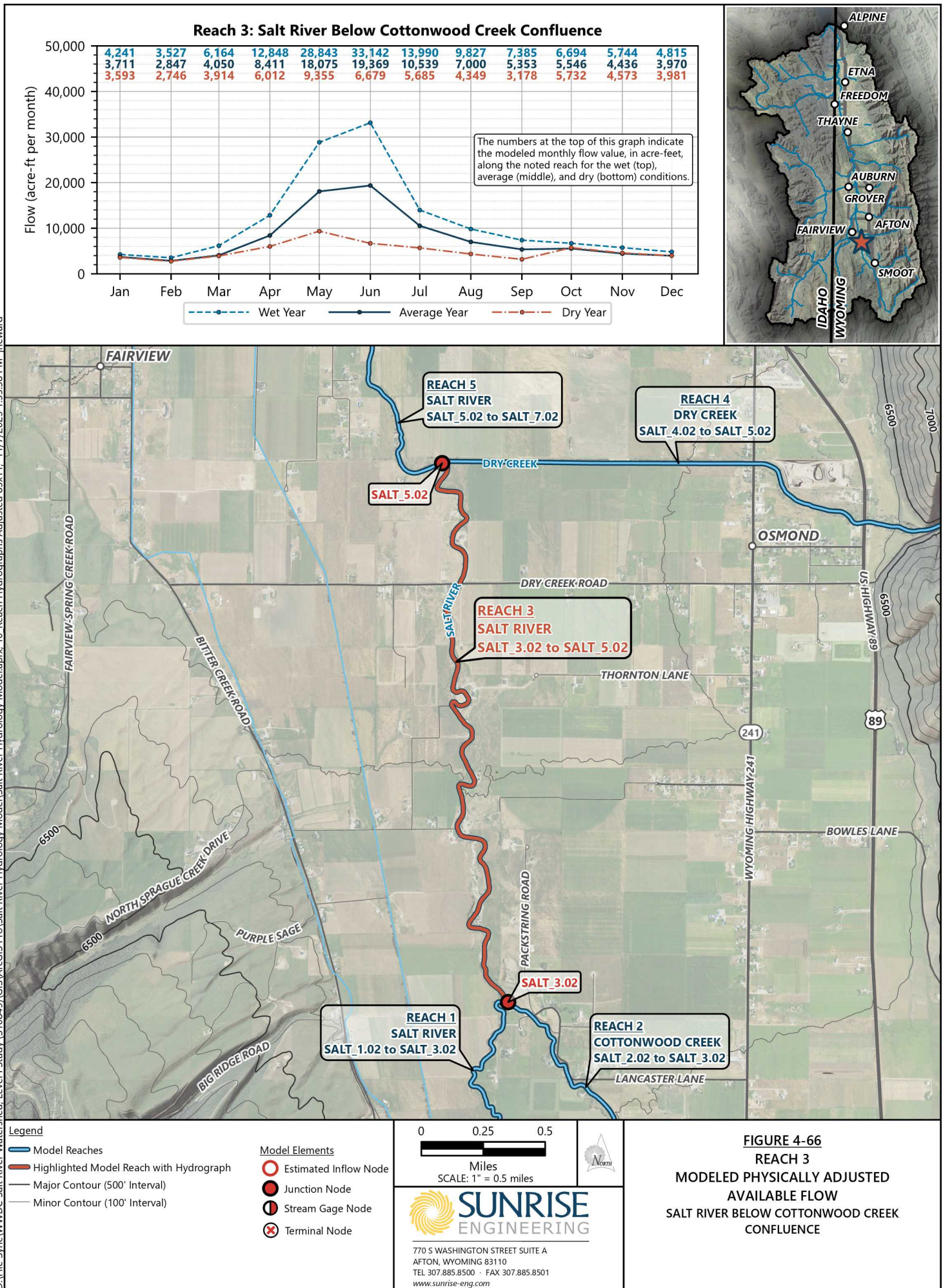
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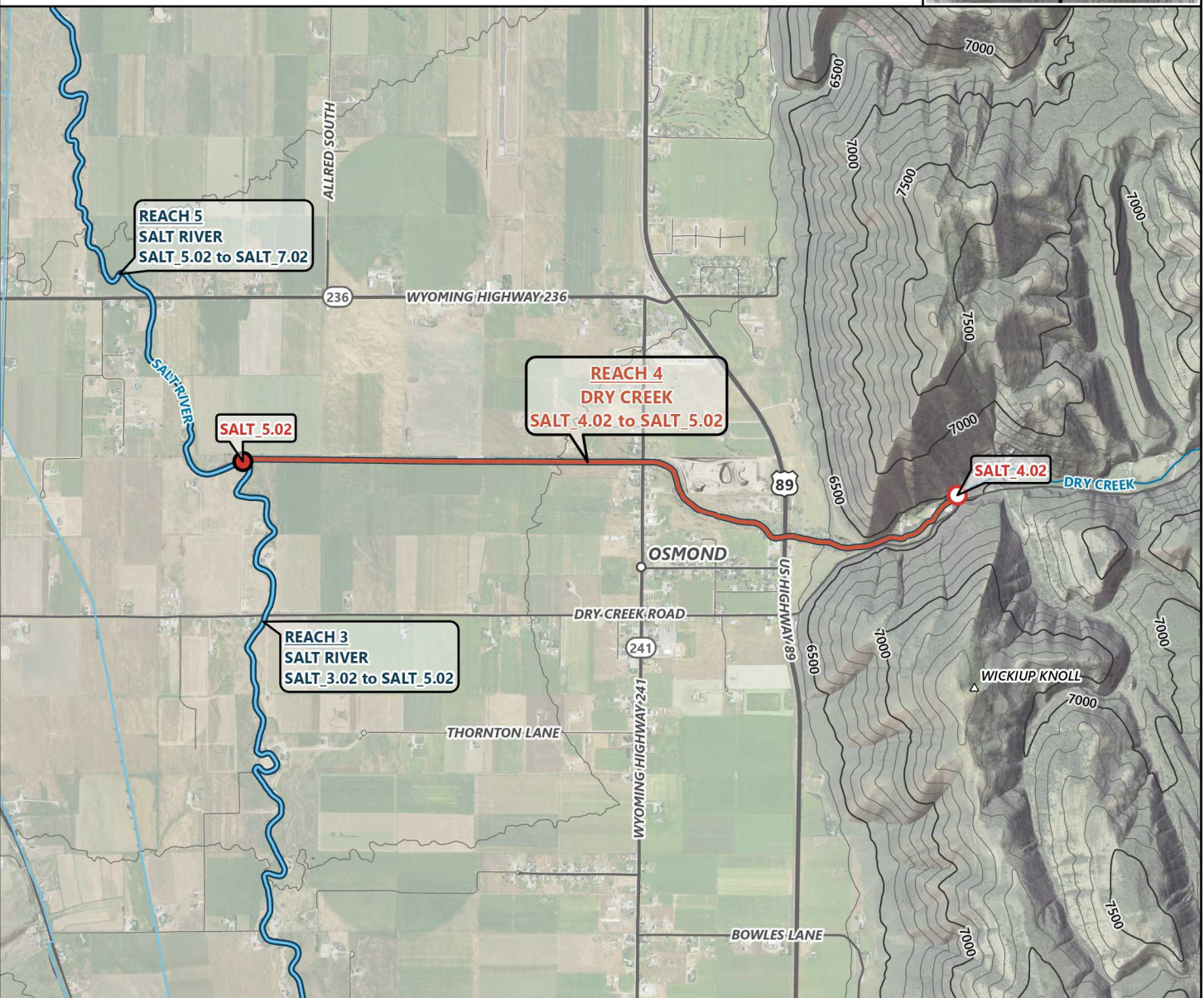
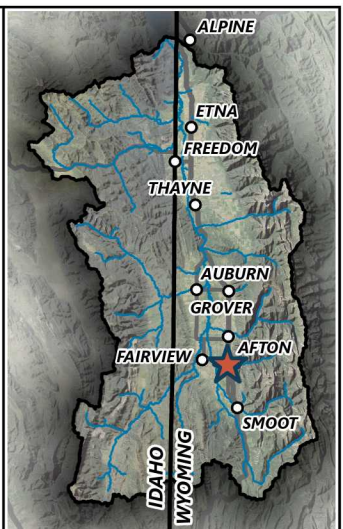
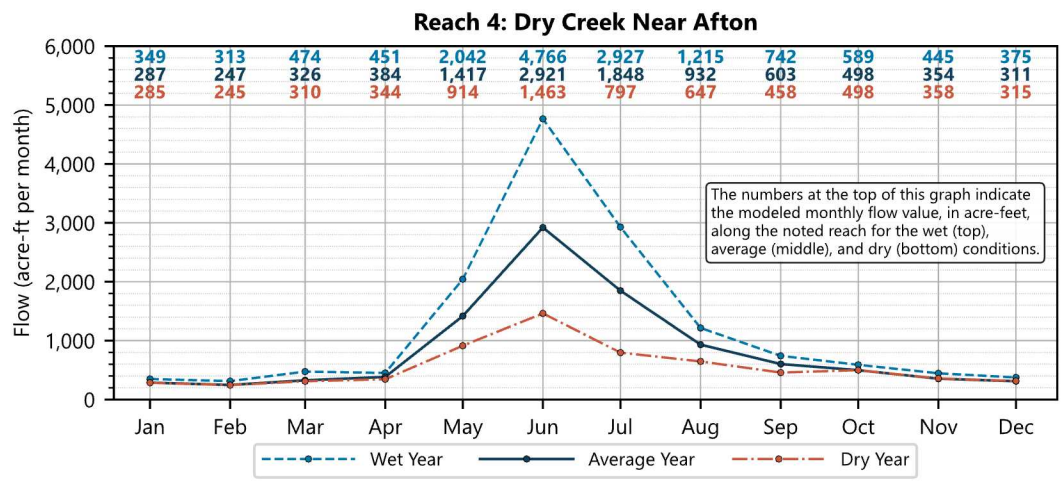
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Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

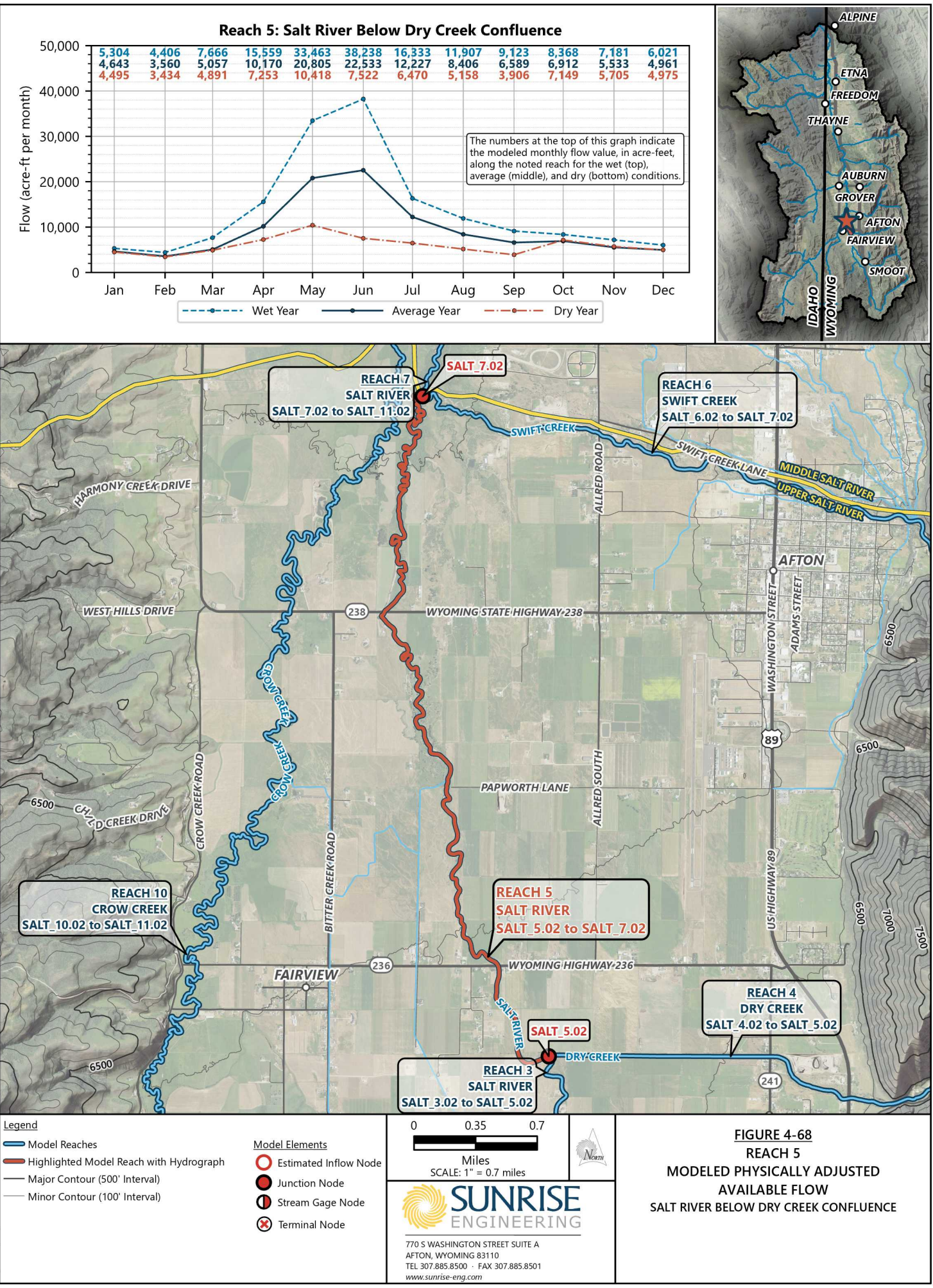
- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

0 0.25 0.5 Miles
SCALE: 1" = 0.5 miles

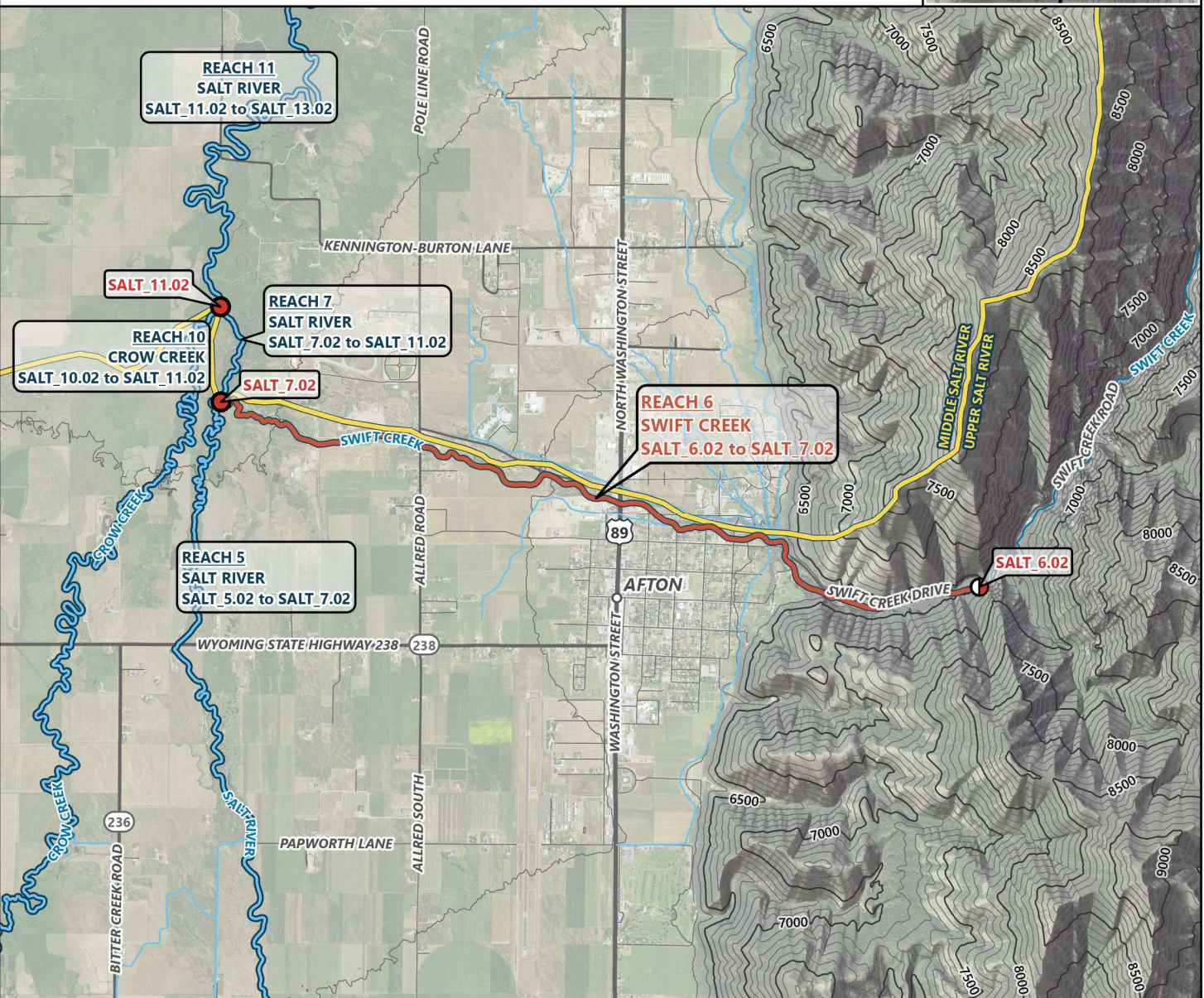
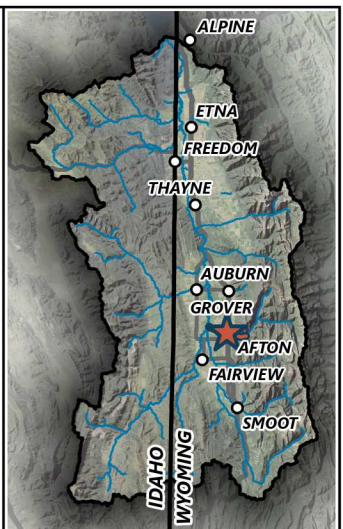
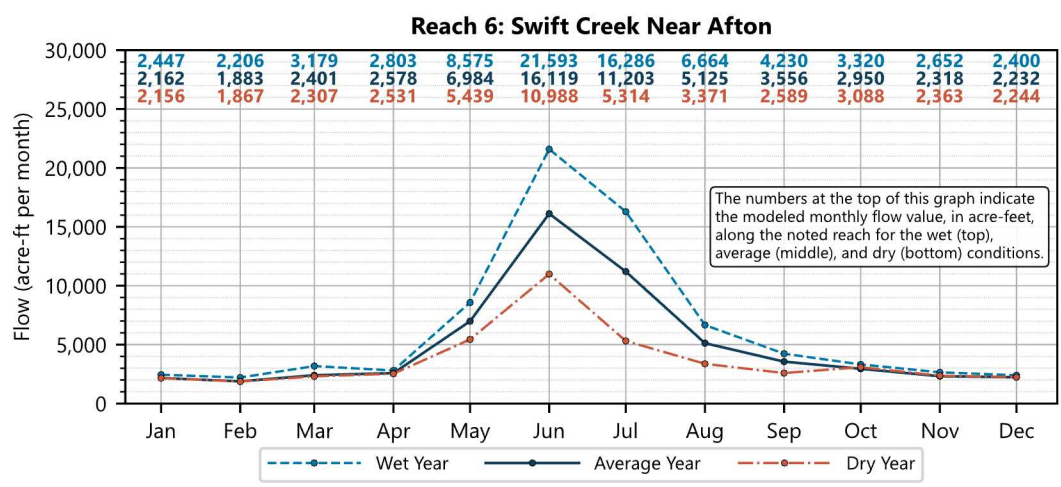
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FIGURE 4-67
REACH 4
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
DRY CREEK NEAR AFTON

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Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

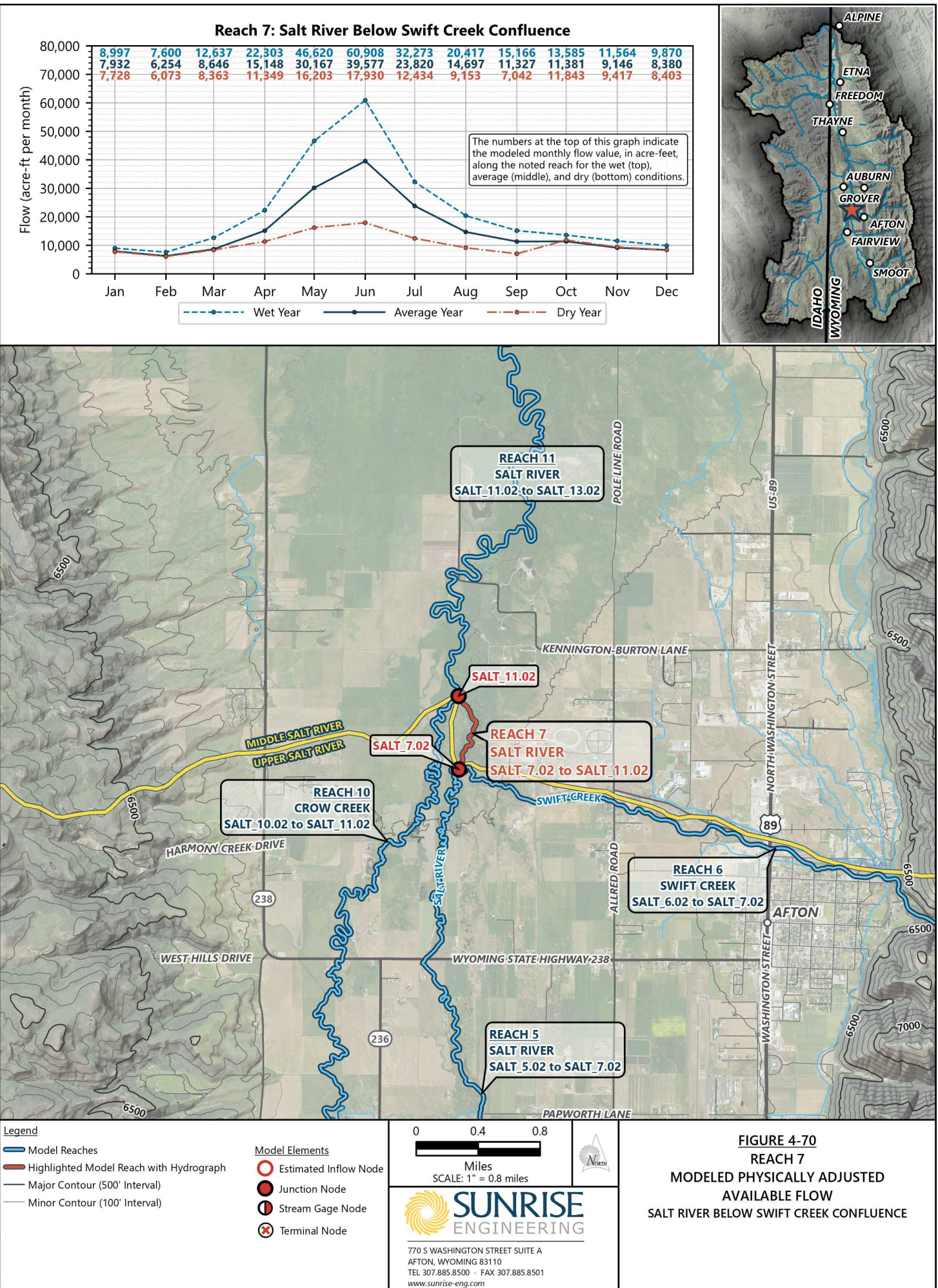
- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

0 0.4 0.8 Miles
SCALE: 1" = 0.8 miles

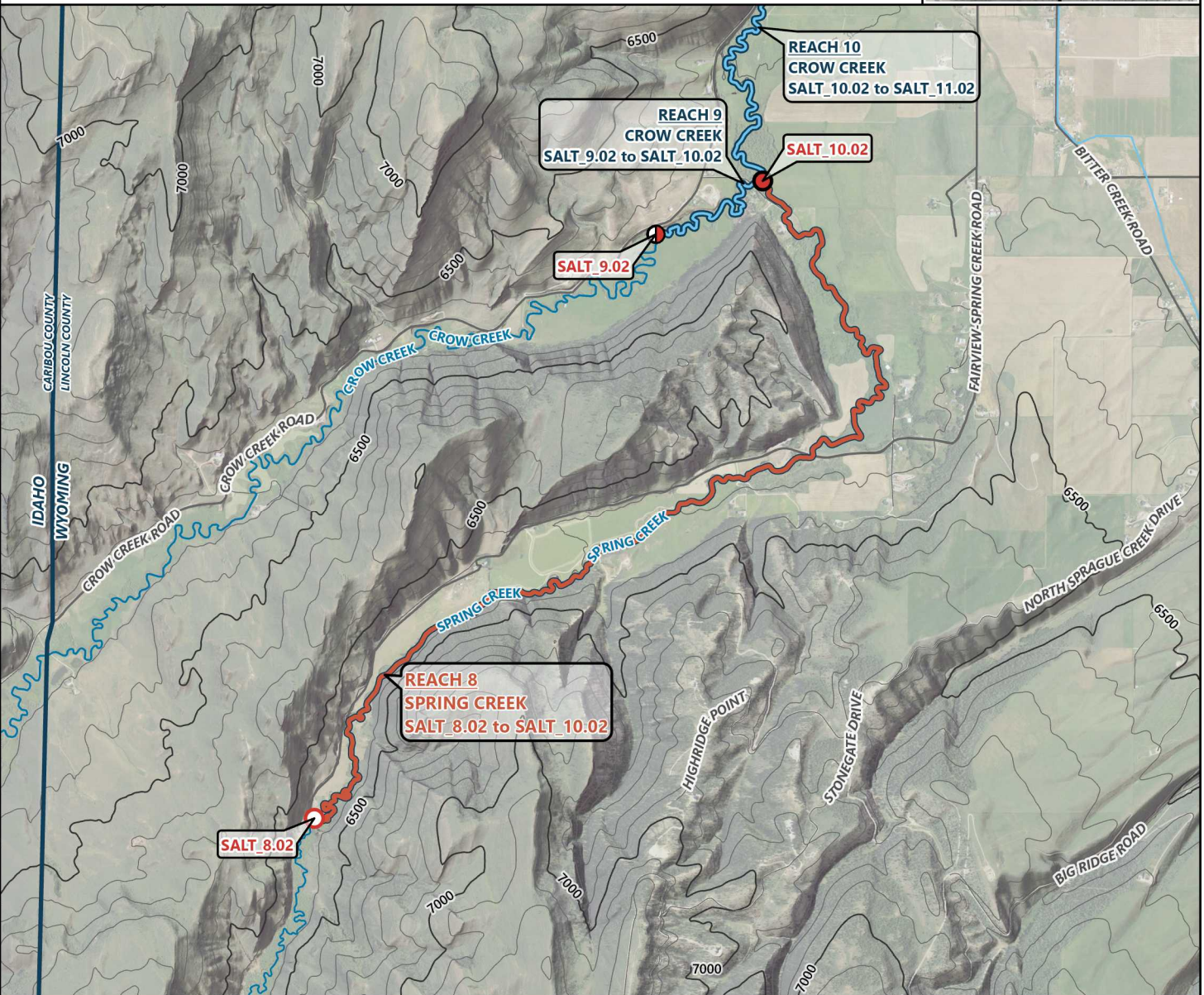
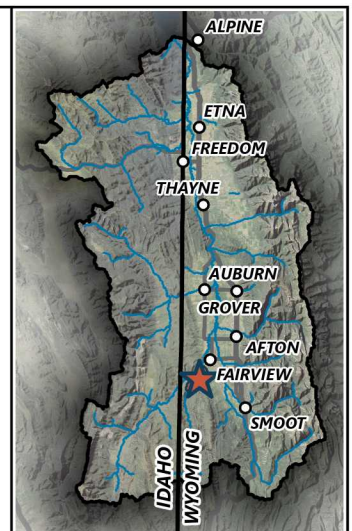
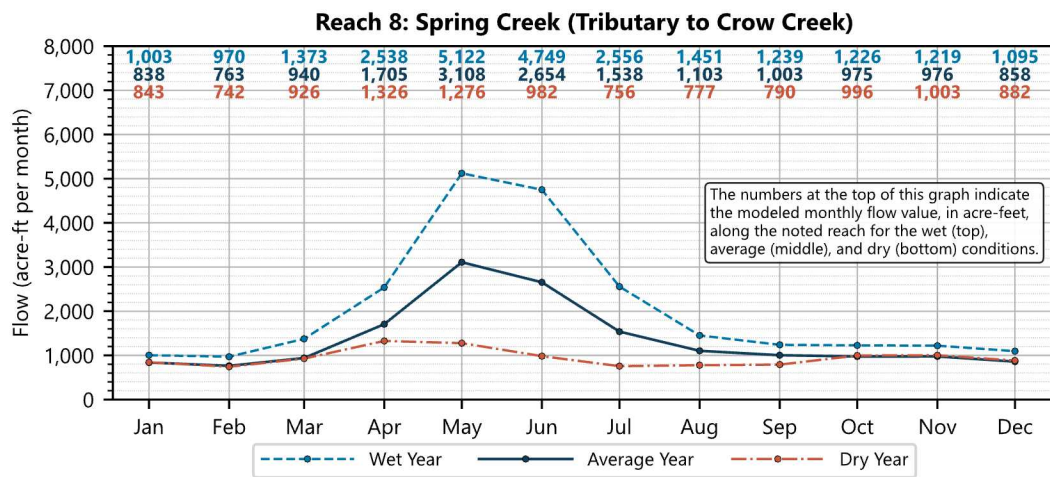
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FIGURE 4-69
REACH 6
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
SWIFT CREEK NEAR AFTON

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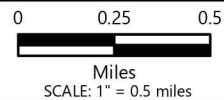


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

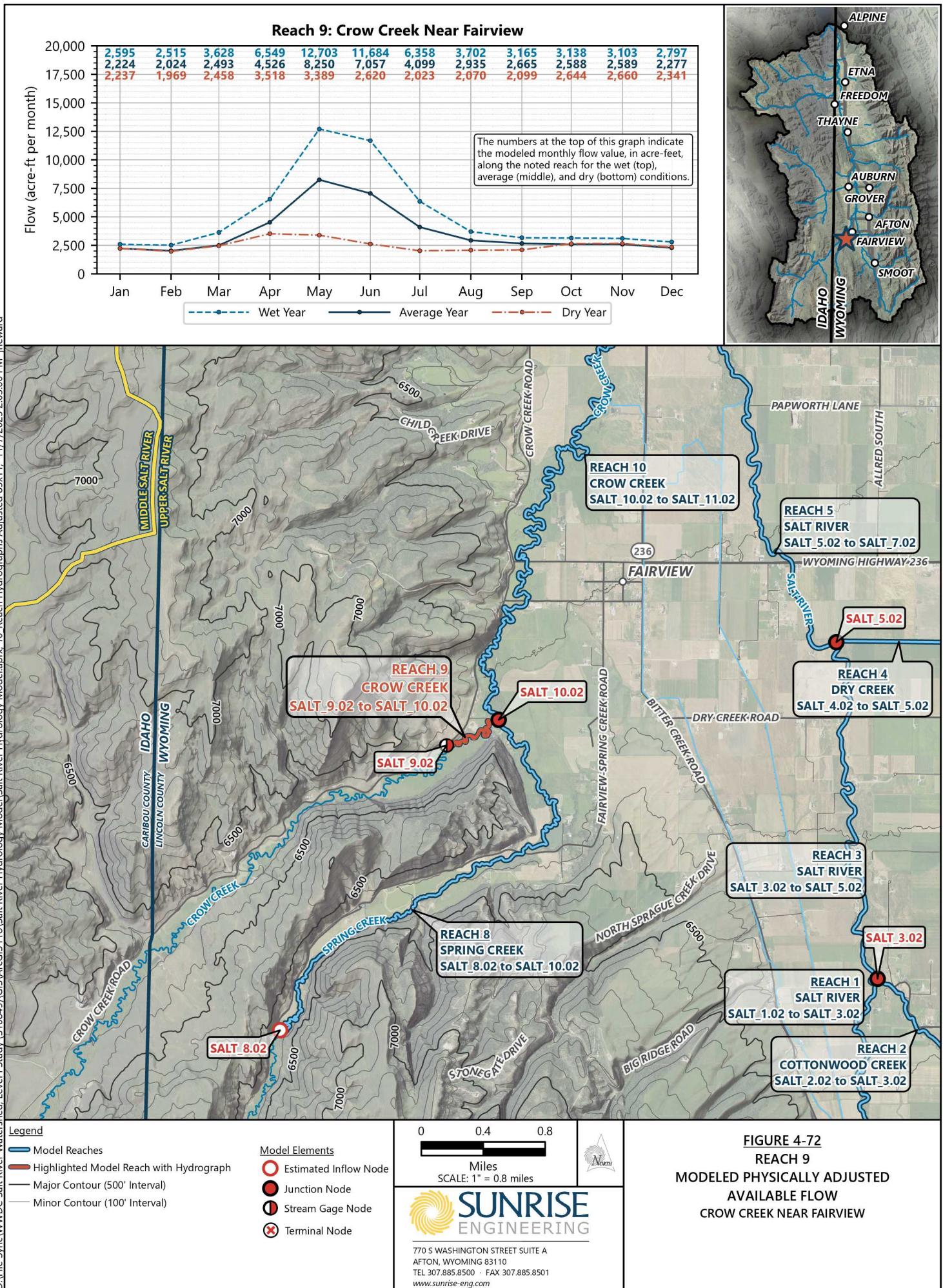


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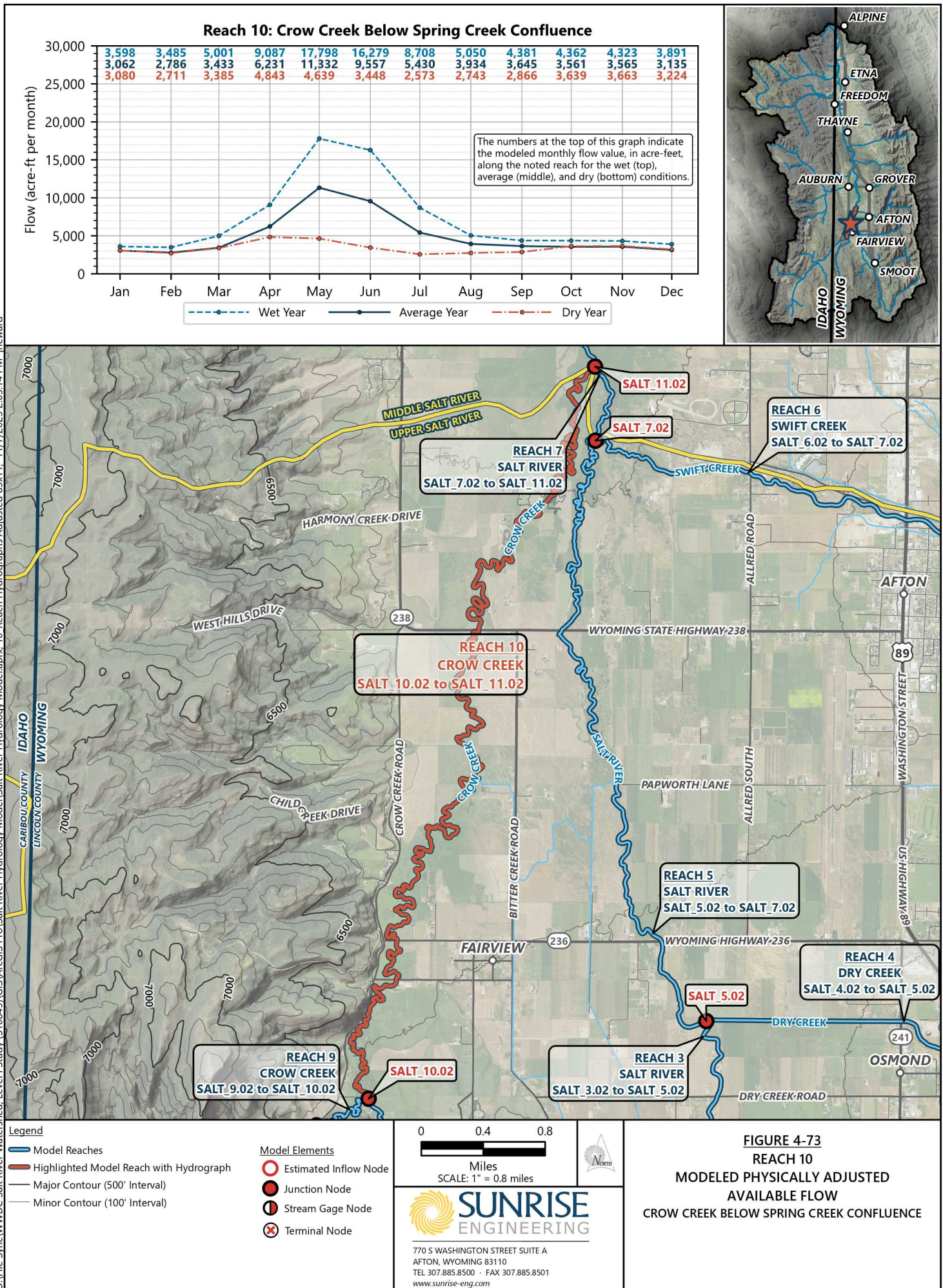


FIGURE 4-71
REACH 8
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
SPRING CREEK (TRIBUTARY TO CROW CREEK)

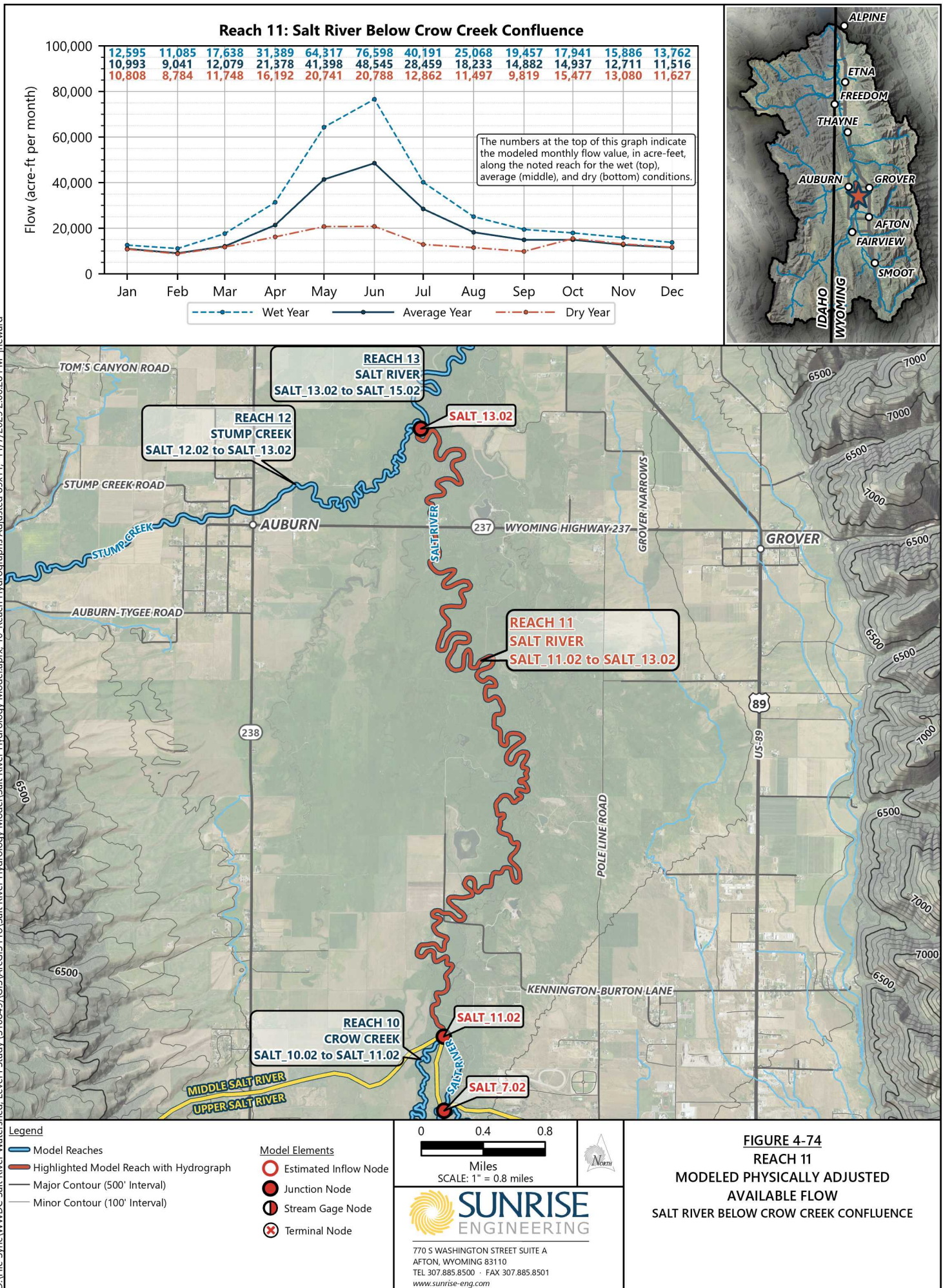
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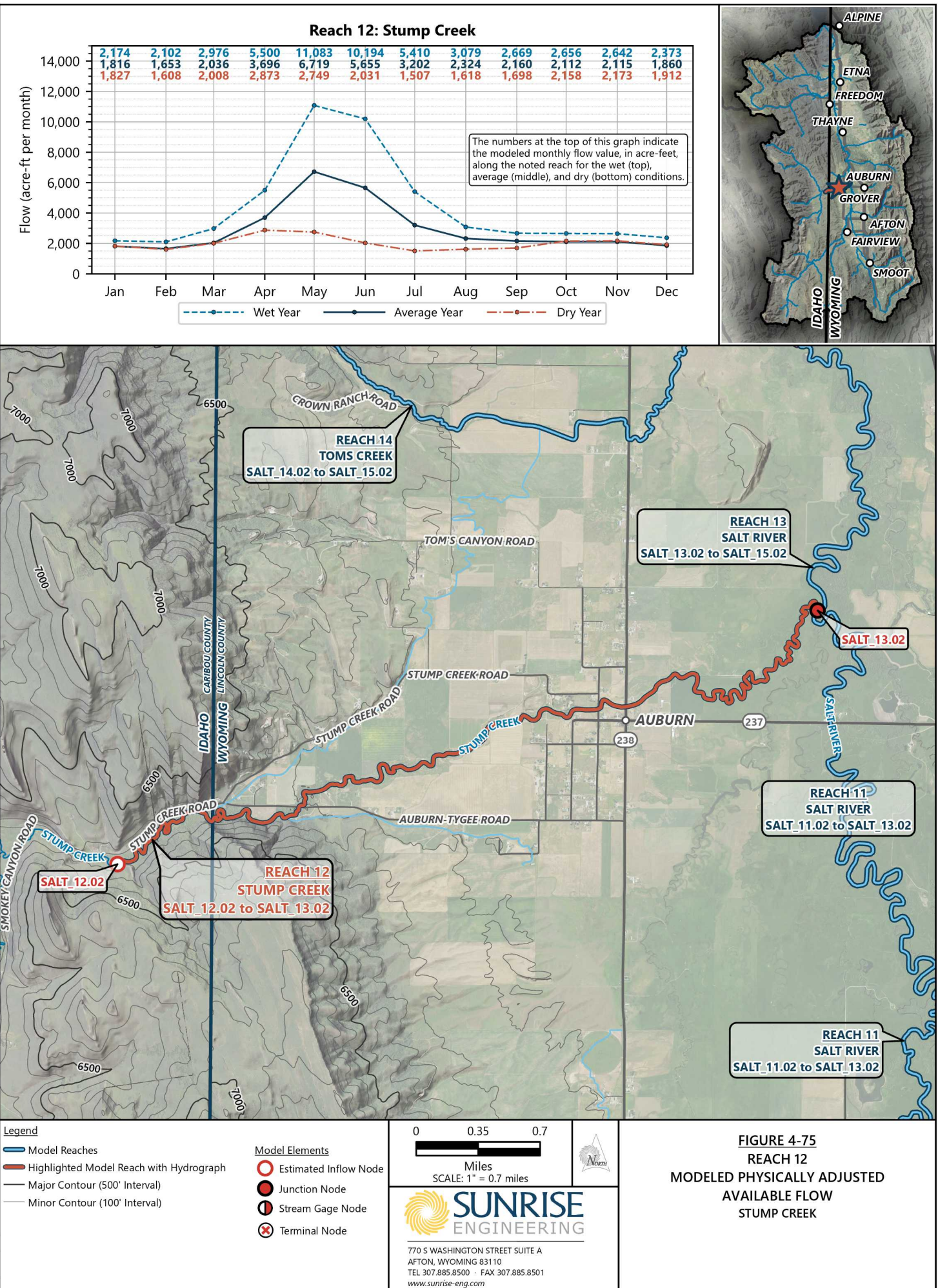
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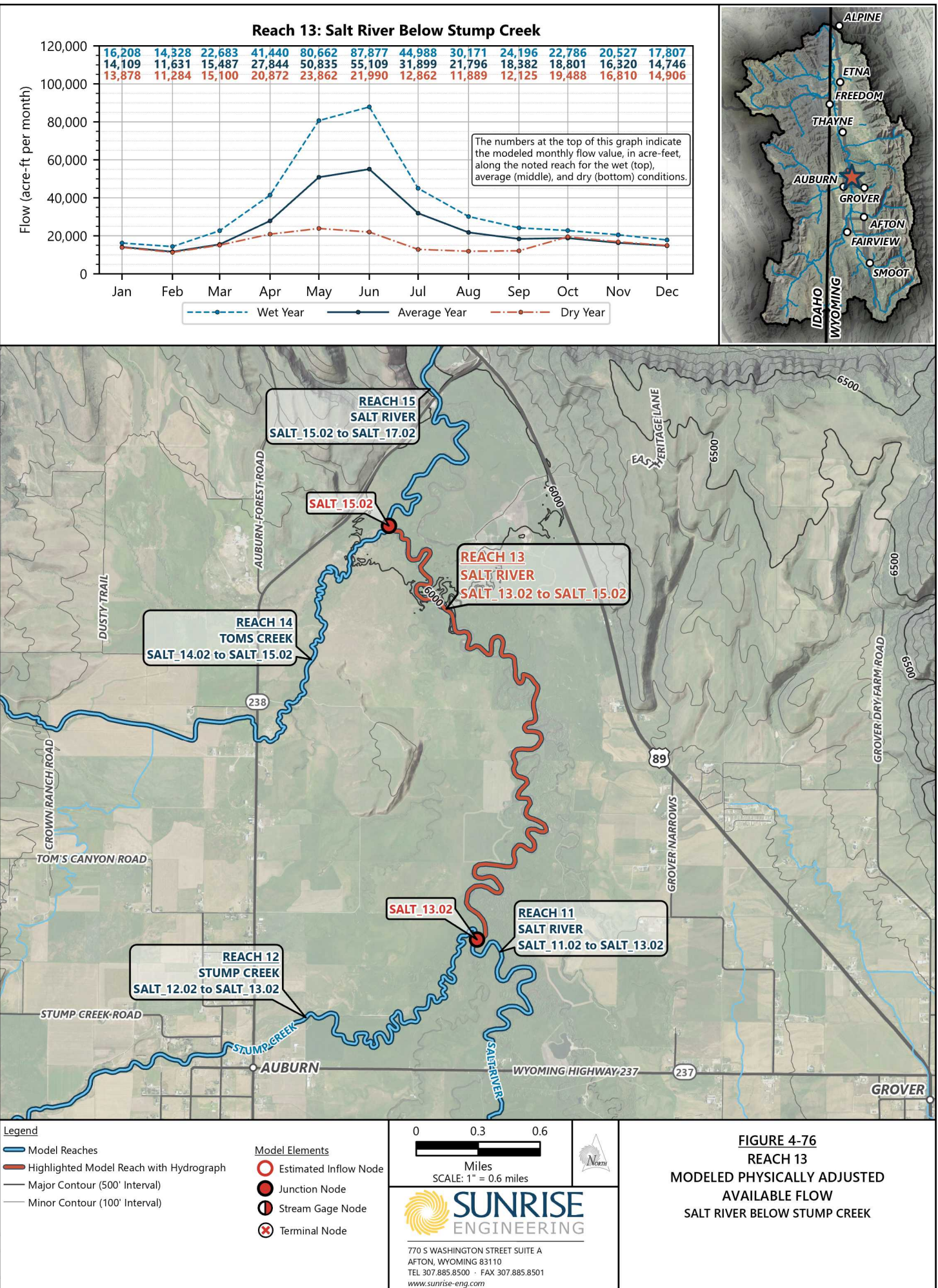
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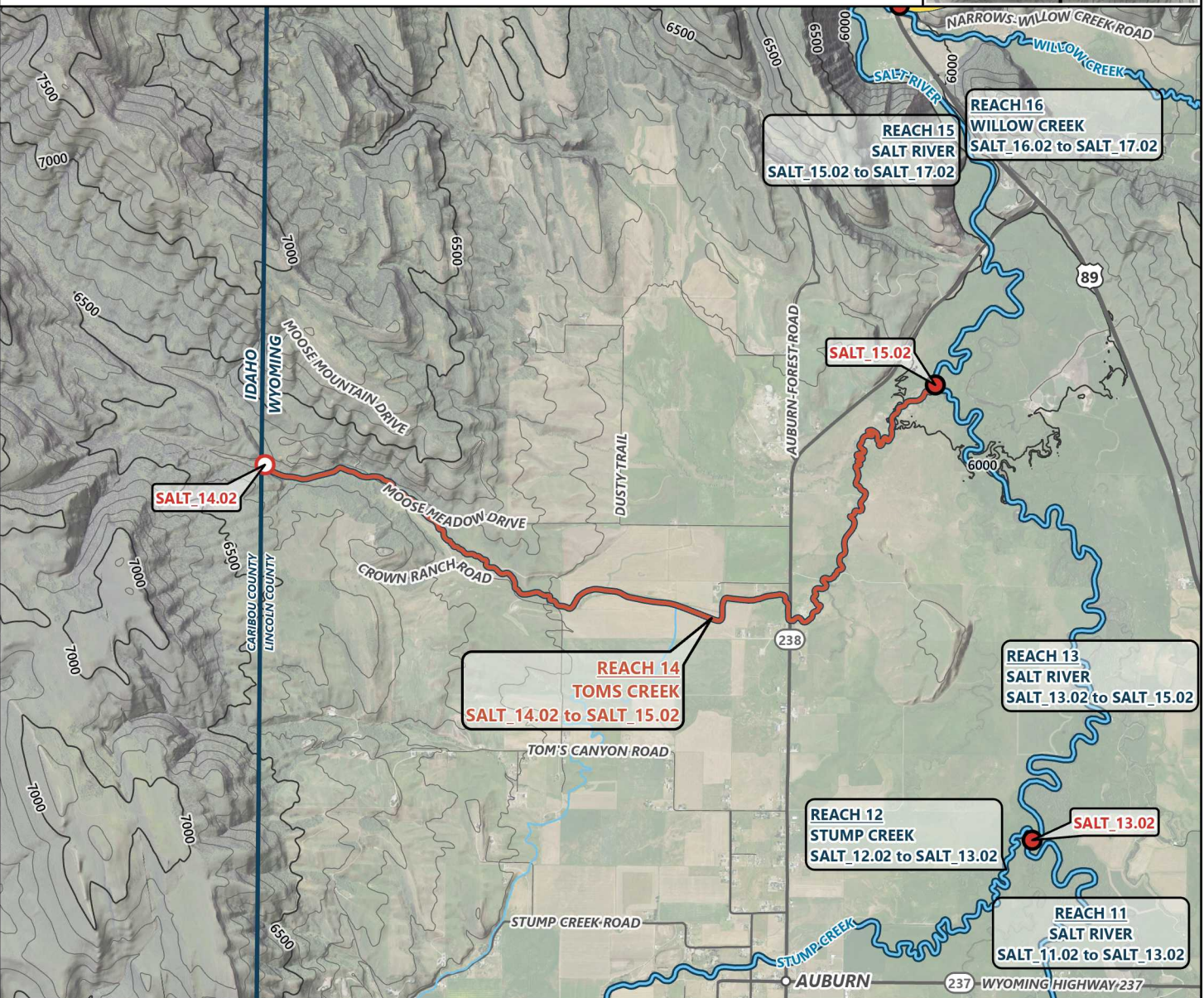
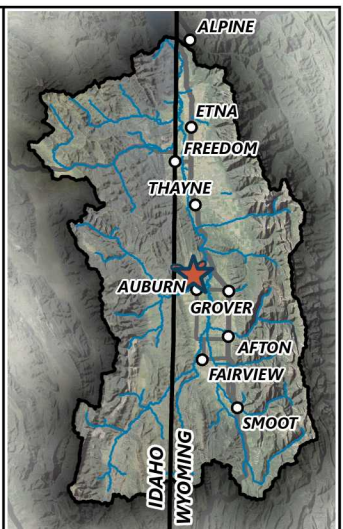
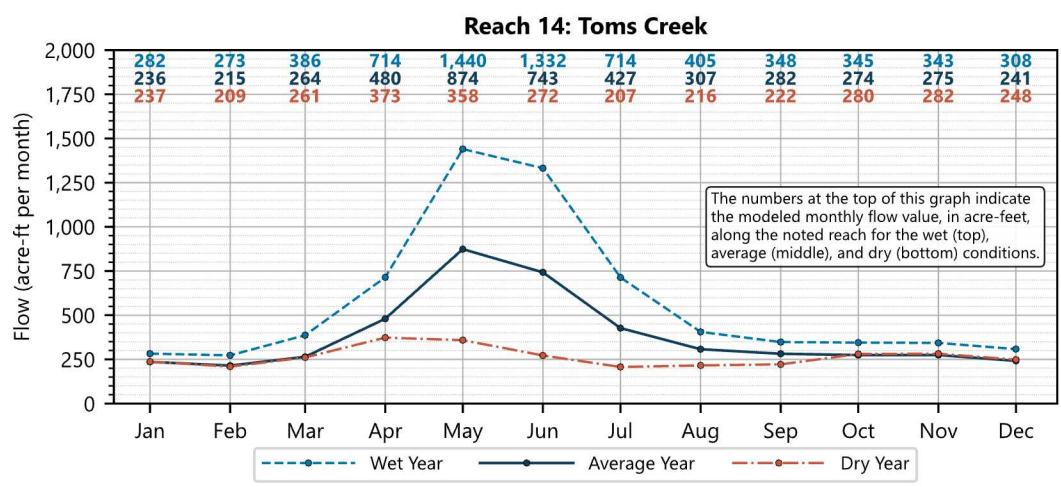
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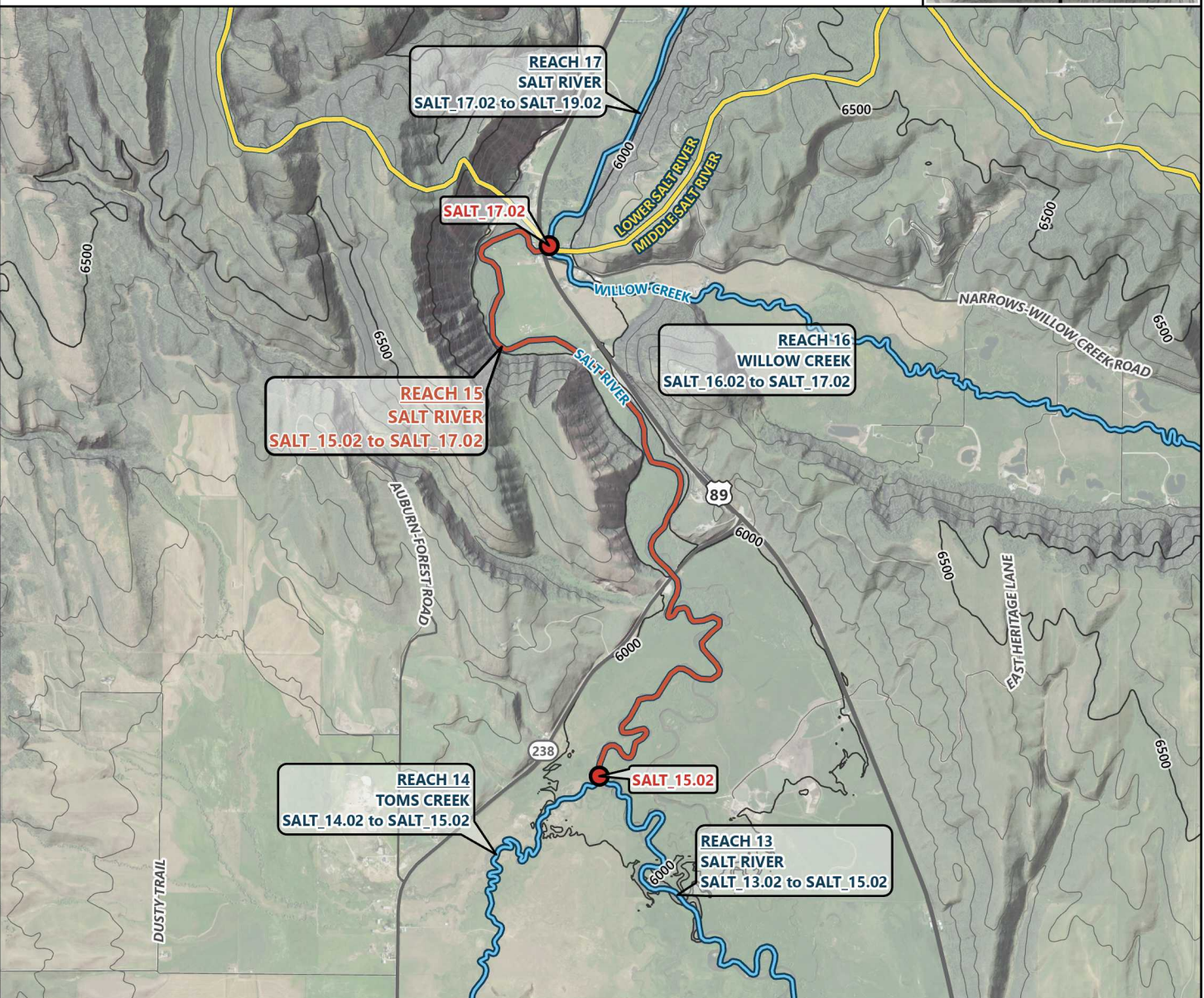
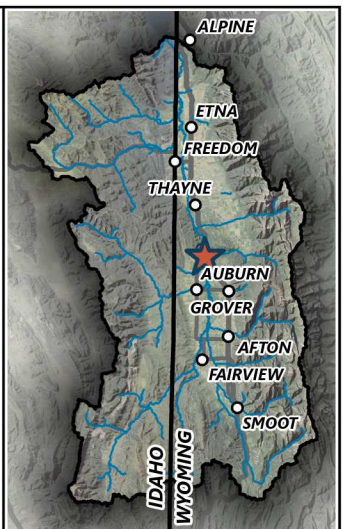
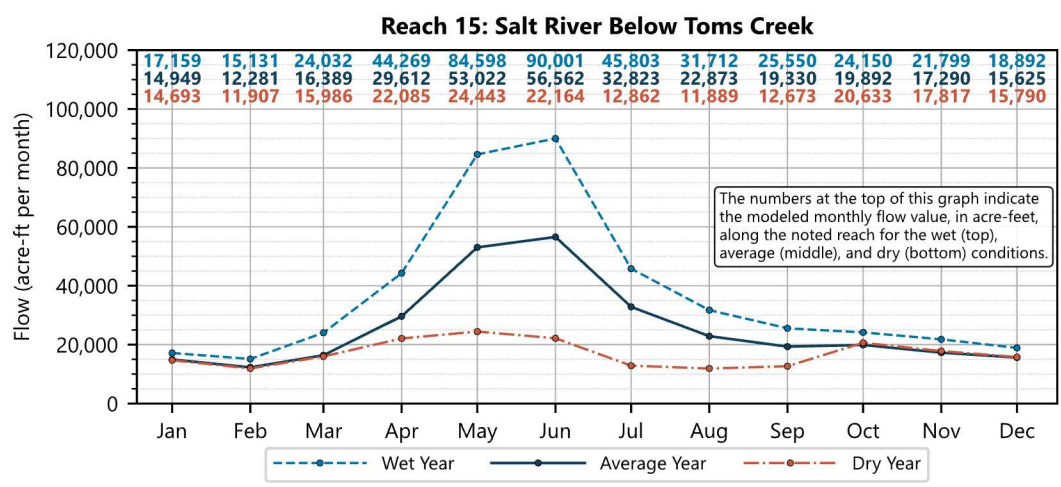
- Legend**
- Model Reaches
 - Highlighted Model Reach with Hydrograph
 - Major Contour (500' Interval)
 - Minor Contour (100' Interval)
- Model Elements**
- Estimated Inflow Node
 - Junction Node
 - Stream Gage Node
 - Terminal Node

0 0.35 0.7
Miles
SCALE: 1" = 0.7 miles

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FIGURE 4-77
REACH 14
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
TOMS CREEK

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Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

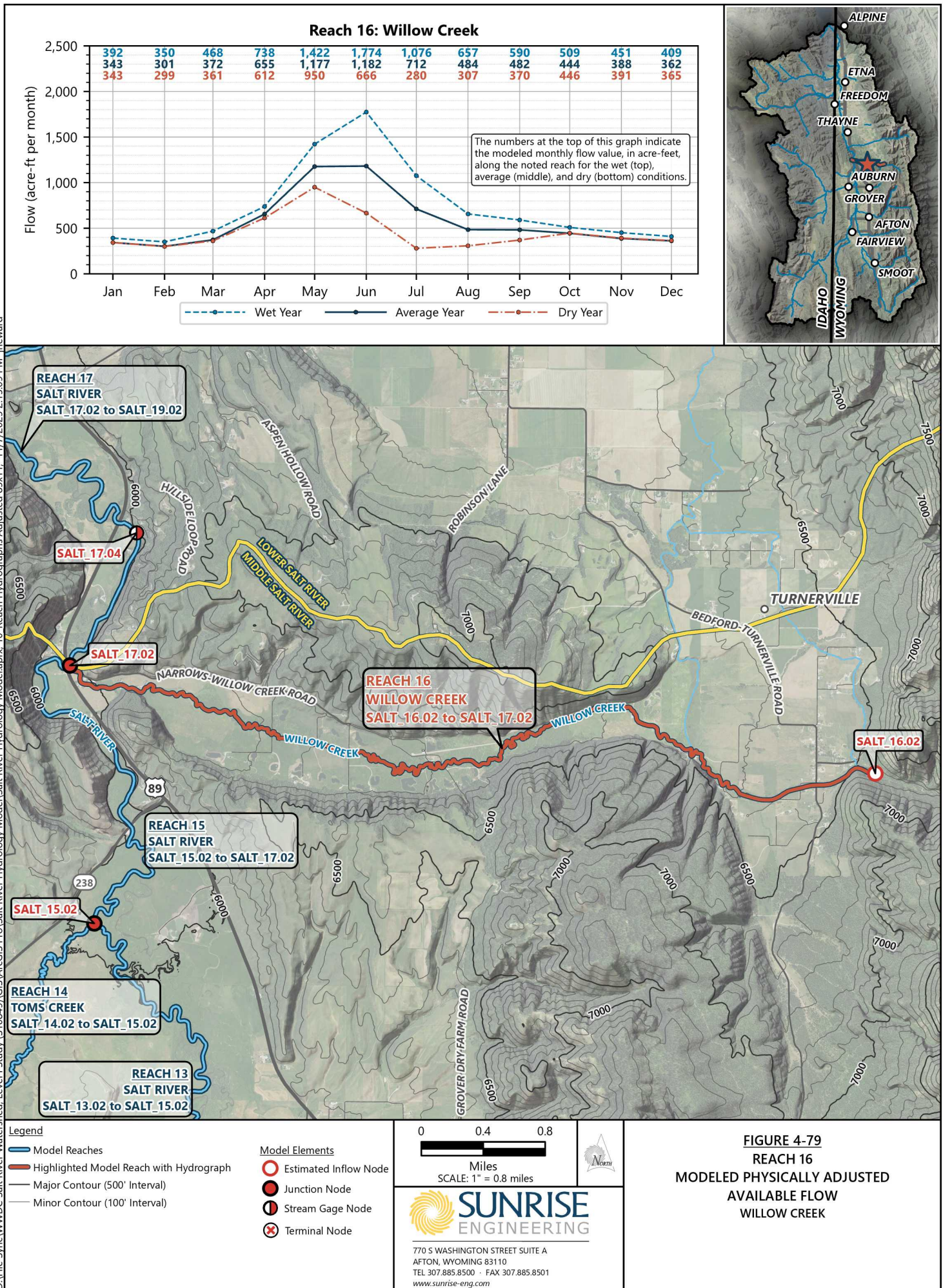
- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

0 0.25 0.5 Miles
SCALE: 1" = 0.5 miles

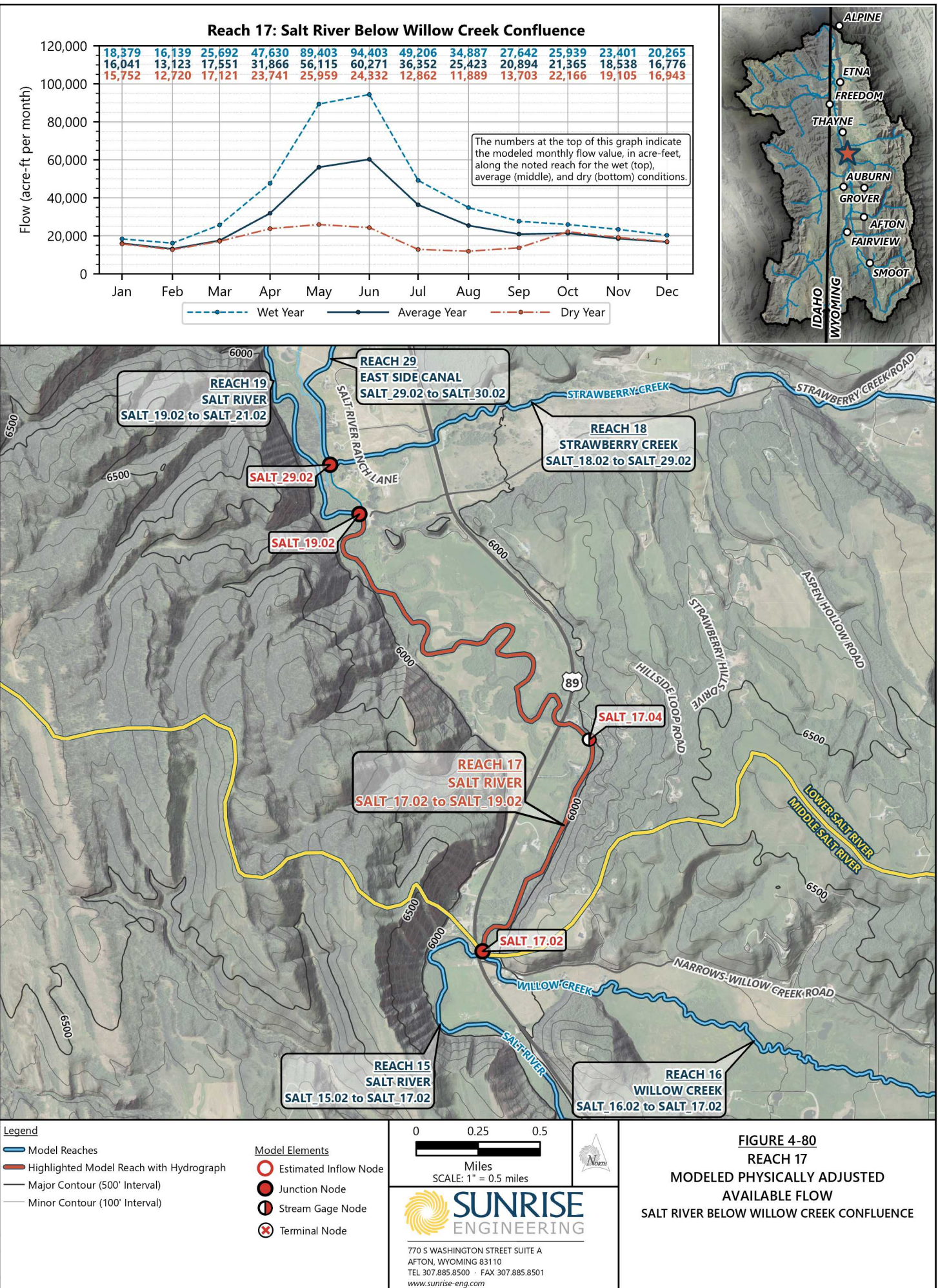
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FIGURE 4-78
REACH 15
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
SALT RIVER BELOW TOMS CREEK

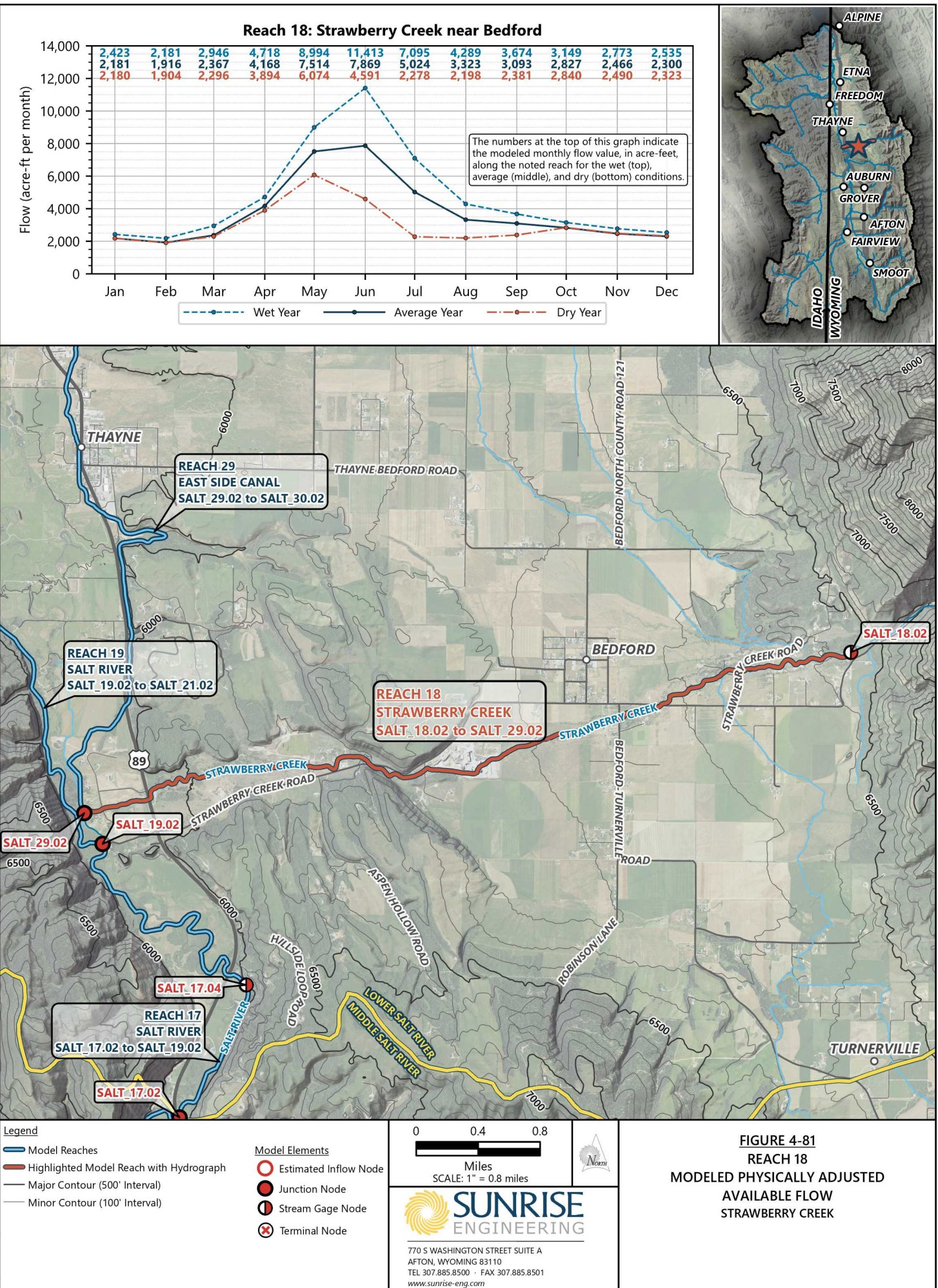
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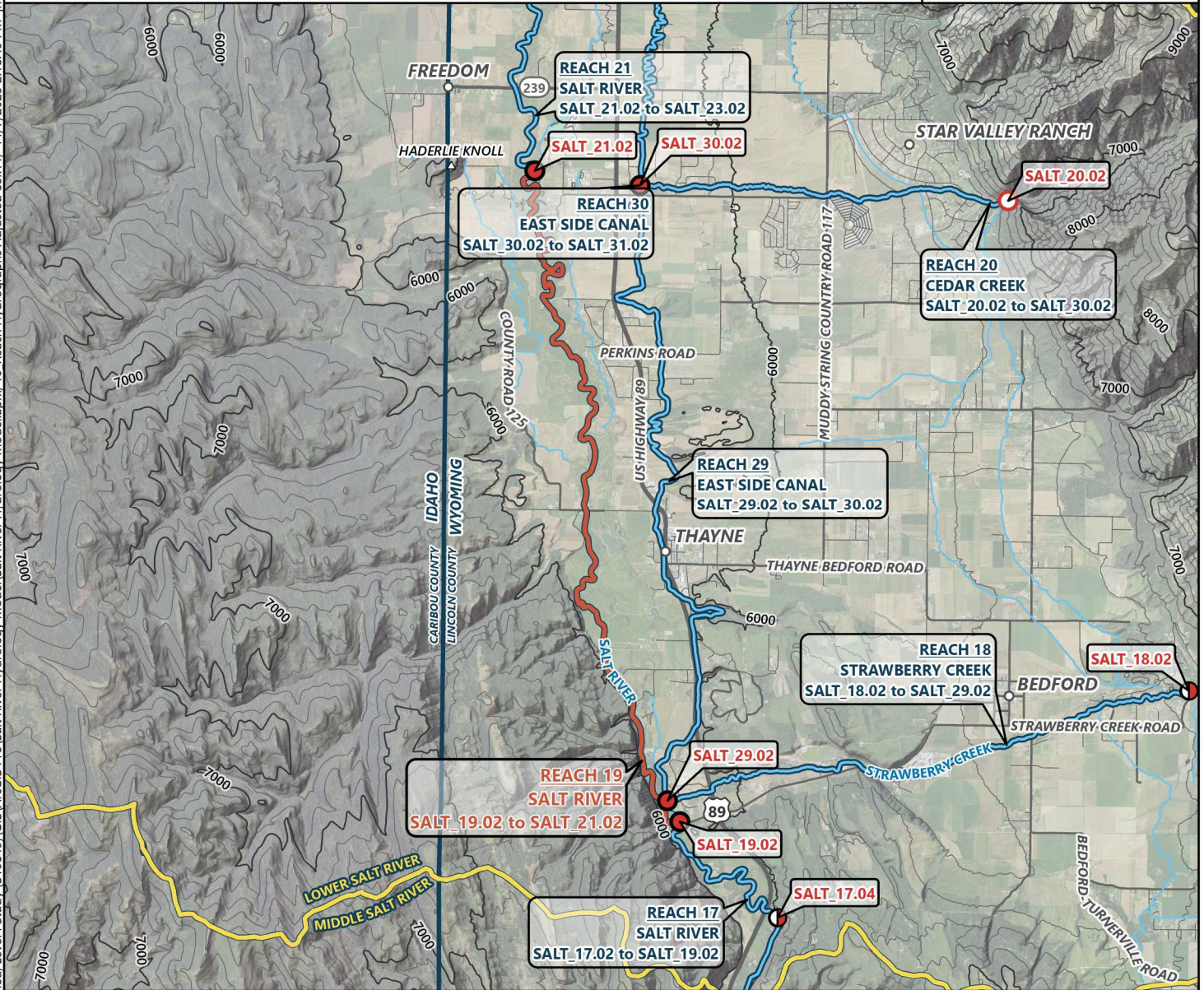
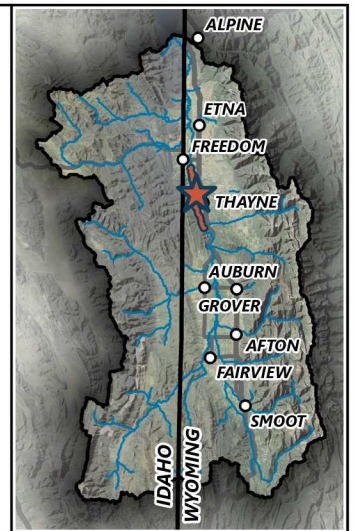
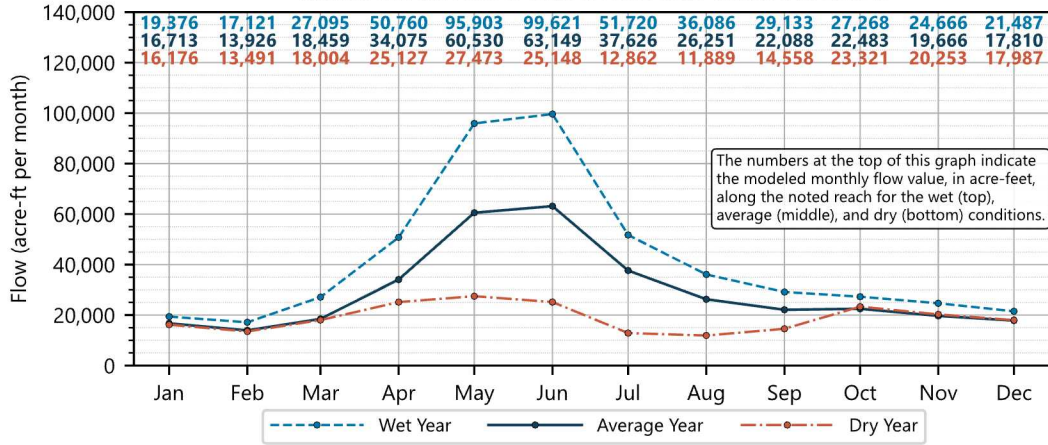
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Reach 19: Salt River below East Side Canal Diversion

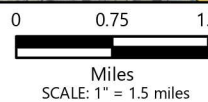


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (1000' Interval)
- Minor Contour (200' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



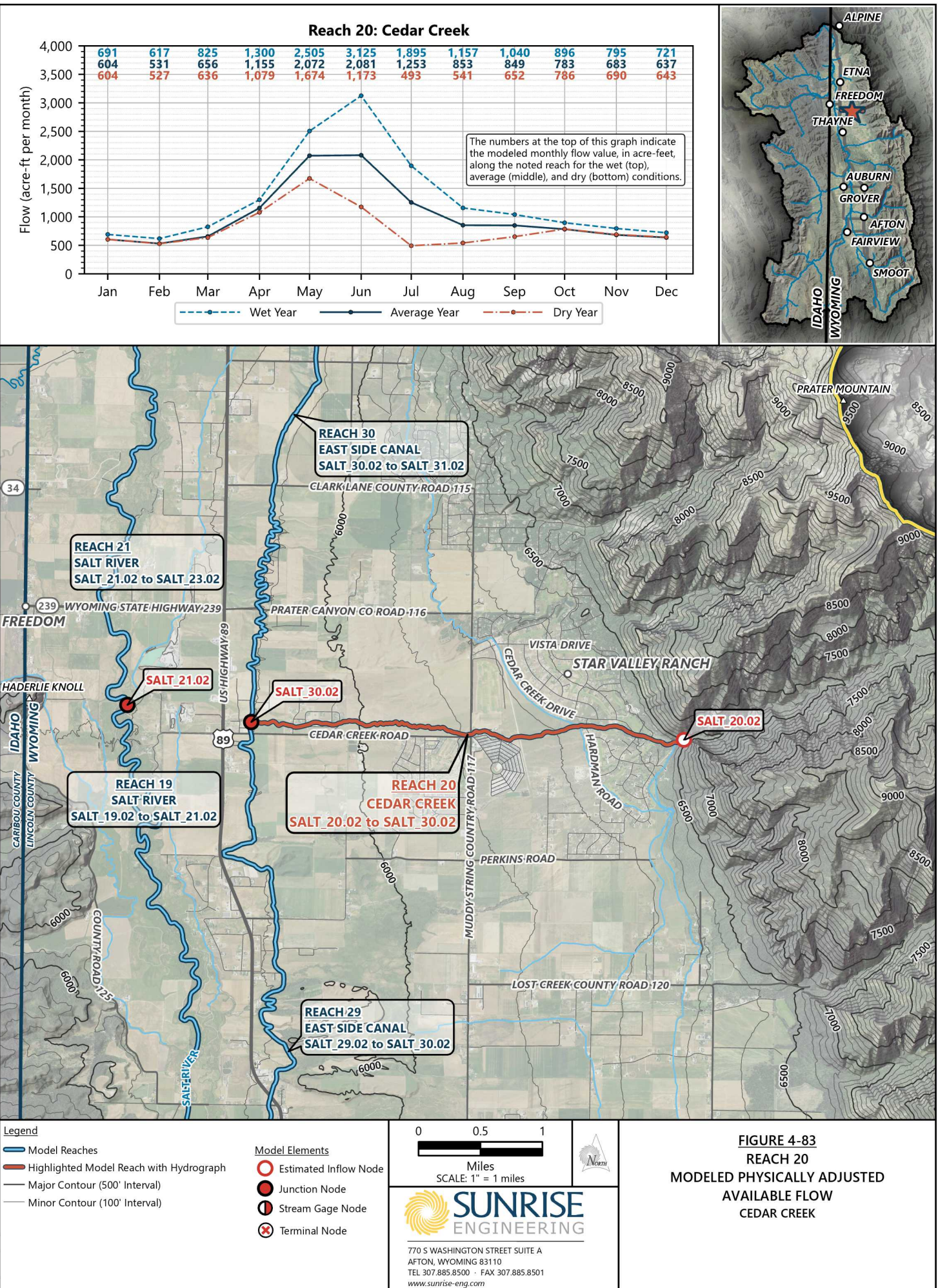
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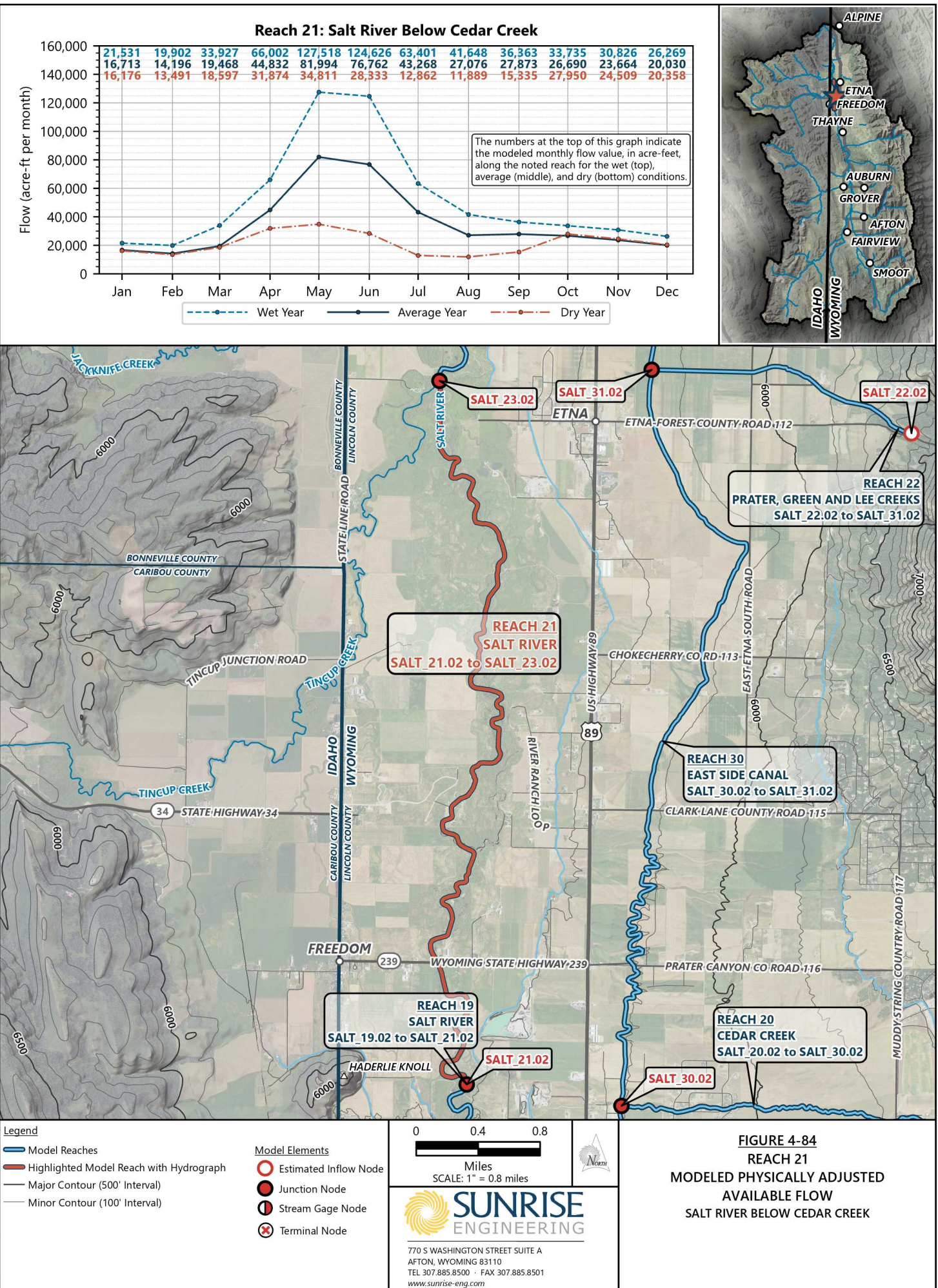
FIGURE 4-82

REACH 19
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
SALT RIVER BELOW EAST SIDE CANAL DIVERSION

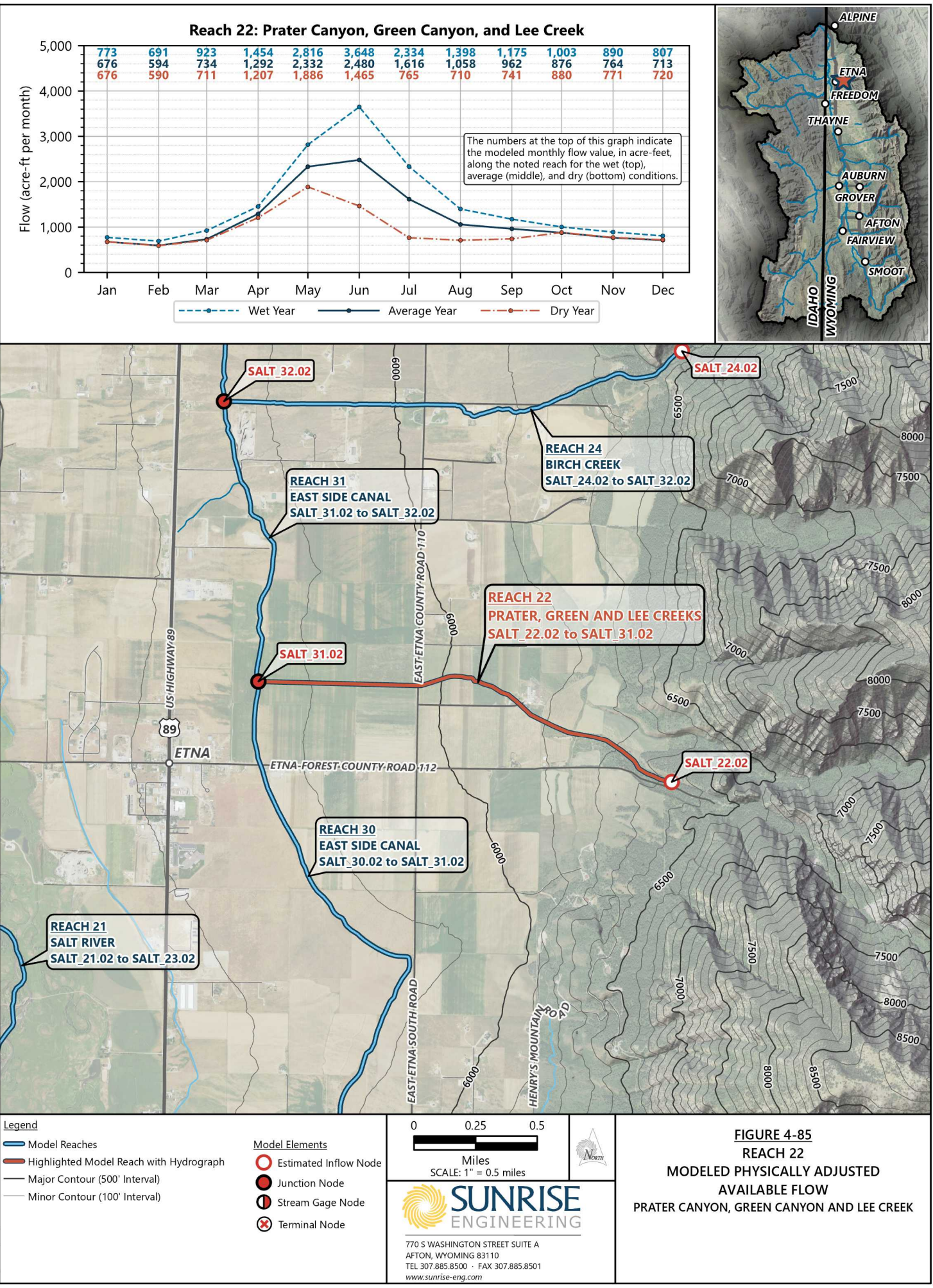
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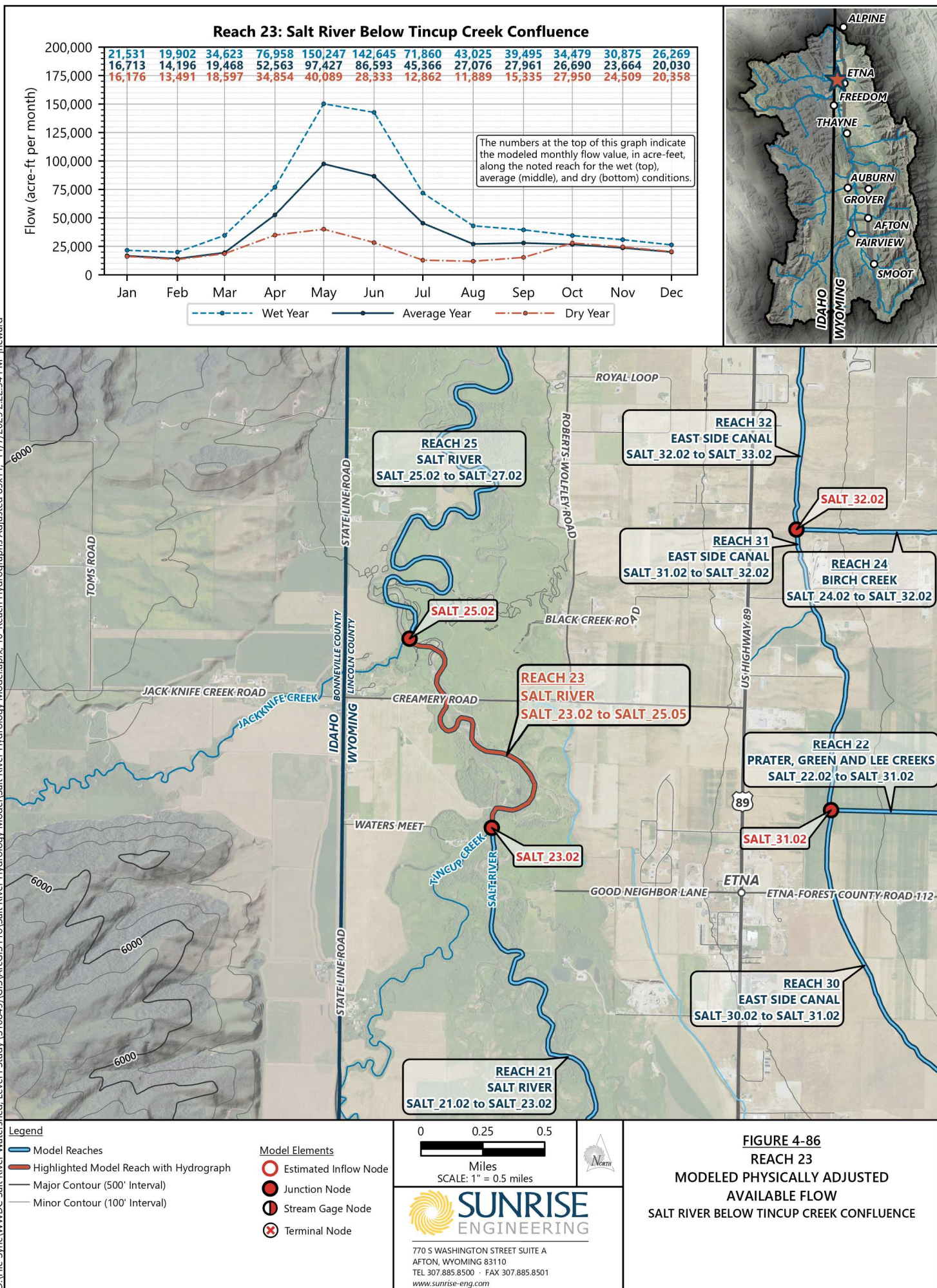
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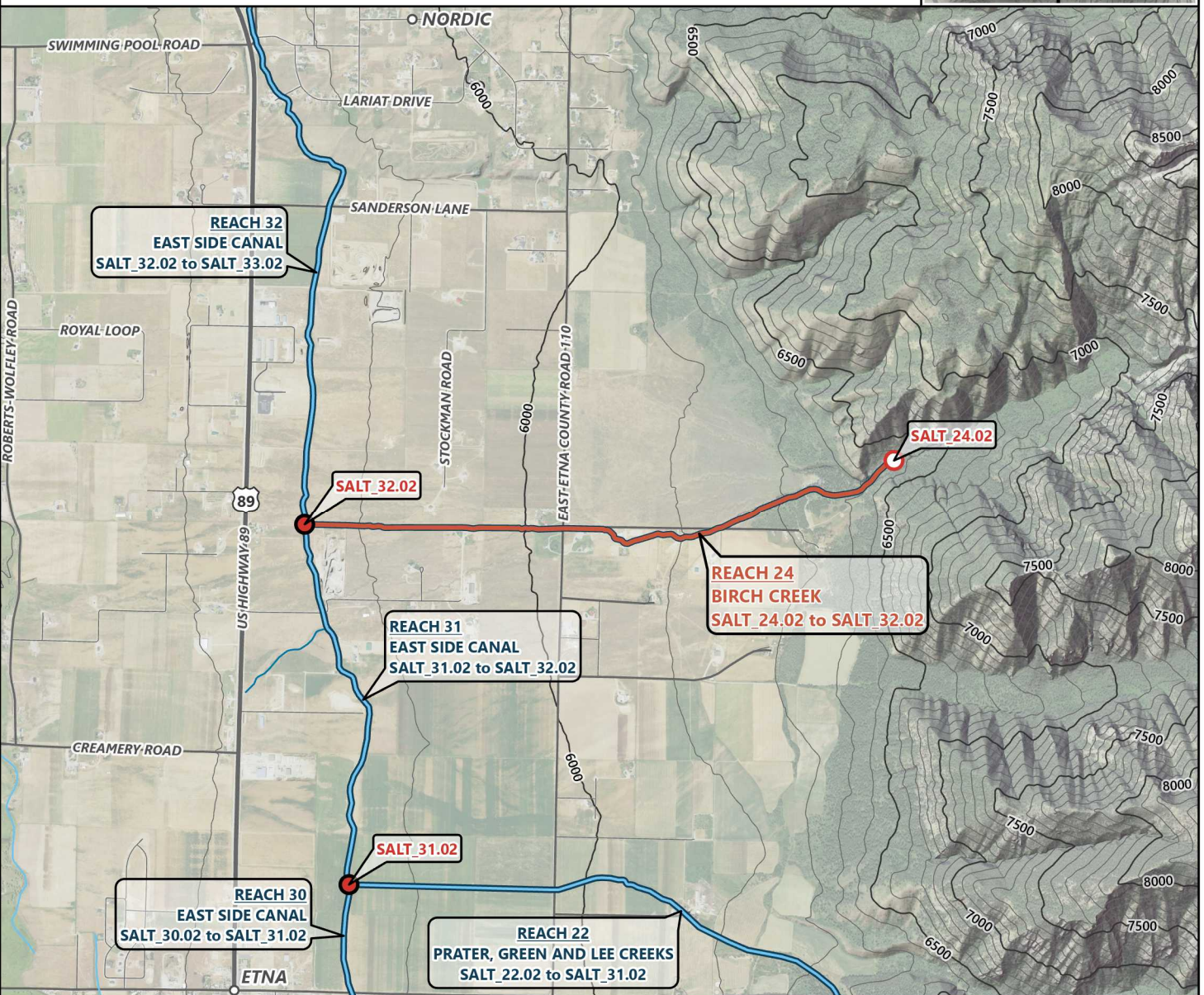
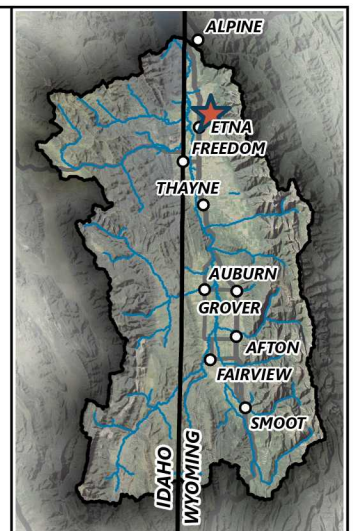
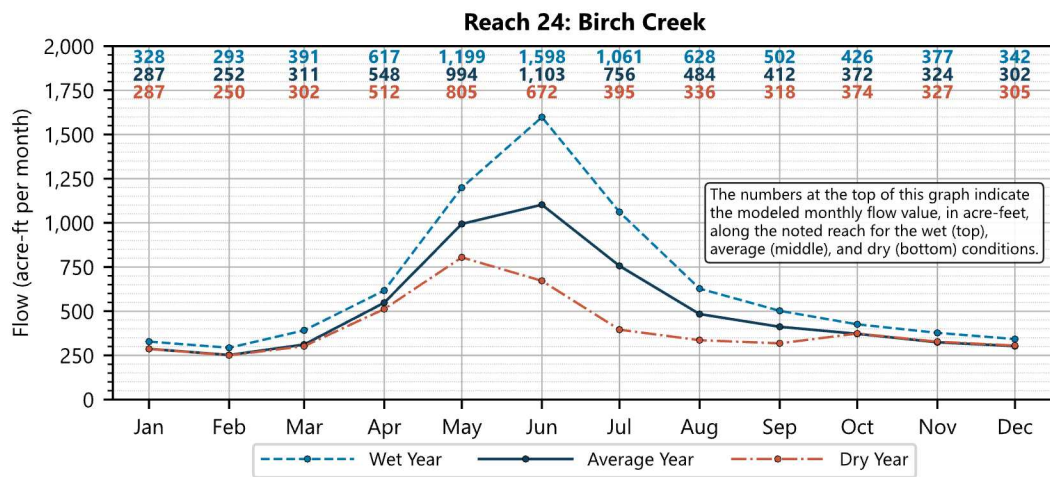
D:\File Sync\WWDC Salt River Watershed_Level I Study (S10849)\GIS\ArcGIS Pro\Salt River Hydrology Model.aprx 10 Reach Hydrographs Adjusted 85x11, 11/7/2025 2:22:14 PM iheward



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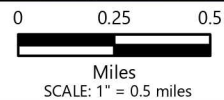


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

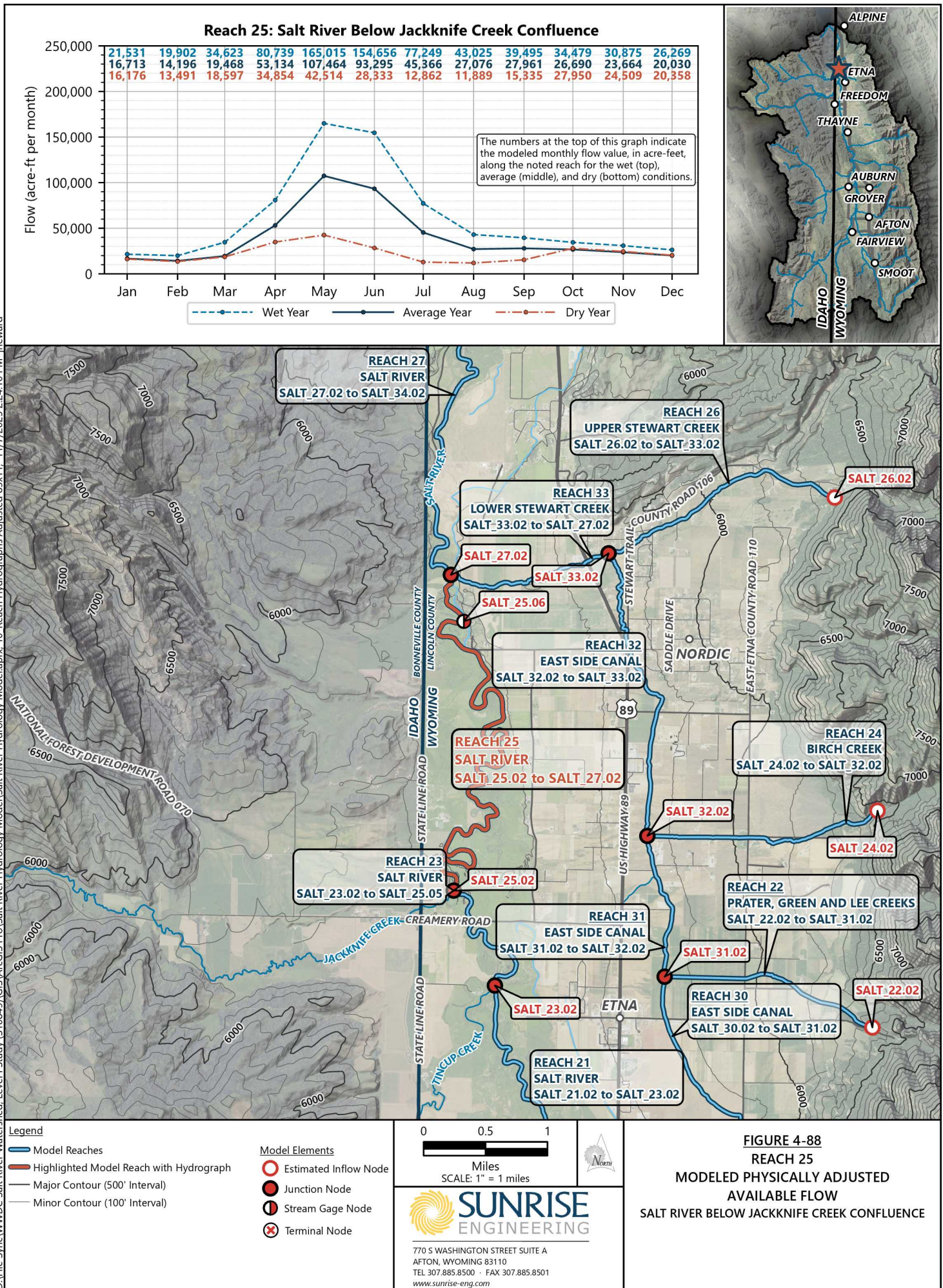
- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



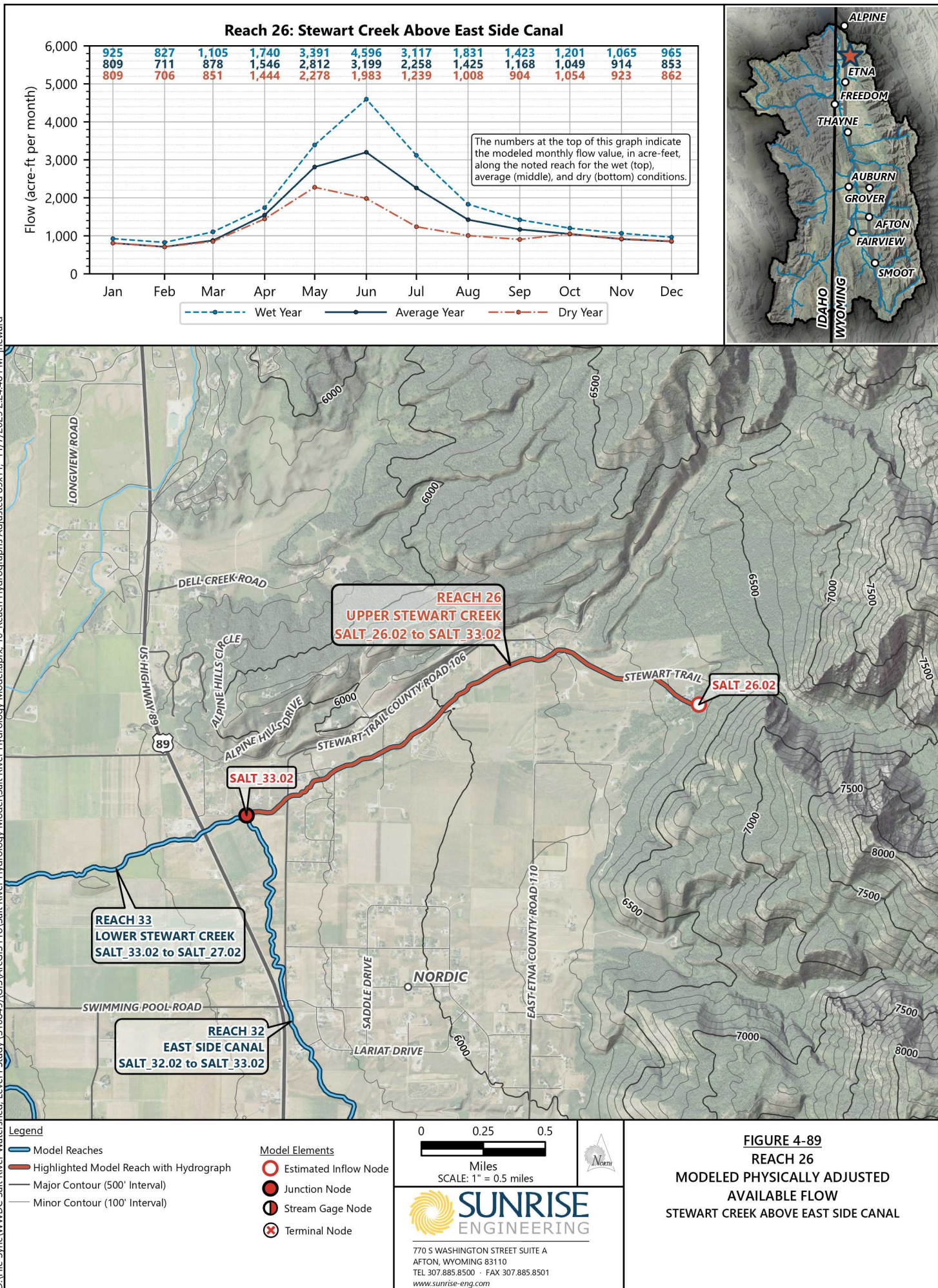
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FIGURE 4-87
REACH 24
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
BIRCH CREEK

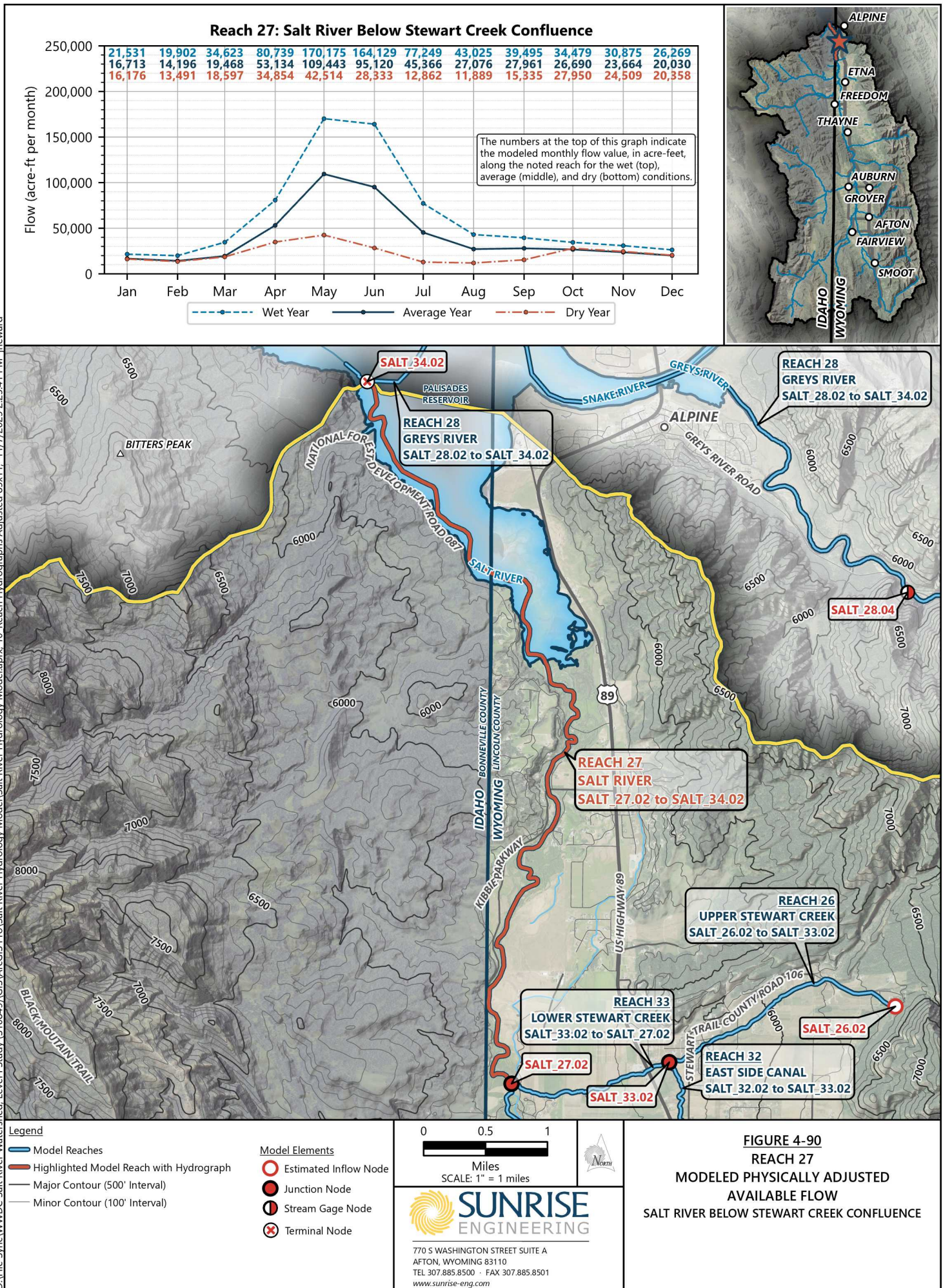
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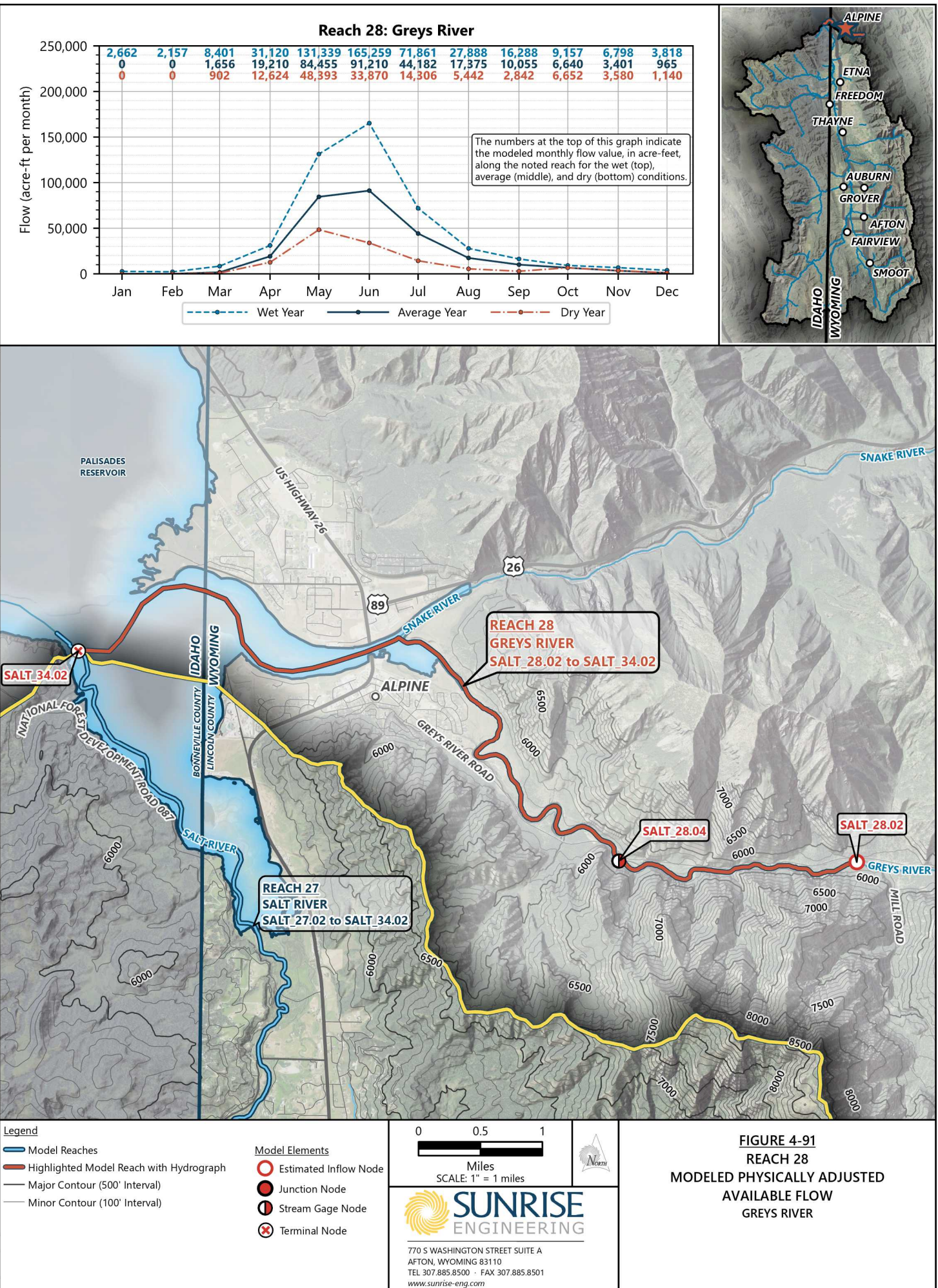
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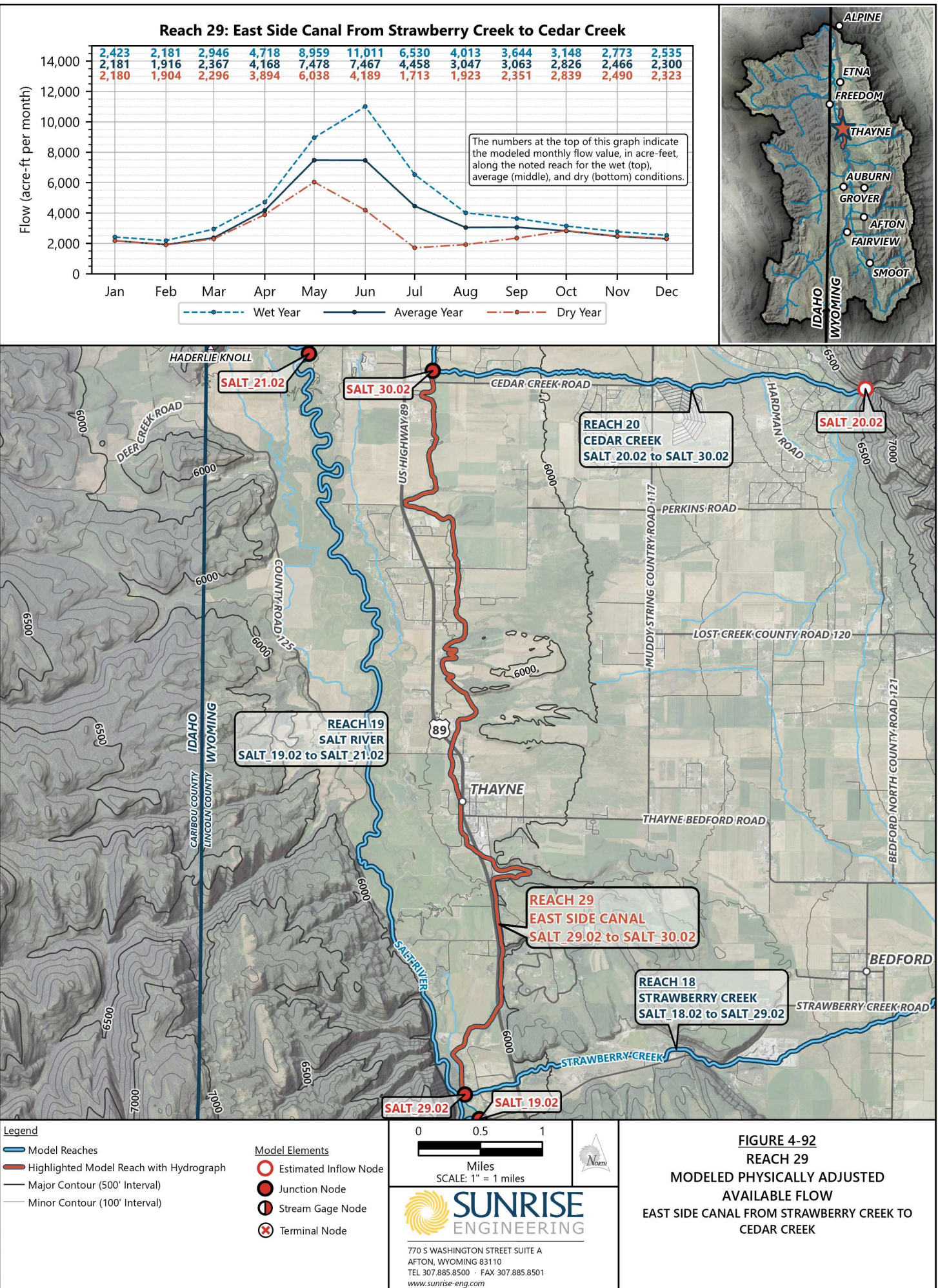
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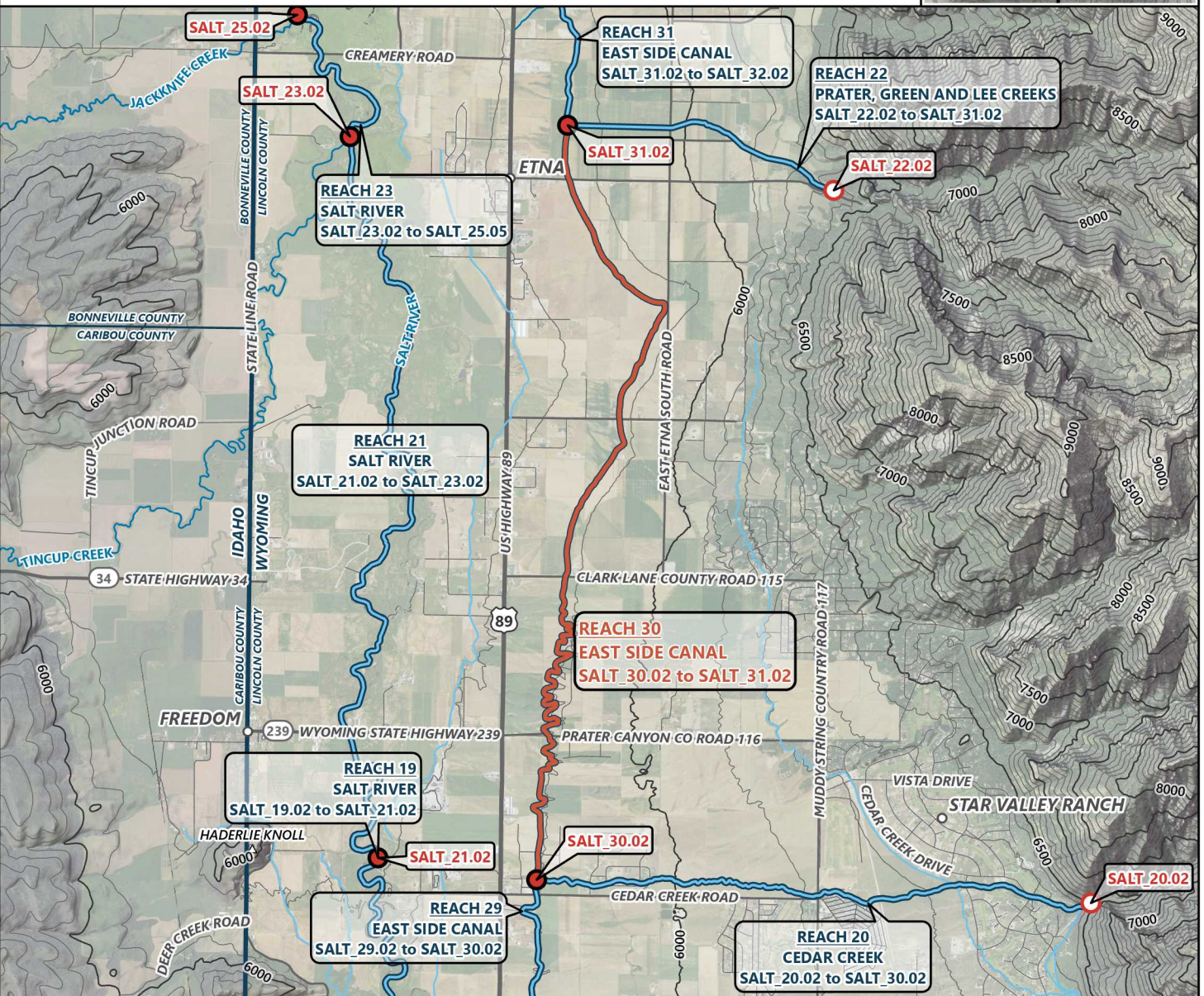
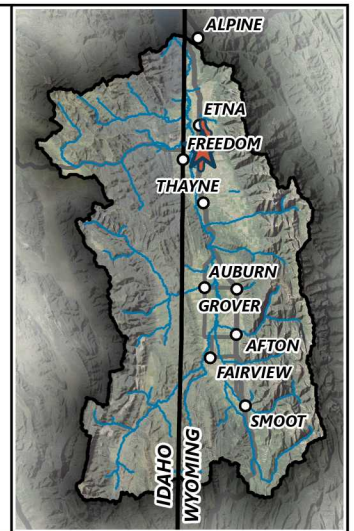
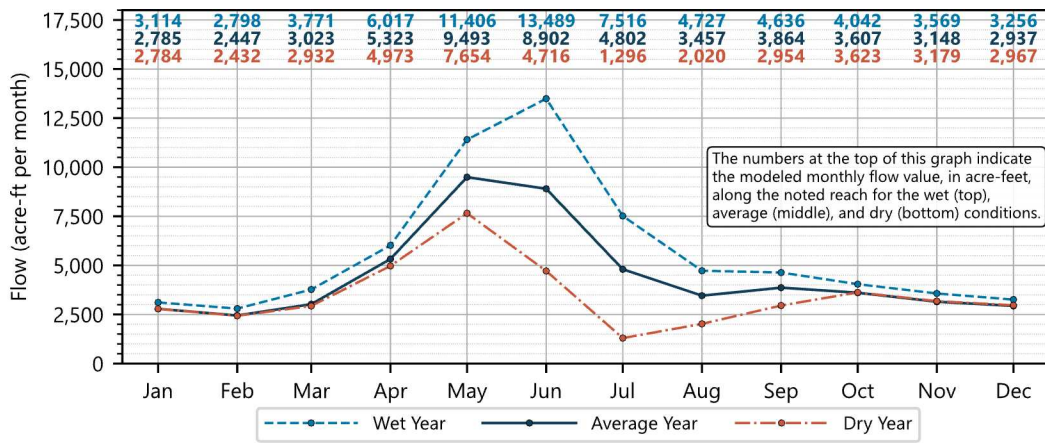
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Reach 30: East Side Canal From Cedar Creek to Prater, Green and Lee Creeks



- Legend**

 - Model Reaches
 - Highlighted Model Reach with Hydrograph
 - Major Contour (500' Interval)
 - Minor Contour (100' Interval)
- Model Elements**

 - Estimated Inflow Node
 - Junction Node
 - Stream Gage Node
 - Terminal Node

0 0.5 1

Miles

SCALE: 1" = 1 miles

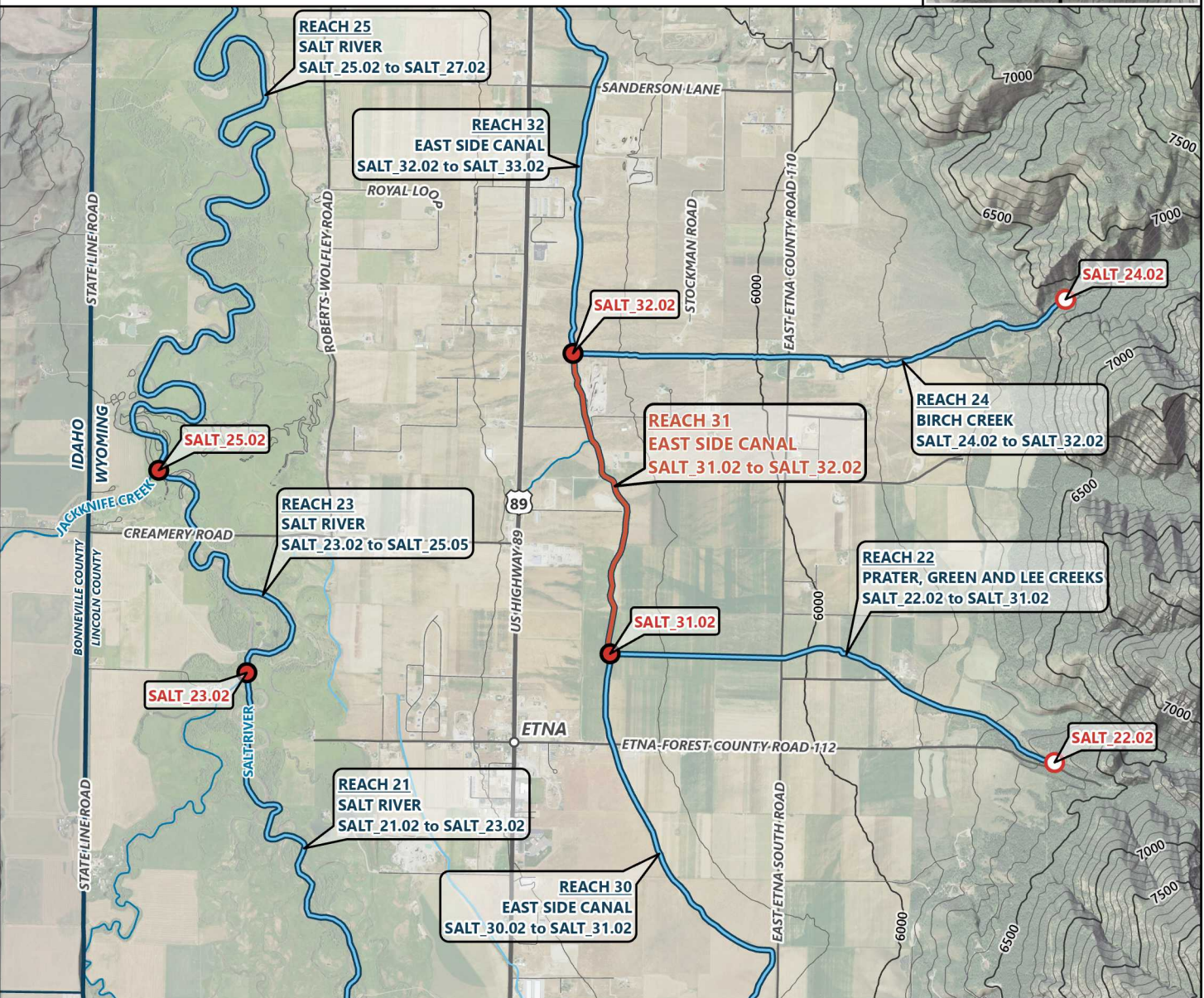
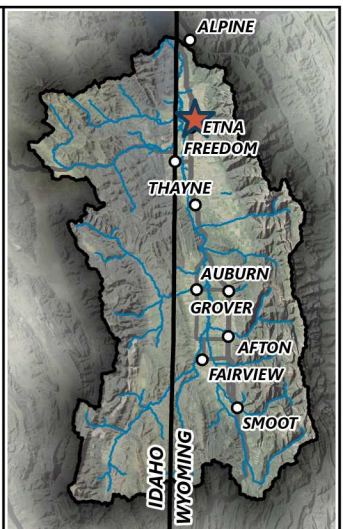
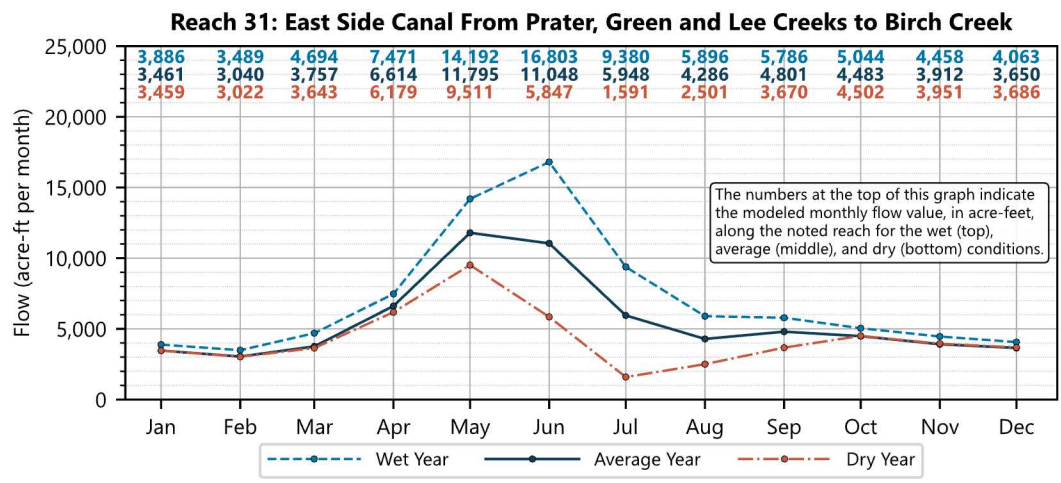
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FIGURE 4-93
REACH 30
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
EAST SIDE CANAL FROM CEDAR CREEK TO PRATER,
GREEN AND LEE CREEKS

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Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

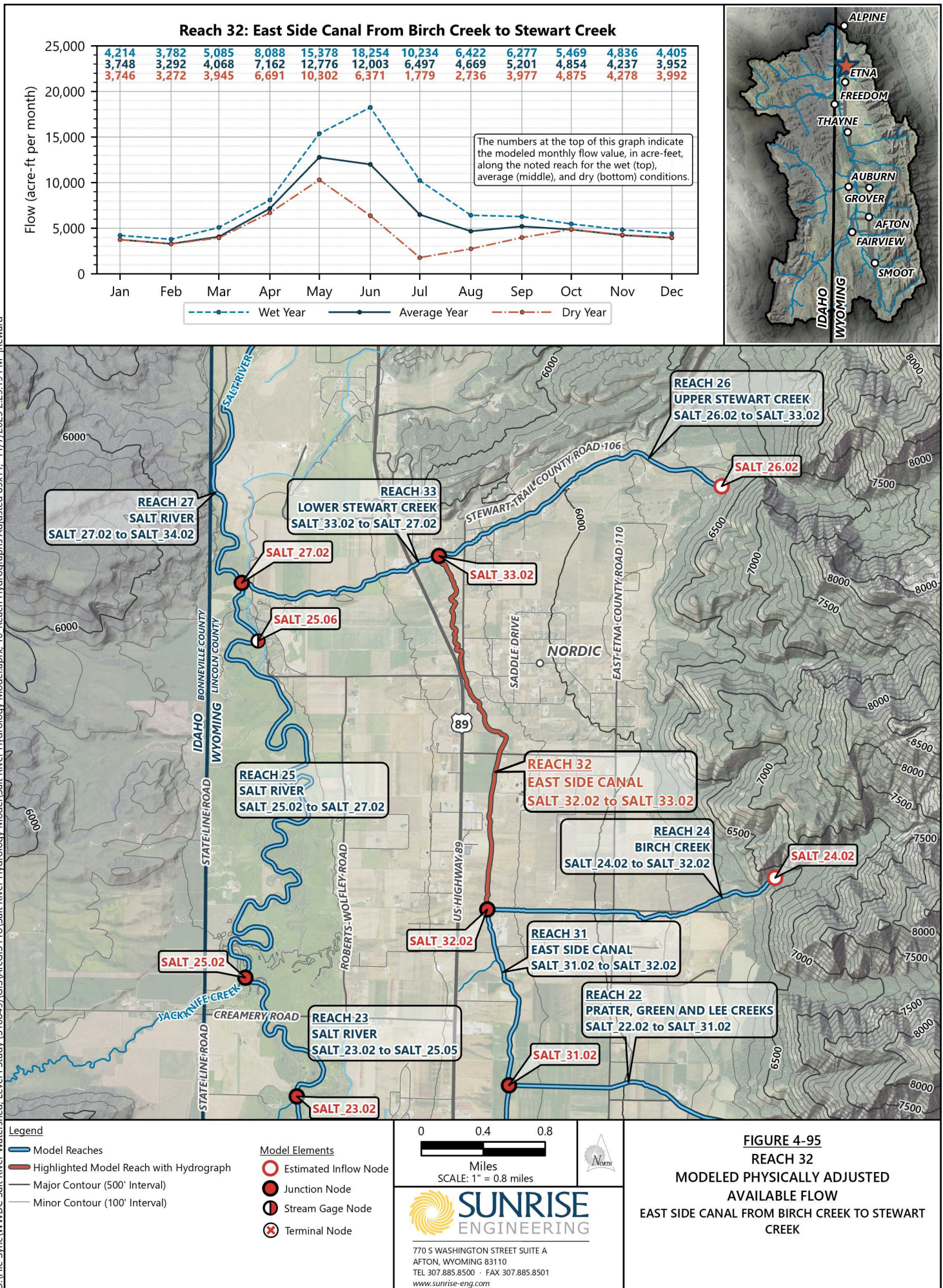
- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node

0 0.3 0.6 Miles
SCALE: 1" = 0.6 miles

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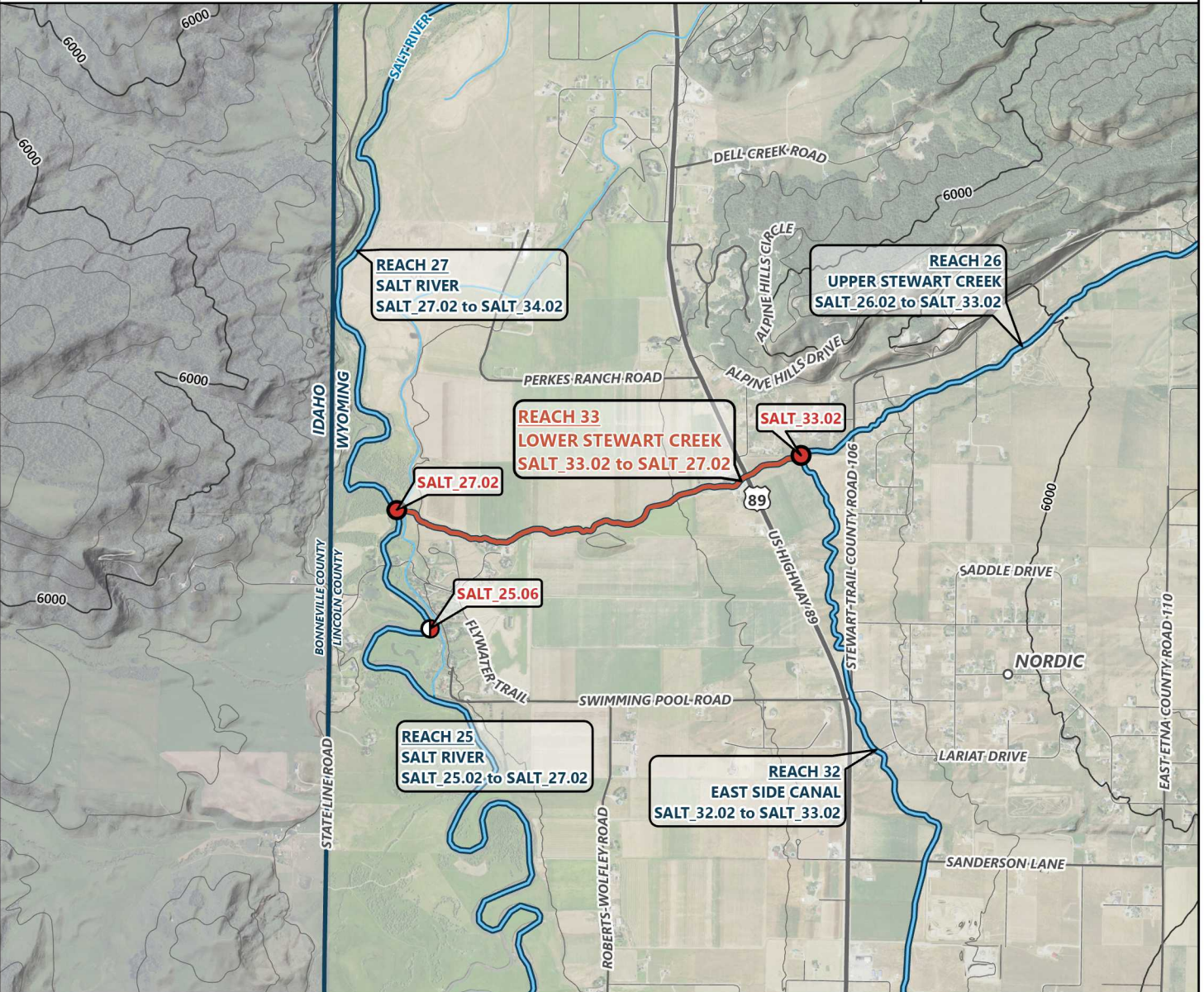
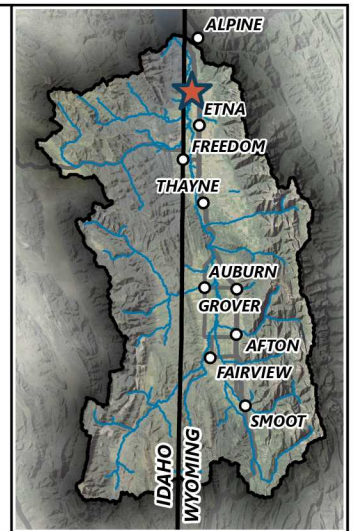
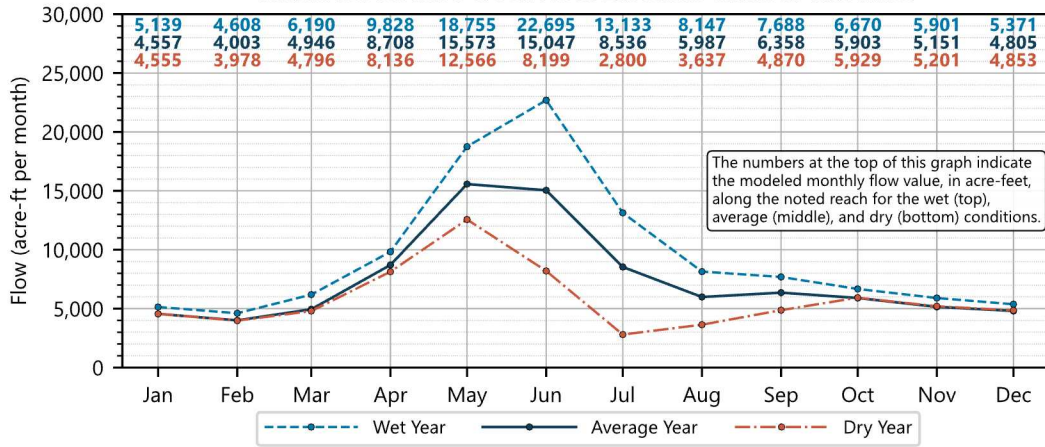
FIGURE 4-94
REACH 31
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
EAST SIDE CANAL FROM PRATER, CREE, AND LEE
CREEKS TO BIRCH CREEK

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Reach 33: Stewart Creek From East Side Canal to Salt River

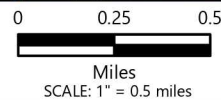


Legend

- Model Reaches
- Highlighted Model Reach with Hydrograph
- Major Contour (500' Interval)
- Minor Contour (100' Interval)

Model Elements

- Estimated Inflow Node
- Junction Node
- Stream Gage Node
- Terminal Node



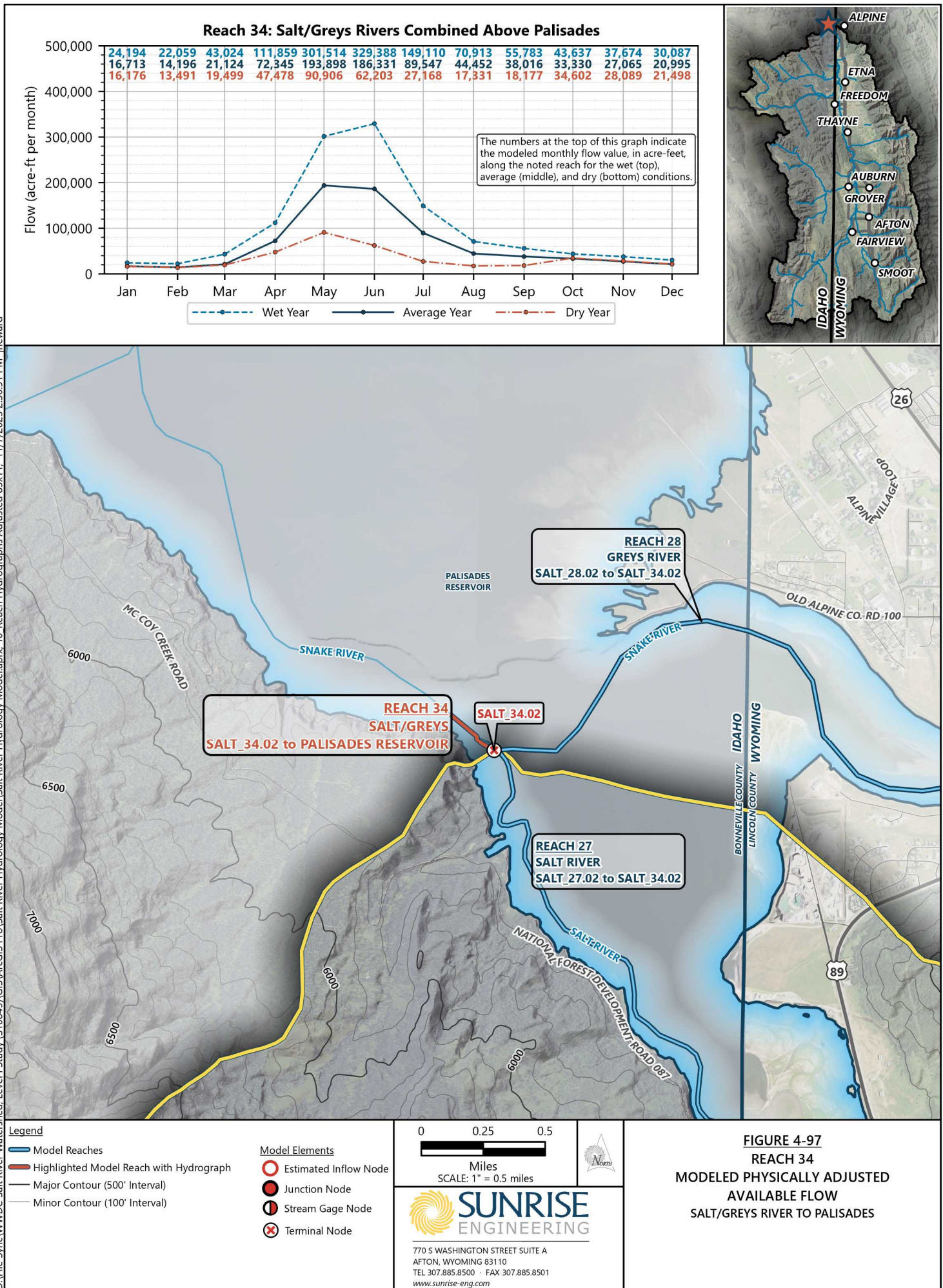
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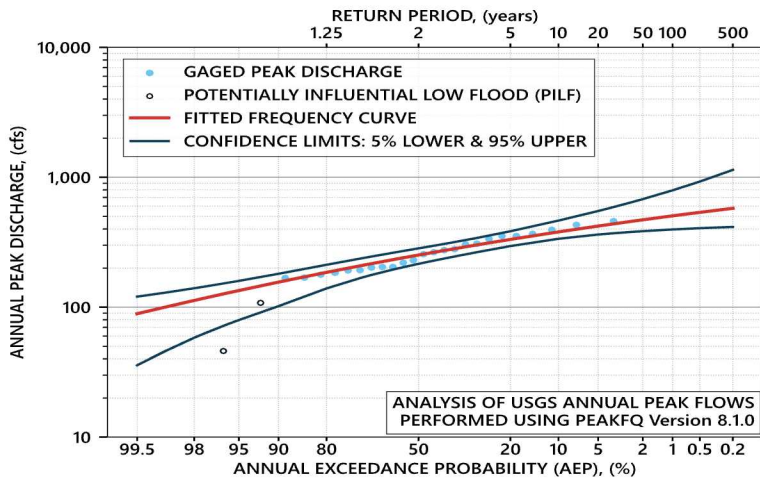
FIGURE 4-96

REACH 33
MODELED PHYSICALLY ADJUSTED
AVAILABLE FLOW
STEWART CREEK FROM EAST SIDE CANAL TO SALT
RIVER

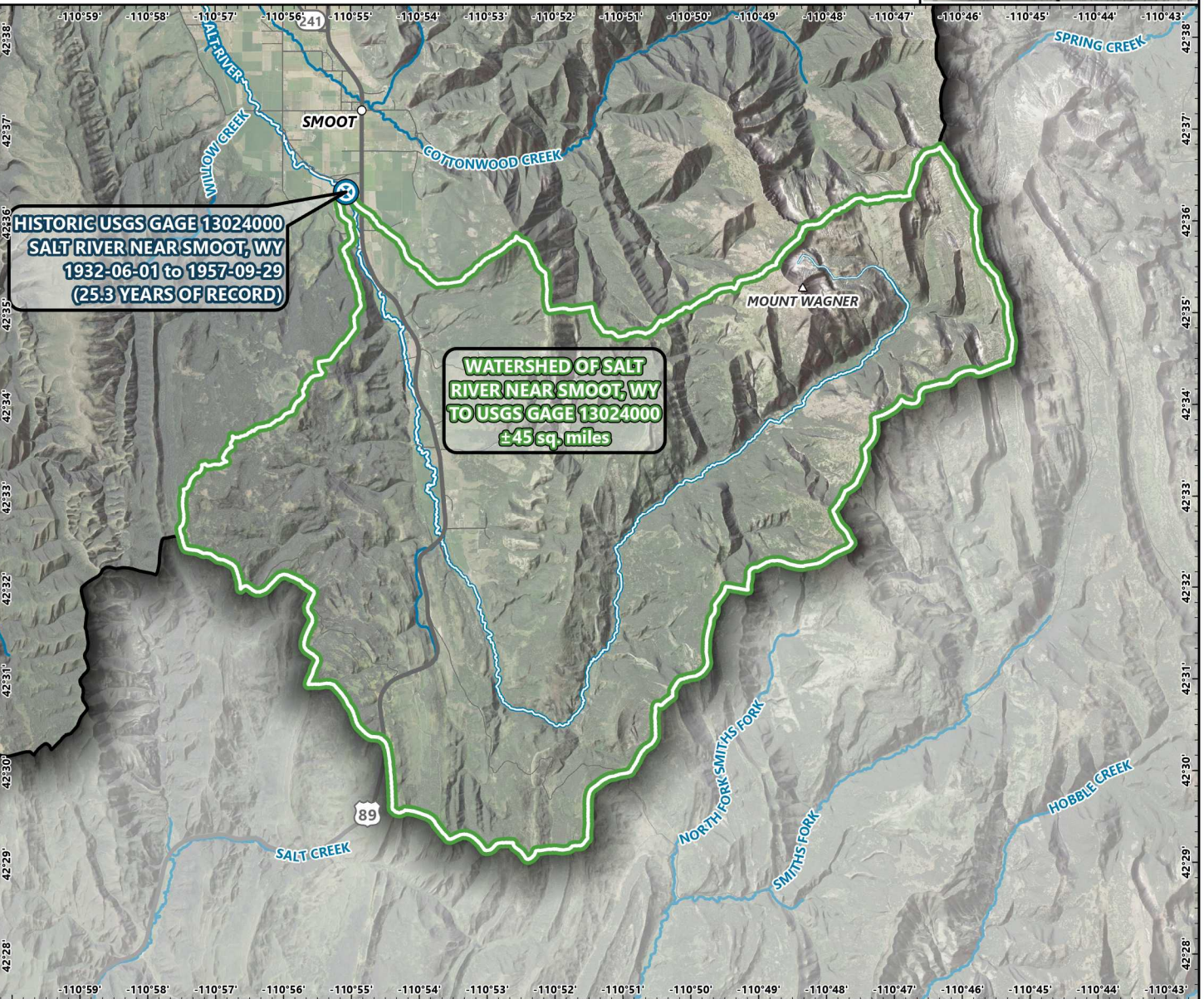
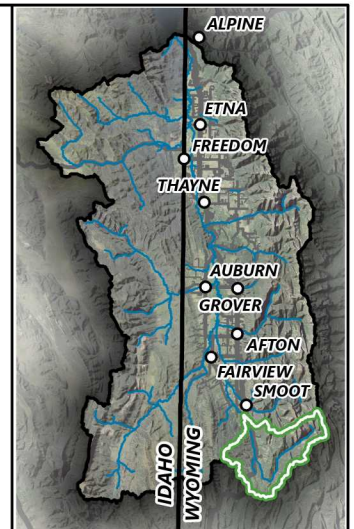
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FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13024000 SALT RIVER NEAR SMOOT, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	89.1
66.7	1.5	216.3
50	2	252.1
40	2.5	274.9
30	3.3	300.6
20	5	332.5
10	10	379.8
5	20	421.3
4	25	433.8
2.5	40	459.1
2	50	470.6
1	100	504.9
0.5	200	537
0.2	500	577



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 1 2
Miles
SCALE: 1" = 2 miles

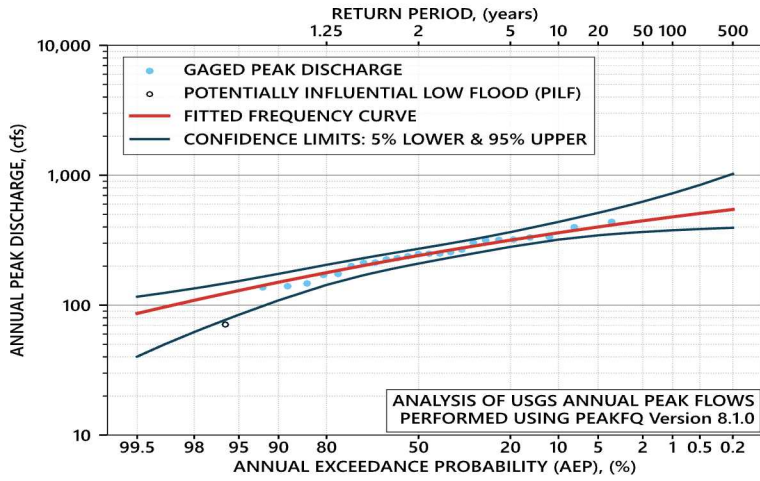


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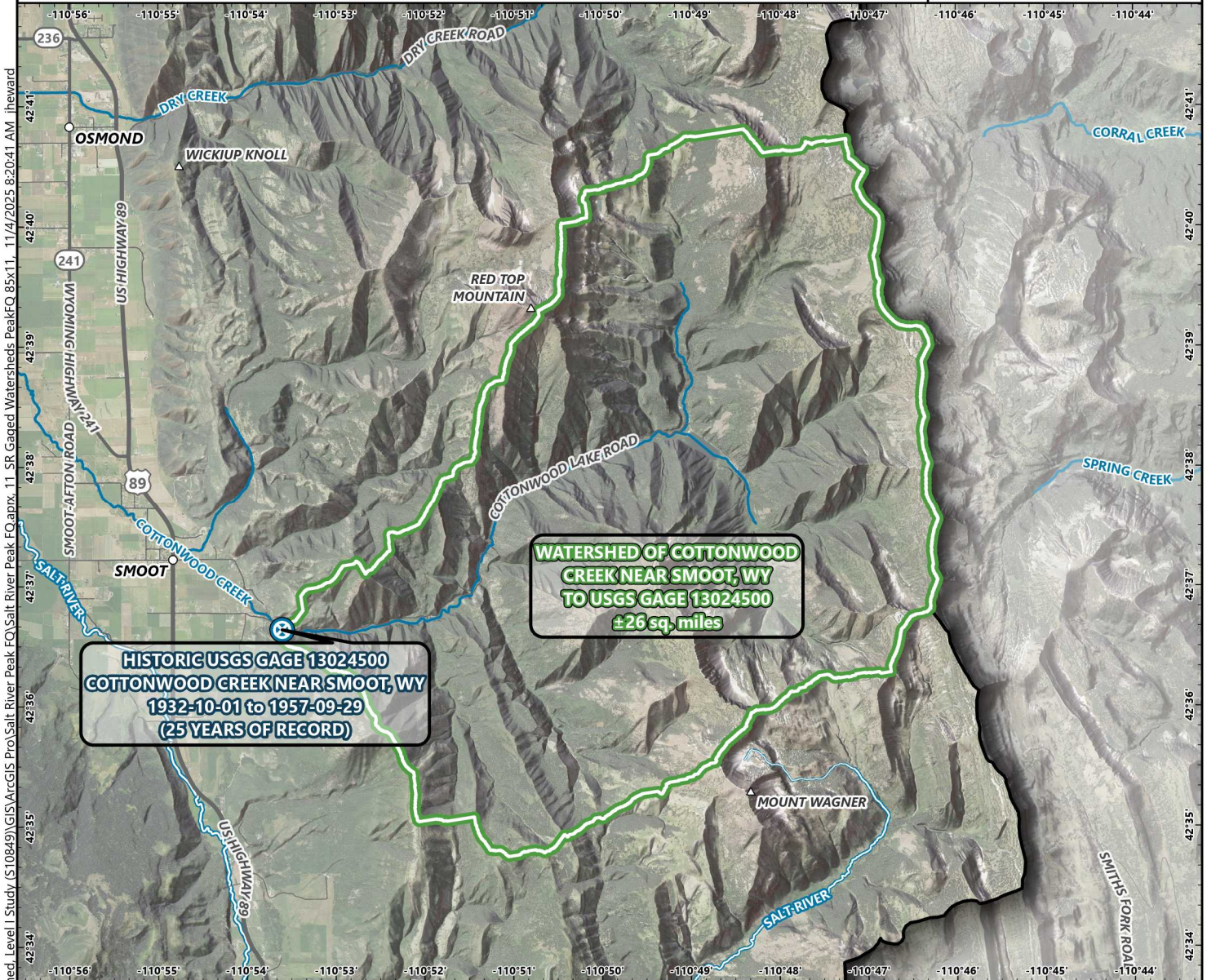
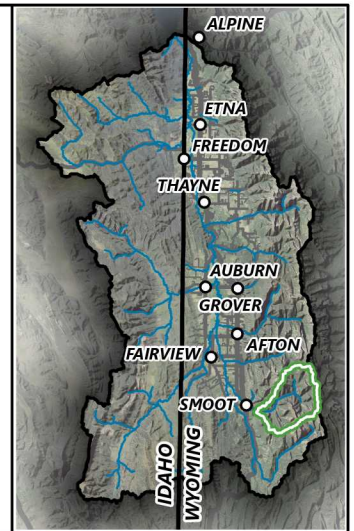


FIGURE 4-98
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13024000
SALT RIVER NEAR SMOOT, WY

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13024500 COTTONWOOD CREEK NEAR SMOOT, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	86.4
66.7	1.5	207.3
50	2	241.1
40	2.5	262.5
30	3.3	286.7
20	5	316.7
10	10	361.1
5	20	400.1
4	25	411.8
2.5	40	435.5
2	50	446.2
1	100	478.3
0.5	200	508.4
0.2	500	545.7



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 0.75 1.5
Miles
SCALE: 1" = 1.5 miles



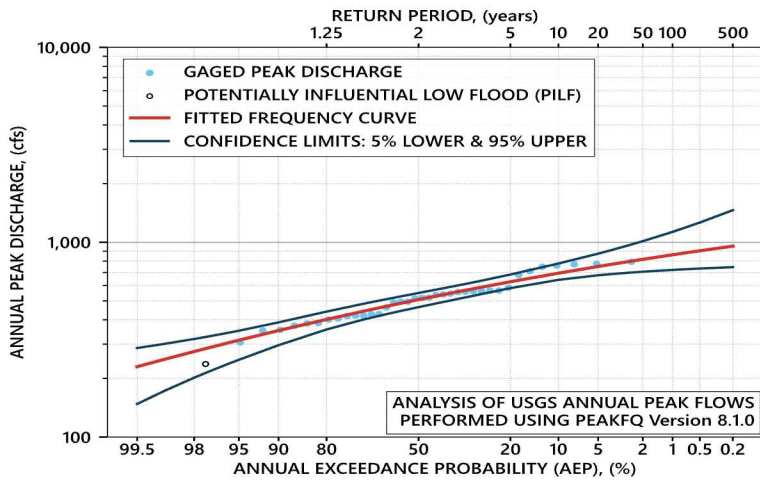
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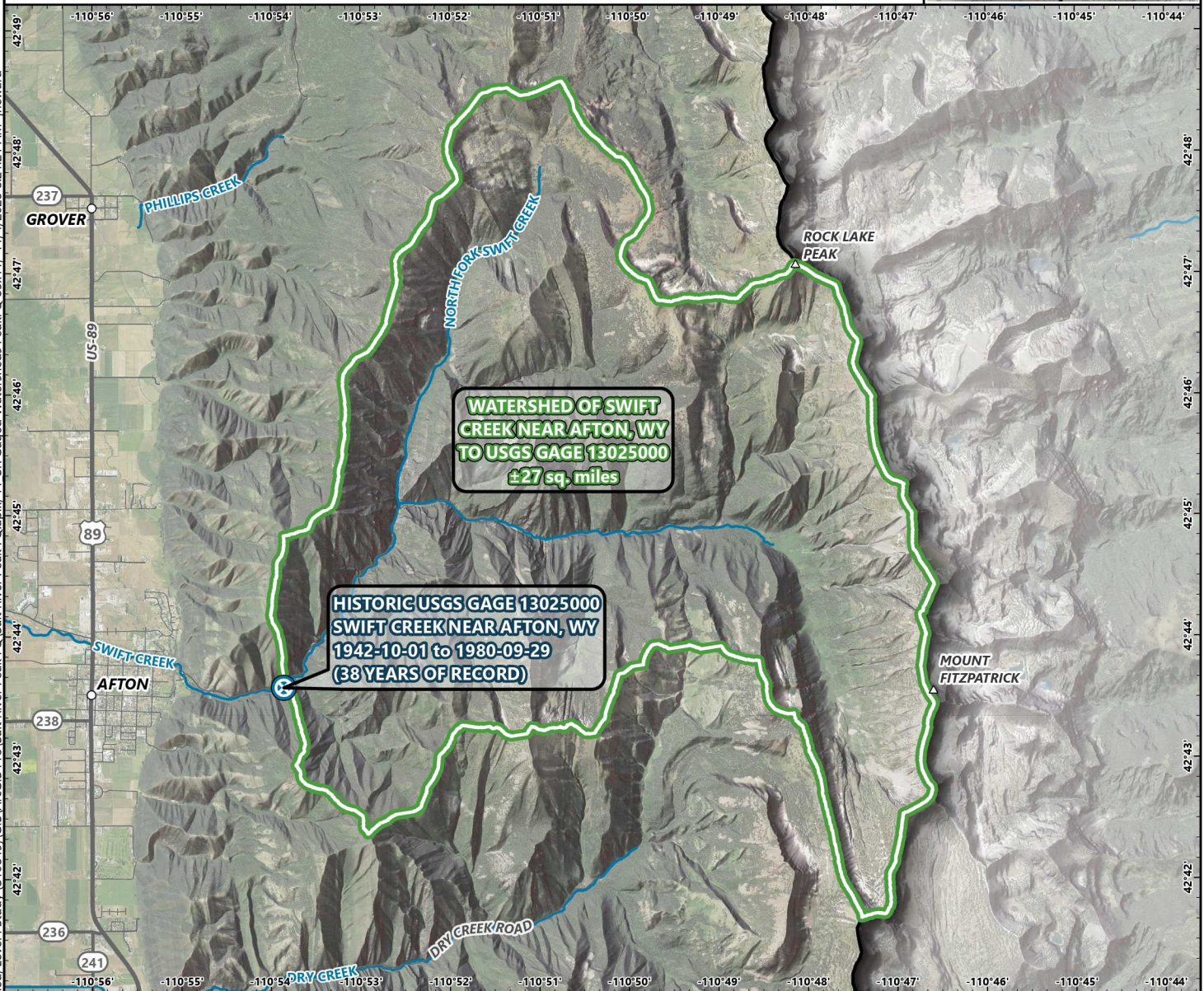
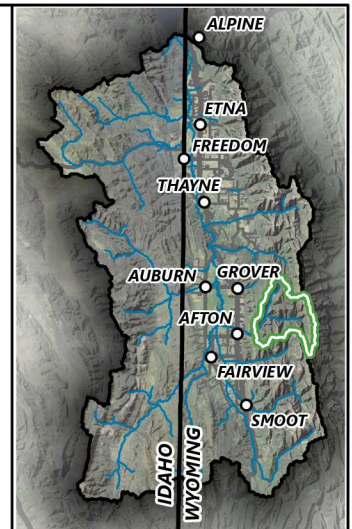


FIGURE 4-99
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13024500
COTTONWOOD CREEK NEAR SMOOT, WY

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13025000 SWIFT CREEK NEAR AFTON, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	229.8
66.7	1.5	451.7
50	2	507.7
40	2.5	542.2
30	3.3	580.5
20	5	626.9
10	10	693.7
5	20	751
4	25	767.9
2.5	40	801.8
2	50	817.2
1	100	862.2
0.5	200	903.8
0.2	500	954.8



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 0.75 1.5
Miles
SCALE: 1" = 1.5 miles

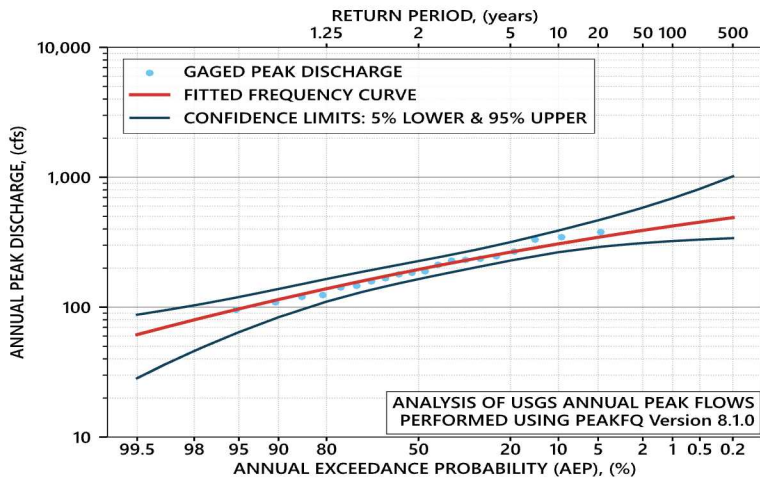


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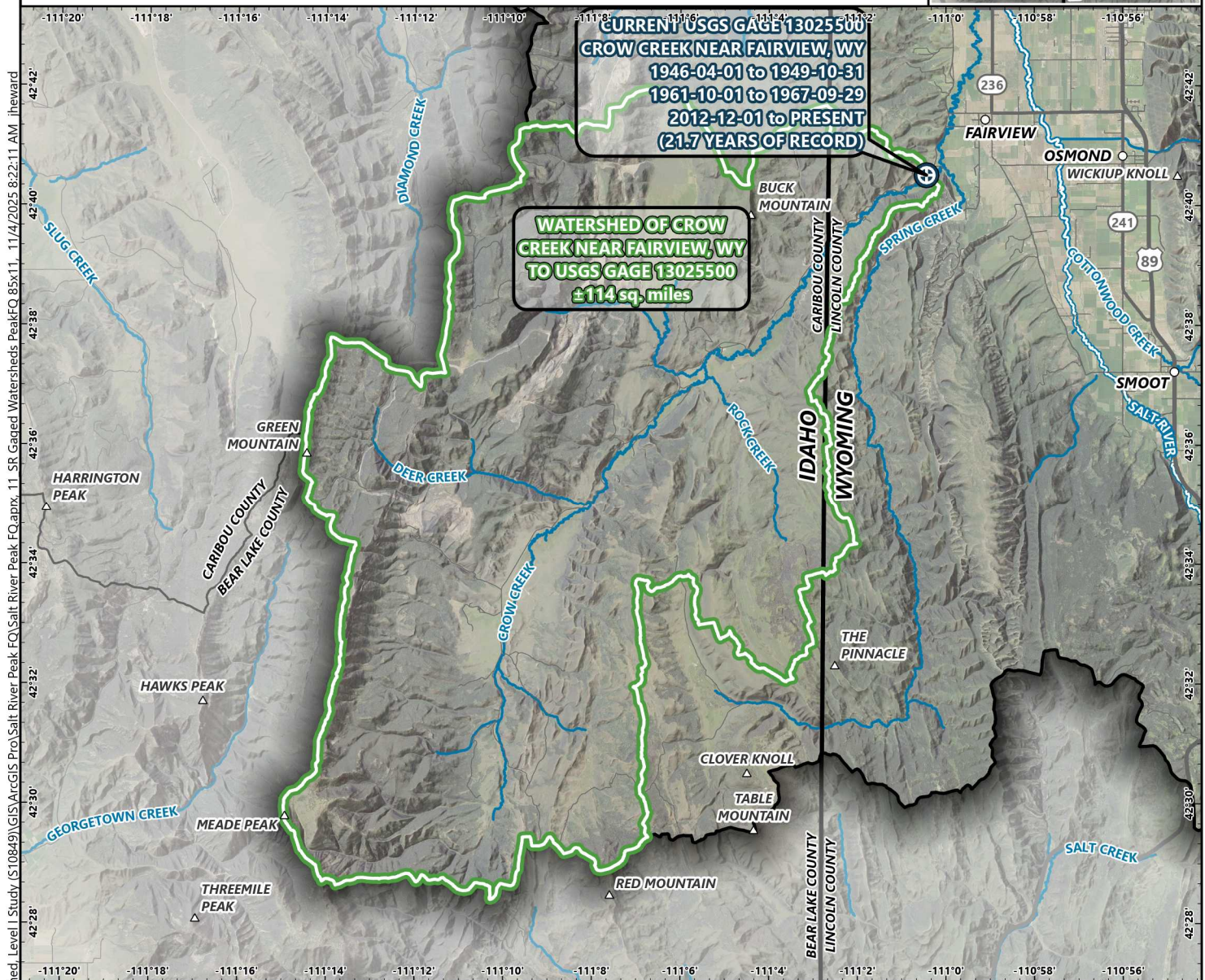
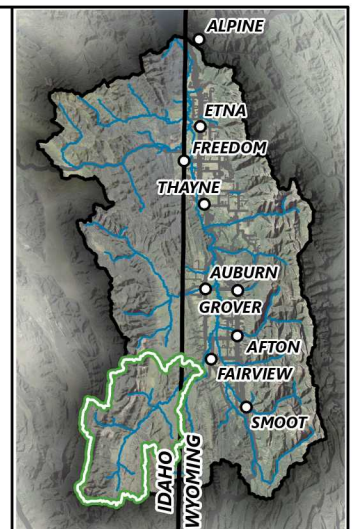


FIGURE 4-100
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13025000
SWIFT CREEK NEAR AFTON, WY

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13025500 CROW CREEK NEAR FAIRVIEW, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	61.5
66.7	1.5	164.6
50	2	195.2
40	2.5	214.8
30	3.3	237.2
20	5	265.3
10	10	307.4
5	20	345
4	25	356.4
2.5	40	379.5
2	50	390.1
1	100	421.7
0.5	200	451.6
0.2	500	489.1



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Current USGS Stream Gage

0 1.5 3
Miles
SCALE: 1" = 3 miles



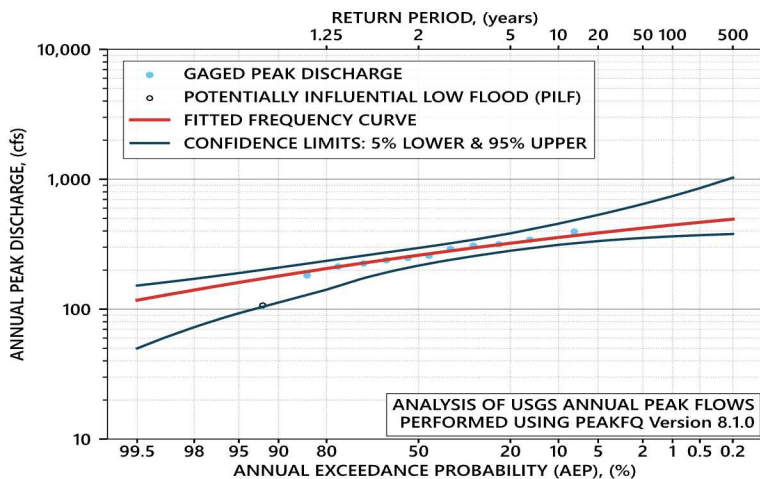
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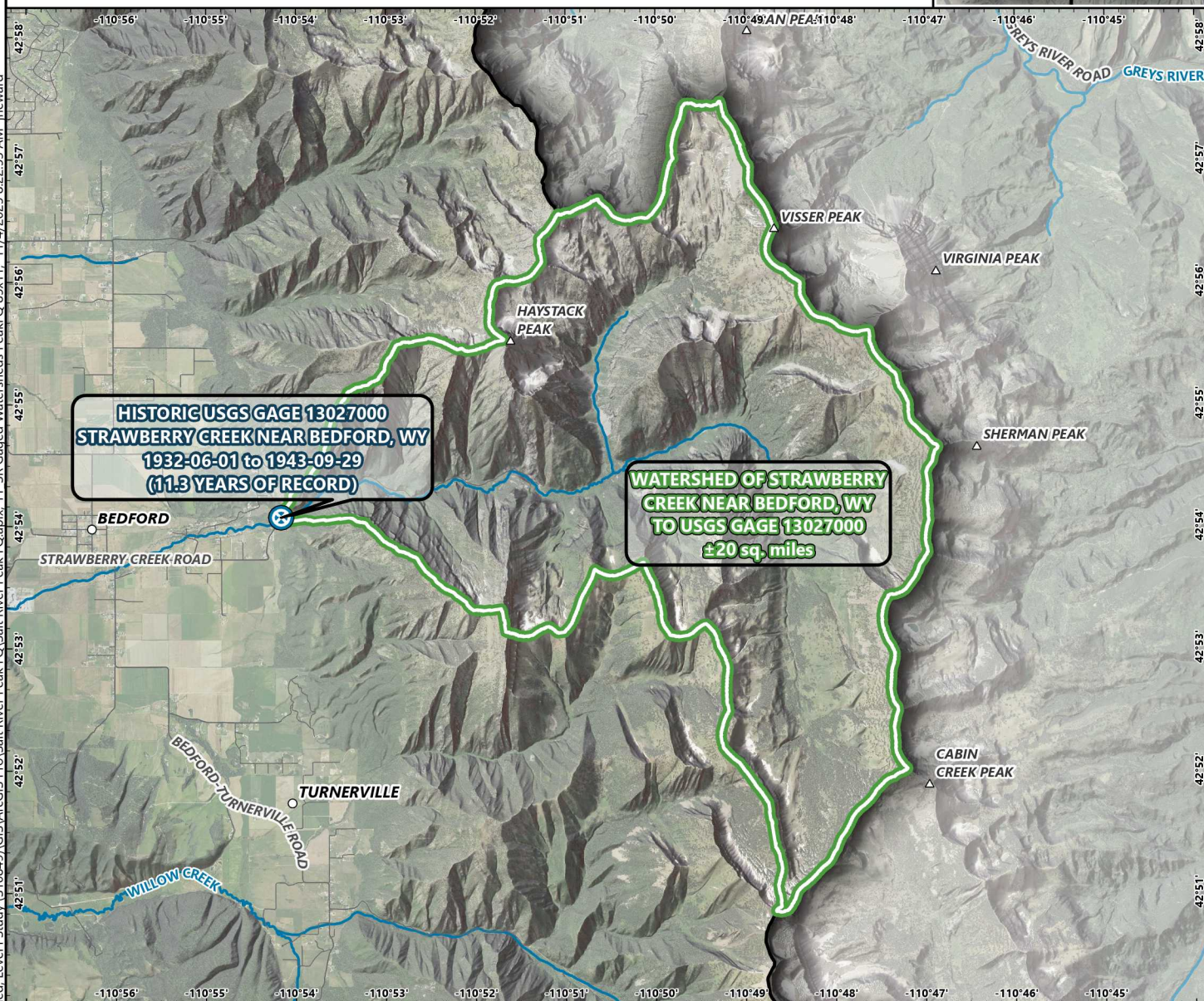
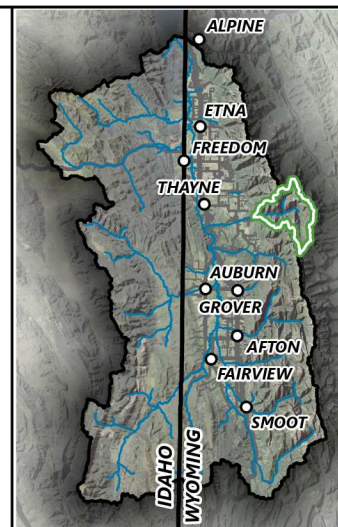


FIGURE 4-101
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13025500
CROW CREEK NEAR FAIRVIEW, WY

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13027000 STRAWBERRY CREEK NEAR BEDFORD, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	117.3
66.7	1.5	231.3
50	2	260.2
40	2.5	278.1
30	3.3	297.9
20	5	321.9
10	10	356.6
5	20	386.4
4	25	395.2
2.5	40	412.9
2	50	420.9
1	100	444.4
0.5	200	466.2
0.2	500	492.9



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

0 0.75 1.5
Miles
SCALE: 1" = 1.5 miles

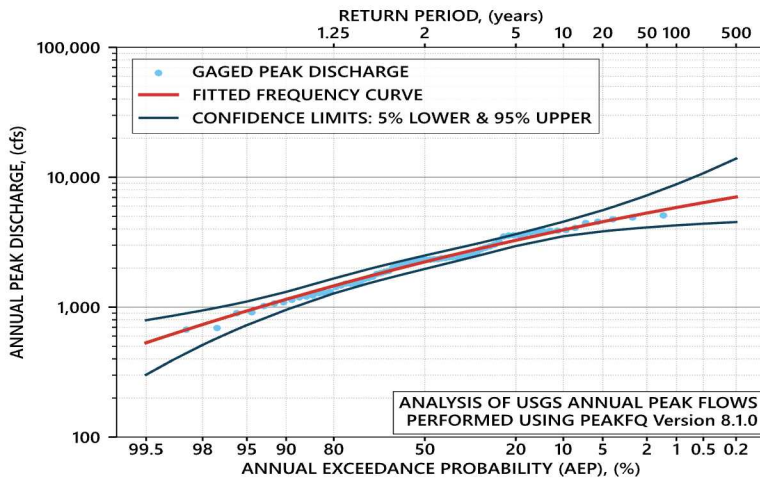


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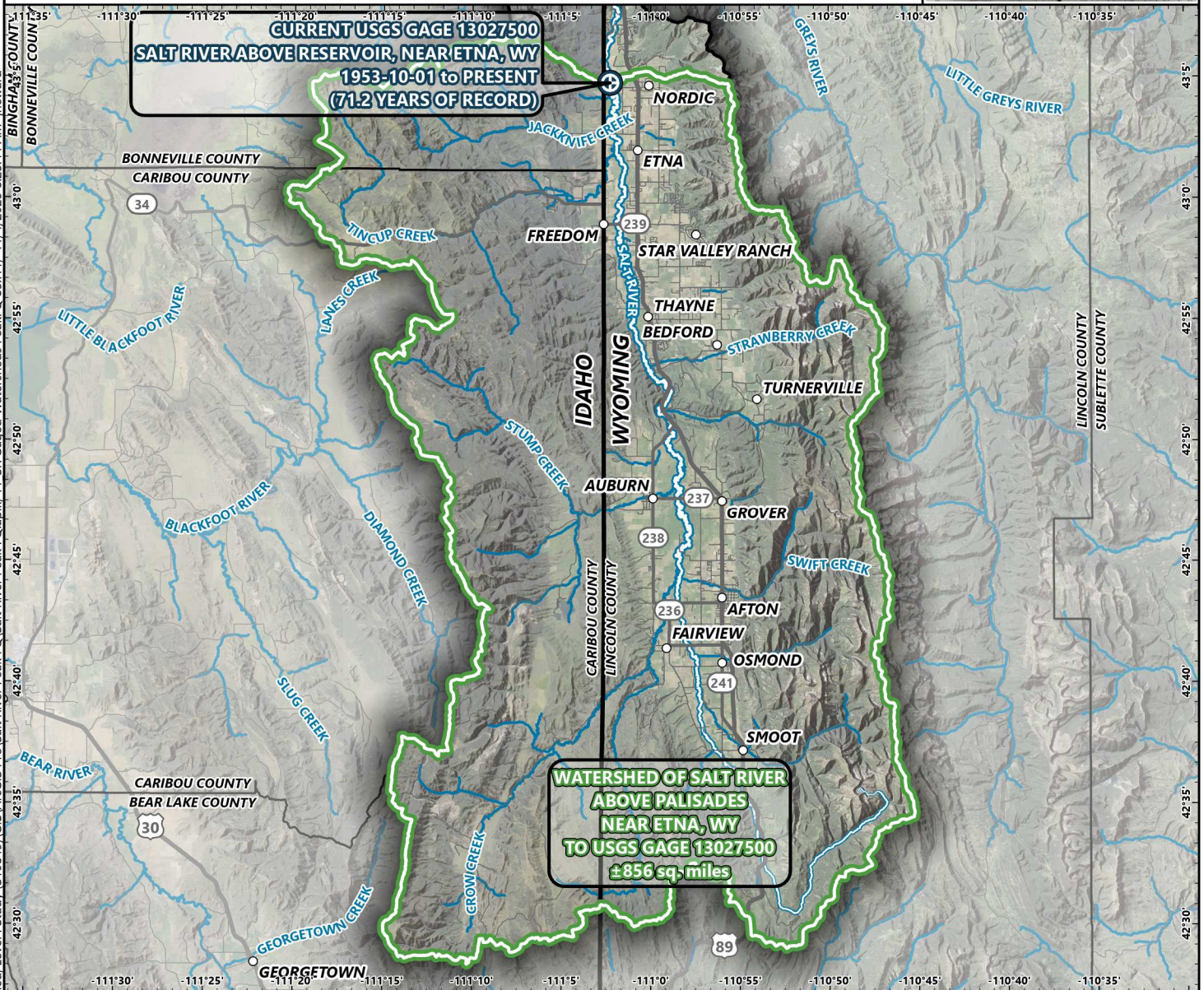
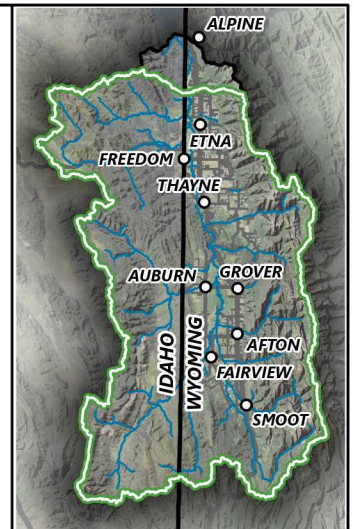


FIGURE 4-102
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13027000
STRAWBERRY CREEK NEAR BEDFORD, WY

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13027500 SALT RIVER ABOVE RESERVOIR, NEAR ETNA, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	532.2
66.7	1.5	1,805
50	2	2,231
40	2.5	2,515
30	3.3	2,847
20	5	3,273
10	10	3,937
5	20	4,549
4	25	4,738
2.5	40	5,126
2	50	5,307
1	100	5,853
0.5	200	6,381
0.2	500	7,055



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Current USGS Stream Gage

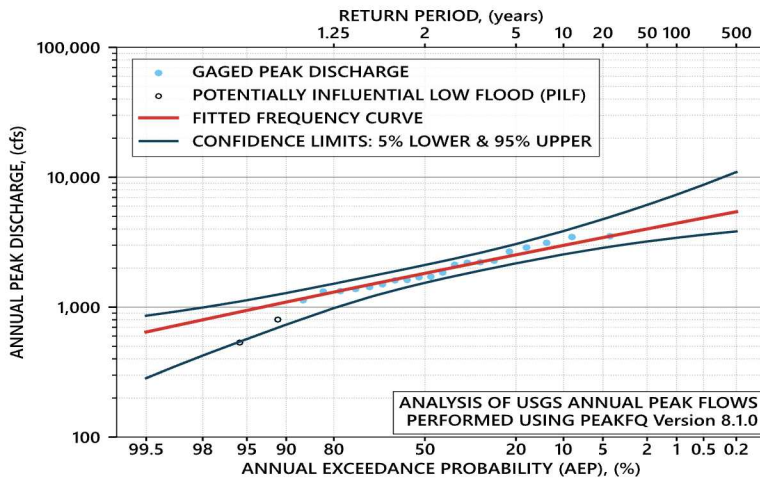
0 3.75 7.5
Miles
SCALE: 1" = 7.5 miles



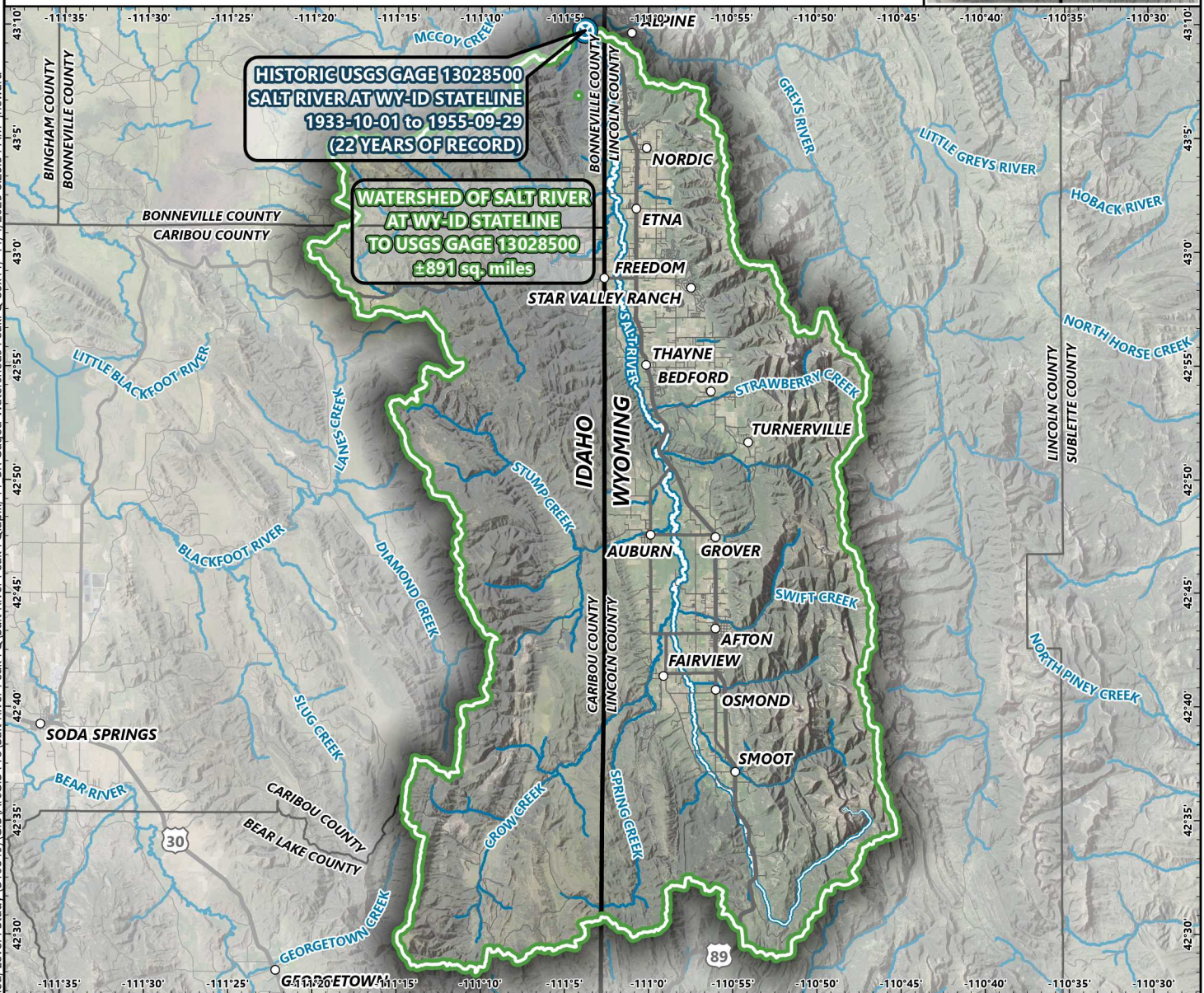
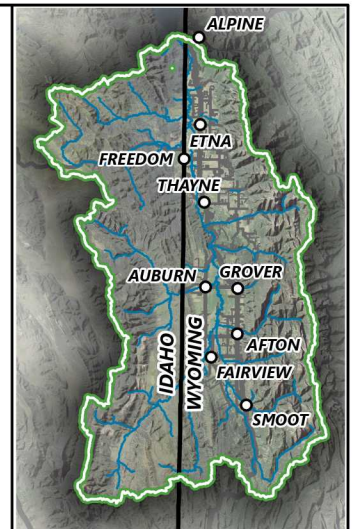
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FIGURE 4-103
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13027500
SALT RIVER ABOVE PALISADES NEAR ETNA, WY

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13028500 SALT RIVER AT WY-ID STATELINE

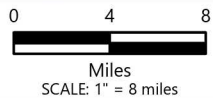


AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	644
66.7	1.5	1,539
50	2	1,823
40	2.5	2,013
30	3.3	2,237
20	5	2,528
10	10	2,991
5	20	3,433
4	25	3,572
2.5	40	3,864
2	50	4,002
1	100	4,429
0.5	200	4,858
0.2	500	5,429



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Historic USGS Stream Gage

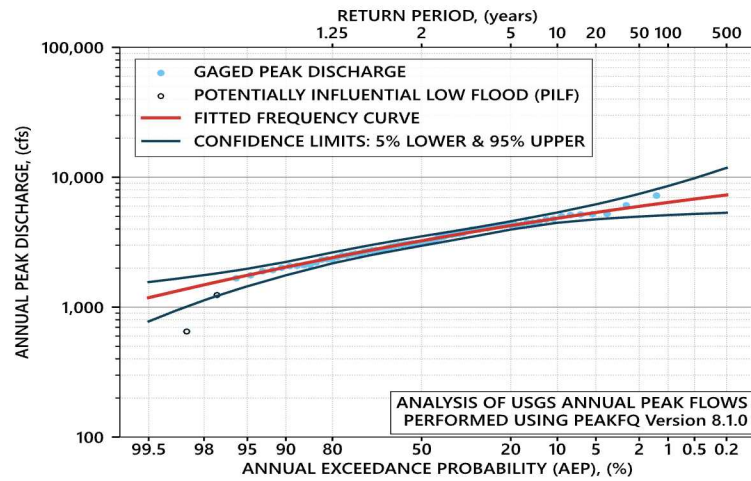


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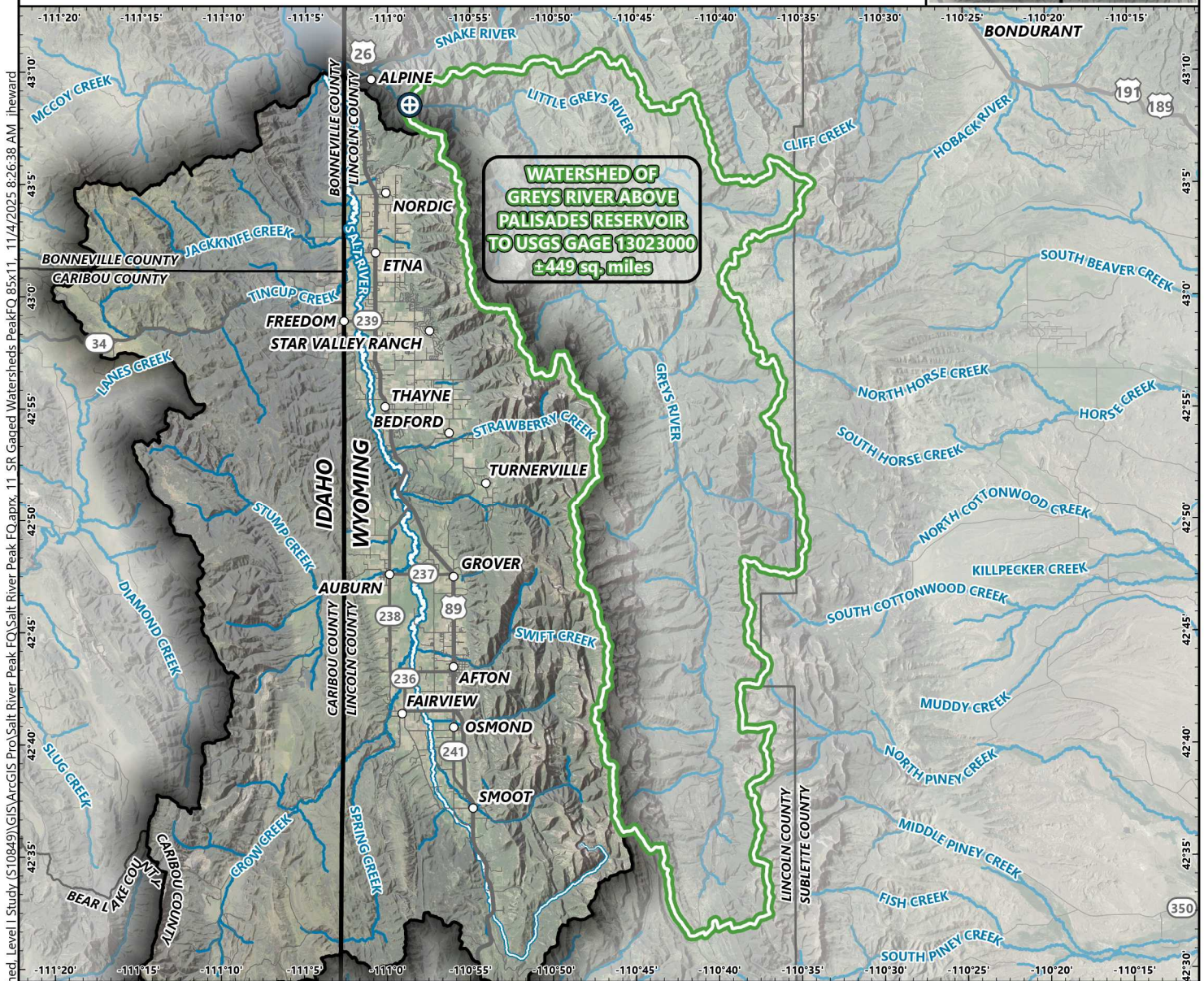
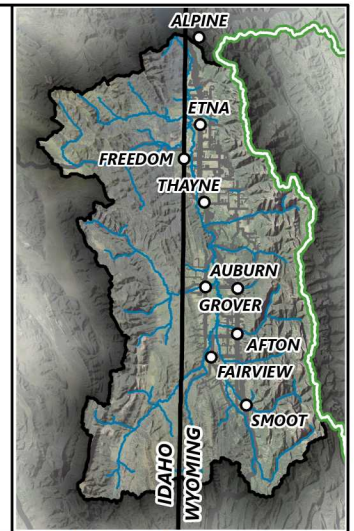


FIGURE 4-104
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13028500
SALT RIVER AT WY-ID STATELINE

FLOOD-FREQUENCY ANALYSIS AT USGS STATION 13023000 GREYS RIVER ABOVE RESERVOIR, NEAR ALPINE, WY



AEP (%)	Return Period (Inverse of AEP, years)	Annual Peak Discharge (cfs)
99.5	1	1,184
66.7	1.5	2,794
50	2	3,243
40	2.5	3,528
30	3.3	3,850
20	5	4,249
10	10	4,839
5	20	5,359
4	25	5,515
2.5	40	5,831
2	50	5,976
1	100	6,404
0.5	200	6,807
0.2	500	7,309



Legend

- Salt River Watershed
- Watershed at Stream Gage Shown
- Current USGS Stream Gage

0 4 8
Miles
SCALE: 1" = 8 miles

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FIGURE 4-105
FLOOD FREQUENCY ANALYSIS AT
USGS GAGE STATION 13023000
GREYS RIVER ABOVE PALISADES RESERVOIR

APPENDIX D: PROJECT DESCRIPTIONS AND COST ESTIMATES

IRR-01 - East Side Canal Diversion Replacement

Project ID: IRR-01

Project Name: East Side Canal Diversion Replacement

Project Type: Irrigation Diversion Improvement

Landowner: 490 LLC

Sponsor: Etna Irrigation District

Land Management: Private

Location (PLSS): SE1/4SW1/4, Sec. 35, T34N, R119W

Location (Lat/Long): 42.8822, -110.9989

Project Description: This project involves replacing the aging diversion gates at the East Side Canal Diversion on the Salt River to address equipment deterioration and prevent fish from entering the canal. The work includes removing the existing structure, constructing a new reinforced concrete diversion with upgraded gates and operating mechanisms, installing a fish-exclusion screen, and making targeted improvements to reduce maintenance requirements and improve flow control. Approximately 1,500 feet downstream, a smaller diversion directs water into a separate canal running north toward the southwestern portion of Section 23, T24N R119W, southwest of Thayne. This secondary canal currently relies on earthen diversions that negatively affect fish passage. There is potential to eliminate this smaller diversion and instead deliver water through a headgate on the East Side Canal, which would require coordination among all stakeholders.

Public Benefit: Installing new diversion gates and an effective fish exclusion screen at the East Side Canal Diversion will keep fish in the Salt River, improve habitat quality, and support a valued fishery. The upgrades will reduce leakage and debris buildup at the headworks, lower routine maintenance, and provide more consistent deliveries to irrigators. The project conserves water supply, improves operational reliability for the canal system, and extends the useful life of critical irrigation infrastructure.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 18,000.00	\$ 18,000.00
2	Demolition & Site Preparation	1	LS	\$ 20,000.00	\$ 20,000.00
3	New Concrete Walls & Headgates	1	LS	\$ 220,000.00	\$ 220,000.00
4	Flow Control & Erosion Improvements	1	LS	\$ 50,000.00	\$ 50,000.00
5	New Headgate for Smaller Canal	1	LS	\$ 10,000.00	\$ 10,000.00
Total Component Cost (Subtotal #2):					\$ 318,000.00

Preparation of Final Designs & Specifications	\$31,800.00
Permitting and Mitigation	\$17,000.00
Legal Fees	\$0.00
Acquisition of Access and Rights-Of-Way	\$0.00
Pre-Construction Costs (Subtotal #1)	\$48,800.00

Total Component Cost (Subtotal #2)	\$318,000.00
------------------------------------	--------------

Construction Engineering Cost (Subtotal #2 x 10%)	\$31,800.00
Components and Engineering Costs (Subtotal #3)	\$349,800.00
Contingency (Subtotal #3 x 15%)	\$52,470.00
Total Construction Cost (Subtotal #4)	\$434,070.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$482,870.00
--	--------------

Potential Funding Partners

Project ID: IRR-01

Project Name: East Side Canal Diversion Replacement

Land Jurisdiction: Private

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- U.S. Fish and Wildlife Service
 - National Fish Passage Program
- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- National Oceanic and Atmospheric Administration
 - Restoring Fish Passage through Barrier Removal Grants

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting/Coordination Requirements:

Project ID: IRR-01

Project Name: East Side Canal Diversion Replacement

Land Jurisdiction: Private

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P1266

Proposed Permit: It is anticipated that a SW-2 permit may be required for the diversion replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is anticipated that a Nationwide Permit (NWP) will be required for the replacement of the diversion structure on the East Side Canal. The most applicable authorization is likely NWP 3 – Maintenance, which covers the repair, rehabilitation, or replacement of existing, currently serviceable structures or fills located within waters of the U.S., including irrigation ditches.

This permit action will require submission of a Pre-Construction Notification (PCN) to the USACE. The PCN process typically involves completing a wetland delineation and receiving written authorization from the USACE prior to the start of construction.

It is important to note that activities authorized under NWP 3 must not expand the structure's footprint or fill area beyond its existing limits. If the proposed design results in a larger footprint or modified channel alignment, the project may instead require an Individual Section 404 Permit or qualify under a different nationwide permit—such as NWP 13 (Bank Stabilization) or NWP 27 (Aquatic Habitat Restoration, Establishment, and Enhancement). Additional details on the permitting process are provided in Section 9 of the watershed report.

A USACE letter of authorization or acceptance should be submitted to the WWDO with the final design package and obtained prior to construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-1. Photo of existing East Side Canal diversion.

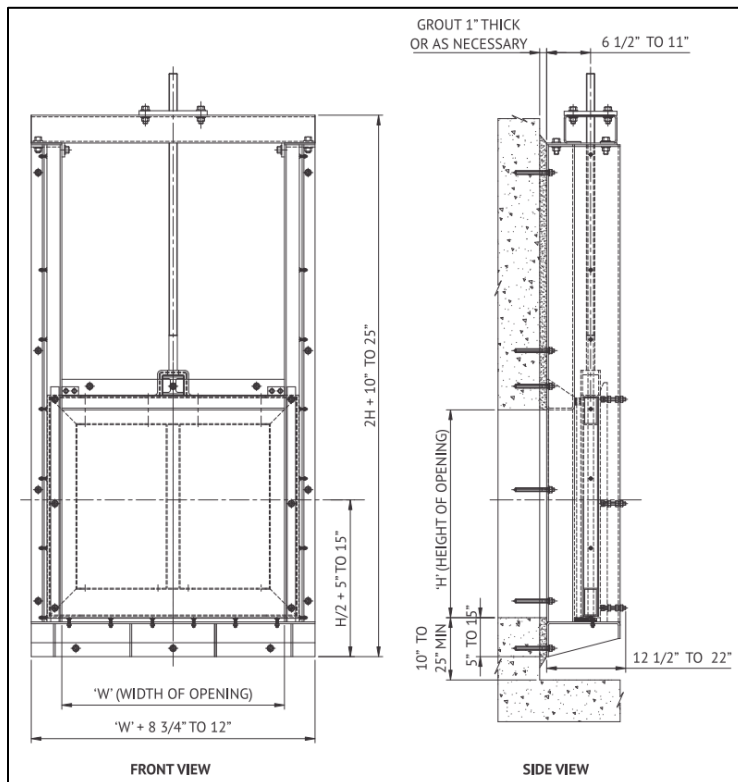


Figure D-2. Typical diversion headgate design (conceptual configuration adapted from standard manufacturer details for slide gates published by Rodney Hunt Company). The figure illustrates a representative single-slide gate; the proposed diversion will require multiple slide gates to accommodate the full canal width, along with supporting concrete structures and wingwalls.

Project Map:

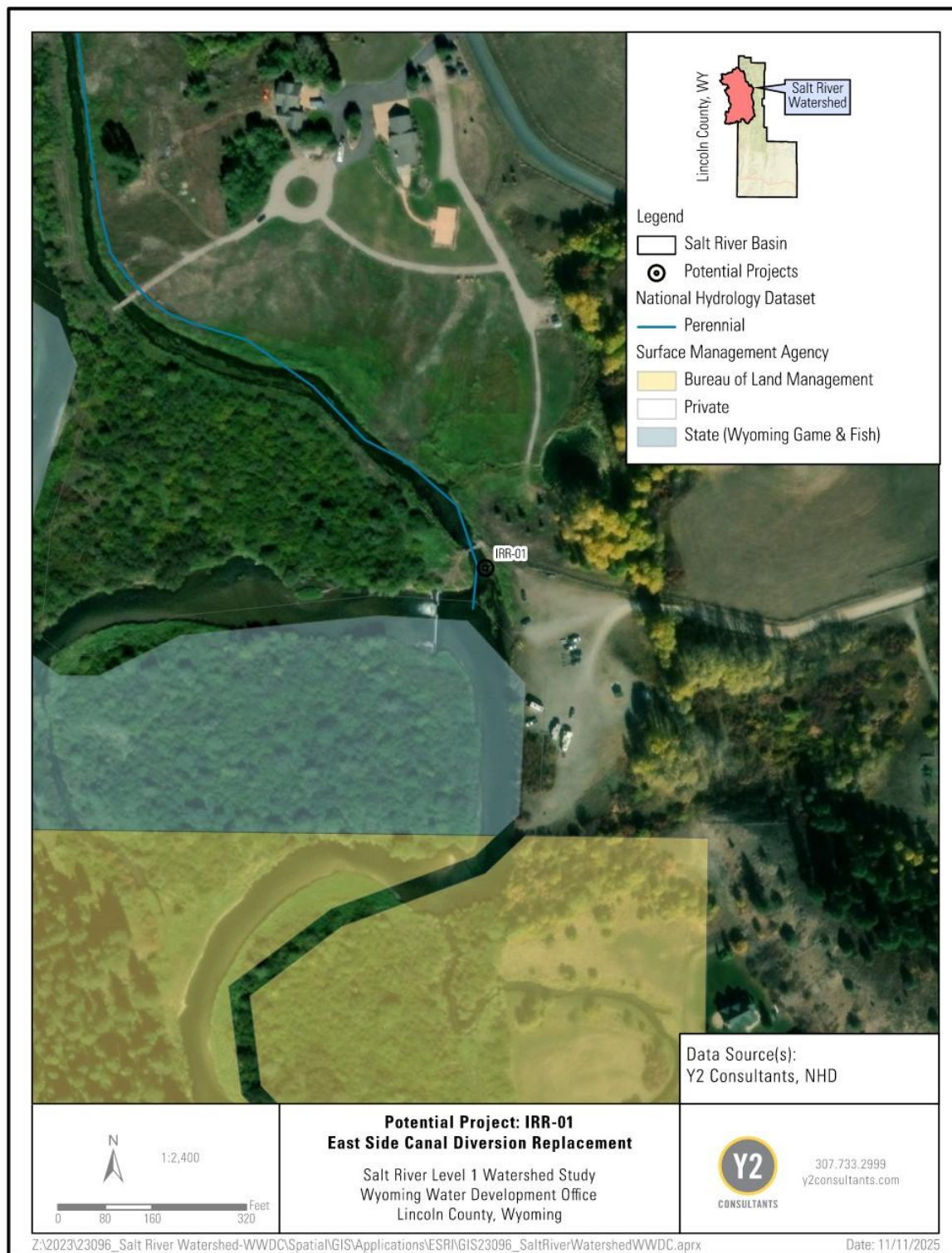


Figure D-3. Project map for project IRR-01 – East Side Canal Diversion Replacement.

IRR-02 – Willow Creek Spillover Diversion Headgate Replacement

Project ID: IRR-02

Project Name: Willow Creek Spillover Diversion Headgate Replacement

Project Type: Irrigation Diversion Improvement

Landowner: Private, Verdean G. & Helen Heiner Trustees

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): NW1/4SW1/4 Sec. 10, T33N, R118W

Location (Lat/Long): 42.8574, -110.9100

Project Description: This project involves replacing the existing headgate on the Willow Creek Spillover Diversion due to ongoing leakage, debris buildup, and operational difficulties. The work includes removing the existing structure, installing a new reinforced concrete headgate with upgraded gates and operating mechanisms, and making improvements to reduce maintenance and enhance flow control in the Willow Creek Canal. The replacement will improve reliability, efficiency, and ease of operation.

Public Benefit: Replacing the failing headgate will improve control of irrigation flows, reduce water losses, and support more reliable deliveries to farms and downstream users. Improved flow management will protect adjacent properties from unintended overtopping and erosion, reduce maintenance costs, and conserve a limited water supply for beneficial use throughout the irrigation season.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 6,600.00	\$ 6,600.00
2	Demolition & Site Preparation	1	LS	\$20,000.00	\$20,000.00
3	New Concrete Walls & Headgates	1	LS	\$60,000.00	\$60,000.00
4	Riprap & Channel Improvements	1	LS	\$30,000.00	\$30,000.00
Total Component Cost (Subtotal #2):					\$116,600.00

Preparation of Final Designs & Specifications	\$11,660.00
Permitting and Mitigation	\$ 15,500.00
Legal Fees	\$0.00
Acquisition of Access and Rights-Of-Way	\$0.00
Pre-Construction Costs (Subtotal #1)	\$27,160.00

Total Component Cost (Subtotal #2)	\$116,600.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$11,660.00
Components and Engineering Costs (Subtotal #3)	\$128,260.00
Contingency (Subtotal #3 x 15%)	\$19,239.00
Total Construction Cost (Subtotal #4)	\$159,159.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$186,319.00
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Potential Funding Partners

Project ID: IRR-02

Project Name: Willow Creek Spillover Diversion Headgate Replacement

Land Jurisdiction: Private, Verdean G & Helen Heiner Trustees

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements:

Project ID: IRR-02

Project Name: Willow Creek Spillover Diversion Headgate Replacement

Land Jurisdiction: Private, Verdean G & Helen Heiner Trustees

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P20352

Proposed Permit: It is anticipated that a SW-2 permit may be required for the headgate replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be found in Section 9 of the watershed report.

Should the headgate be moved from its current location, even slightly, a SW-1 permit would be required for a new headgate.

U.S. Army Corps of Engineers (USACE)

It is anticipated that a Nationwide Permit (NWP) will be required for the replacement of the diversion structure on the East Side Canal. The most applicable authorization is likely NWP 3 – Maintenance, which covers the repair, rehabilitation, or replacement of existing, currently serviceable structures or fills located within waters of the U.S., including irrigation ditches.

This permit action will require submission of a Pre-Construction Notification (PCN) to the USACE. The PCN process typically involves completing a wetland delineation and receiving written authorization from the USACE prior to the start of construction.

It is important to note that activities authorized under NWP 3 must not expand the structure's footprint or fill area beyond its existing limits. If the proposed design results in a larger footprint or modified channel alignment, the project may instead require an Individual Section 404 Permit or qualify under a different nationwide permit—such as NWP 13 (Bank Stabilization) or NWP 27 (Aquatic Habitat Restoration, Establishment, and Enhancement). Additional details on the permitting process are provided in Section 9 of the watershed report.

A USACE letter of authorization or acceptance should be submitted to the WWDO with the final design package and obtained prior to construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-4. Photo of existing diversion structure on Willow Creek.

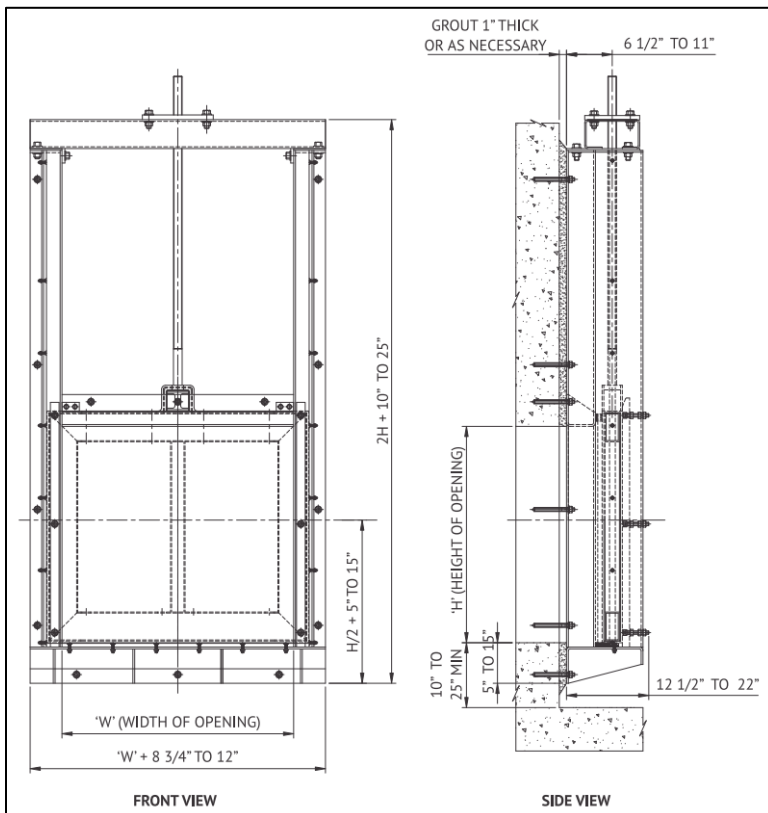


Figure D-5. Typical diversion headgate design (conceptual configuration adapted from standard manufacturer details for slide gates published by Rodney Hunt Company).

Project Map:



Figure D-6. Project map for project IRR-02 – Willow Creek Spillover Diversion Headgate Replacement.

IRR-03 – A Frame Diversion Headgate Replacement

Project ID: IRR-03

Project Name: A Frame Diversion Headgate Replacement

Project Type: Irrigation Diversion Improvement

Landowner: Private, Mark Dickson

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): NW1/4/SE1/4 Sec. 28, T34N, R118W

Location (Lat/Long): 42.8990, -110.9201

Project Description: This project involves replacing the existing headgate on the Strawberry Creek and Willow Creek canals due to ongoing leakage, debris buildup, and operational difficulties. The work includes removing the existing structure, installing a new reinforced concrete headgate with upgraded gates and operating mechanisms, and making improvements to reduce maintenance and enhance flow control. The replacement will improve reliability, efficiency, and ease of operation.

Public Benefit: Replacing the failing headgate will improve control of irrigation flows, reduce water losses, and support more reliable deliveries to farms and downstream users. Improved flow management will protect adjacent properties from unintended overtopping and erosion, reduce maintenance costs, and conserve a limited water supply for beneficial use throughout the irrigation season.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 8,400.00	\$ 8,400.00
2	Demolition & Site Preparation	1	LS	\$ 20,000.00	\$ 20,000.00
3	New Concrete Walls & Headgates	1	LS	\$ 90,000.00	\$ 90,000.00
4	Riprap & Channel Improvements	1	LS	\$ 30,000.00	\$ 30,000.00
Total Component Cost (Subtotal #2):					\$ 148,400.00

Preparation of Final Designs & Specifications	\$ 14,840.00
Permitting and Mitigation	\$ 5,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 19,840.00

Total Component Cost (Subtotal #2)	\$ 148,400.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 14,840.00
Components and Engineering Costs (Subtotal #3)	\$ 163,240.00
Contingency (Subtotal #3 x 15%)	\$ 24,486.00
Total Construction Cost (Subtotal #4)	\$ 202,566.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 222,406.00
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Potential Funding Partners

Project ID: IRR-03

Project Name: A Frame Diversion Headgate Replacement

Land Jurisdiction: Private, Mark Dickson

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements:

Project ID: IRR-03

Project Name: A Frame Diversion Headgate Replacement

Land Jurisdiction: Private, Mark Dickson

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P137

Proposed Permit: It is anticipated that a SW-2 permit may be required for the headgate replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be found in Section 9 of the watershed report.

Should the headgate be moved from its current location, even slightly, a SW-1 permit would be required for a new headgate.

U.S. Army Corps of Engineers (USACE)

It is anticipated that a Nationwide Permit (NWP) will be required for the replacement of the diversion structure on the East Side Canal. The most applicable authorization is likely NWP 3 – Maintenance, which covers the repair, rehabilitation, or replacement of existing, currently serviceable structures or fills located within waters of the U.S., including irrigation ditches.

This permit action will require submission of a Pre-Construction Notification (PCN) to the USACE. The PCN process typically involves completing a wetland delineation and receiving written authorization from the USACE prior to the start of construction.

It is important to note that activities authorized under NWP 3 must not expand the structure's footprint or fill area beyond its existing limits. If the proposed design results in a larger footprint or modified channel alignment, the project may instead require an Individual Section 404 Permit or qualify under a different nationwide permit—such as NWP 13 (Bank Stabilization) or NWP 27 (Aquatic Habitat Restoration, Establishment, and Enhancement). Additional details on the permitting process are provided in Section 9 of the watershed report.

A USACE letter of authorization or acceptance should be submitted to the WWDO with the final design package and obtained prior to construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-7. Photo of existing A Frame Diversion.

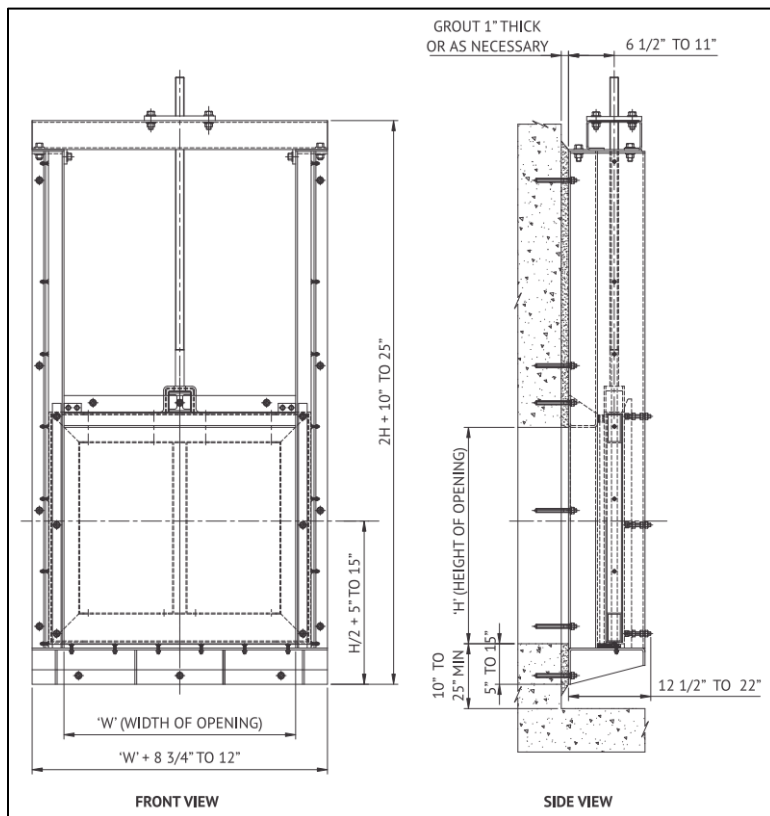


Figure D-8. Typical diversion headgate design (adapted from standard details published by Rodney Hunt Company).

Project Map:

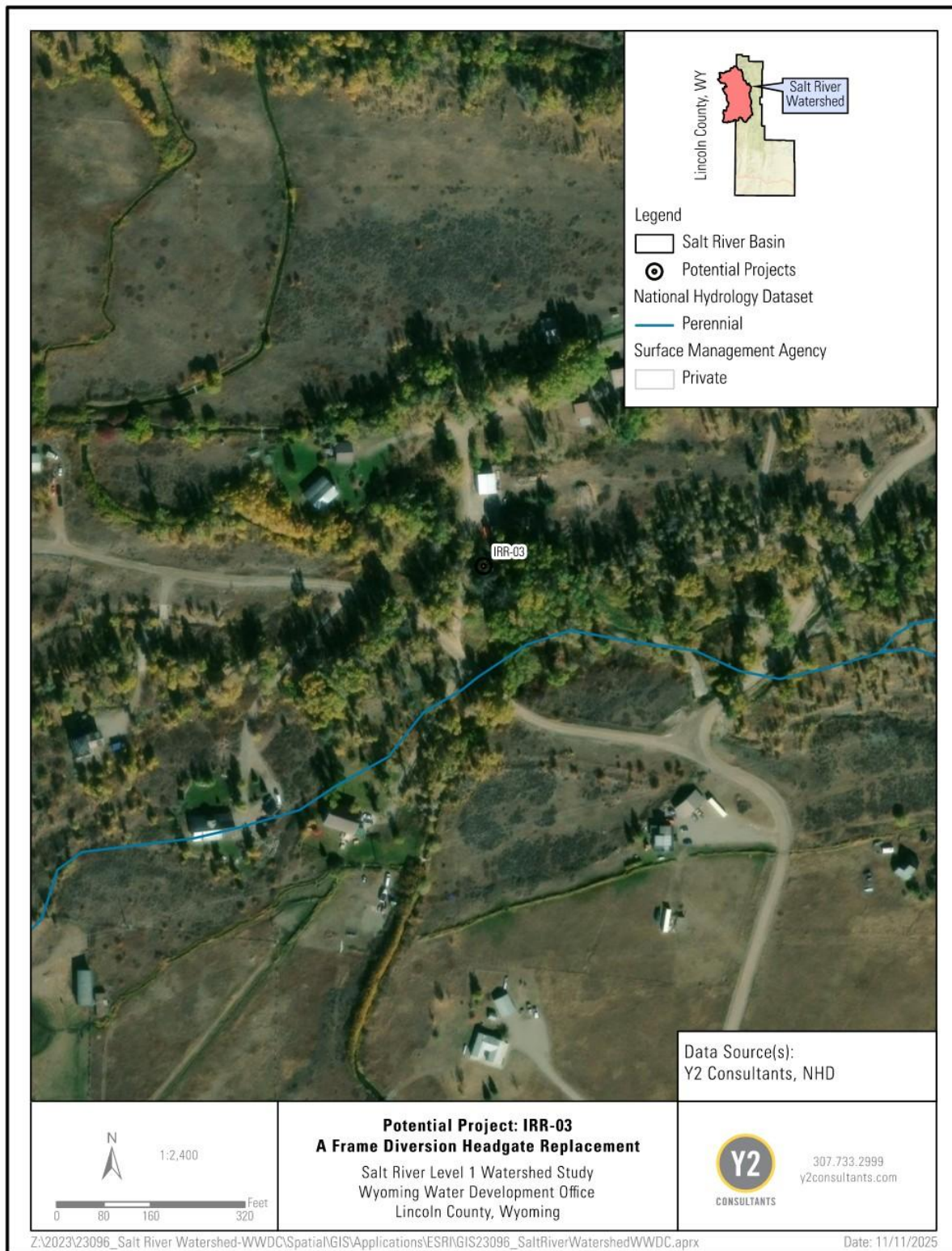


Figure D-9. Project map for project IRR-03 – A Frame Diversion Headgate Replacement.

IRR-04 – Stump Creek Diversion Replacement

Project ID: IRR-04

Project Name: Stump Creek Diversion Replacement

Project Type: Diversion Structure

Landowner: Jenny Luthi (Trout Unlimited is the project proponent)

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): SE1/4SE1/4, Sec. 35, T33N, R119W

Location (Lat/Long): 42.7952, -110.9976

Project Description: This project involves replacing the existing diversion gates at the Stump Creek Diversion, located just east of Highway 238, due to aging infrastructure and the need to improve fish passage. Work includes removal of the existing structure, construction of a new reinforced concrete diversion with upgraded gates and operating systems, full replacement of the existing screen, and provisions for a fish ladder. Additional improvements will target reduced maintenance and better flow control. The new system will enhance reliability, efficiency, and environmental performance while maintaining dependable water deliveries to irrigators.

Public Benefit: This project will deliver clear public benefits by improving water management, supporting local agriculture, and enhancing environmental stewardship. By upgrading aging infrastructure and adding a fish ladder, the project supports native fish populations and improves river health. More efficient flow control reduces water loss and operational downtime, helping ensure reliable water deliveries to irrigators who depend on the canal system. Together, these improvements promote long-term sustainability for both the local ecosystem and the communities that rely on Stump Creek.

Project Components (Engineer's Estimate)

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 12,900.00	\$ 12,900.00
2	Demolition & Site Preparation	1	LS	\$ 20,000.00	\$ 20,000.00
3	New Concrete Walls & Headgates	1	LS	\$ 115,000.00	\$ 115,000.00
4	Fish Ladder	1	LS	\$ 50,000.00	\$ 50,000.00
5	Riprap & Channel Improvements	1	LS	\$ 30,000.00	\$ 30,000.00
Total Component Cost (Subtotal #2):					\$ 227,900.00

Preparation of Final Designs & Specifications	\$ 22,790.00
Permitting and Mitigation	\$ 17,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 39,790.00

Total Component Cost (Subtotal #2)	\$ 227,900.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 22,790.00
Components and Engineering Costs (Subtotal #3)	\$ 250,690.00
Contingency (Subtotal #3 x 15%)	\$ 37,603.50
Total Construction Cost (Subtotal #4)	\$ 311,083.50

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 350,873.50
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Potential Funding Partners

Project ID: IRR-04

Project Name: Stump Creek Diversion Replacement

Land Jurisdiction: Private, Genevieve Giles

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- U.S. Fish and Wildlife Service
 - National Fish Passage Program
- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- National Oceanic and Atmospheric Administration
 - Restoring Fish Passage through Barrier Removal Grants

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements:

Project ID: IRR-04

Project Name: Stump Creek Diversion Replacement

Land Jurisdiction: Private, Genevieve Giles

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P1685

Proposed Permit: It is anticipated that a SW-2 permit may be required for the diversion replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is anticipated that a Nationwide Permit (NWP) will be required for the replacement of the diversion structure on the East Side Canal. The most applicable authorization is likely NWP 3 – Maintenance, which covers the repair, rehabilitation, or replacement of existing, currently serviceable structures or fills located within waters of the U.S., including irrigation ditches.

This permit action will require submission of a Pre-Construction Notification (PCN) to the USACE. The PCN process typically involves completing a wetland delineation and receiving written authorization from the USACE prior to the start of construction.

It is important to note that activities authorized under NWP 3 must not expand the structure's footprint or fill area beyond its existing limits. If the proposed design results in a larger footprint or modified channel alignment, the project may instead require an Individual Section 404 Permit or qualify under a different nationwide permit—such as NWP 13 (Bank Stabilization) or NWP 27 (Aquatic Habitat Restoration, Establishment, and Enhancement). Additional details on the permitting process are provided in Section 9 of the watershed report.

A USACE letter of authorization or acceptance should be submitted to the WWDO with the final design package and obtained prior to construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-10. Existing diversion structure on Stump Creek.

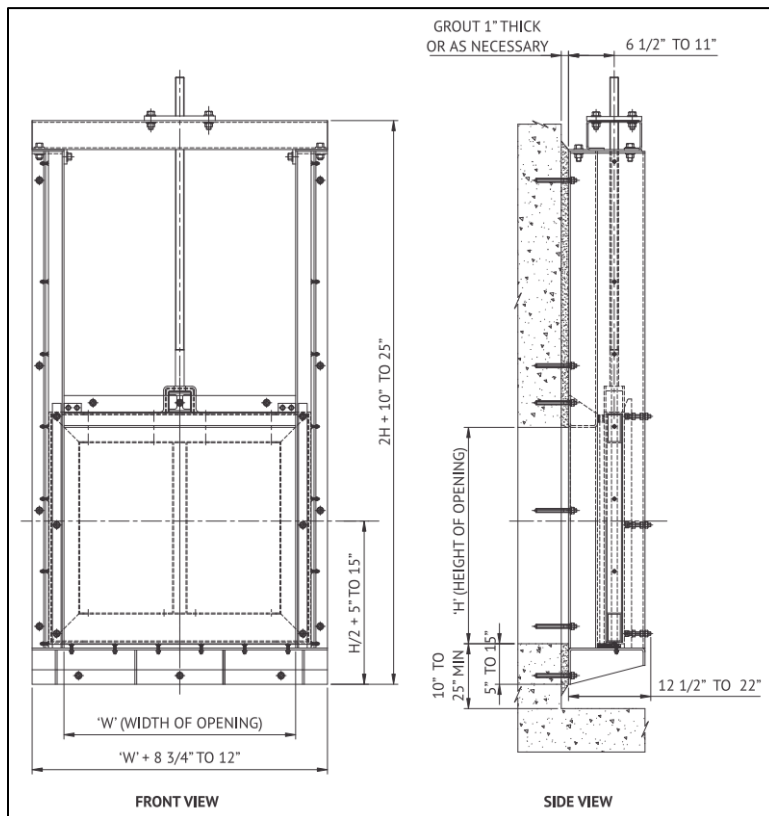


Figure D-11. Typical diversion headgate design (adapted from standard details published by Rodney Hunt Company).

Project Map:



Figure D-12. Project map for project IRR-04 – Stump Creek Diversion Replacement.

IRR-05 – Craney Creek Culvert Replacement

Project ID: IRR-05

Project Name: Craney Creek Culvert Replacement

Project Type: Culverts

Landowner: Daniel M. Hesse Trustee (Trout Unlimited is project proponent)

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): Sec. 36 T33N R119W; Sec. 3,9,10,15 T32N R119W

Location (Lat/Long): 42.7976, -110.9801

Project Description: This project involves improving several culverts along Craney Creek, located between the Stump Creek Diversion and the Salt River. The existing culverts are outdated and pose barriers to fish movement, limiting access to upstream habitat. The work will include replacing or retrofitting the culverts to improve flow conditions, reduce erosion, and restore fish passage. These upgrades aim to enhance aquatic connectivity and support healthier fish populations throughout the Craney Creek system, contributing to broader habitat improvement efforts in the watershed.

Public Benefit: This project will provide meaningful public benefits by restoring natural fish movement and improving overall stream health in Craney Creek. By upgrading culverts that currently block or restrict passage, the project opens access to critical upstream habitat for native fish species, supporting their recovery and long-term viability. Healthier fish populations contribute to a more resilient ecosystem and support recreational activities such as fishing and wildlife viewing. In addition, improved culvert design will help reduce road and streambed erosion, protecting infrastructure and water quality.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 19,320.00	\$ 19,320.00
2	Large Culvert Replacement (8'+ Dia.)	14	Each	\$ 12,000.00	\$ 168,000.00
3	Channel Grading	14	Each	\$ 5,000.00	\$ 70,000.00
4	Erosion Control	14	Each	\$ 6,000.00	\$ 84,000.00
Total Component Cost (Subtotal #2):					\$341,320.00

Preparation of Final Designs & Specifications	\$ 34,132.00
Permitting and Mitigation	\$ 1,500.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 35,632.00

Total Component Cost (Subtotal #2)	\$ 341,320.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 34,132.00
Components and Engineering Costs (Subtotal #3)	\$ 375,452.00
Contingency (Subtotal #3 x 15%)	\$ 56,317.80
Total Construction Cost (Subtotal #4)	\$ 465,901.80

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 501,533.80
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Potential Funding Partners

Project ID: IRR-05

Project Name: Craney Creek Culvert Replacement

Land Jurisdiction: Private

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- U.S. Fish and Wildlife Service
 - National Fish Passage Program
- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- Federal Highway Administration
 - Culvert Aquatic Organism Passage Program

State

- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements:

Project ID: IRR-05

Project Name: Craney Creek Culvert Replacement

Land Jurisdiction: Private

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: None

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

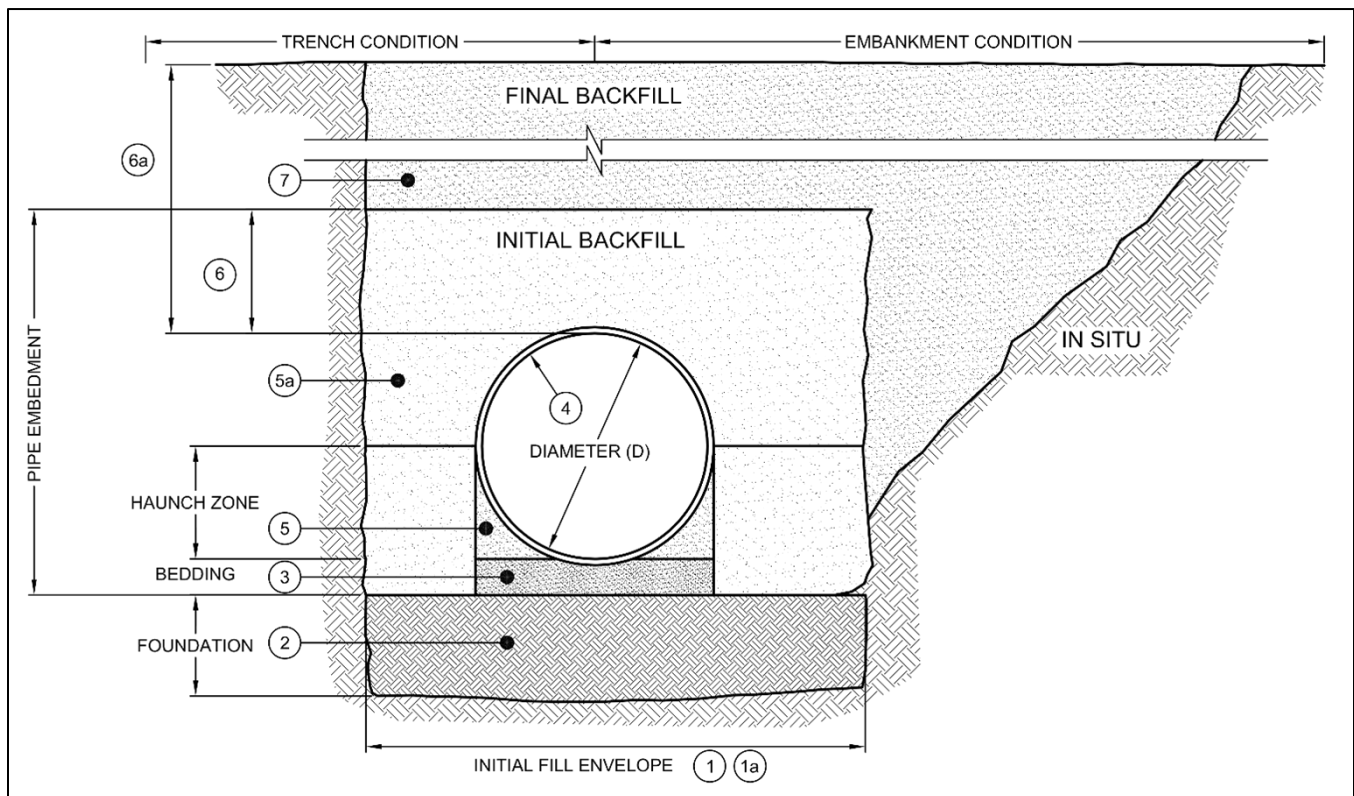


Figure D-13. Typical culvert section (*CMP End Sections by Contech, n.d.*)

Project Map:

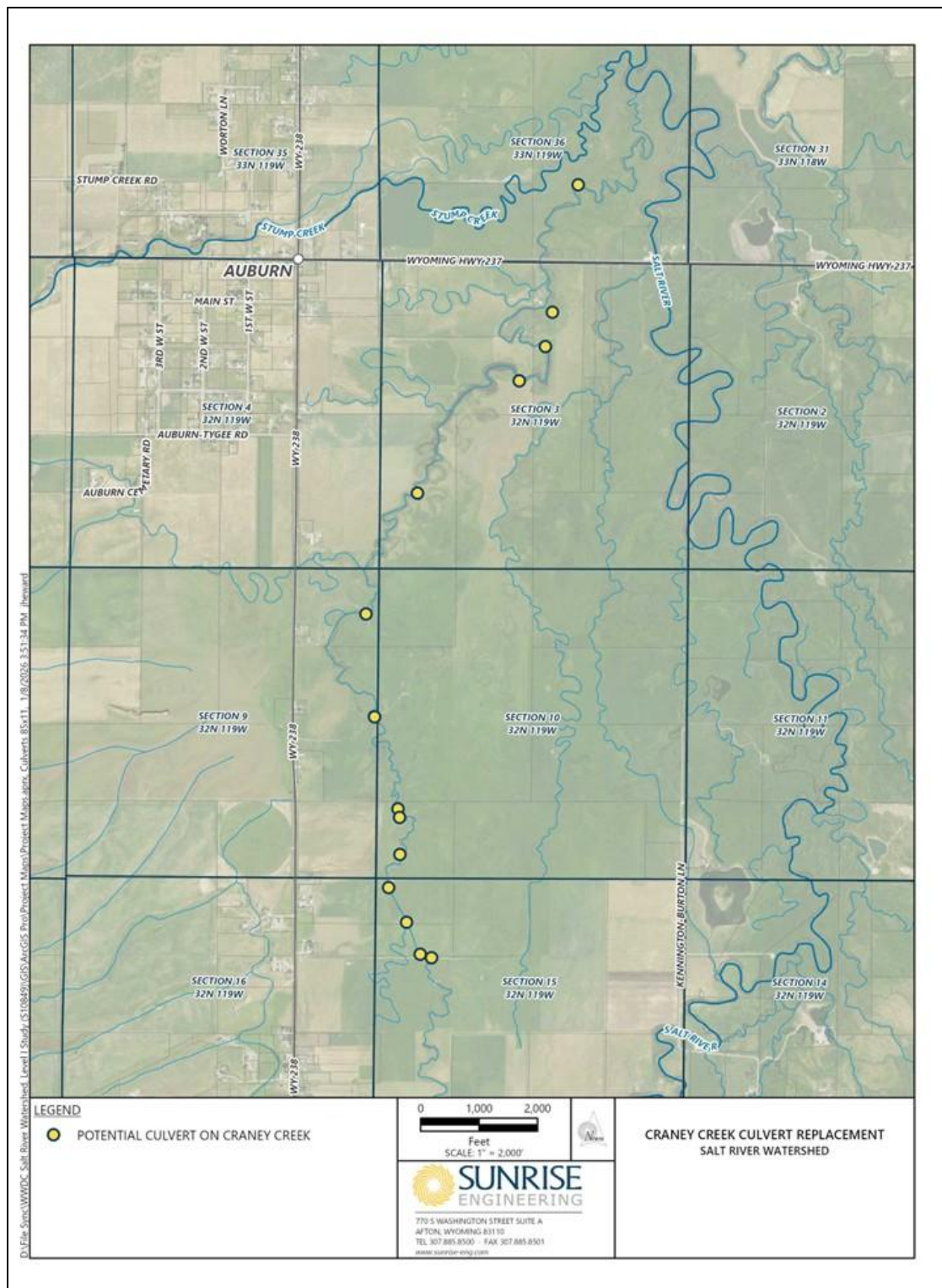


Figure D-14. Project map for IRR-05 – Craney Creek Culvert Replacement.

PIPE-01 – West Cedar Creek Pipeline Improvements

Project ID: PIPE-01

Project Name: West Cedar Creek Pipeline Improvements

Project Type: Irrigation Conveyance Improvement

Landowner: West Cedar Creek Company Board, pipeline crosses multiple private parcels

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): Sec. 1 and 2, T34N, R119W and Sec. 5 and 6, T34N, R118W

Location (Lat/Long): 42.9572, -110.9434

Project Description: The project will improve the West Cedar Creek irrigation pipeline by replacing approximately 1 mile of aging, failing pipeline to eliminate leaks, increase capacity, and extend service life. Work includes removing and replacing deteriorated pipe segments with modern, durable materials and completing tie-ins to existing laterals to ensure reliable and efficient water delivery throughout the system.

Public Benefit: Replacing this irrigation pipeline will conserve water by eliminating leakage, providing more consistent flows to irrigators, and reducing unplanned outages during the irrigation season. Recently, numerous repairs have been made to easements within residential properties. The project will protect adjacent property and roads by reducing the risk of breaks and erosion, decreasing routine maintenance and emergency repair costs, and extending the useful life of critical irrigation infrastructure.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 30,200.00	\$ 30,200.00
2	Excavation, Bedding, & Backfill	1	LS	\$ 20,000.00	\$ 20,000.00
3	12" Irrigation Main	5280	LF	\$ 80.00	\$ 422,400.00
4	Surface Restoration	5280	LF	\$ 6.00	\$ 31,680.00
5	Connect to Existing Water	2	LS	\$ 4,000.00	\$ 8,000.00
6	Misc. Valves & Appurtenances	1	LS	\$ 21,120.00	\$ 21,120.00
Total Component Cost (Subtotal #2):					\$ 533,400.00

Preparation of Final Designs & Specifications	\$ 53,340.00
Permitting and Mitigation	\$ 13,500.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 66,840.00

Total Component Cost (Subtotal #2)	\$ 533,400.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 53,340.00
Components and Engineering Costs (Subtotal #3)	\$ 586,740.00
Contingency (Subtotal #3 x 15%)	\$ 88,011.00
Total Construction Cost (Subtotal #4)	\$ 728,091.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 794,931.00
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Potential Funding Partners

Project ID: PIPE-01

Project Name: West Cedar Creek Pipeline Improvements

Land Jurisdiction: Private, multiple landowners – West Cedar Creek Board Company

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- Environmental Protection Agency
 - Clean Water State Revolving Fund

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited

Permitting and Agency Review Requirements:

Project ID: PIPE-01

Project Name: West Cedar Creek Pipeline Improvements

Land Jurisdiction: Private, multiple landowners – West Cedar Creek Board Company

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: Unknown

Proposed Permit: It is anticipated that a SW-2 permit may be required for the pipeline replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review before final submission to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

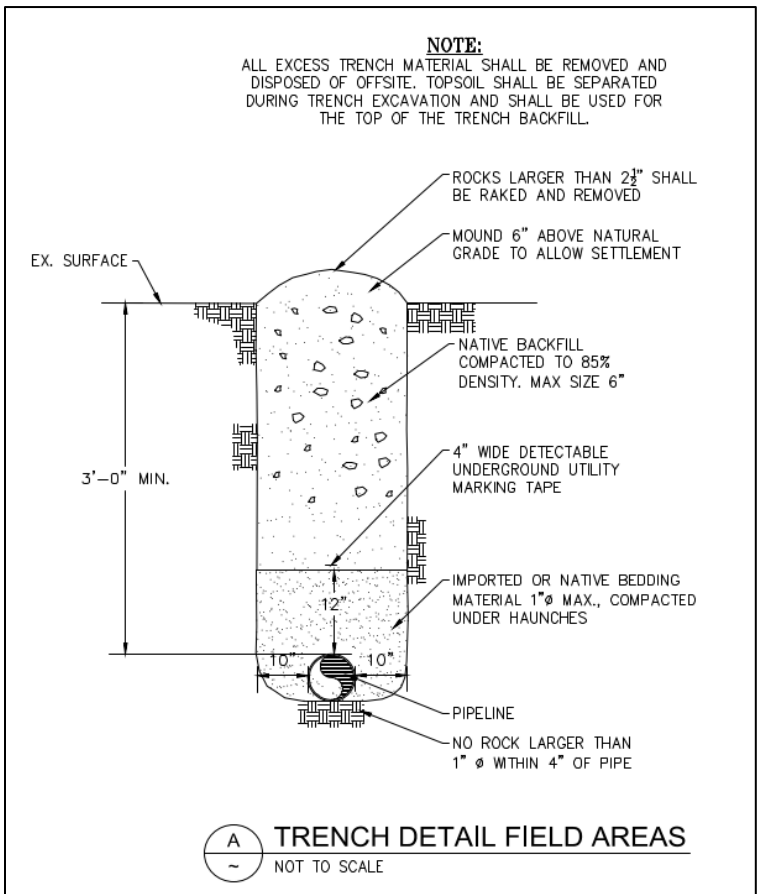


Figure D-15. Typical irrigation ditch main detail (NRCS).

Project Map:

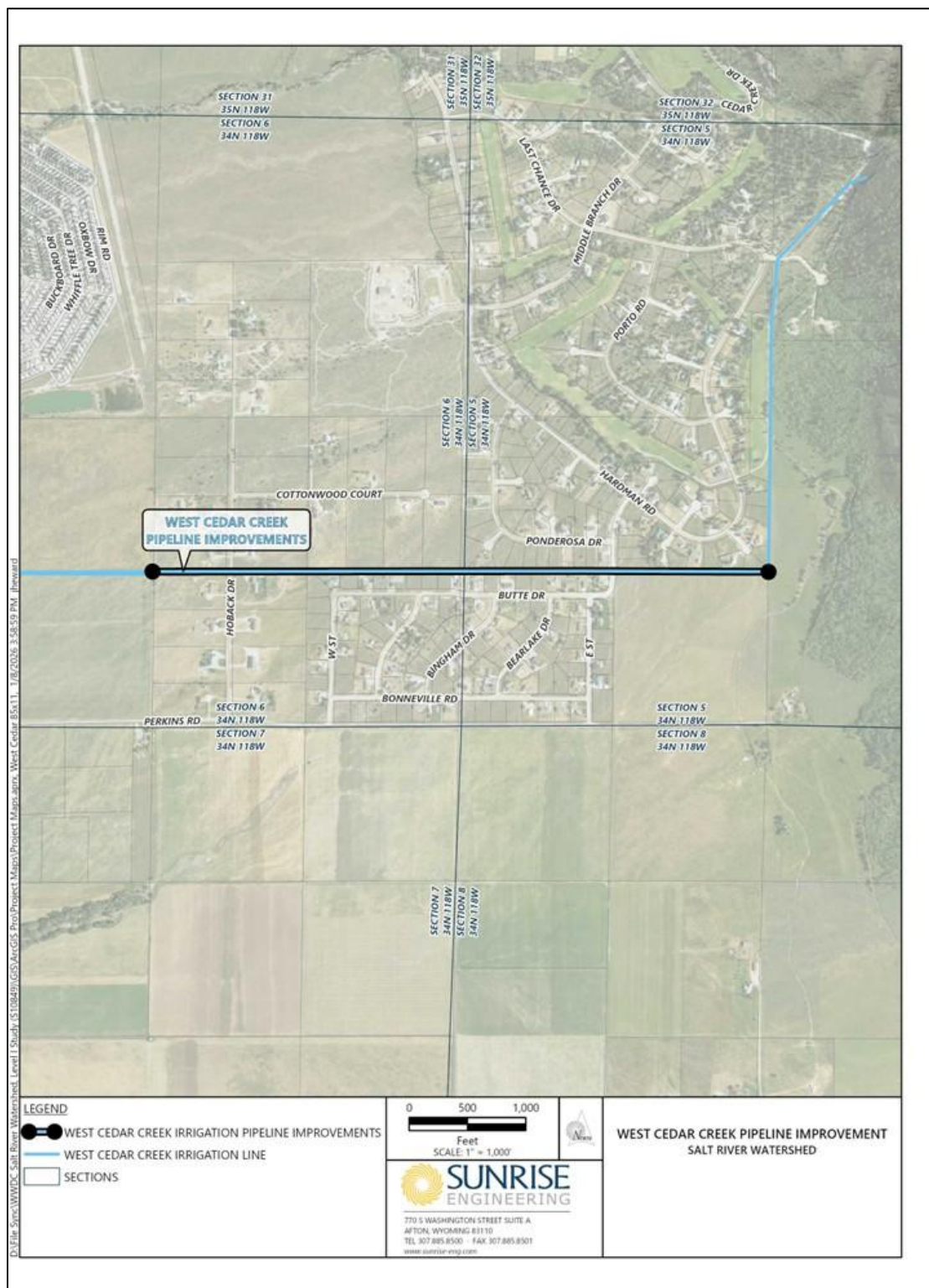


Figure D-16. Project map for PIPE-01 – West Cedar Creek Pipeline Improvement.

PIPE-02 – Miller Transmission Main Pipeline Improvements

Project ID: PIPE-02

Project Name: Miller Transmission Main Pipeline Improvements

Project Type: Irrigation Conveyance Improvement

Landowner: Strawberry Canal Company, pipeline crosses multiple private parcels

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): Sec. 19, 20, 28 & 29, T34N, R118 W and Sec. 24, T34N R, 119 W

Location (Lat/Long): 42.9028, -110.9247

Project Description: The project will improve the Miller Transmission main of the Strawberry Canal irrigation system by replacing over three miles of aging pipeline, thereby eliminating leaks, increasing capacity, and extending service life. Work includes removing and replacing deteriorated pipes with modern, durable materials and completing tie-ins to existing laterals to ensure reliable and efficient water delivery throughout the system.

Public Benefit: Replacing this irrigation transmission mainline will conserve water by eliminating leakage, provide more consistent flows to irrigators, and reduce unplanned outages during the irrigation season. The project will protect adjacent property and roads by reducing the risk of breaks and erosion, decreasing routine maintenance and emergency repair costs, and extending the useful life of critical irrigation infrastructure.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 90,420.00	\$ 90,420.00
2	Excavation, Bedding, & Backfill	1	LS	\$ 20,000.00	\$ 20,000.00
3	12" Irrigation Main	17450	LF	\$ 75.00	\$1,308,750.00
4	Surface Restoration	17450	LF	\$ 6.00	\$ 104,700.00
5	Connect to Existing Water	2	LS	\$ 4,000.00	\$ 8,000.00
6	Misc. Valves & Appurtenances	1	LS	\$ 65,437.50	\$ 65,500.00
Total Component Cost (Subtotal #2):					\$1,597,370.00

Preparation of Final Designs & Specifications	\$ 159,737.00
Permitting and Mitigation	\$ 13,500.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 173,237.00

Total Component Cost (Subtotal #2)	\$1,597,307.50
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 159,737.00
Components and Engineering Costs (Subtotal #3)	\$1,757,107.00
Contingency (Subtotal #3 x 15%)	\$ 263,566.05
Total Construction Cost (Subtotal #4)	\$2,180,410.05

Total Project Cost (Subtotal #1 + Subtotal #4)	\$2,353,647.05
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Potential Funding Partners

Project ID: PIPE-02

Project Name: Miller Transmission Main Pipeline Improvement

Land Jurisdiction: Private, multiple landowners – Strawberry Canal Company

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- Environmental Protection Agency
 - Clean Water State Revolving Fund

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited

Permitting and Agency Review Requirements:

Project ID: PIPE-02

Project Name: Miller Transmission Main Pipeline Improvement

Land Jurisdiction: Private, multiple landowners – Strawberry Canal Company

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: Unknown

Proposed Permit: It is anticipated that a SW-2 permit may be required for the pipeline replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

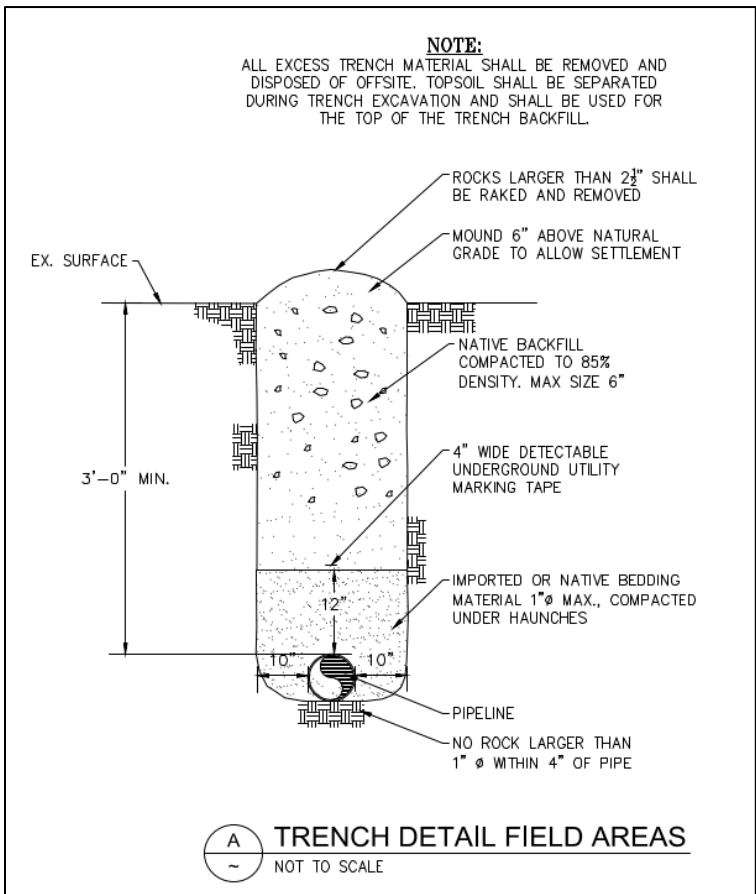


Figure D-17. Typical irrigation main detail (NRCS).

Project Map:

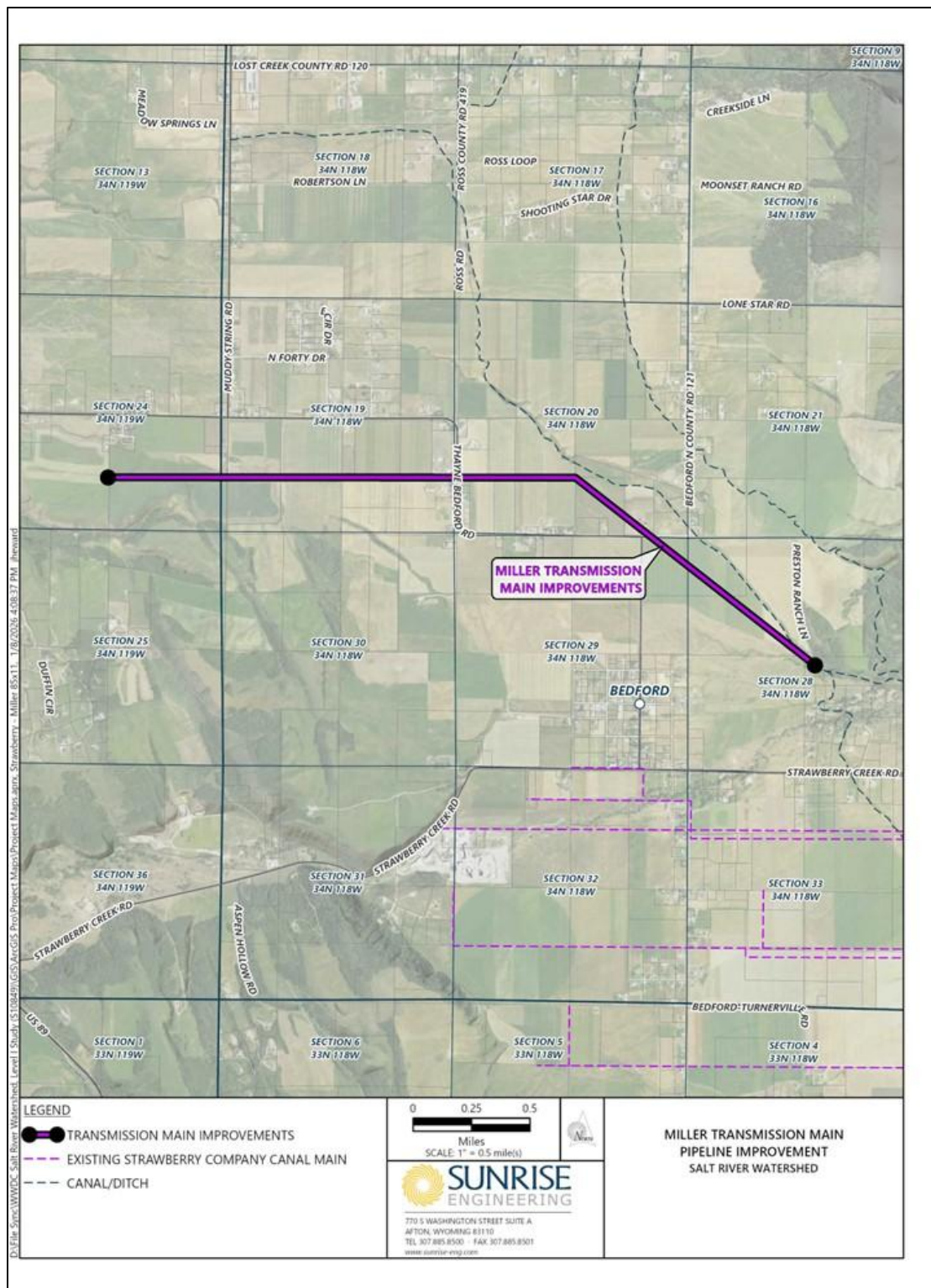


Figure D-18. Project map of PIPE-02 – Miller Transmission Main Pipeline Improvement.

PIPE-03 – Upper Strawberry Transmission Main Pipeline Improvements

Project ID: PIPE-03

Project Name: Upper Strawberry Transmission Main Pipeline Improvements

Project Type: Irrigation Conveyance Improvement

Landowner: Strawberry Canal Company, pipeline crosses multiple private parcels

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): Sec. 32, 33 & 34, T33N, R118W

Location (Lat/Long): 42.8863, -110.9029

Project Description: The project will improve the Upper Strawberry irrigation transmission main by replacing nearly three miles of aging pipeline to eliminate leaks, increase capacity, and extend service life. Work includes removing and replacing deteriorated pipe segments with modern, durable materials and completing tie-ins to existing laterals to ensure reliable and efficient water delivery throughout the system.

Public Benefit: Replacing nearly three miles of the Upper Strawberry irrigation transmission main will conserve water by eliminating leakage, provide more consistent flows to irrigators, and reduce unplanned outages during the irrigation season. The project will protect adjacent property and roads by reducing the risk of breaks and erosion, decreasing routine maintenance and emergency repair costs, and extending the useful life of critical irrigation infrastructure.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 77,710.00	\$ 77,710.00
2	Excavation, Bedding, & Backfill	1	LS	\$ 20,000.00	\$ 20,000.00
3	12" Irrigation Main	14950	LF	\$ 75.00	\$1,121,250.00
4	Surface Restoration	14950	LF	\$ 6.00	\$ 89,700.00
5	Connect to Existing Water	2	LS	\$ 4,000.00	\$ 8,000.00
6	Misc. Valves & Appurtenances	1	LS	\$ 56,062.50	\$ 56,100.00
Total Component Cost (Subtotal #2):					\$1,372,760.00

Preparation of Final Designs & Specifications	\$ 137,276.00
Permitting and Mitigation	\$ 1,500.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 138,776.00

Total Component Cost (Subtotal #2)	\$1,372,722.50
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 137,272.25
Components and Engineering Costs (Subtotal #3)	\$1,509,994.75
Contingency (Subtotal #3 x 15%)	\$ 226,499.21
Total Construction Cost (Subtotal #4)	\$1,736,493.96

Total Project Cost (Subtotal #1 + Subtotal #4)	\$1,875,269.96
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Potential Funding Partners

Project ID: PIPE-03

Project Name: Upper Strawberry Transmission Main Pipeline Improvements

Land Jurisdiction: Private, multiple landowners – Strawberry Canal Company

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- Environmental Protection Agency
 - Clean Water State Revolving Fund

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited

Permitting and Agency Review Requirements:

Project ID: PIPE-03

Project Name: Upper Strawberry Transmission Main Pipeline Improvements

Land Jurisdiction: Private, multiple landowners – Strawberry Canal Company

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: Unknown

Proposed Permit: It is anticipated that a SW-2 permit may be required for the pipeline replacement. SW-2 permits are required for modifications to existing surface water diversions, such as enlarging a ditch, replacing a pipeline, or changing diversion capacity. Further information on the SW-2 process can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

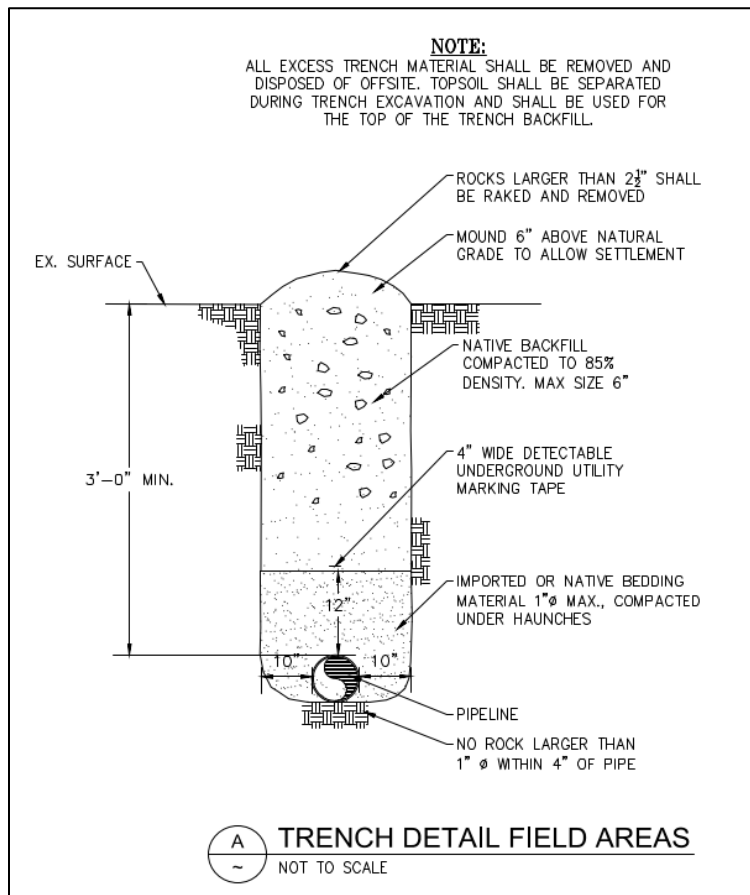


Figure D-19. Typical irrigation main detail (NRCS).

Project Map:

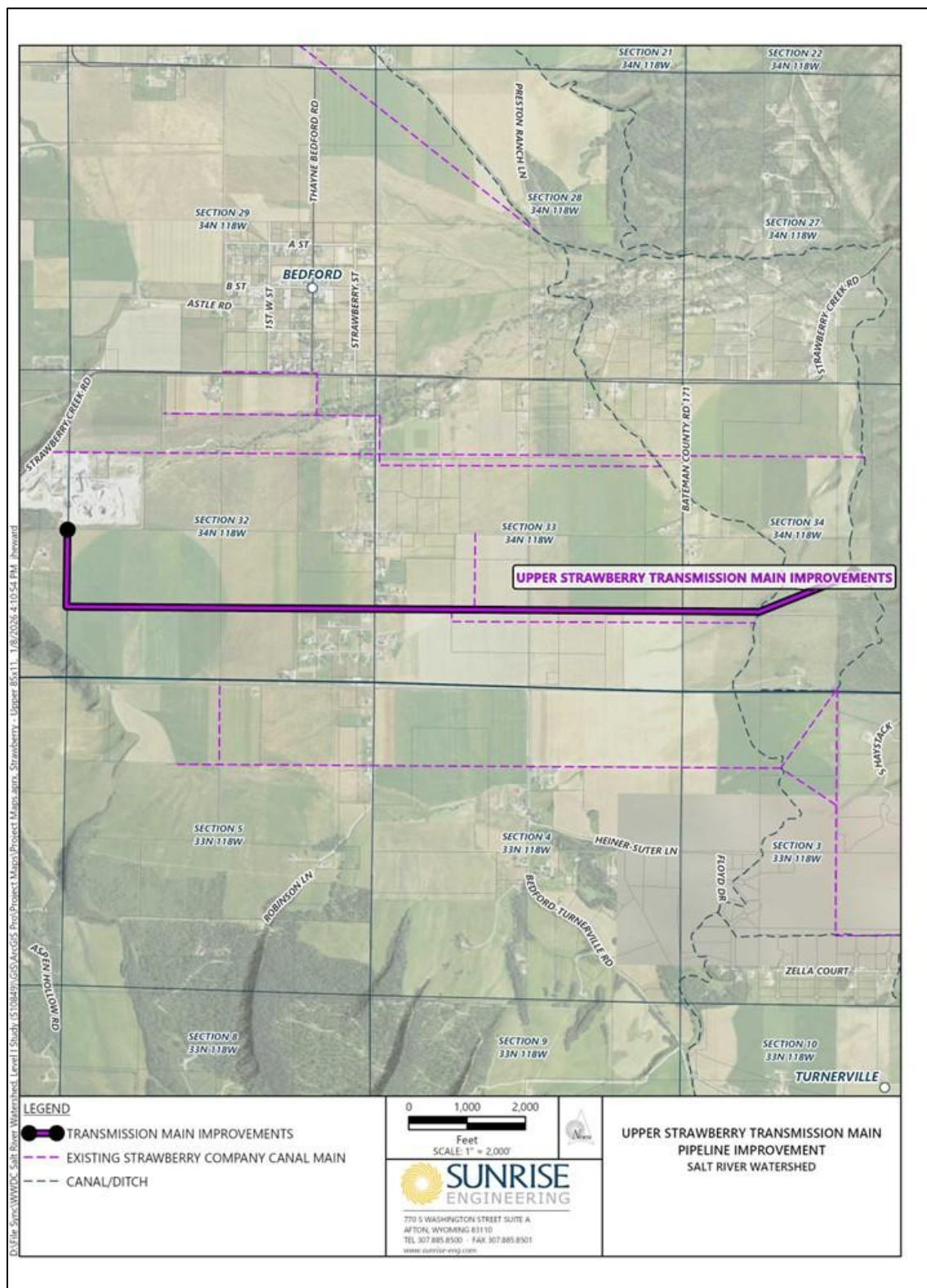


Figure D-20. Project map of PIPE-03 – Upper Strawberry Transmission Main Pipeline Improvement.

PIPE-04 – Star Valley Ranch Pipeline Conversion

Project ID: PIPE-04

Project Name: Ditch to Pipe Conversion – Star Valley Ranch

Project Type: Irrigation Conveyance Improvement- Ditch to Pipe

Landowner: Town of Star Valley Ranch

Sponsor: Town of Star Valley Ranch; Star Valley Conservation District

Land Management: Town of Star Valley Ranch

Location (PLSS): NW1/4NW1/4 Sec. 31, T35N, R118W

Location (Lat/Long): 42.9788, -110.9691

Project Description: This project replaces the irrigation ditch in Star Valley Ranch with buried pipeline systems to conserve water, improve delivery reliability, reduce maintenance and safety risks, and enhance water quality and land usability. Converting leaky open ditches to pressurized or gravity pipelines will reduce seepage and evaporative losses, limit sediment transport and nutrient loading to downstream channels, stabilize adjacent banks, and free up former ditch corridors for productive use or habitat restoration.

Public Benefit: The conversion of this irrigation ditch to a closed pipeline system will provide significant public benefits, as well as environmental benefits. These include improved water-use efficiency, reduced seepage and evaporation losses, and enhanced water quality through decreased sediment and nutrient transport. The piped system will improve public safety by eliminating open water hazards and reduce infrastructure maintenance needs associated with erosion and bank failures. Pipelines enable the use of modern, efficient irrigation technologies that conserve energy and water, while supporting more reliable agricultural production. At a landscape scale, this project will help maintain stream flows for fish and wildlife habitat, reduce flood and contamination risks, and contribute to the long-term sustainability of the Star Valley Ranch community.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 22,644.90	\$ 22,644.90
2	12" Pipe (HDPE, PVC, or steel)	1,218	LF	\$ 75.00	\$ 91,350.00
3	Fittings and Couplers	1	LF	\$ 25,000.00	\$ 25,000.00
4	Excavating and Trenching	1	LS	\$ 20,000.00	\$ 20,000.00
5	Surface Restoration	1,218	LF	\$ 12.00	\$ 14,616.00
Total Component Cost (Subtotal #2):					\$ 173,610.90

Preparation of Final Designs & Specifications	\$ 34,722.18
Permitting and Mitigation	\$ 1,500.00
Legal Fees	\$0.00
Acquisition of Access and Rights-Of-Way	\$0.00
Pre-Construction Costs (Subtotal #1)	\$ 36,222.18

Total Component Cost (Subtotal #2)	\$ 173,610.90
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 17,361.09
Components and Engineering Costs (Subtotal #3)	\$ 190,971.99
Contingency (Subtotal #3 x 15%)	\$ 28,645.80
Total Construction Cost (Subtotal #4)	\$ 219,617.79

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 255,839.97
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Potential Funding Partners

Project ID: PIPE-04

Project Name: Star Valley Ranch Pipeline Conversion

Land Jurisdiction: Town of Star Valley Ranch

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP – WaterSMART and Watershed Plans
- Bureau of Reclamation
 - WaterSMART grants
- Environmental Protection Agency
 - Clean Water State Revolving Fund

State

- Wyoming Water Development Commission
 - Small Water Project Program
- Wyoming Game and Fish
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited

Permitting and Agency Review Requirements:

Project ID: PIPE-04

Project Name: Star Valley Ranch Pipeline Conversion

Land Jurisdiction: Town of Star Valley Ranch

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P33684

Proposed Permit: No permit is anticipated, assuming that flow, volume, capacity, and demand do not change in the conversion of the ditch into a pipeline.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-21. Existing conditions of Star Valley Ranch area for ditch to pipeline project.

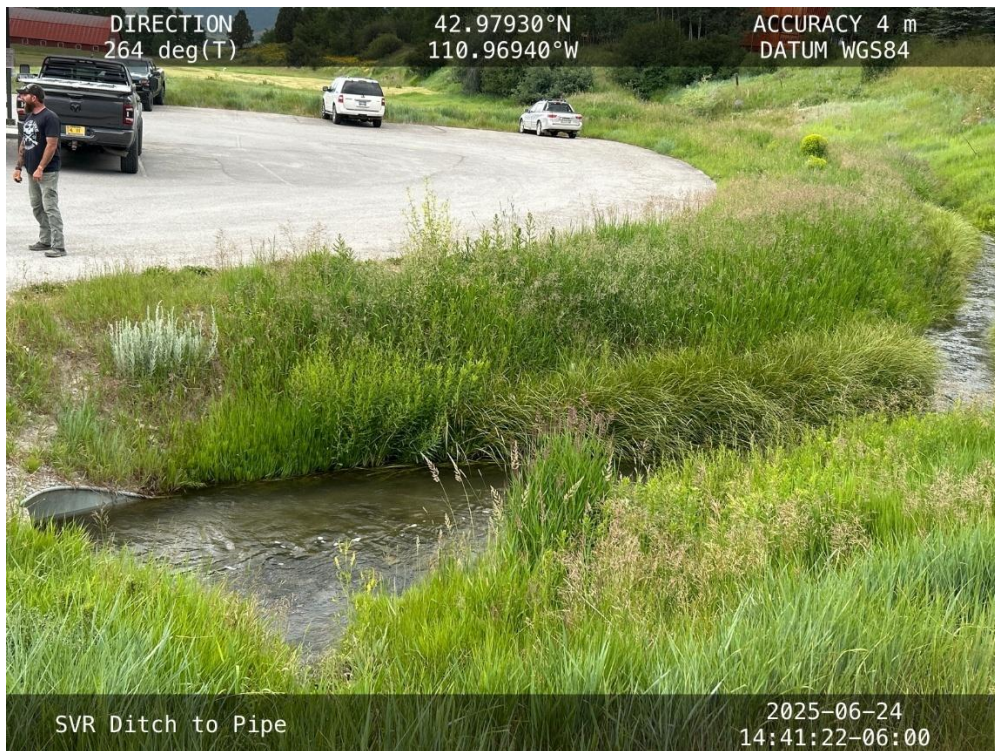


Figure D-22. Existing conditions of the Star Valley Ranch ditch to the pipeline proposed project.



Figure D-23. Existing conditions of the Star Valley Ranch ditch to pipeline proposed project.

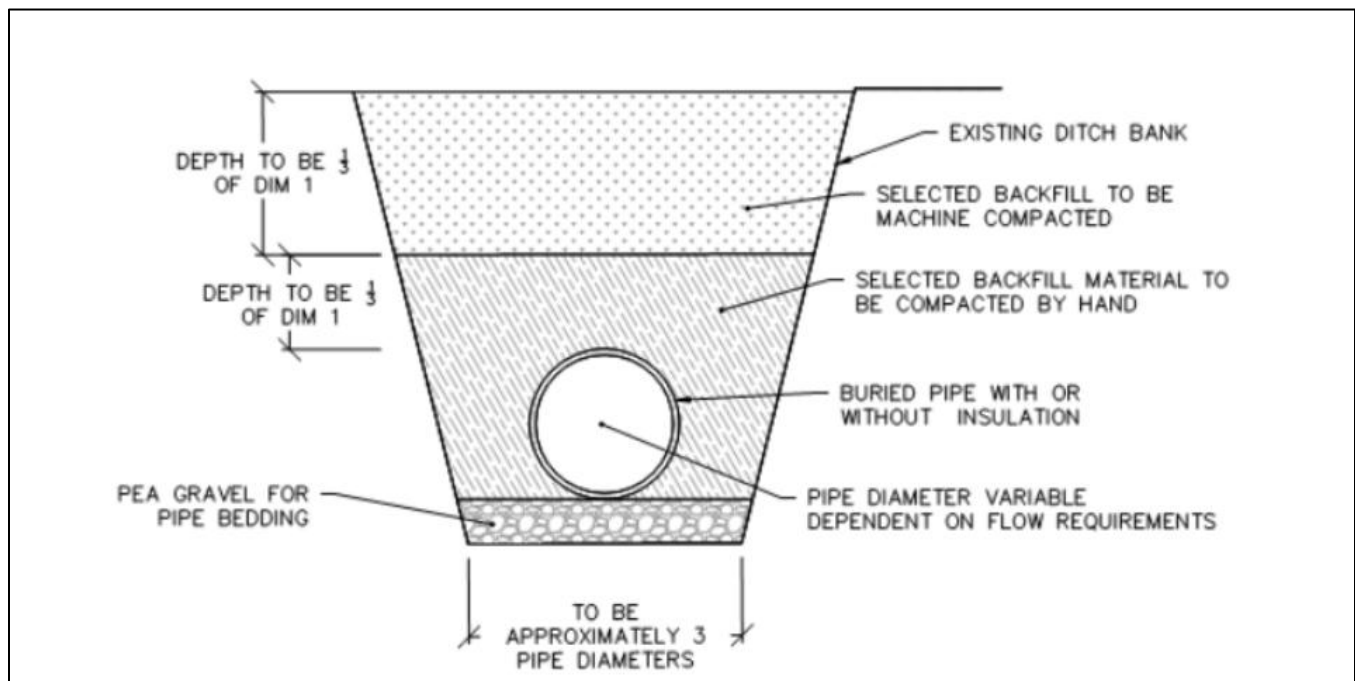


Figure D-24. Typical design for ditch to pipeline conversion (NRCS).

Project Map:



Figure D-25. Project map for PIPE-04 – Star Valley Ranch Pipeline Conversion. (Lincoln County, 2025)

FIRE-01 – Star Valley Ranch Draft Station

Project ID: FIRE-01

Project Name: Star Valley Ranch Draft Station

Project Type: Fire Suppression Infrastructure Development

Landowner: Town of Star Valley Ranch

Sponsor: Town of Star Valley Ranch; Star Valley Conservation District

Land Management: Town of Star Valley Ranch

Location (PLSS): SE1/4SE1/4 Sec. 30, T35N, R118W

Location (Lat/Long): 42.9838, -110.9564

Project Description: The proposed project involves the design and installation of a new fire-suppression draft system in an existing pond to enhance local firefighting capacity in the Star Valley Ranch area. The system will provide a reliable and accessible water source for emergency response vehicles, reducing fire response times and improving protection for residential WUI and forested areas.

The project will include construction of a dedicated draft point equipped with hardened access, a dry hydrant or suction standpipe, and associated intake piping connected to a nearby perennial waterbody or storage pond. The installation will be designed to meet National Fire Protection Association (NFPA) standards and accommodate rural firefighting apparatus used by local departments. Additional components may include signage, site grading, erosion protection, and minor access improvements to ensure year-round functionality and safety.

This project supports community and watershed resilience by improving firefighting efficiency, minimizing wildfire-related watershed damage, and protecting developed WUI areas adjacent to forested lands. Coordination will occur with the Star Valley Ranch Association, Mid-Valley Fire Department, and relevant state and federal agencies to ensure compliance with all design and permitting requirements.

Public Benefit: The primary public benefit of this project is enhanced firefighting capacity, which will help reduce wildfire impacts on the watershed and increase protection for nearby developed areas. By improving water availability and delivery for fire suppression, the project supports both community safety and long-term watershed resilience.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization/Demobilization	1	LS	\$ 1,500.00	\$ 3,500.00
2	Dry Hydrant Kit	1	LS	\$ 4,000.00	\$ 4,000.00
3	PVC/HDPE Intake Piping	50	LF	\$ 20.00	\$ 1,000.00
4	Fittings & Valves	1	LS	\$ 2,000.00	\$ 2,000.00
5	Gravel/Concrete Pad	1	LS	\$ 3,500.00	\$ 3,500.00
6	Signage	1	LS	\$ 300.00	\$ 300.00
7	Erosion Protection	1	LS	\$ 2,500.00	\$ 2,500.00
8	Excavation/Site Prep	1	LS	\$ 3,500.00	\$ 3,500.00
Total Component Cost (Subtotal #2):					\$ 18,300.00

Preparation of Final Designs & Specifications	\$ 7,500.00
Permitting and Mitigation	\$ 16,500.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 24,000.00

Total Component Cost (Subtotal #2)	\$ 18,300.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 1,830.00
Components and Engineering Costs (Subtotal #3)	\$ 20,130.00
Contingency (Subtotal #3 x 15%)	\$ 3,019.50
Total Construction Cost (Subtotal #4)	\$ 23,149.50

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 47,149.50
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Potential Funding Partners

Project ID: FIRE-01

Project Name: Star Valley Ranch Draft Station

Land Jurisdiction: Town of Star Valley Ranch

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Bureau of Land Management
 - Wildland Urban Interface Grants
- Federal Emergency Management Agency
 - Assistance to Firefighters Grant
- USDA Rural Development
 - Emergency Community Water Assistance Grants
 - Community Facilities Program

State

- Wyoming State Forestry
 - Wyoming Volunteer Fire Assistance Program
- Wyoming Water Development Office
 - Small Water Project Program

Permitting and Agency Review Requirements:

Project ID: FIRE-01

Project Name: Star Valley Ranch Draft Station

Land Jurisdiction: Town of Star Valley Ranch

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P7528

Proposed Permit: This project will require appropriate well-enlargement permits (UW-5 and UW-8) to ensure compliance with Wyoming water law. The pond supplying the draft station will need to have fire suppression added as an official beneficial use. In addition, because installing a new point-of-use may slightly enlarge the reservoir, a SW-3 permit may also be necessary. Further information on the SW-2 process can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review before final submission to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-26. Proposed location for drafting station.



Figure D-27. Proposed location for drafting station.

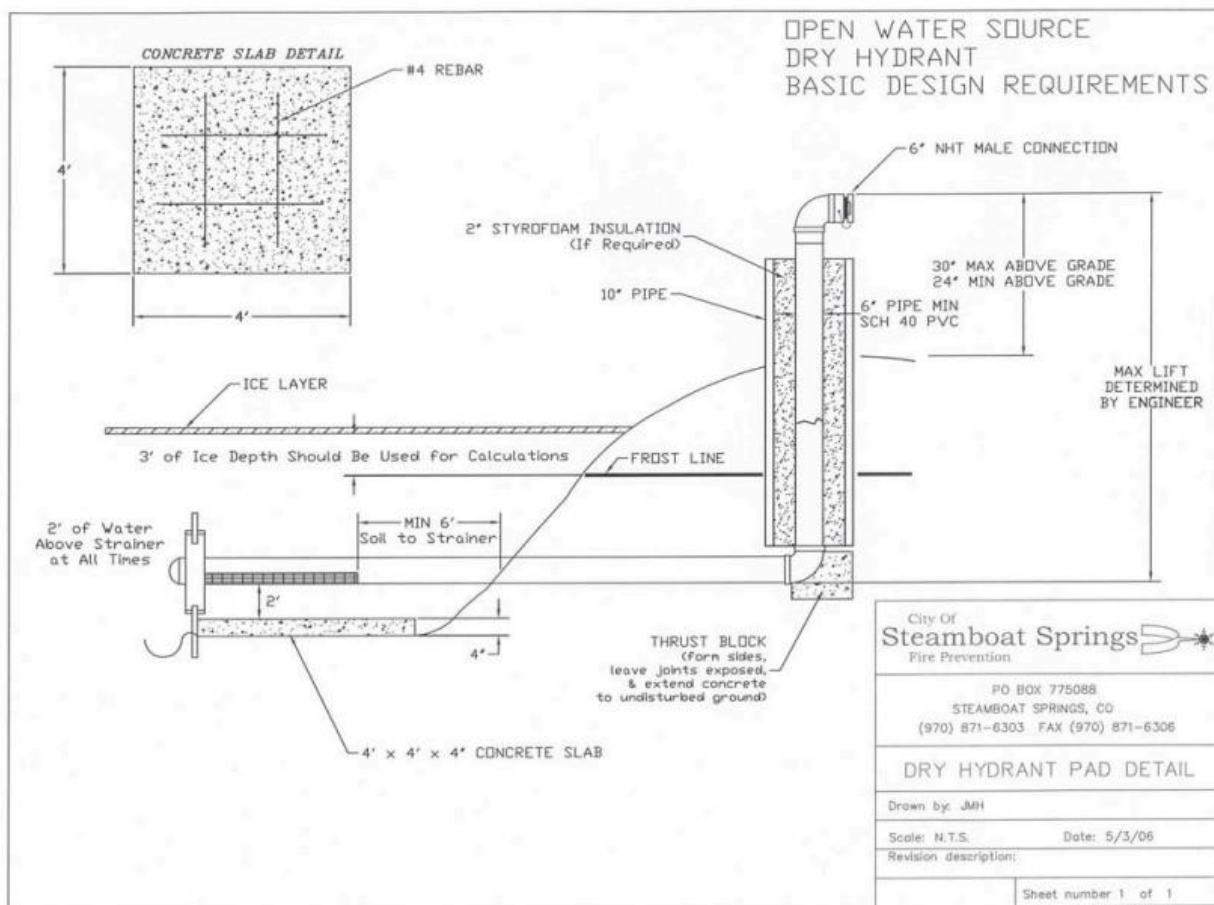


Figure D-28. Typical design of dry hydrant (City of Steamboat Dry Hydrant Manual).

Project Map:



Figure D-29. Project map for FIRE-01 – Star Valley Ranch Draft Station.

FIRE-02 – Alpine Village Draft Station Retrofit

Project ID: FIRE-02

Project Name: Alpine Village Draft Station Retrofit

Project Type: Fire Suppression

Landowner: Lynn Ferguson, Signature Investments LLC

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): NE1/4NE1/4 Sec. 19, T37N, R118W

Location (Lat/Long): 43.1822, -111.0407

Project Description: This project will retrofit existing drafting stations to provide a dedicated fire-suppression water supply to Alpine Village, which currently lacks a suppression water source. Work includes installing or replacing piping and fittings, adding storage or flow-management features as needed, and outfitting stations with strainers, connection points, and valves compatible with local fire apparatus. The retrofit will ensure reliable, code-compliant delivery pressures and flow rates for fire response, incorporate freeze protection and vandalism-resistant features, and include site work for access, signage, and minimal vegetation restoration.

Public Benefit: The project provides critical public benefits: it significantly improves community safety by supplying reliable water for firefighting in Alpine Village, reducing fire response times and limiting property, infrastructure, and life safety losses; protects public investments and local economy by lowering the risk of catastrophic fire damage to homes, businesses, and utilities; enhances resilience and emergency preparedness for residents and first responders; and yields long-term cost savings by preventing extensive reconstruction and emergency response expenses.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 1,800.00	\$ 1,800.00
2	Site Preparation	1	LS	\$ 1,500.00	\$ 1,500.00
3	Electrical & Controls	1	LS	\$ 2,500.00	\$ 2,500.00
4	Piping, Valves, & Connections	1	LS	\$ 6,500.00	\$ 6,500.00
5	Freeze Protection	1	LS	\$ 1,100.00	\$ 1,100.00
Total Component Cost (Subtotal #2):					\$ 13,400.00

Preparation of Final Designs & Specifications	\$ 2,680.00
Permitting and Mitigation	\$ 1,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 3,680.00

Total Component Cost (Subtotal #2)	\$ 13,400.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 1,340.00
Components and Engineering Costs (Subtotal #3)	\$ 14,740.00
Contingency (Subtotal #3 x 15%)	\$ 2,211.00
Total Construction Cost (Subtotal #4)	\$ 16,951.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 20,631.00
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Potential Funding Partners

Project ID: FIRE-02

Project Name: Alpine Village Draft Station Retrofit

Land Jurisdiction: Private, Lynn Ferguson, Signature Investments LLC

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Bureau of Land Management
 - Wildland Urban Interface Grants
- Federal Emergency Management Agency
 - Assistance to Firefighters Grant
- USDA Rural Development
 - Emergency Community Water Assistance Grants
 - Community Facilities Program

State

- Wyoming State Forestry
 - Wyoming Volunteer Fire Assistance Program
- Wyoming Water Development Office
 - Small Water Project Program

Permitting and Agency Review Requirements:

Project ID: FIRE-02

Project Name: Alpine Village Draft Station Retrofit

Land Jurisdiction: Private, Lynn Ferguson, Signature Investments LLC

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: P15184

Proposed Permit: None. As long as there is no enlargement to the existing reservoir.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-30. Pond where the retrofitted draft station is located.



Figure D-31. Existing drafting station.

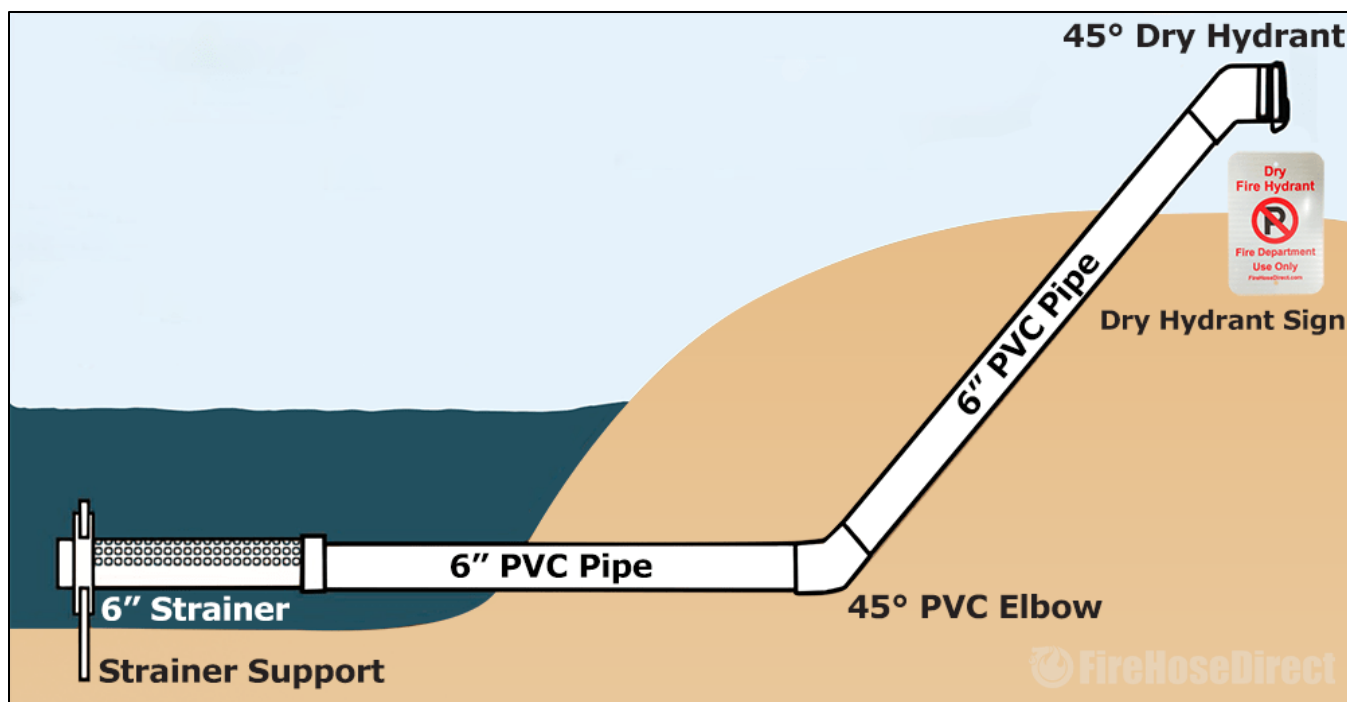


Figure D-32. Diagram of screen on dry hydrant design. (FireHoseDirect)

Project Map:

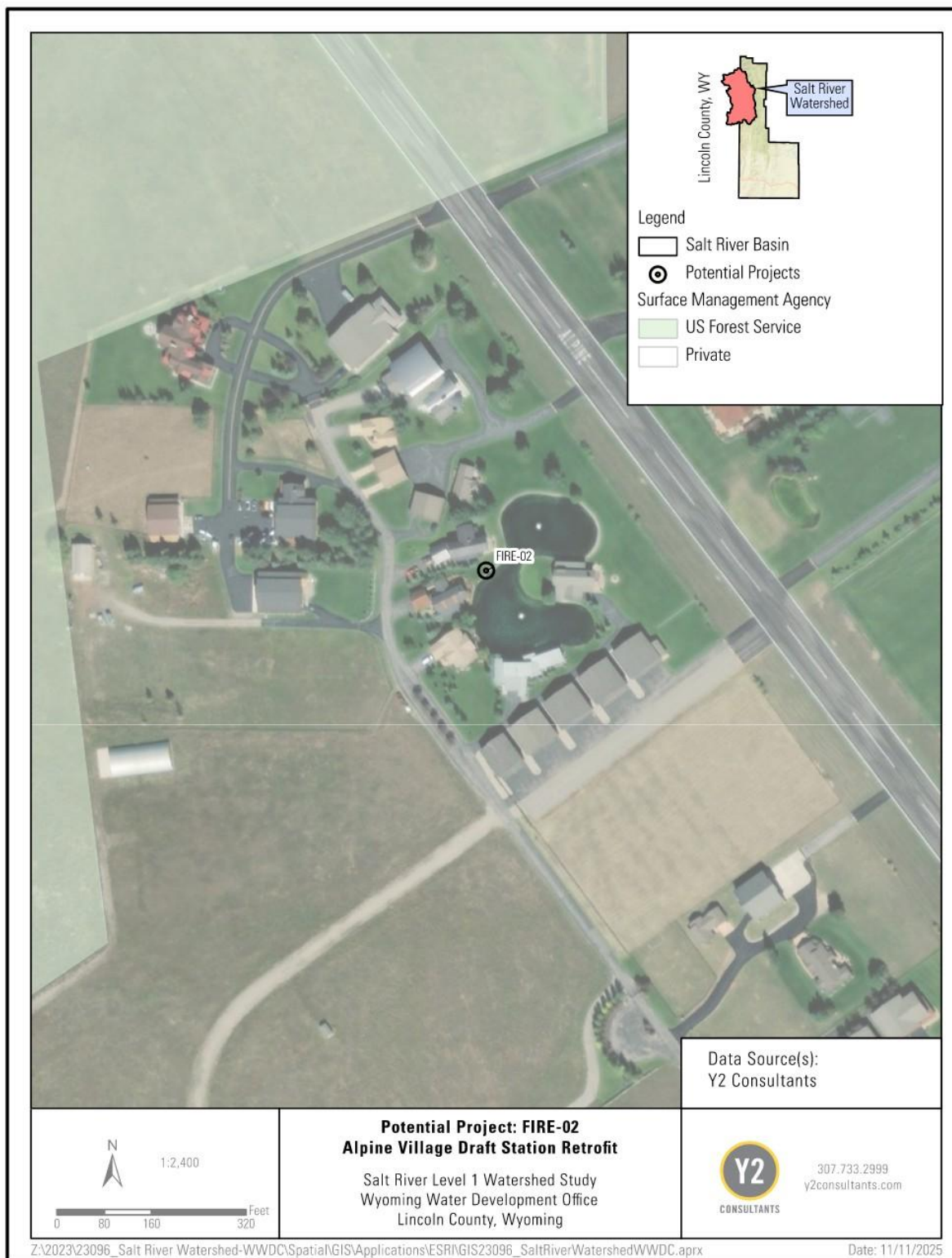


Figure D-33. Project map for FIRE-02 – Alpine Village Draft Station Retrofit.

FIRE-03 – Granite Ridge Draft Station Retrofit

Project ID: FIRE-03

Project Name: Granite Ridge Draft Station Retrofit

Project Type: Environmental, Fire Suppression Development

Landowner: Lincoln County, Lincoln County Roads and Bridges

Sponsor: Town of Alpine; Star Valley Conservation District

Land Management: Town of Alpine

Location (PLSS): NE1/4SE1/4 Sec. 9, T36N, R119W

Location (Lat/Long): 43.1192, -111.0348

Project Description: This project will retrofit an existing drafting station to provide a dedicated fire suppression water supply for the Alpine Retreat and Granite Ridge subdivisions. Upgrades include strainers, suction and discharge piping and fittings, frost-protected enclosures or heat-trace and insulation, and fire department connections; site work will consist of a concrete equipment pad, brief trenching, and erosion control. The retrofit will deliver reliable, code-compliant flow and pressure for firefighting, improve emergency response capability, and protect homes and infrastructure.

Public Benefit: The project provides critical public benefits: it significantly improves community safety by supplying reliable water for firefighting in Alpine Village, reducing fire response times and limiting property, infrastructure, and life safety losses; protects public investments and local economy by lowering the risk of catastrophic fire damage to homes, businesses, and utilities; enhances resilience and emergency preparedness for residents and first responders; and yields long-term cost savings by preventing extensive reconstruction and emergency response expenses.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 1,800.00	\$ 1,800.00
2	Site Preparation	1	LS	\$ 1,500.00	\$ 1,500.00
3	Electrical & Controls	1	LS	\$ 2,500.00	\$ 2,500.00
4	Piping, Valves, & Connections	1	LS	\$ 6,500.00	\$ 6,500.00
5	Freeze Protection	1	LS	\$ 1,100.00	\$ 1,100.00
Total Component Cost (Subtotal #2):					\$ 13,400.00

Preparation of Final Designs & Specifications	\$ 2,680.00
Permitting and Mitigation	\$ 1,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 3,680.00

Total Component Cost (Subtotal #2)	\$ 13,400.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 1,340.00
Components and Engineering Costs (Subtotal #3)	\$ 14,740.00
Contingency (Subtotal #3 x 15%)	\$ 2,211.00
Total Construction Cost (Subtotal #4)	\$ 16,951.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 20,631.00
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Potential Funding Partners

Project ID: FIRE-03

Project Name: Granite Ridge Draft Station Retrofit

Land Jurisdiction: County Owned, Lincoln County, Lincoln County Roads and Bridges

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Bureau of Land Management
 - Wildland Urban Interface Grants
- Federal Emergency Management Agency
 - Assistance to Firefighters Grant
- USDA Rural Development
 - Emergency Community Water Assistance Grants
 - Community Facilities Program

State

- Wyoming State Forestry
 - Wyoming Volunteer Fire Assistance Program
- Wyoming Water Development Office
 - Small Water Project Program

Permitting and Agency Review Requirements:

Project ID: FIRE-03

Project Name: Granite Ridge Draft Station Retrofit

Land Jurisdiction: County Owned, Lincoln County, Lincoln County Roads and Bridges

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: None. As long as there is no enlargement to the existing reservoir.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-34. Existing draft station on Salt River.



Figure D-35. Existing draft station on Salt River.

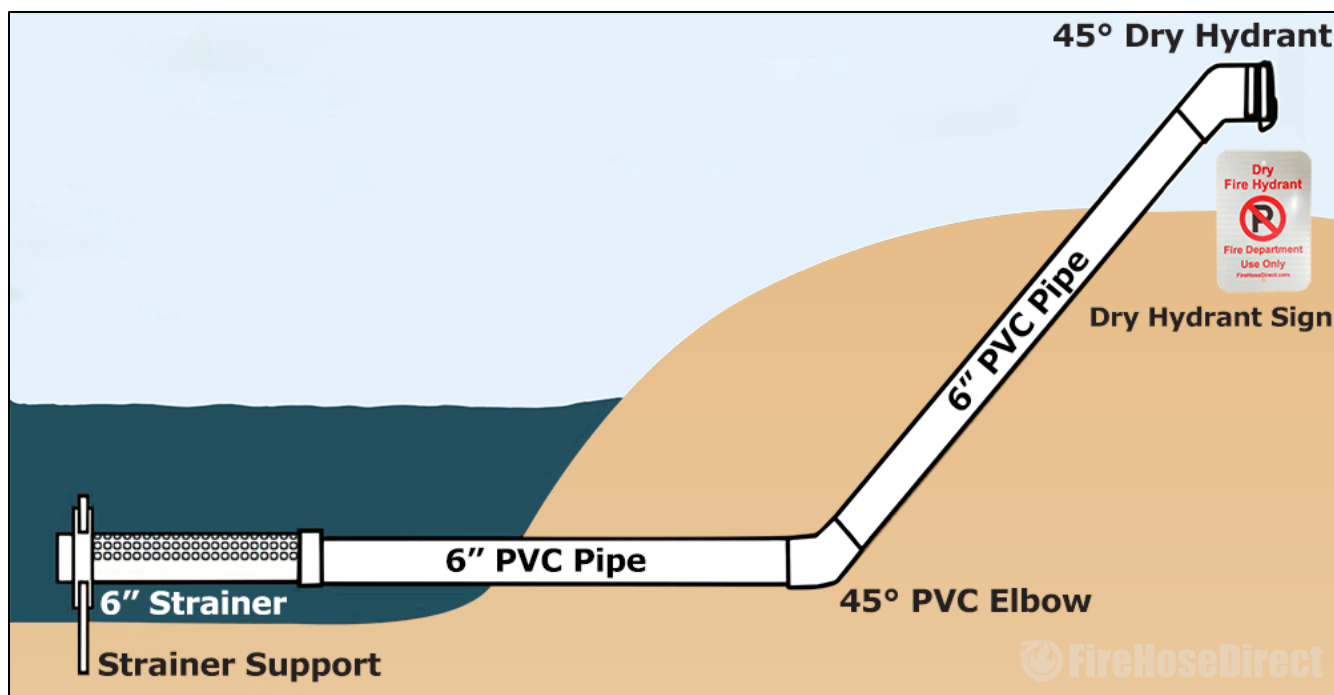


Figure D-36. Diagram of screen on dry hydrant design (FireHoseDirect).

Project Map:

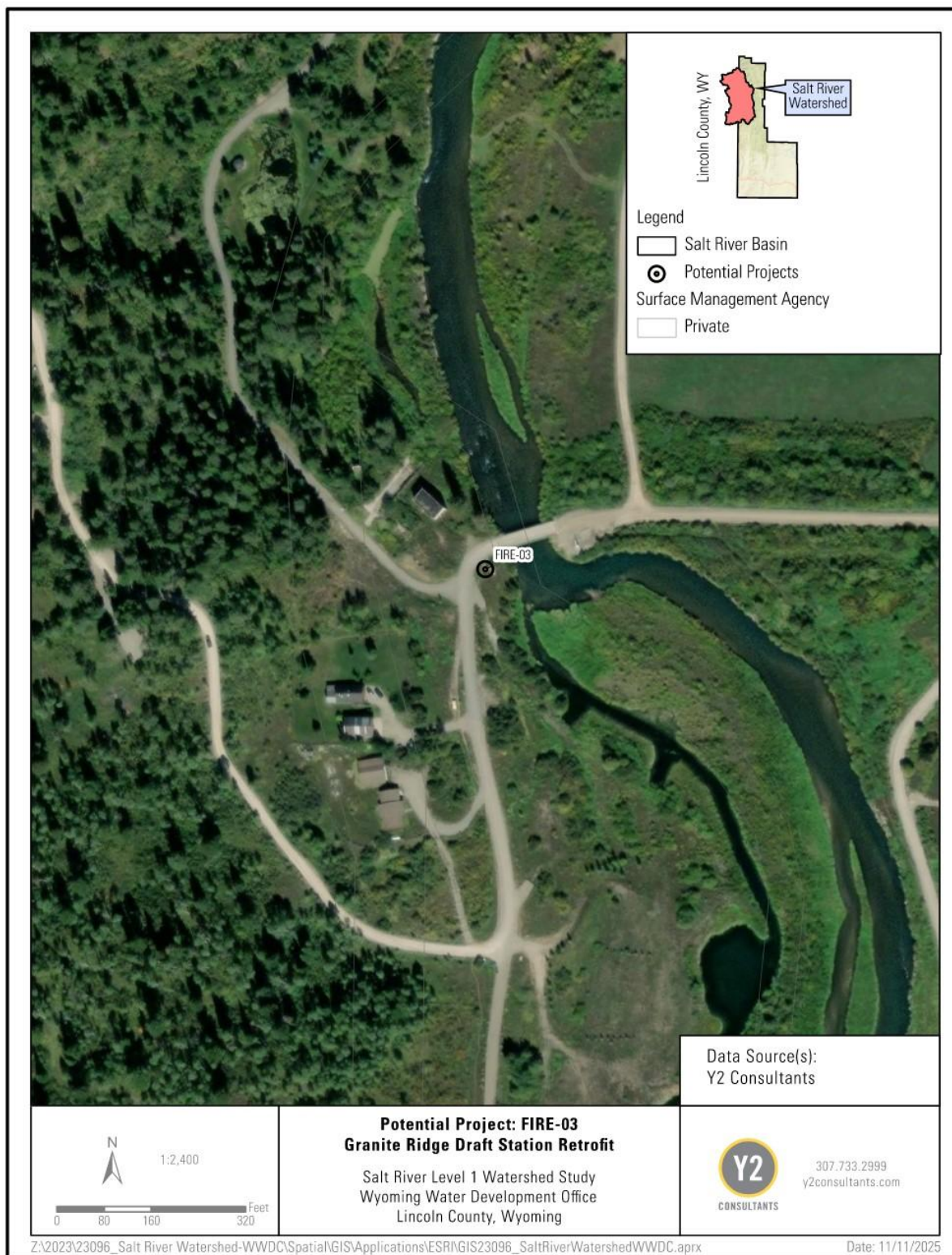


Figure D-37. Project map for FIRE-03 – Granite Ridge Draft Station Retrofit.

SOLAR-01 – Nield Solar Water Development 01

Project ID: SOLAR-01

Project Name: Nield Solar Water Development 01

Project Type: Source Water Development

Landowner: Nield Livestock

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): NE1/4SW1/4 Sec. 22, T32N, R119W

Location (Lat/Long): 42.7402, -110.9831

Project Description: This project will develop a solar-powered well and livestock watering trough to replace reliance on a pond as the primary water source for cattle. Work includes drilling a well, installing a solar array and pump system sized to reliably supply seasonal herd demand, laying supply piping to one or more frost-protected troughs with float controls and overflow. The system will incorporate filtration and freeze-protection measures, water-level monitoring, and hardened troughs to minimize leakage and contamination. Replacing pond watering improves livestock health, reduces pond erosion and sedimentation, protects wildlife and water quality, and provides a low-maintenance water supply. Design will follow [solar well livestock system](#) specification set forth by the NRCS.

Public Benefit: This project provides multiple public benefits: it improves livestock health and local agricultural productivity by delivering reliable, clean water that reduces disease and stress; protects water quality and aquatic habitat by removing or reducing livestock access to the pond, cutting erosion, sedimentation, and nutrient loading downstream; and benefits the broader community and environment by preserving ecosystem values, reducing maintenance and regulatory burdens, and supporting sustainable ranching practices.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 4,125.00	\$ 4,125.00
2	Well Drilling	100	LF	\$ 15.00	\$ 1,500.00
3	Solar Pumping System (Pump, Array, Inverter)	1	LF	\$ 15,000.00	\$ 15,000.00
4	Troughs	1	EA	\$ 3,500.00	\$ 3,500.00
5	Storage (Optional)	1	EA	\$ 3,000.00	\$ 3,000.00
6	Piping, Valves, Fittings	1	LS	\$ 2,500.00	\$ 2,500.00
7	Electrical & Controls	1	LS	\$ 2,000.00	\$ 2,000.00
Total Component Cost (Subtotal #2):					\$ 31,625.00
Preparation of Final Designs & Specifications					\$ 6,325.00
Permitting and Mitigation					\$ 5,000.00
Legal Fees					\$ 0.00
Acquisition of Access and Rights-Of-Way					\$ 0.00
Pre-Construction Costs (Subtotal #1)					\$ 11,325.00
Total Component Cost (Subtotal #2)					\$ 31,625.00
Construction Engineering Cost (Subtotal #2 x 10%)					\$ 3,162.50
Components and Engineering Costs (Subtotal #3)					\$ 34,787.50
Contingency (Subtotal #3 x 15%)					\$ 5,218.13
Total Construction Cost (Subtotal #4)					\$ 40,005.63
Total Project Cost (Subtotal #1 + Subtotal #4)					\$ 51,330.63

Potential Funding Partners

Project ID: SOLAR-01

Project Name: Solar Water Development

Land Jurisdiction: Private; Nield Livestock

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP

State

- Wyoming Water Development Office
 - Small Water Project Program (will not fund any exclusion fencing)
- Wyoming Wildlife and Natural Resource Trust

Other

- Trout Unlimited

Permitting and Agency Review Requirements:

Project ID: SOLAR-01

Project Name: Solar Water Development

Land Jurisdiction: Private; Nield Livestock

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: This project would require UW5, UW6, and UW8 permits for well installation. More details on those permits can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

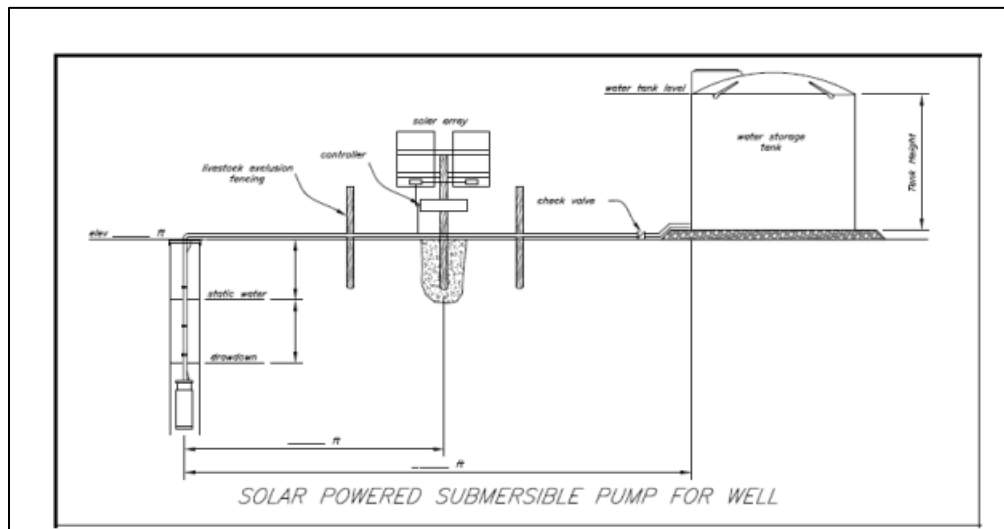


Figure D-38. Typical design for solar-powered well system (NRCS).

Project Map:



Figure D-39. Project map for SOLAR-01 – Nield Solar Water Development 01

SOLAR-02 – Nield Solar Water Development 02

Project ID: SOLAR-02

Project Name: Nield Solar Water Development 02

Project Type: Source Water Development

Landowner: Nield Livestock

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): SW1/4NW1/4 Sec. 10, T32N, R119W

Location (Lat/Long): 42.7759, -110.9880

Project Description: This project will develop a solar-powered well and livestock watering-trough system to provide a reliable, clean, off-grid water supply for cattle. The project will include drilling a well, installing a solar array and pump system sized to meet seasonal herd demand, trenching and laying supply piping to frost-protected troughs with float controls and overflow, and constructing secure mounting, fencing, and maintenance access. System components will include a screened intake, pump, and controller (MPPT or inverter as required), PV array with mounting, wiring, and disconnects, piping and valves, and trough(s) on a prepared pad. Installation will incorporate freeze protection, erosion control, and measures to prevent contamination and limit livestock access to sensitive areas (e.g., hardened access points and riparian exclusion fencing).

Public Benefit: This project provides multiple public benefits: it improves livestock health and local agricultural productivity by delivering reliable, clean water that reduces disease and stress; protects water quality and aquatic habitat by removing or reducing livestock access to the pond, cutting erosion, sedimentation, and nutrient loading downstream; and benefits the broader community and environment by preserving ecosystem values, reducing maintenance and regulatory burdens, and supporting sustainable ranching practices.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 4,125.00	\$ 4,125.00
2	Well Drilling	100	LF	\$ 15.00	\$ 1,500.00
3	Solar Pumping System (Pump, Array, Inverter)	1	LF	\$ 15,000.00	\$ 15,000.00
4	Troughs	1	EA	\$ 3,500.00	\$ 3,500.00
5	Storage (Optional)	1	EA	\$ 3,000.00	\$ 3,000.00
6	Piping, Valves, Fittings	1	LS	\$ 2,500.00	\$ 2,500.00
7	Electrical & Controls	1	LS	\$ 2,000.00	\$ 2,000.00
Total Component Cost (Subtotal #2):					\$ 31,625.00

Preparation of Final Designs & Specifications	\$ 6,325.00
Permitting and Mitigation	\$ 5,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 11,325.00

Total Component Cost (Subtotal #2)	\$ 31,625.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 3,162.50
Components and Engineering Costs (Subtotal #3)	\$ 34,787.50
Contingency (Subtotal #3 x 15%)	\$ 5,218.13
Total Construction Cost (Subtotal #4)	\$ 40,005.63

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 51,330.63
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Potential Funding Partners

Project ID: SOLAR-02

Project Name: Solar Water Development

Land Jurisdiction: Private; Nield Livestock

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP

State

- Wyoming Water Development Office
 - Small Water Project Program (will not fund any exclusion fencing)
- Wyoming Wildlife and Natural Resource Trust

Other

- Trout Unlimited

Permitting and Agency Review Requirements:

Project ID: SOLAR-02

Project Name: Solar Water Development

Land Jurisdiction: Private; Nield Livestock

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: This project would require UW5, UW6, and UW8 permits for well installation. More details on those permits can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

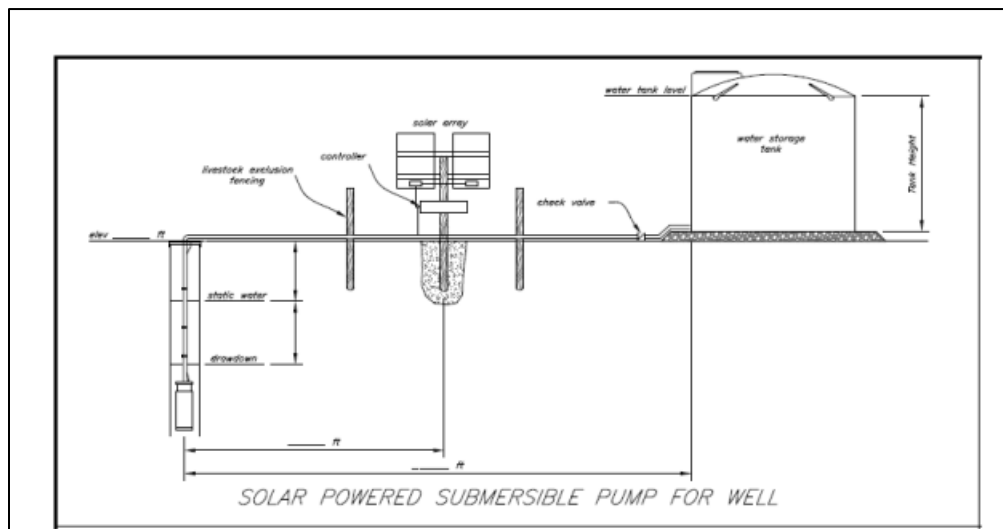


Figure D-40. Typical design for solar-powered well system (NRCS).

Project Map:



Figure D-41. Project map for SOLAR-02 – Nield Solar Water Development 02.

SPRING-01 – Brown State Spring Development

Project ID: SPRING-01

Project Name: Brown State Spring Development

Project Type: Spring Development

Landowner: Wyoming State Land (Nield Livestock)

Sponsor: Star Valley Conservation District

Land Management: State

Location (PLSS): SE1/4NW1/4 Sec. 16, T32N, R119W

Location (Lat/Long): 42.7604, -111.0061

Project Description: This project will develop a degraded spring used by cattle during winter months and pipe its water to an off-site, frost-protected livestock trough to protect the spring source and provide a reliable, clean water supply. Work includes springhead stabilization (sanitary cap, concrete or rock-lined collection box, and overflow), installation of screened intake and sediment/filtering as needed, buried conveyance piping to a hardened trough location outside the immediate spring area, and construction of a frost protected trough with float control and overflow. Site improvements will include hardened animal access or exclusion fencing around the spring to eliminate direct hoof impact. The system will be designed to preserve spring flow, prevent contamination, reduce sediment and bank degradation, and improve livestock health while restoring and protecting riparian habitat.

Public Benefit: The spring development and offsite trough project provides clear public benefits: it protects and restores a vulnerable groundwater/surface water source by preventing bank erosion, sedimentation, and contamination from hoof impact; improves livestock health and agricultural productivity by supplying cleaner, reliable water; enhances riparian and aquatic habitat through reduced trampling and restored vegetation; lowers long-term maintenance and remediation costs for landowners and public agencies; reduces disease and water quality risks to downstream users; and supports sustainable land stewardship and resilience of local water resources for the broader community.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 6,688.80	\$ 6,688.80
2	Springhead Development	1	LS	\$ 10,000.00	\$ 10,000.00
3	Piping (1-2")	1,320	LF	\$ 3.60	\$ 4,752.00
4	Trough & Pad	1	EA	\$ 6,000.00	\$ 6,000.00
5	Controls & Float/Overflow	1	EA	\$ 1,500.00	\$ 1,500.00
6	Fencing & Hardened Access	1	LS	\$ 6,500.00	\$ 6,500.00
7	Erosion Control & Revegetation	1,320	LF	\$ 12.00	\$ 15,840.00
Total Component Cost (Subtotal #2):					\$ 51,280.80

Preparation of Final Designs & Specifications	\$ 10,256.16
Permitting and Mitigation	\$ 7,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 17,256.16

Total Component Cost (Subtotal #2)	\$ 51,280.80
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 5128.08
Components and Engineering Costs (Subtotal #3)	\$ 56,408.88
Contingency (Subtotal #3 x 15%)	\$ 8,461.33
Total Construction Cost (Subtotal #4)	\$ 64,870.21

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 82,126.37
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Potential Funding Partners

Project ID: SPRING-01

Project Name: Brown State Spring Development

Land Jurisdiction: Wyoming State Land (Nield Livestock)

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP

State

- Wyoming Water Development Office
 - Small Water Project Program (will not fund any exclusion fencing)
- Wyoming Office of State Lands and Investments
- Wyoming Wildlife and Natural Resource Trust

Other

- Trout Unlimited

Permitting Requirements:

Project ID: SPRING-01

Project Name: Brown State Spring Development

Land Jurisdiction: Wyoming State Land (Nield Livestock)

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: This project will require UW5, UW6, UW7, and UW8 permits. Further information on these permits can be found in Section 9 of the watershed report.

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Wyoming Office of State Lands and Investments

Written approval from the OSLI for the spring development project will be required prior to notice to proceed.

Project Details:



Figure D-42. Proposed location for Brown spring development on State land.

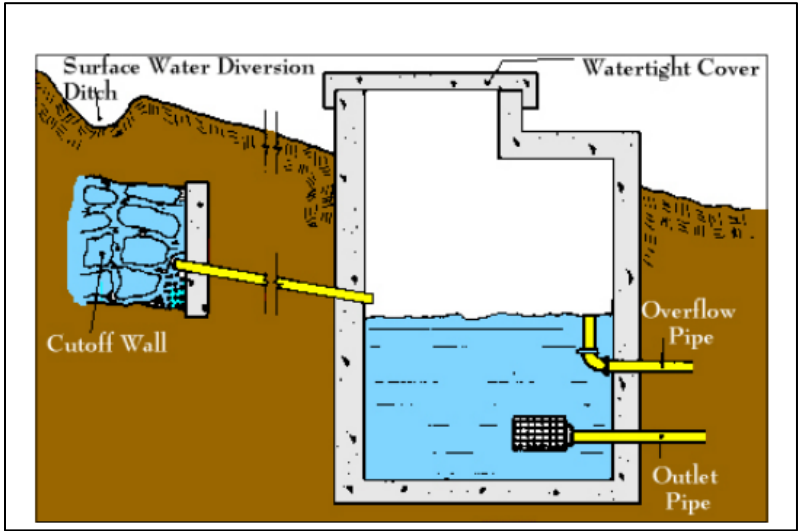


Figure D-43. Spring development design (NRCS).

Project Map:

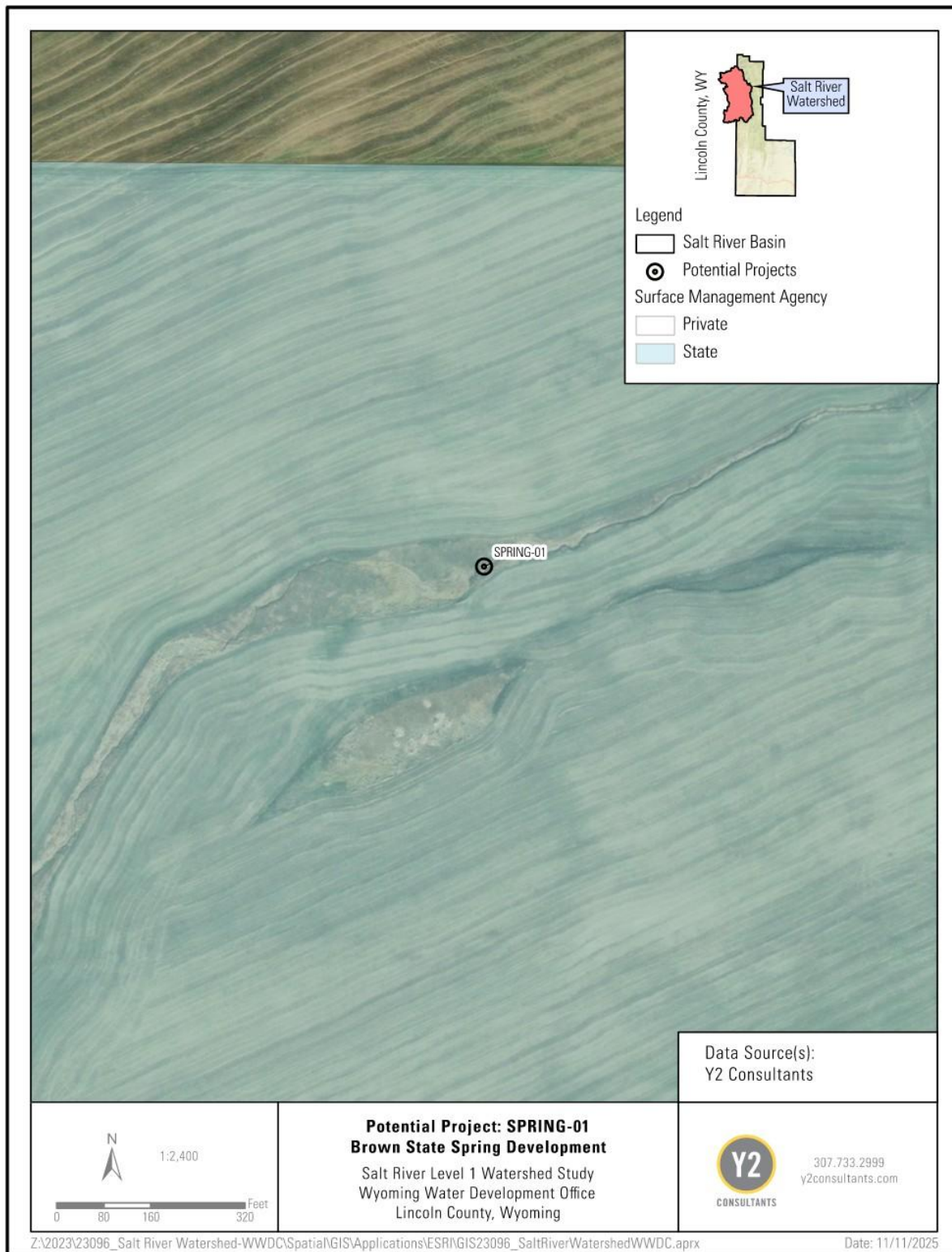


Figure D-44. Project map for SPRING-01 – Brown State Spring Development

ENV-01 – Stewart Creek Channel Stabilization

Project ID: ENV-01

Project Name: Stewart Creek Channel Stabilization

Project Type: Creek Channel Stabilization

Landowner: Etna Irrigation District / Channel crosses various private parcels

Sponsor: Etna Irrigation District

Land Management: Private

Location (PLSS): Sec. 21 and 22, T36N, R119W

Location (Lat/Long): 43.0844, -111.0249

Project Description: The historic Stewart Creek channel between the East Side Canal return and the Salt River, approximately 5,700', has experienced chronic bed and bank erosion from irrigation return flows and seasonal mountain runoff. This project will stabilize the channel to reduce sediment delivery to the Salt River and protect adjacent property and habitat. Eligible for SWP as it is a bank stability project.

Public Benefit: Replacing eroding banks and adding grade control in the historic Stewart Creek channel will reduce sediment delivered to the Salt River, improve water quality for aquatic life, and protect adjacent property and roads from washouts. Stabilizing the channel will safely convey canal return flows and mountain runoff. The project will decrease emergency maintenance, extend the useful life of nearby irrigation and drainage features, and support reliable water delivery for agriculture and the community.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 11,286.00	\$ 11,286.00
2	Clearing & Grubbing	5,700	LF	\$ 6.00	\$ 34,200.00
3	Channel Grading	5,700	LF	\$ 12.00	\$ 68,400.00
4	Bank Stabilization & Willow Planting	5,700	LF	\$ 15.00	\$ 85,500.00
Total Component Cost (Subtotal #2):					\$ 199,386.00

Preparation of Final Designs & Specifications	\$ 19,939.00
Permitting and Mitigation	\$ 10,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 29,939.00

Total Component Cost (Subtotal #2)	\$ 199,386.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 19,938.60
Components and Engineering Costs (Subtotal #3)	\$ 219,324.60
Contingency (Subtotal #3 x 15%)	\$ 32,898.69
Total Construction Cost (Subtotal #4)	\$ 252,223.29

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 282,162.29
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Potential Funding Partners

Project ID: ENV-01

Project Name: Stewart Creek Channel Stabilization

Land Jurisdiction: Private, multiple landowners – Etna Irrigation District

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP
 - CSP
- Environmental Protection Agency
 - Clean Water State Revolving Fund
 - Nonpoint Source Grant (Section 319)
-

State

- Wyoming Water Development Office
 - Small Water Project Program
- Wyoming Game and Fish Department
 - Aquatic Habitat Trust Fund
 - Habitat Partnership Program

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements:

Project ID: ENV-01

Project Name: Stewart Creek Channel Stabilization

Land Jurisdiction: Private, multiple landowners – Etna Irrigation District

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: There are no anticipated permitting needs associated with this project, as the channel stabilization will not affect volume or flow.

U.S. Army Corps of Engineers (USACE)

This project is expected to require an Individual Section 404 Permit from USACE. The Individual Permit process involves wetland delineation, issuance of public notice, and completion of a comprehensive environmental review. It may include mitigation measures to offset unavoidable impacts to waters of the United States. Additional details on this permitting process are provided in Section 9 of this report.

A USACE letter of permit approval or acceptance should be submitted to the WWDO with the final design package and must be obtained prior to the start of construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-45. Photo of the existing Stewart Creek channel west of HWY 89 looking east.

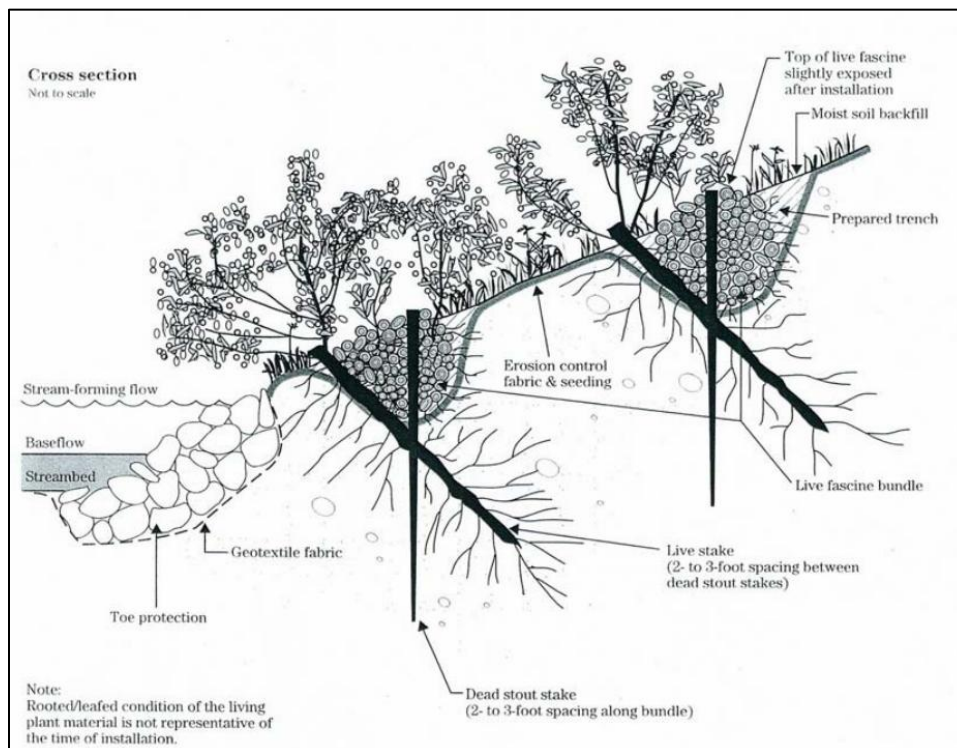


Figure D-46. Typical design for channel stabilization project (NRCS).

Project Map:



Figure D-47. Project map for ENV-01 – Stewart Creek Channel Stabilization.

ENV-02 – Prater Canyon Erosion Protection

Project ID: ENV-02

Project Name: Prater Canyon Erosion Protection

Project Type: Environmental

Landowner: U.S. Forest Service, Town of Star Valley Ranch

Sponsor: Town of Star Valley Ranch; Star Valley Conservation District

Land Management: U.S. Forest Service; Town of Star Valley Ranch

Location (PLSS): Sec. 29, T35N, R118W

Location (Lat/Long): 42.9949, -110.9464

Project Description: This project will install an appropriately sized pipe on Prater Canyon Road to capture and convey concentrated runoff beneath the roadway, reduce surface flow velocity, and prevent erosive overtopping that threatens the roadbed and the culinary water pipeline beneath. The culvert installation includes reshaping roadside grades and inlets to direct flow into the pipe, durable inlet and outlet energy dissipators (riprap or concrete aprons) to prevent scour, trash racks or grates where debris is likely, and upstream sediment-trapping features to reduce sediment load. Together with revegetation and erosion-control matting on disturbed slopes, the culvert will stabilize drainage patterns, minimize sediment delivery to downstream areas, and protect the buried water supply from exposure, abrasion, and potential contamination.

Public Benefit: The Prater Canyon erosion-control project provides clear public benefits: it protects the community's culinary water supply by preventing pipeline exposure or damage that could compromise water quality and service; reduces roadway failures and safety hazards by stabilizing slopes and controlling storm runoff; lowers long-term public costs by minimizing emergency repairs, pipeline replacements, and routine maintenance; improves downstream water quality and aquatic habitat by reducing sediment and turbidity; increases community resilience to extreme weather and reduces service interruption risk; and enhances roadside aesthetics and habitat through revegetation, supporting local quality of life and economic stability.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 15,675.00	\$ 15,675.00
2	Site Preparation & Earthwork	1	LS	\$ 25,000.00	\$ 25,000.00
3	Culvert & Appurtenances	1	LS	\$ 9,500.00	\$ 9,500.00
4	Sediment Control & BMPs	1	LS	\$ 7,000.00	\$ 7,000.00
5	Grade Control & Armoring	1	LS	\$ 35,000.00	\$ 35,000.00
6	Pipeline Protection/Encasement	1	LS	\$ 12,500.00	\$ 12,500.00
7	Slope Stabilization & Reinforcement	1	LS	\$ 8,000.00	\$ 8,000.00
8	Vegetation & Final Site Restoration	1	LS	\$ 7,500.00	\$ 7,500.00
Total Component Cost (Subtotal #2):					\$ 120,175.00

Preparation of Final Designs & Specifications	\$ 24,150.00
Permitting and Mitigation	\$ 20,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 44,150.00

Total Component Cost (Subtotal #2)	\$ 120,175.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 12,017.50
Components and Engineering Costs (Subtotal #3)	\$ 132,192.50
Contingency (Subtotal #3 x 15%)	\$ 19,828.88
Total Construction Cost (Subtotal #4)	\$ 152,021.38

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 196,171.38
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Potential Funding Partners

Project ID: ENV-02

Project Name: Prater Canyon Erosion Protection

Land Jurisdiction: U.S. Forest Service, Town of Star Valley Ranch

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- U.S. Forest Service
 - Cooperative Agreements & Grants
 - Watershed Restoration & Aquatic Organism Passage
- Federal Highway Administration
 - Culvert Aquatic Organism Passage Program
- Natural Resource Conservation Service
 - EQIP
 - Emergency Watershed Protection
- Environmental Protection Agency
 - Clean Water State Revolving Fund
 - Nonpoint Source Grant (Section 319)
-

State

- Wyoming Department of Environmental Quality
 - Nonpoint Source Grant (Section 319)
- Wyoming Water Development Office
 - Small Water Project Program (would not fund the culvert)
- Wyoming Game and Fish Department
 - Habitat Partnership Program
 - Aquatic Habitat Trust Fund

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements

Project ID: ENV-02

Project Name: Prater Canyon Erosion Protection

Land Jurisdiction: U.S. Forest Service, Town of Star Valley Ranch

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: None

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

National Environmental Policy Act

If the project is limited to existing road prism disturbance, avoids extraordinary circumstances, and has negligible effects on listed species, waters, wetlands, cultural resources, and other sensitive resources, or effects that can be mitigated, it will likely qualify for a Categorical Exclusion (CE).

An EA may be necessary if impacts occur to wetlands or any listed plant/wildlife species.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-48. Existing conditions on Prater Canyon Road.



Figure D-49. Existing erosion conditions on Prater Canyon Road.



Figure D-50. Existing conditions on Prater Canyon Road.

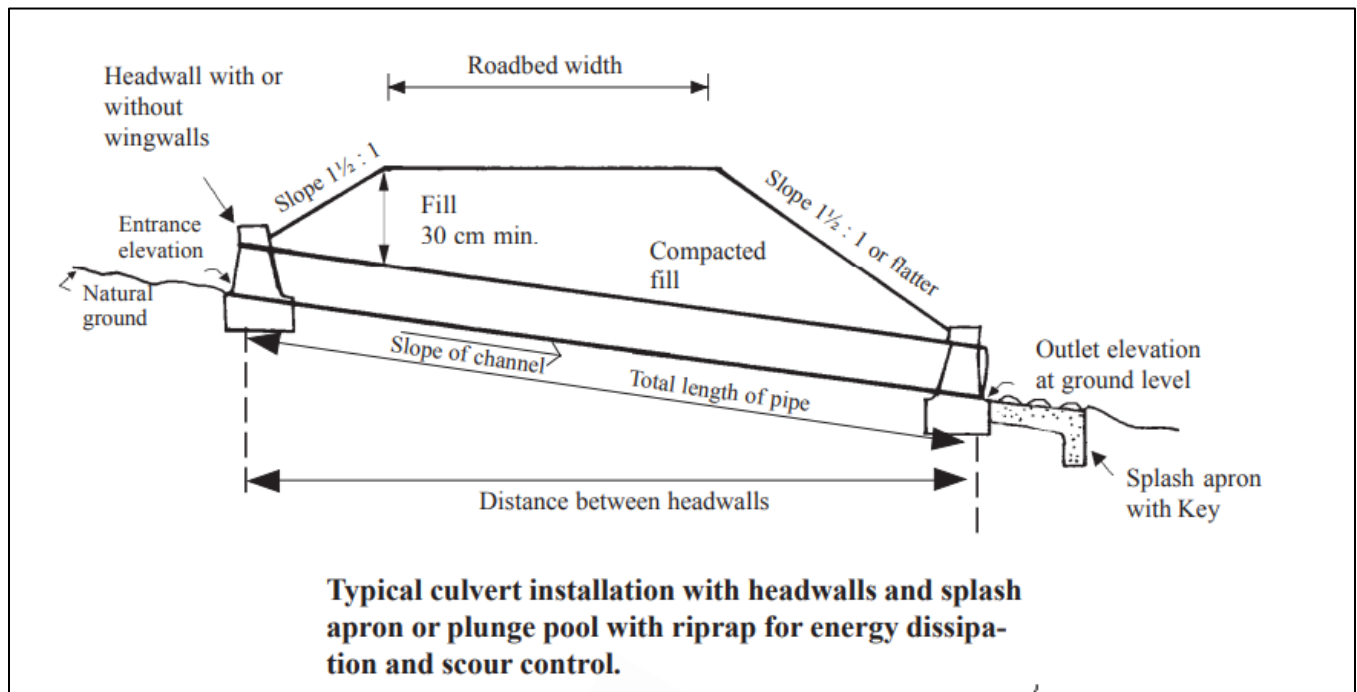


Figure D-51. Typical design for culvert placement (USFS).

Project Map:

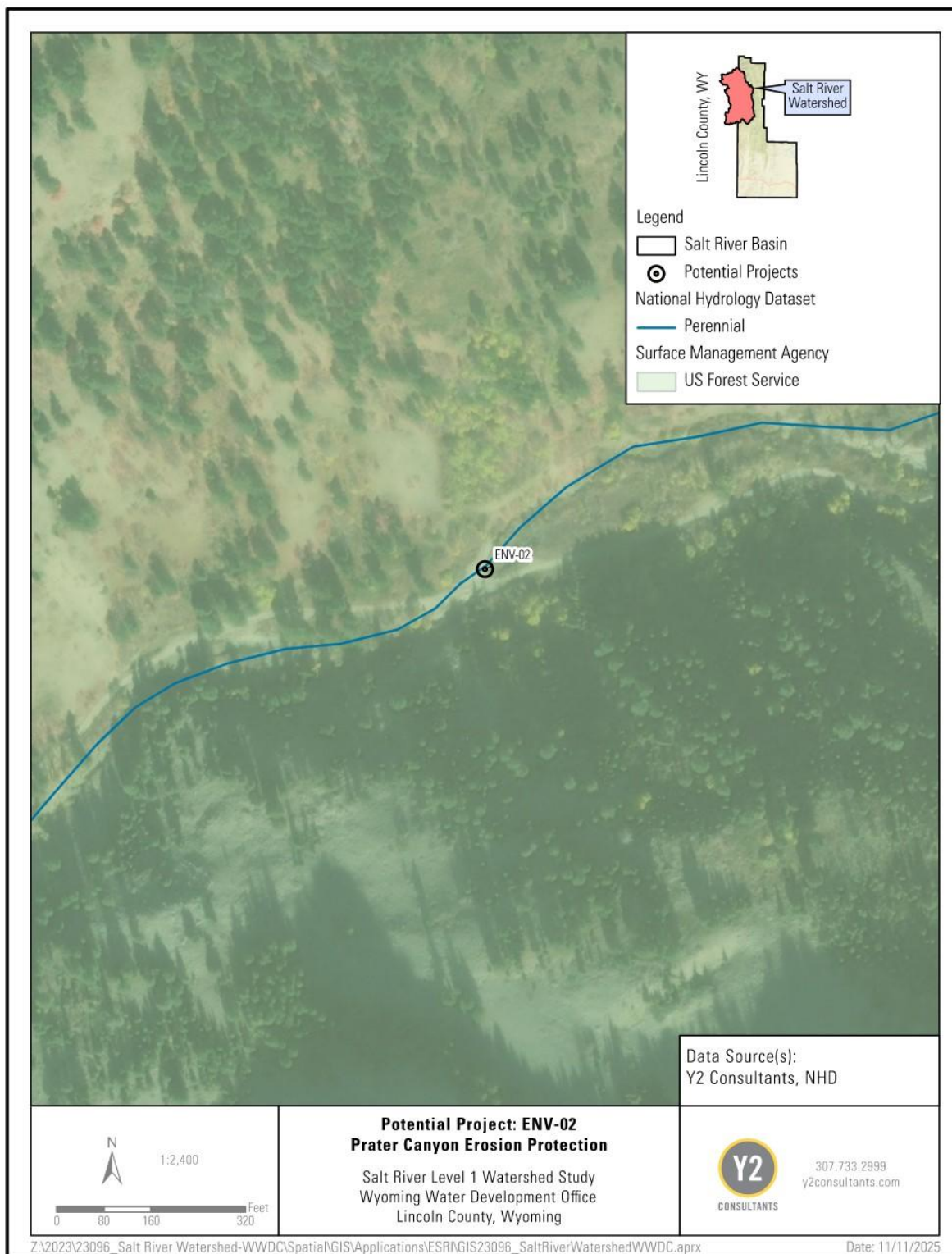


Figure D-52. Project map for ENV-02 – Prater Canyon Erosion Protection.

ENV-03 – Nield Livestock River Channel Restoration

Project ID: ENV-03

Project Name: Nield Livestock River Channel Restoration

Project Type: Environmental

Landowner: Nield Livestock

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): NW1/4SW1/4 Sec. 35, T32N, R119W

Location (Lat/Long): 42.7112, -110.9723

Project Description: This project will restore the original overflow channel by re-establishing the historic riverbed connection, install a headgate to divert flow into the overflow channel, and place a gated distribution (galler) system to convey water from the overflow channel to multiple off-channel sites. Work includes excavation and grading to regrade the downcut channel reach and reconnect it to the historic overflow inlet, bank stabilization and erosion control where needed, fabrication and installation of a headgate with control and fish-friendly screens. The design will incorporate hydraulic analysis to size diversions and galleries, sediment and vegetation management measures, fish and aquatic passage considerations, and temporary BMPs during construction. Project outcomes include restored surface flow to previously inundated areas, improved water distribution and water right utilization, enhanced wetland and riparian habitat, and stabilized channel conditions to reduce further incision and sediment transport.

Public Benefit: This project provides substantial public benefits by increasing subsurface groundwater recharge, reducing further downcutting and instability of the river channel, and restoring surface and floodplain connectivity that supports expanded spawning and rearing habitat for fish. Enhanced groundwater and surface flows improve baseflows for downstream water users, raise water tables beneficial to riparian vegetation and wetlands, reduce sediment loads and erosion-related infrastructure damage, and bolster ecosystem resilience to drought and extreme storms. Together, these outcomes support fisheries, biodiversity, recreational opportunities, and long-term water supply reliability for the local area and surrounding landowners.

Project Components (Engineer's Estimate)

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Topographic Survey	1	LS	\$ 8,000.00	\$ 8,000.00
2	Geotechnical Investigation	1	LS	\$ 6,000.00	\$ 6,000.00
3	Mobilization	1	LS	\$ 30,198.00	\$ 30,198.00
4	Clearing, Grubbing, Topsoil Salvage	2,040	LF	\$ 6.00	\$ 12,240.00
5	Channel Excavation & Grading	1	LS	\$ 20,000.00	\$ 20,000.00
6	Headgates	1	LS	\$ 30,000.00	\$ 30,000.00
7	Bank Stabilization & Erosion Control	2,040	LF	\$ 15.00	\$ 30,600.00
8	Galler Distribution System	1	LS	\$ 45,000.00	\$ 45,000.00
9	Fish Passage Structure	1	LS	\$ 25,000.00	\$ 25,000.00
10	Seeding, Revegetation, Final Restoration	2,040	LF	\$ 12.00	\$ 24,480.00
Total Component Cost (Subtotal #2):					\$ 231,518.00

Preparation of Final Designs & Specifications	\$ 46,303.60
Permitting and Mitigation	\$ 25,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 71,303.60

Total Component Cost (Subtotal #2)	\$ 231,518.00
------------------------------------	---------------

Construction Engineering Cost (Subtotal #2 x 10%)	\$ 23,151.80
Components and Engineering Costs (Subtotal #3)	\$ 254,669.80
Contingency (Subtotal #3 x 15%)	\$ 38,200.47
Total Construction Cost (Subtotal #4)	\$ 292,870.27

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 364,173.87
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Potential Funding Partners

Project ID: ENV-03

Project Name: Nield Livestock River Channel Restoration

Land Jurisdiction: Private, Nield Livestock

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP
 - CSP
 - Emergency Watershed Protection
- U.S. Fish and Wildlife Service
 - National Fish Passage Program
- Environmental Protection Agency
 - Nonpoint Source Grants (Section 319)
 - Clean Water State Revolving Fund
-

State

- Wyoming Water Development Office
 - Small Water Project Program
- Wyoming Game and Fish Department
 - Aquatic Habitat Trust Fund
 - Habitat Partnership Program

Other

- Trout Unlimited
- National Fish and Wildlife Foundation
- The Nature Conservancy

Permitting and Agency Review Requirements:

Project ID: ENV-03

Project Name: Nield Livestock River Channel Restoration

Land Jurisdiction: Private, Nield Livestock

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: This project will need an SW-1 permit for the installation of the new headgate.

U.S. Army Corps of Engineers (USACE)

This project is expected to require an Individual Section 404 Permit from USACE. The Individual Permit process involves wetland delineation, issuance of public notice, and completion of a comprehensive environmental review. It may include mitigation measures to offset unavoidable impacts to waters of the United States. Additional details on this permitting process are provided in Section 9 of the watershed report.

A USACE letter of permit approval or acceptance should be submitted to the WWDO with the final design package and must be obtained prior to the start of construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:



Figure D-53. Channel stabilization area proposed for enhancement.

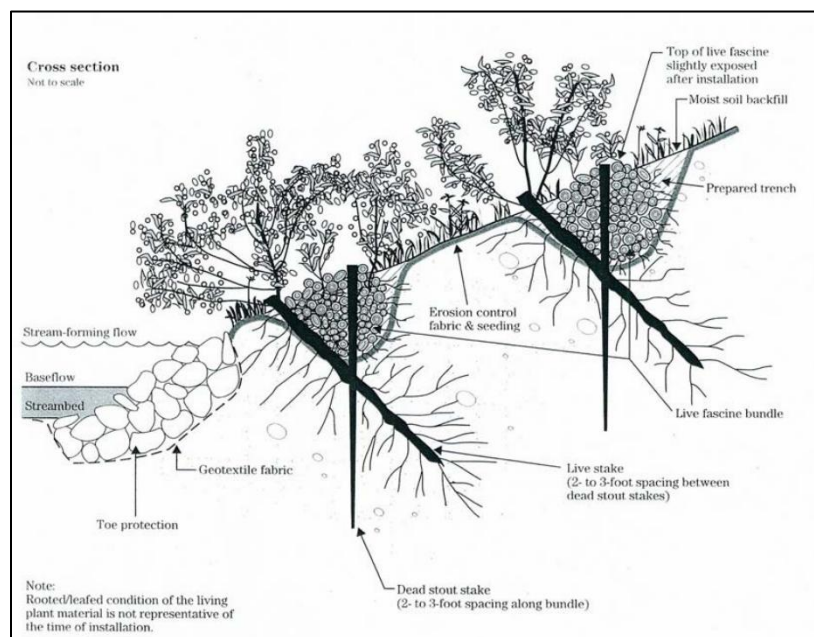


Figure D-54. Typical design for channel stabilization project (NRCS).

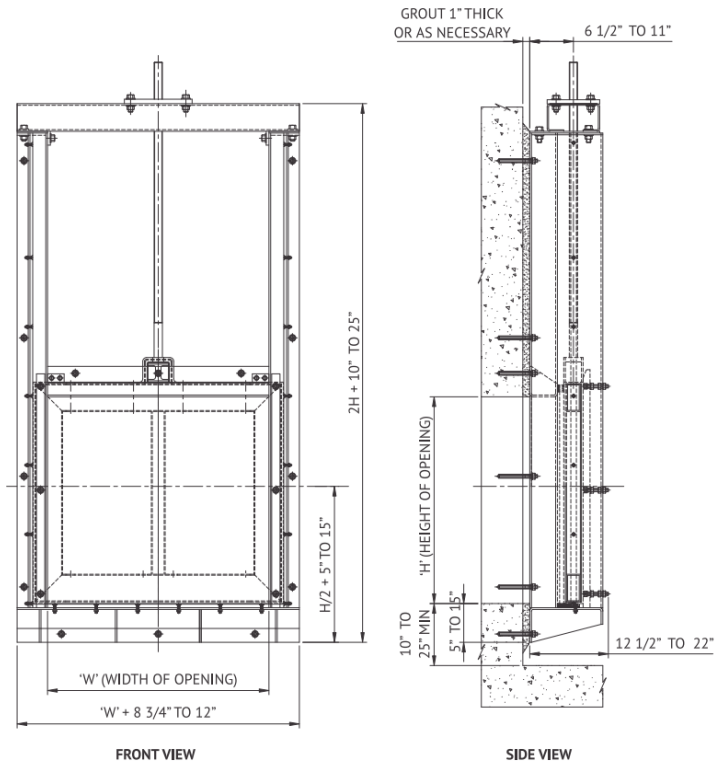


Figure D-55. Typical diversion headgate design (adapted from standard details published by Rodney Hunt Company).

Project Map:



Figure D-56. Project map for ENV-03 – Nield Livestock River Channel Restoration.

ENV-04 – West Fork Salt River Bank Stabilization

Project ID: ENV-04

Project Name: West Fork Salt River Bank Stabilization

Project Type: Environmental

Landowner: Ralph K. Haderlie Revoc Trust (Trout Unlimited Project Proponent)

Sponsor: Star Valley Conservation District

Land Management: Private

Location (PLSS): NE/14SW1/4 Sec. 34, T34N, R119W

Location (Lat/Long): 42.9464, -111.0268 to 42.9573, -111.0316

Project Description: The West Fork Salt Riverbank Stabilization project will stabilize actively eroding banks along targeted reaches to reduce sediment loads, protect infrastructure and private property, and restore riparian and aquatic habitat. Using a blend of engineered toe protection (keyed riprap, rock vanes) and bioengineered techniques, the project will regrade unstable slopes, reconnect floodplain benches where feasible, and install in-stream features to deflect flows and create habitat complexity. Work will be guided by geomorphic and geotechnical surveys, timed to avoid sensitive fish and wildlife periods, include turbidity controls and staged low flow construction methods, and be followed by revegetation, monitoring, and a maintenance plan to ensure long-term stability and improved water quality and ecosystem outcomes.

Public Benefit: The West Fork Salt Riverbank Stabilization project delivers multiple public benefits: it reduces sediment loads and turbidity in the Salt River, improving water quality for downstream users and aquatic habitat; protects public infrastructure and private property (roads, bridges, culverts, utilities, and homes) from costly erosion and failure; enhances fisheries and riparian ecosystems by restoring habitat complexity and vegetative cover; lowers long-term maintenance and emergency repair costs for local governments and landowners; increases flood resilience and reduces risk of service interruptions during high flow events; and supports recreational values, scenic character, and community economic stability tied to a healthy river system.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Topographic Survey	1	LS	\$ 16,000.00	\$ 16,000.00
2	Geotechnical Investigation	1	LS	\$ 10,000.00	\$ 10,000.00
3	Mobilization	1	LS	\$ 3.50	\$ 53,604.00
4	Clearing, Grubbing, Topsoil Salvage	7,920	LF	\$ 6.00	\$ 47,520.00
5	Channel Excavation & Grading	1	LS	\$ 20,000.00	\$ 20,000.00
6	Bank Stabilization & Erosion Control	7,920	LF	\$ 15.00	\$ 118,800.00
7	Fish Passage Structure	2	LS	\$ 25,000.00	\$ 50,000.00
8	Seeding, Revegetation, Final Restoration	7,920	LF	\$ 12.00	\$ 95,040.00
Total Component Cost (Subtotal #2):					\$ 410,964.00

Preparation of Final Designs & Specifications	\$ 82,192.80
Permitting and Mitigation	\$ 12,000.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 94,192.80

Total Component Cost (Subtotal #2)	\$ 410,964.00
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Construction Engineering Cost (Subtotal #2 x 10%)	\$ 41,096.40
Components and Engineering Costs (Subtotal #3)	\$ 452,060.40
Contingency (Subtotal #3 x 15%)	\$ 67,809.06
Total Construction Cost (Subtotal #4)	\$ 519,869.46

Total Project Cost (Subtotal #1 + Subtotal #4)	\$ 614,062.26
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Potential Funding Partners

Project ID: ENV-04

Project Name: West Fork Salt RiverBank Stabilization

Land Jurisdiction: Private

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- Natural Resource Conservation Service
 - EQIP
 - CSP
 - Emergency Watershed Protection
- U.S. Fish and Wildlife Service
 - National Fish Passage Program
- Environmental Protection Agency
 - Nonpoint Source Grants (Section 319)
 - Clean Water State Revolving Fund
-

State

- Wyoming Water Development Office
 - Small Water Project Program
- Wyoming Game and Fish Department
 - Aquatic Habitat Trust Fund
 - Habitat Partnership Program

Other

- Trout Unlimited
- National Fish and Wildlife Foundation
- The Nature Conservancy

Permitting and Agency Review Requirements:

Project ID: ENV-04

Project Name: West Fork Salt RiverBank Stabilization

Land Jurisdiction: Private

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: There are no anticipated permitting needs associated with this project, as the channel stabilization will not affect volume or flow.

U.S. Army Corps of Engineers (USACE)

This project is expected to require an Individual Section 404 Permit from USACE. The Individual Permit process involves wetland delineation, issuance of public notice, and completion of a comprehensive environmental review. It may include mitigation measures to offset unavoidable impacts to waters of the United States. Additional details on this permitting process are provided in Section 9 of the watershed report.

A USACE letter of permit approval or acceptance should be submitted to the WWDO with the final design package and must be obtained prior to the start of construction.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

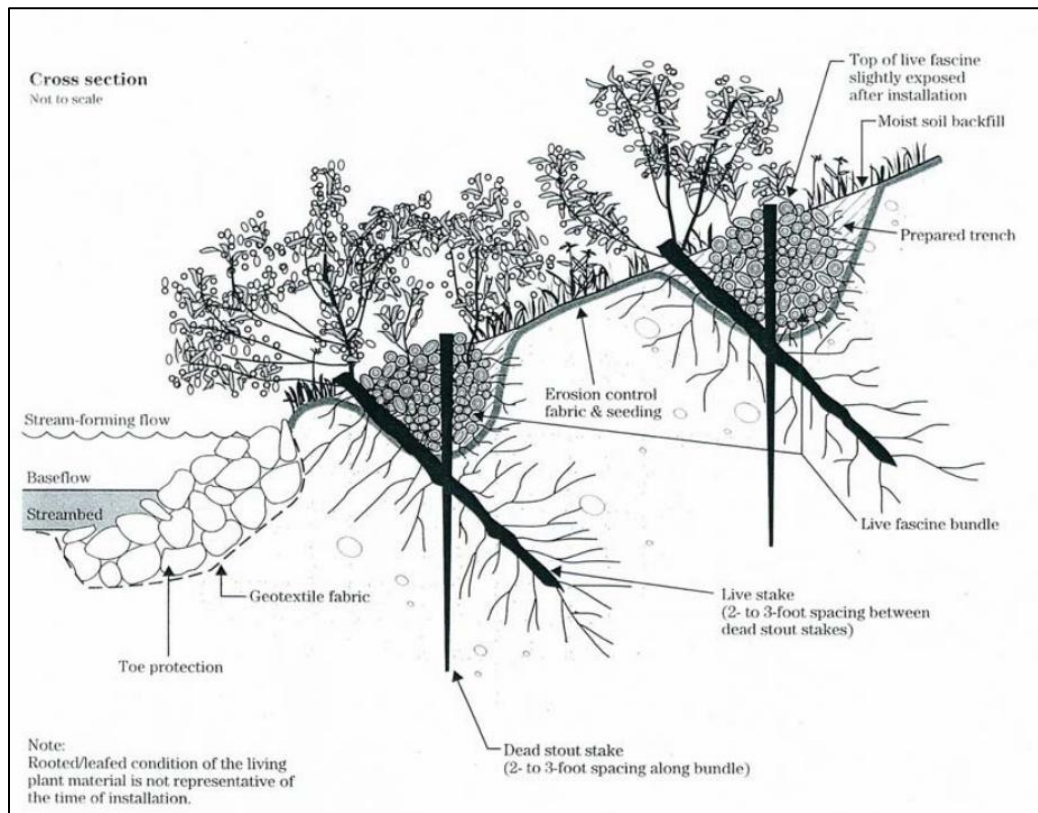


Figure D-57. Typical design for channel stabilization project (NRCS).

Project Map:

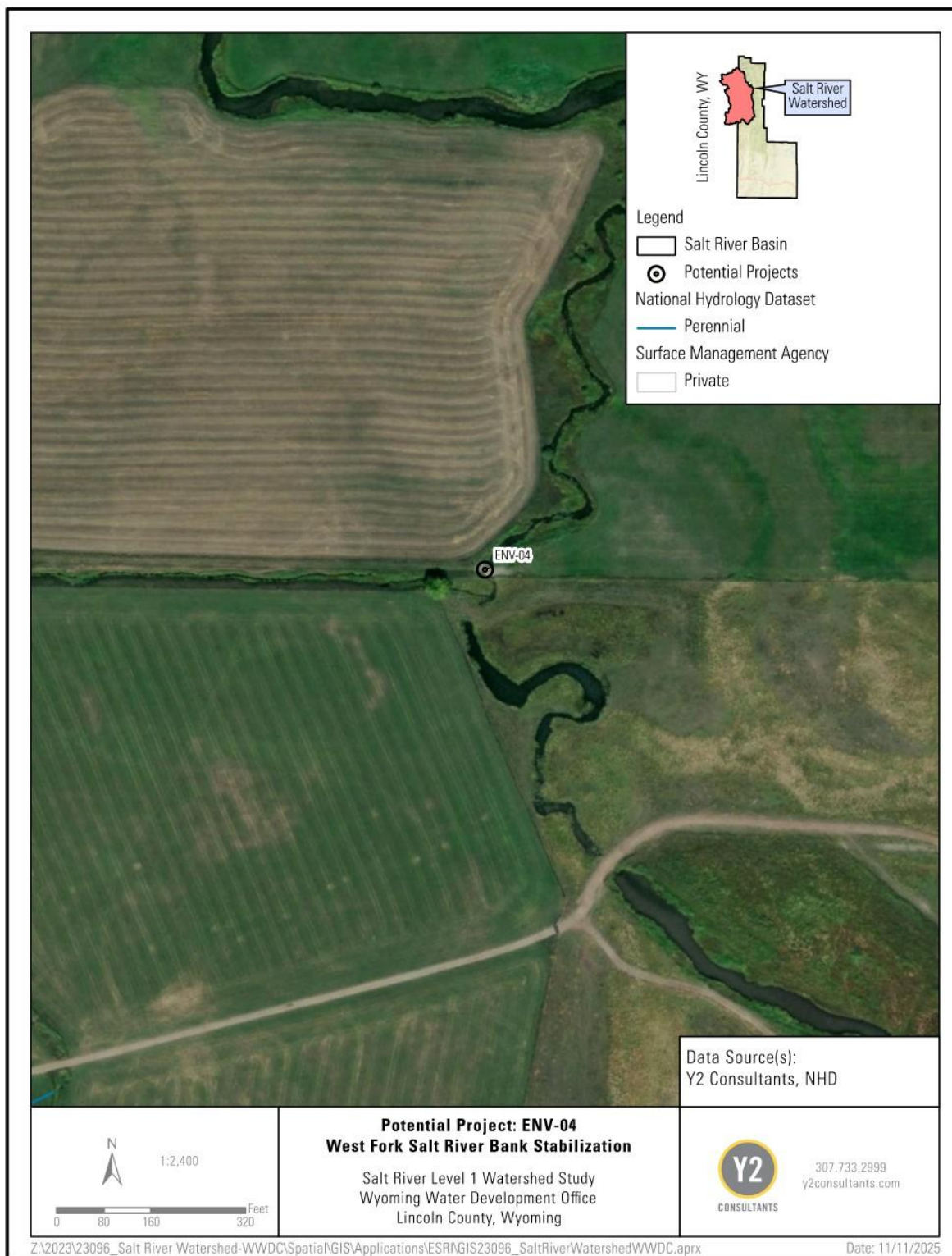


Figure D-58. Project map for ENV-04 – West Fork Salt River Bank Stabilization.

REC-01 – WGFD Salt River Public Access Area Improvements

Project ID: REC-01

Project Name: Salt River Public Access Area Improvements

Project Type: Access

Landowner: Wyoming Game & Fish Department

Sponsor: Star Valley Conservation District

Land Management: Mix of private and public

Location (PLSS): Various, see map for locations.

Location (Lat/Long): Various, see map for locations.

Project Description: This current project with the Wyoming Game and Fish Department involves a series of site-specific upgrades across nine Public Access Areas (PAAs) along the Salt River in western Wyoming. The focus is on improving recreational access, restoring streambank stability, fish passages, fish barriers to irrigation ditches, and enhancing overall site functionality and user experience. Planned work includes the design and construction of new or rehabilitated semi-primitive boat ramps at Clark's Barn, A-G Lane, Narrows Bridge, Freedom Bridge, Creamery Road, Diversion Dam, Perkes', Bateman's, and McCoy Creek. Additional improvements include upgrades to parking areas, development of comfort stations with ADA accessibility, and reconfiguration of approaches to meet highway safety standards. In several locations erosion concerns will be addressed through stabilization measures.

Preliminary design work will evaluate the conditions and constraints at each site to determine which locations are best suited to move forward into more detailed design and construction planning. Collectively, these improvements aim to support sustainable recreation, protect aquatic resources, and promote long-term stewardship of the Salt River corridor.

Public Benefit: These improvements will provide significant public benefits by enhancing access to the Salt River for anglers, boaters, and other recreationists while protecting the natural resources that make the area unique. Upgraded boat ramps and parking areas will improve safety, reduce congestion, and support a wider range of users, including those with disabilities. Stabilization of riverbanks and improved site design will help reduce erosion and sedimentation, protecting water quality and fish movement and habitat. This investment supports both environmental stewardship and recreational opportunity in one of Wyoming's most valued river corridors.

Project Components (Engineer's Estimate):

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	\$ 81,000.00	\$ 81,000.00
2	Primitive Boat Ramp	9	Each	\$ 80,000.00	\$ 720,000.00
3	Parking Area Upgrades	9	Each	\$ 55,000.00	\$ 495,000.00
4	Comfort Stations (Restrooms)	4	Each	\$ 30,000.00	\$ 120,000.00
5	Bank Stabilization	1000	LF	\$ 15.00	\$ 15,000.00
Total Component Cost (Subtotal #2):					\$1,431,000.00

Preparation of Final Designs & Specifications	\$ 143,100.00
Permitting and Mitigation	\$ 13,500.00
Legal Fees	\$ 0.00
Acquisition of Access and Rights-Of-Way	\$ 0.00
Pre-Construction Costs (Subtotal #1)	\$ 156,600.00

Total Component Cost (Subtotal #2)	\$1,431,000.00
------------------------------------	----------------

Construction Engineering Cost (Subtotal #2 x 10%)	\$ 143,100.00
Components and Engineering Costs (Subtotal #3)	\$ 1,574,100.00
Contingency (Subtotal #3 x 15%)	\$ 236,115.00
Total Construction Cost (Subtotal #4)	\$1,810,215.00

Total Project Cost (Subtotal #1 + Subtotal #4)	\$1,966,815.00
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Potential Funding Partners

Project ID: REC-01

Project Name: Salt River Public Access Area Improvements

Land Jurisdiction: Mix of private and public

The following section outlines potential funding partners for this project, with additional details provided in Section 8. Please note that funding opportunities can vary from year to year, so it is essential to review and confirm availability on an annual basis.

Federal

- U.S. Fish and Wildlife Service
 - Boating Access Program
 - National Fish Passage Program
- National Oceanic and Atmospheric Administration
 - Restoring Fish Passage through Barrier Removal grants

State

- Wyoming Water Development Office
 - Small Water Project Program
- Wyoming Game and Fish Department
 - Aquatic Habitat Trust Fund
 - Habitat Partnership Program
 - Wildlife Restoration and Habitat Enhancement Grants
 - Access and Habitat Program
- Wyoming State Parks, Historic Sites, and Trails
 - Land and Water Conservation grant

Other

- Trout Unlimited
- National Fish and Wildlife Foundation

Permitting and Agency Review Requirements:

Project ID: REC-01

Project Name: Salt River Public Access Area Improvements

Land Jurisdiction: Mix of private and public

Greater Sage-Grouse Core Area Protection (Executive Order 2019-3)

Not Applicable. The project is not within the designated sage-grouse core area.

State Engineer's Office

Current Permit: None

Proposed Permit: None

U.S. Army Corps of Engineers (USACE)

It is recommended that the project plan set be submitted to the USACE Wyoming Regulatory Office for preliminary review prior to final submittal to the WWDO. Based on current information, a wetland delineation or PCN is not anticipated to be necessary, as the proposed pipeline alignment does not appear to intersect waters of the U.S. However, the final jurisdictional determination rests with the USACE Wyoming Regulatory Office.

A USACE letter of concurrence or acceptance should be provided to the WWDO along with the final design package and must be secured prior to initiating construction activities.

Cultural

This project will comply with all applicable federal and state cultural resource laws and regulations. Prior to any ground-disturbing activities, a qualified archaeologist will conduct a cultural resource inventory of the project's Area of Potential Effect (APE) to identify and evaluate any historic properties potentially eligible for listing on the National Register of Historic Places.

Project Details:

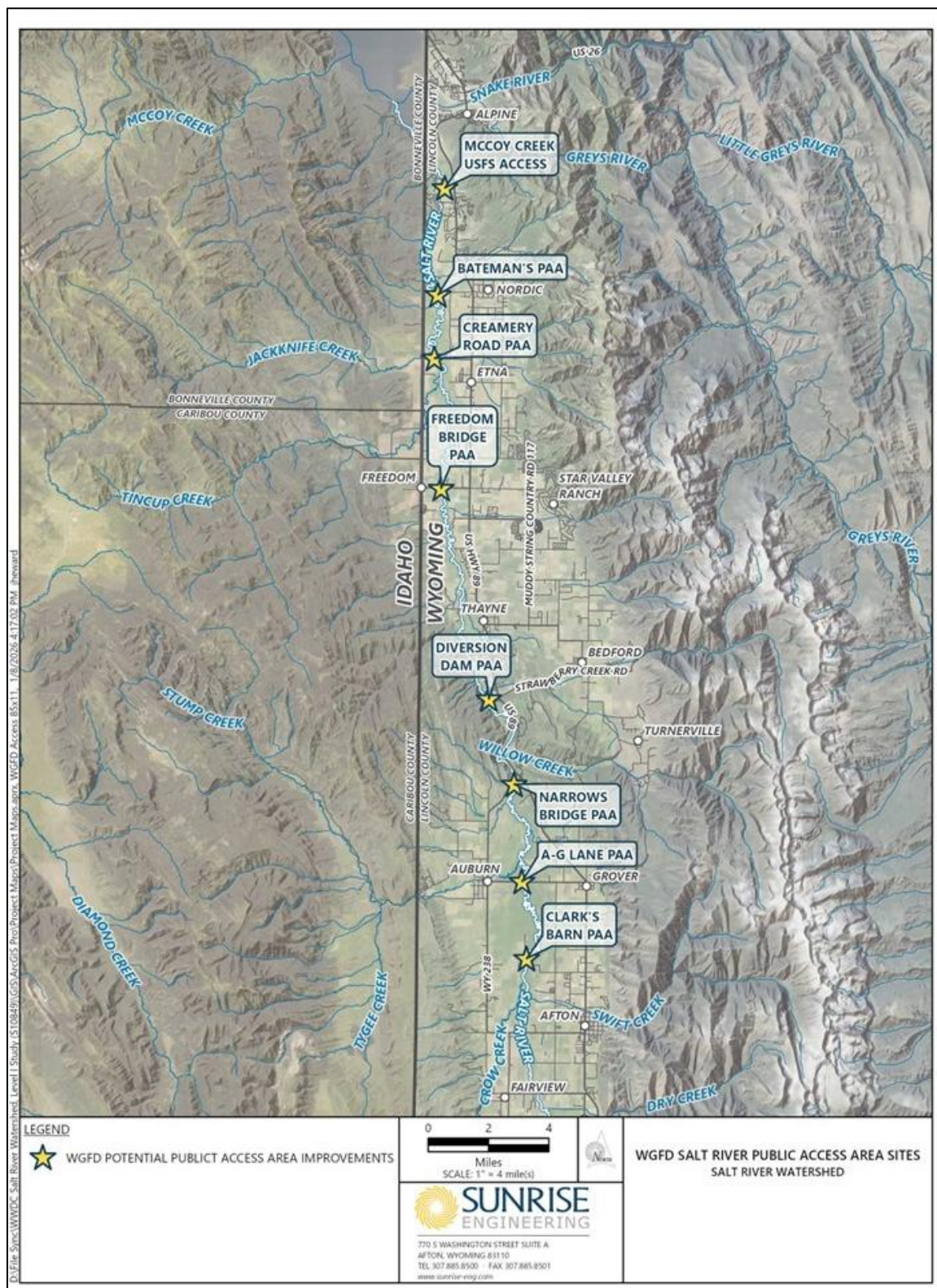


Figure D-59. Project map REC-01 – WGFD Salt River Public Access Area Improvement, potential sites.

APPENDIX E: REPORT PRESENTATION



WYOMING WATER
DEVELOPMENT OFFICE



PUBLIC MEETING NOTICE

Salt River Watershed – Level I Study (Final)

 February 2, 2026 • 6:00 PM

 Afton Civic Center – Video Room, Afton, WY

Meeting Overview

The public is encouraged to attend a meeting to review the Salt River Watershed Level I Study (Final). The meeting includes a presentation of findings, a discussion of next steps, and time for questions and comments.

Agenda

- Brief Presentation – Overview of findings
- Discussion of Next Steps – Watershed project planning
- Q&A / Public Comment Session

Study Document Availability

A hard copy is available at the Star Valley Conservation District Office. Online version here: [Insert link].

Submit Written Comments

Comments accepted until February 9, 2026. Submit to:
Mabel Jones
Wyoming Water Development Office
mabel.jones1@wyo.gov



SALT RIVER WATERSHED LEVEL I STUDY



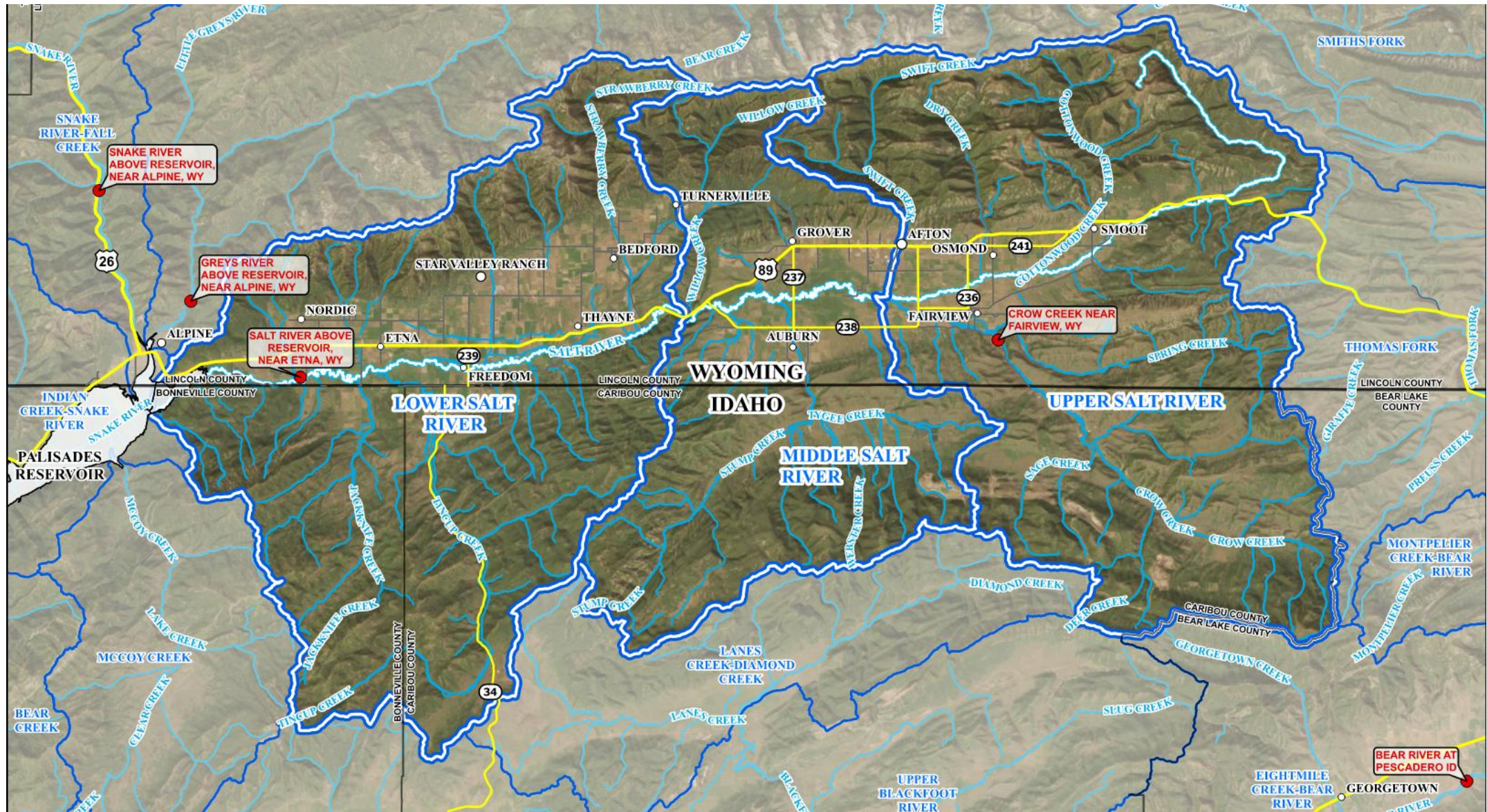
PREPARED FOR THE
WYOMING WATER DEVELOPMENT OFFICE

PROJECT OVERVIEW



- The Salt River Level I Watershed Study evaluated current watershed function, irrigation conveyance systems, stream health, vulnerability of water systems to wildfire, and rehabilitation opportunities within the watershed.





PROJECT APPROACH



Inventory existing and potential projects



Gather Potential Projects from Constituents



Conduct streamflow hydrology



Develop Watershed Management and Rehabilitation Plans



Provide Cost Estimates



Provide Permitting Needs for Projects



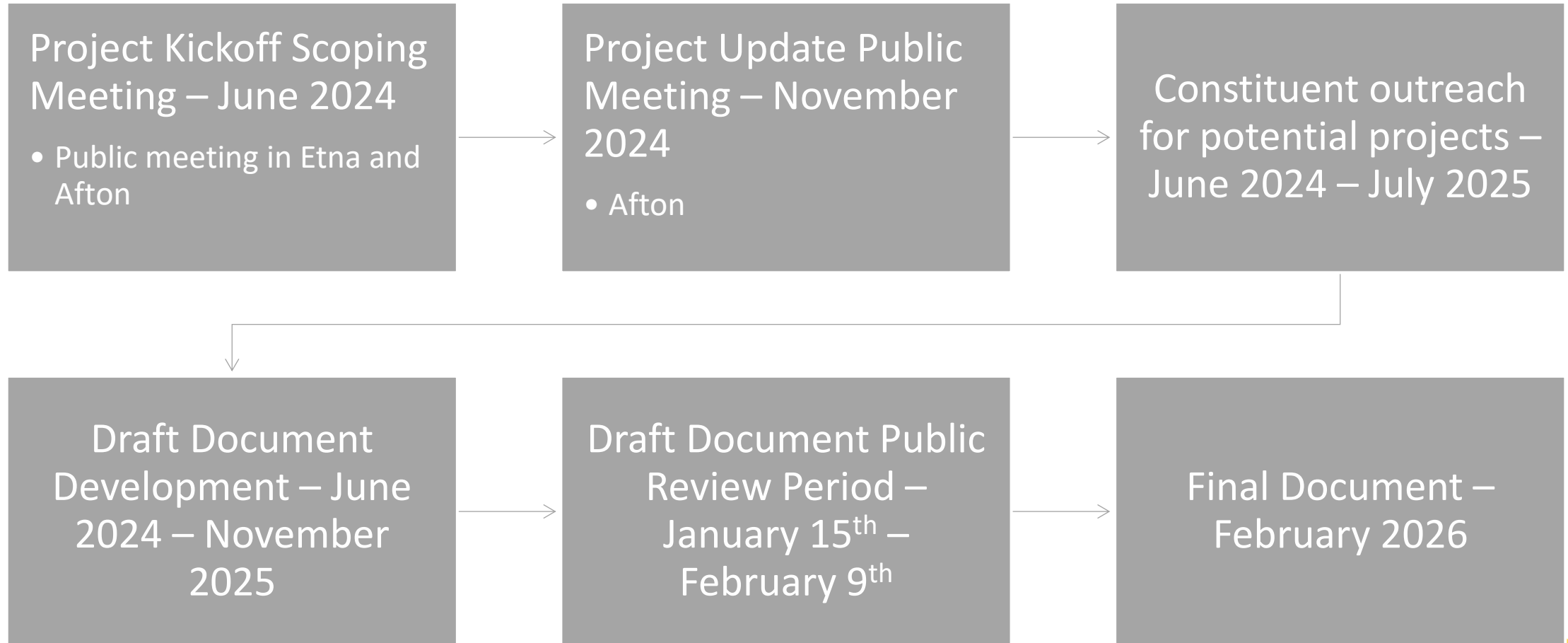
Present Final Report



SALT RIVER WATERSHED LEVEL I STUDY



Project Timeline



Water

transmission

improvement

planning

watershed

irrigation

district

supply

basin

municipal

rehabilitation

stock

ditch

pond

well

study

check

pasture

replacement

allotment

pipeline

dam

river

warp

-

Background Information Review

- Collected existing Information in the watershed
- Reviewed previous WWDO projects in the watershed
- Developed a digital library of information within the watershed for future use by SVCD



Inventory & Descriptions

- Physical Systems

- Climate
- Geology
- Ground water
- Surface water
- Geomorphology

- Biologic Systems

- Land Cover
- Fish and Wildlife
- Wildfire

- Anthropogenic Systems

- Agricultural water use
- Domestic water use
- Water storage
- Land



Streamflow Hydrology Key Points

- Updated through Water Year 2025 using 50+ years of streamflow records
- Enhanced modeling of gaged and ungaged tributaries with improved flow routing
- Expanded irrigated acreage estimates using parcel-level land use and GIS analysis
- Incorporates major diversions and instream flow requirements for more realistic water availability
- Completed peak-flow frequency analyses for all gages with sufficient data
- Added visualization tools to interpret hydrologic conditions across dry, average, and wet years
- Strengthens the technical foundation for long-term water planning and understanding seasonal/annual streamflow patterns



Watershed Management & Rehabilitation

- Long-term strategy for improving watershed health and function
- Defines priority BMPs and conservation actions
- Provides implementation guidance and funding pathways



How Projects Were Identified

- Landowner requests and site visits
- Input from SVCD and partners
- Review of previous WWDO studies
- Eligibility for Small Water Project Program



Types of Projects Identified

- Irrigation infrastructure improvements
- Pipeline conversions and improvements
- Fire protection and draft stations
- Livestock and upland water developments
- Environmental restoration



Irrigation Infrastructure Improvements

- Diversion headgate replacements
- Canal and culvert upgrades
- Improved flow control
- Increased efficiency and reduced maintenance



Pipeline Improvement Projects

- Ditch-to-pipeline conversions
- Transmission main upgrades
- Reduced water loss
- Improved water quality



Fire Protection and Draft Stations

- New and upgraded draft stations
- Improved wildfire response
- Increased community safety



Livestock and Upland Water Developments

- Solar-powered water developments
- Spring developments
- Improved livestock distribution
- Reduced stream impacts



Environmental Restoration

- Streambank stabilization
- Channel restoration
- Erosion control
- Improved riparian function



Small Water Project Program

Program Overview

- Cost-share funding covering up to 50% of eligible expenses
- Maximum award - \$35K/project
- Eligible projects: small reservoirs, wells, pipelines, springs, solar/wind platforms, irrigation improvements, wetland/riparian/habitat projects, rural fire suppression, recreation-related enhancements

Application and Review Timeline

- Application Deadline – November 15
- Eligibility Screening – Conducted by SWPP project manager
- Funding announcement – March after legislative review



GIS Platform for SVCD

- Foundational GIS system for watershed planning
- Data generated from watershed study will be used to develop
- Hosted by Lincoln County GIS; mobile field map included
- Supports long-term, data-driven decision making



Cost Estimates & Permitting

- Cost estimates provided for each identified project
- Potential funding sources identified for each project
- Potential permitting requirements for each project were also identified



Recommendations

- Prioritize Small Water Project Program Implementation
- Leverage Multi-Source Funding & Partnerships
- Use and Maintain Existing Analytical Tools
- Promote Community Involvement in Stream Restoration
- Maintain Communication & Outreach
- Facilitate Application for all Interested Parties
- Pond Inventory Assessment and Enhancement



Conclusions

- Delivers a comprehensive assessment of watershed conditions and critical resource concerns
- Provides a prioritized Watershed Management to enhance watershed health, water quality, and sustainable management
- Serves as a roadmap for future projects, funding, partnerships, and community-led stewardship





QUESTIONS



DEFINE.



DESIGN.



DELIVER.

Commenting

<https://bit.ly/SaltRiverWatershedStudy>

Hard Copy located at the Star Valley Conservation District

Submit Comments To:
Mabel Jones
WWDO Project Manager
Mabel.jones1@wyo.gov



SALT RIVER WATERSHED LEVEL I STUDY

