

Staff Report

TO: Board of Directors

FROM: Chip Close, Water Operations Manager

DATE: December 7, 2021

**SUBJECT: Plan for Water Workshop #2- Mountain System Overview
Continued**

OPERATIONS

RECOMMENDATION:

Open a workshop and continue a presentation detailing NID's Mountain System operations and facilities.

BACKGROUND:

NID is embarking on the Plan for Water (PFW) process which includes a comprehensive review of available water supply and the long-term impacts on varying water demands. Once complete, it is anticipated the PFW will consist of a suite of possible supply and demand management strategies to address a range of future conditions to ensure reliable water supplies.

The success of the PFW will be largely dependent on stakeholder involvement. As such, NID has interest in providing relevant details and information regarding current system operations. A better understanding of NID today will help better inform future discussion as we navigate the PFW process.

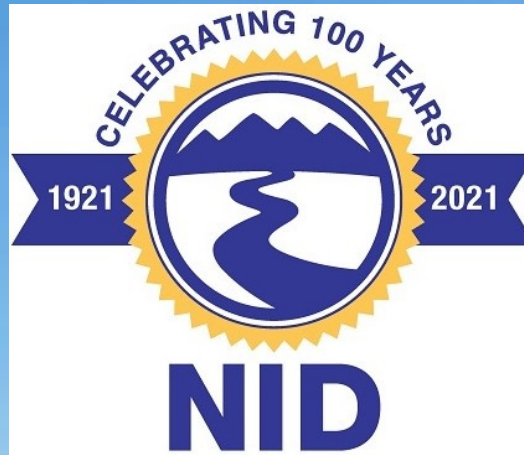
This is a continuation of the first workshop and includes details of NID's Mountain System operations and facilities. This is an open forum workshop, and public engagement is encouraged.

BUDGETARY IMPACT:

None at this time.

Attachments:

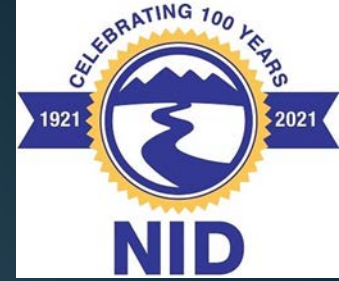
- PowerPoint – Mountain System Overview



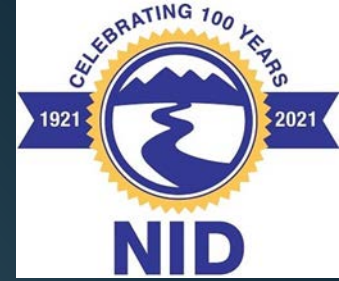
NID PLAN FOR WATER WORKSHOP #2 MOUNTAIN DIVISION OVERVIEW

Plan For Water Workshop #2

Mountain Division Overview



- ▶ This Will Be An Open Forum Workshop
 - ▶ Feel free to ask questions as we go
 - ▶ Zoom attendees; raise hand on zoom app, or press *9 on your phone
 - ▶ We will call on you to unmute and join the conversation



NID Lands Divided by Watershed Collection and Service Area

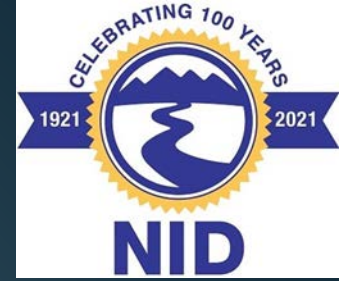
Watershed Area

- ▶ Generally known as NID's Mountain Division
- ▶ Operated and Maintained by NID's Hydroelectric Division

Service Area

- ▶ Lands where NID provides water delivery for consumptive uses
- ▶ Operated and Maintained by NID's Water Division





Two Halves of NID

Watershed Lands

- ▶ 70k acres
- ▶ Lands Purchased With Water Rights
- ▶ Area of interest in NID SOI
- ▶ 9 Storage Res
- ▶ 270,089 Acre Feet Total Volume
- ▶ 24.4 Miles of Canal, Flume and Tunnel
- ▶ 7 Powerhouses
 - ▶ 82.2 Megawatts Max Cap.
- ▶ 19 Campgrounds and Dispersed Camping
- ▶ Roughly 300,000 Annual Visitors

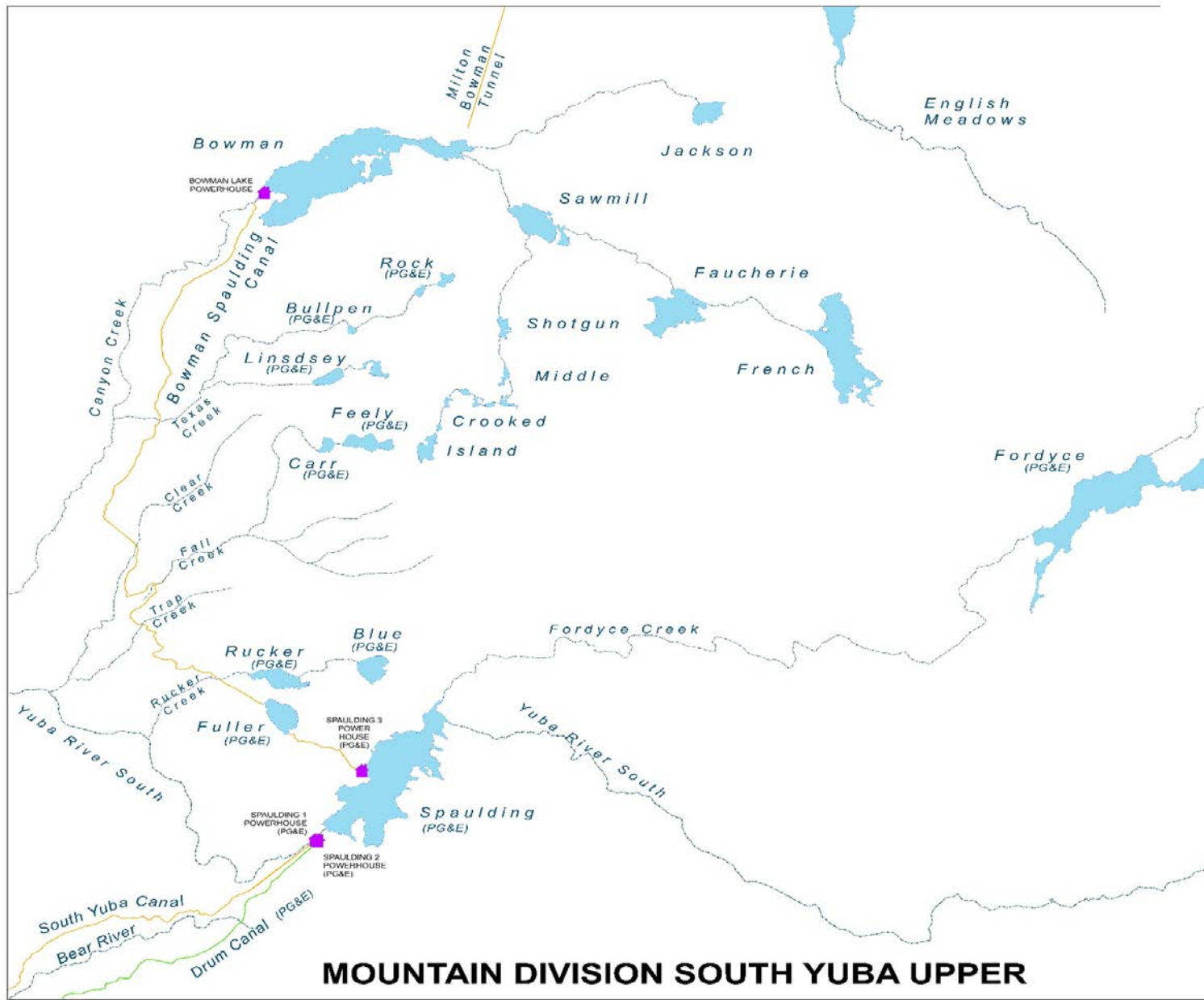
Service Area

- ▶ 287,000 Acres of Land
- ▶ Lands Included in Water Rights Service Area for Consumptive Use
- ▶ 500 Miles of Canal
- ▶ 6500 Raw Water Customers
- ▶ 6 Water Treatment Plants
- ▶ 400 Miles Treated Water Pipes
- ▶ 19,600 Treated Water Customers
- ▶ Utilize Roughly 150,000 Acre Feet a Year

SOUTH YUBA RIVER SYSTEM

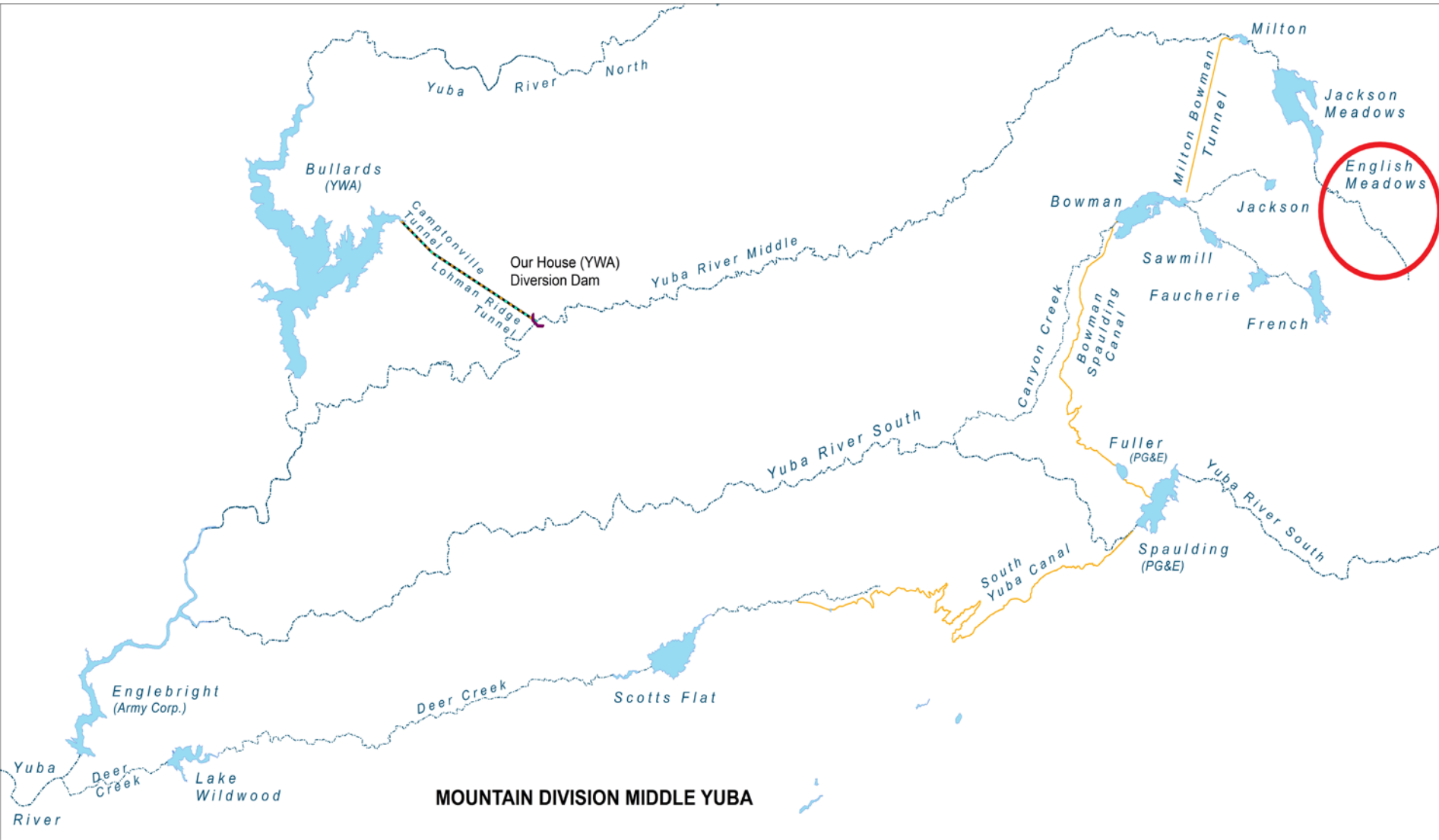
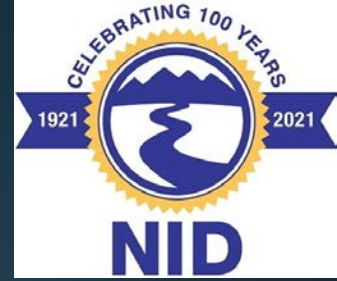


NID

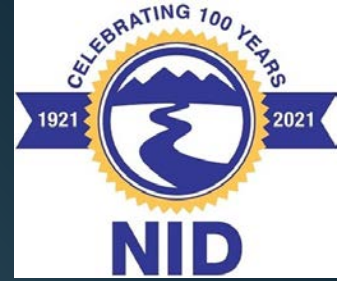


MOUNTAIN DIVISION SOUTH YUBA UPPER

MIDDLE YUBA RIVER SYSTEM



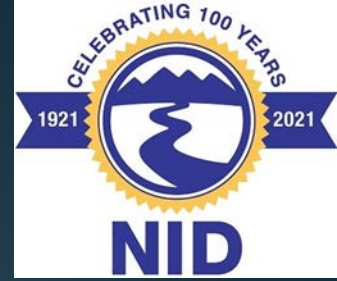
English Meadows



- ▶ Head Waters of Middle Yuba River
- ▶ Home to English Reservoir in 1857
 - ▶ Constructed to Support Hydraulic Mining
 - ▶ Dam was Ruptured in 1883



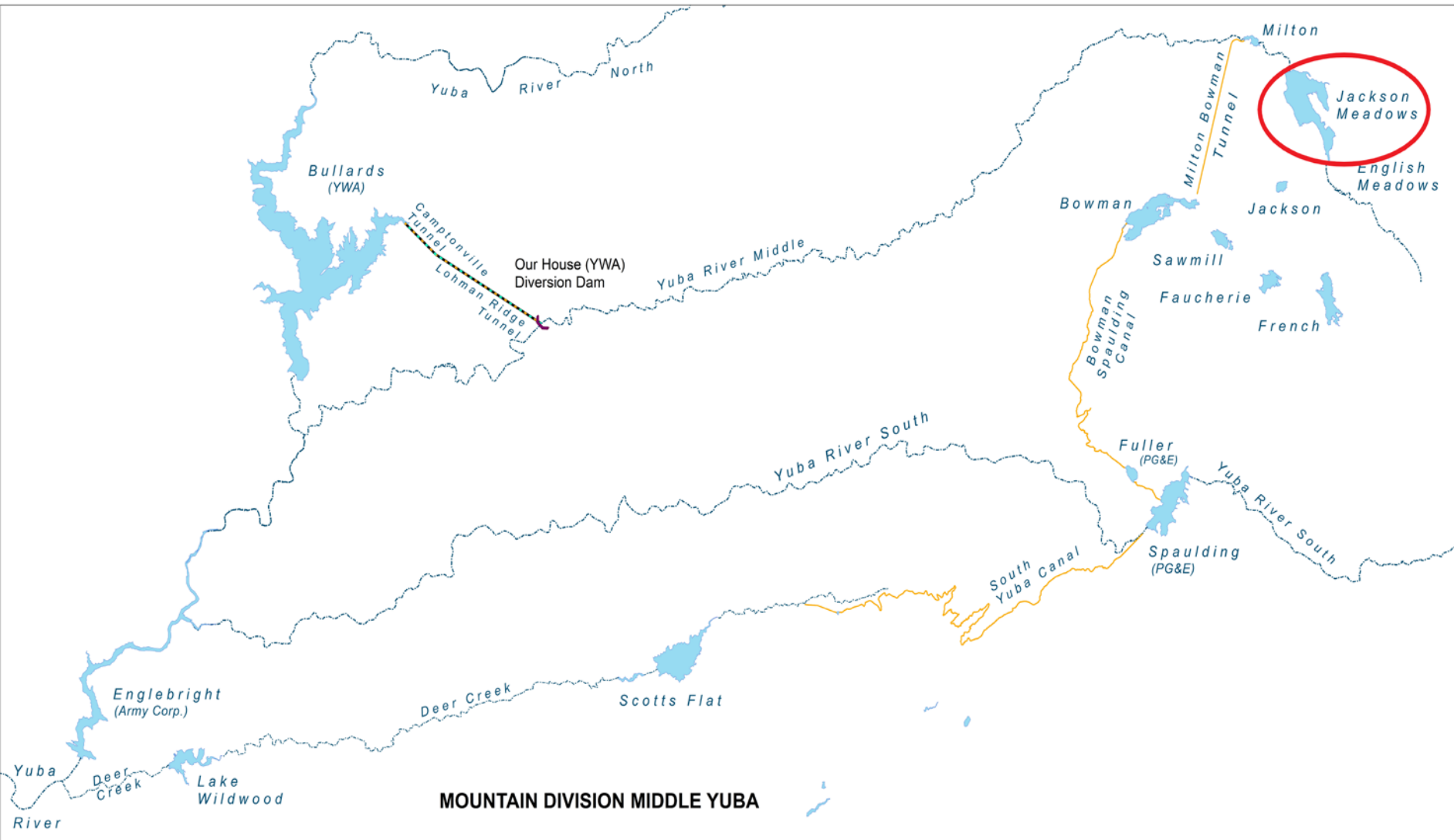
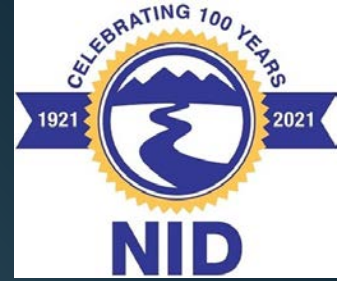
English Meadows



- ▶ NID Purchased the Land and the Water Rights During its Formation in the Early 1900's
 - ▶ NID Continues to Maintain and Improve the Meadow for Water Supply and Environmental Benefit



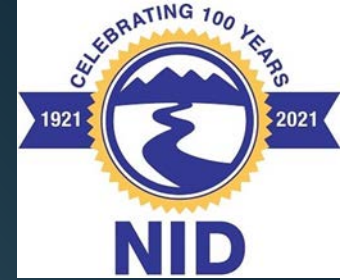
MIDDLE YUBA RIVER SYSTEM



Jackson Meadows Reservoir



Jackson Meadows Reservoir



- ▶ Instream Reservoir on Middle Yuba River
- ▶ Constructed in 1964-65
- ▶ Earth – Rock fill Dam
- ▶ Capacity = 69,205 Acre Feet
- ▶ Normal Max Elevation 6,036 feet
 - ▶ Typical Low Level = 30-35,000 Acre Feet
 - ▶ Minimum Pool of 21,000 ac-ft During Summer Months and 3,000-10,000 ac-ft Fall-Spring Depending on Water Year Type
- ▶ Water Rights – Storage rights for consumptive and non-consumptive uses
- ▶ Environmental Flow Requirements to Middle Yuba
 - ▶ Current Requirement = 5 CFS
 - ▶ Post FERC License Renewal = 11 – 120 CFS Depending on Month and Water Year Type
- ▶ No Power Generation Onsite
- ▶ Includes Multiple Campgrounds, Day Use and Boating:
 - ▶ Silvertip, Aspen, East Meadows, Pass Creek, Pass Creek Overflow, Jackson Point Boat-in, Findley, Fir Top and Woodcamp
 - ▶ Supports Roughly 30,000 Visitors Annually

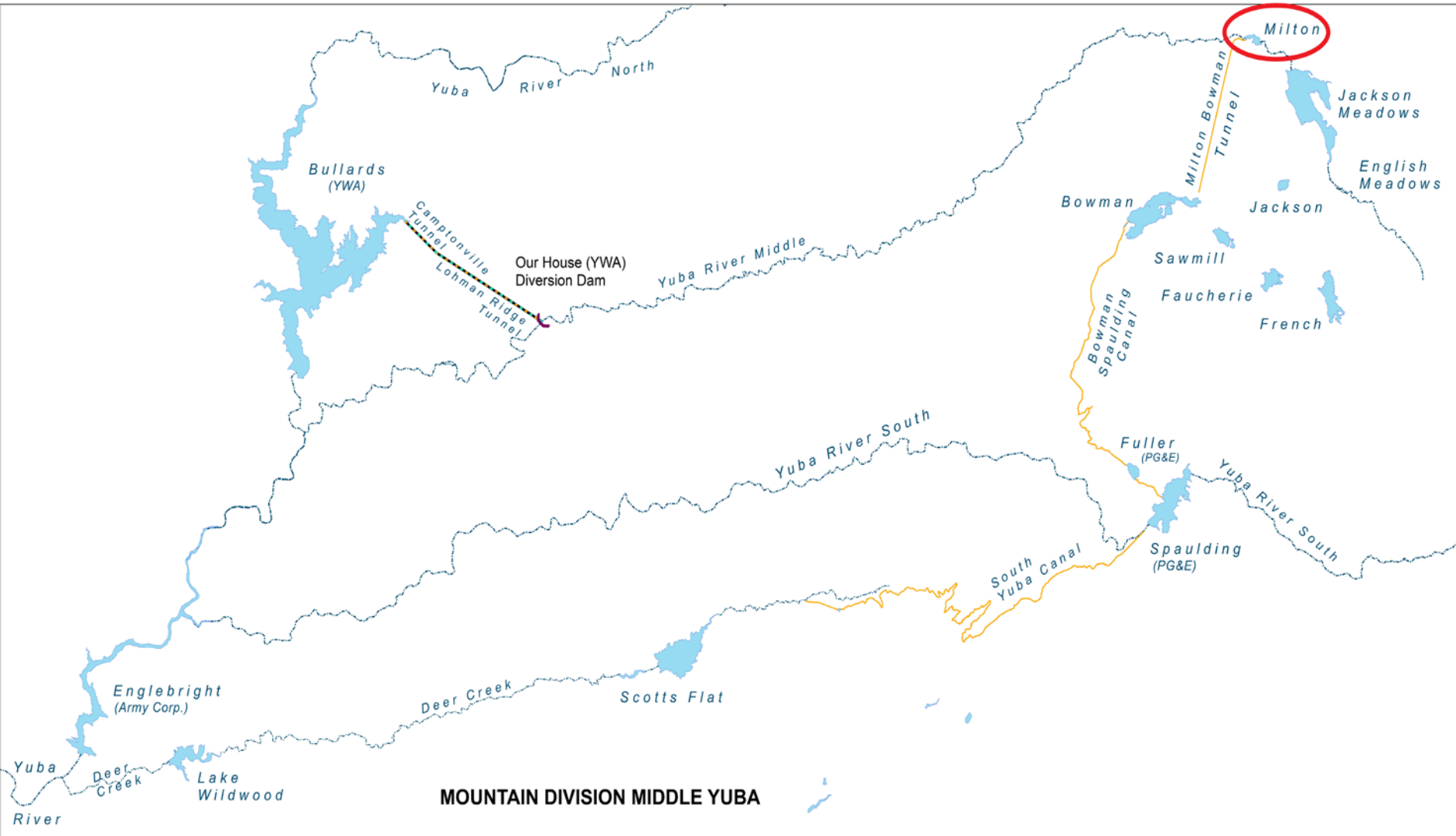
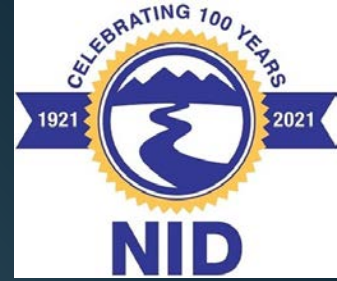
An aerial photograph of the Jackson Meadows Dam, a large concrete structure with a radial gate spillway. The dam is situated on a rocky, forested hillside. To the left of the dam, a small waterfall flows down a rocky slope. The reservoir behind the dam is a large, deep blue body of water, surrounded by dense evergreen forests. The sky is clear and blue.

Low Level Outlet
To Middle Yuba River

JACKSON MEADOWS DAM

Height: 195 feet
Crest Elevation: 6,044.5 ft.
Spillway Type: Radial Gates

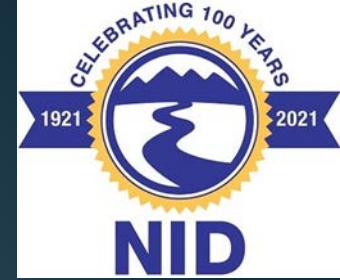
MIDDLE YUBA RIVER SYSTEM



Milton Diversion



Milton Diversion



- ▶ Instream Diversion in Middle Yuba River
- ▶ Constructed to Build Head and Push Water into Milton Bowman Conduit
- ▶ Constructed in 1926
- ▶ Concrete Diversion
- ▶ Capacity of 295 Acre Feet
 - ▶ Not Considered a Storage Facility
- ▶ Normal Max Elevation 5,690 ft.
- ▶ Environmental Flow Requirements to Middle Yuba
 - ▶ Current Requirement =3 CFS
 - ▶ Post FERC License Renewal = 4-70 CFS Depending on Month and Water Year Type
- ▶ Known for Trophy Trout Fishing (Catch and Release)
- ▶ Supports Dispersed Camping and Fishing

MILTON DIVERSION DAM

Dam Height: 37 feet

Crest Elevation: 5,690.0 ft

Spillway: Ungated

Fish Release

Middle
Yuba River

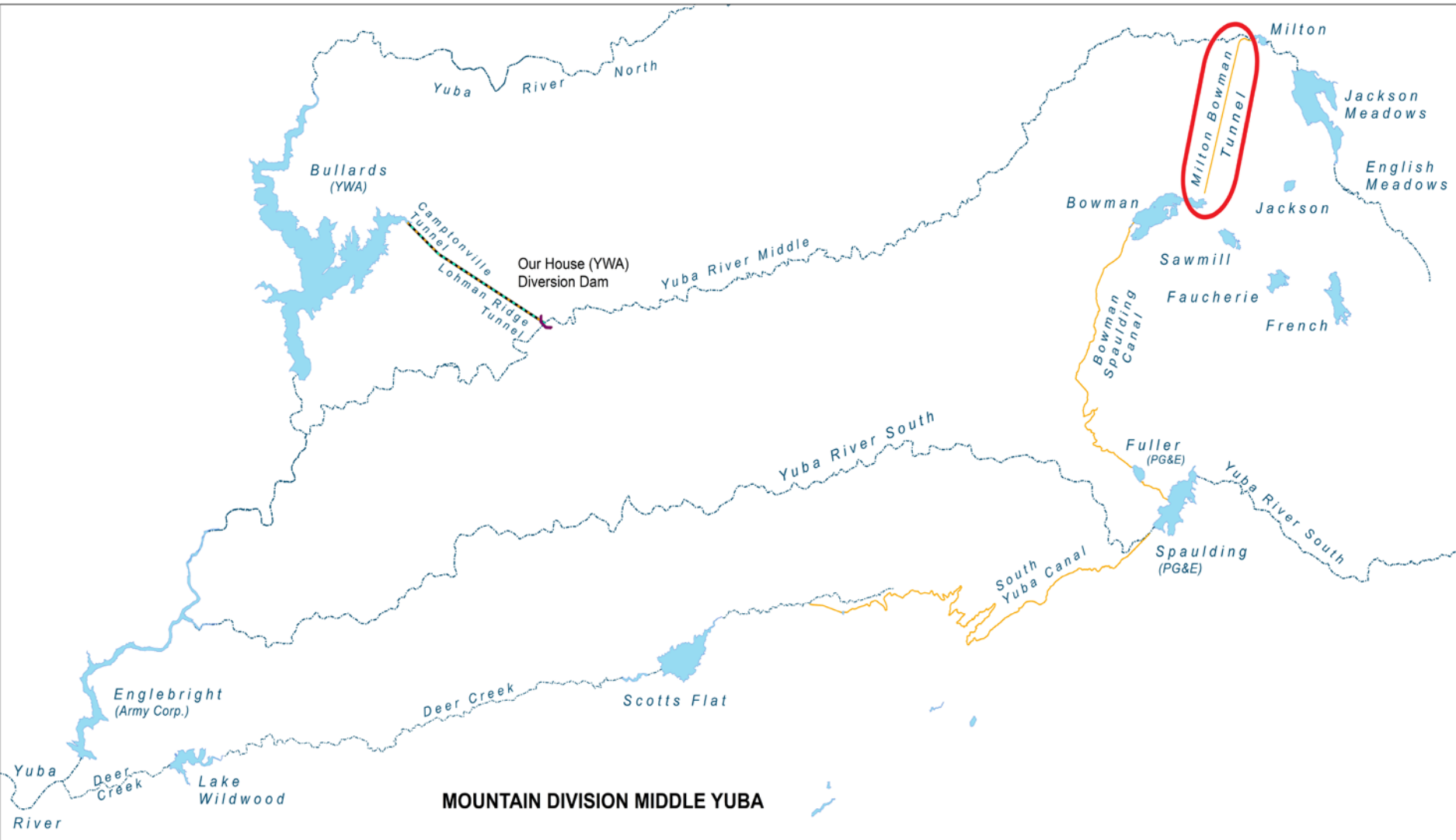
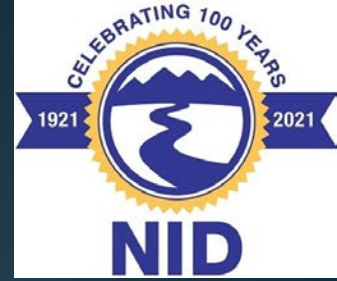
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MILTON DIVERSION IMPOUNDMENT

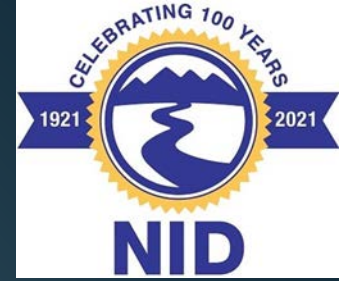
MIDDLE YUBA RIVER SYSTEM



MILTON-BOWMAN CONDUIT PIPE INTAKE

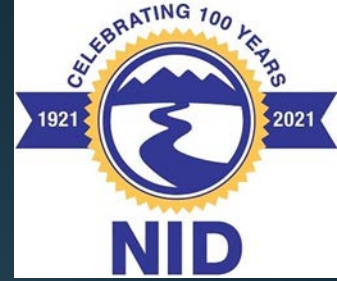


Milton Bowman Conduit



- ▶ Transfers Water From Milton to Bowman Reservoir
- ▶ Middle Yuba Watershed to Canyon Creek Watershed in the South Yuba Watershed
- ▶ Constructed 1926 – Pipeline Portion Rebuilt in 1965
- ▶ 3,315 ft of Pipeline and 22,623 ft Tunnel
- ▶ 450 cfs Maximum Capacity
- ▶ Normal Summer Flows 150 – 190 CFS

Milton Bowman Conduit



Milton-Bowman Conduit

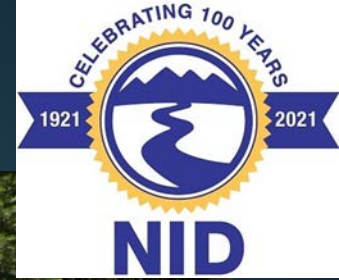
Milton-Bowman Tunnel

Inflow from Wilson Creek Diversion



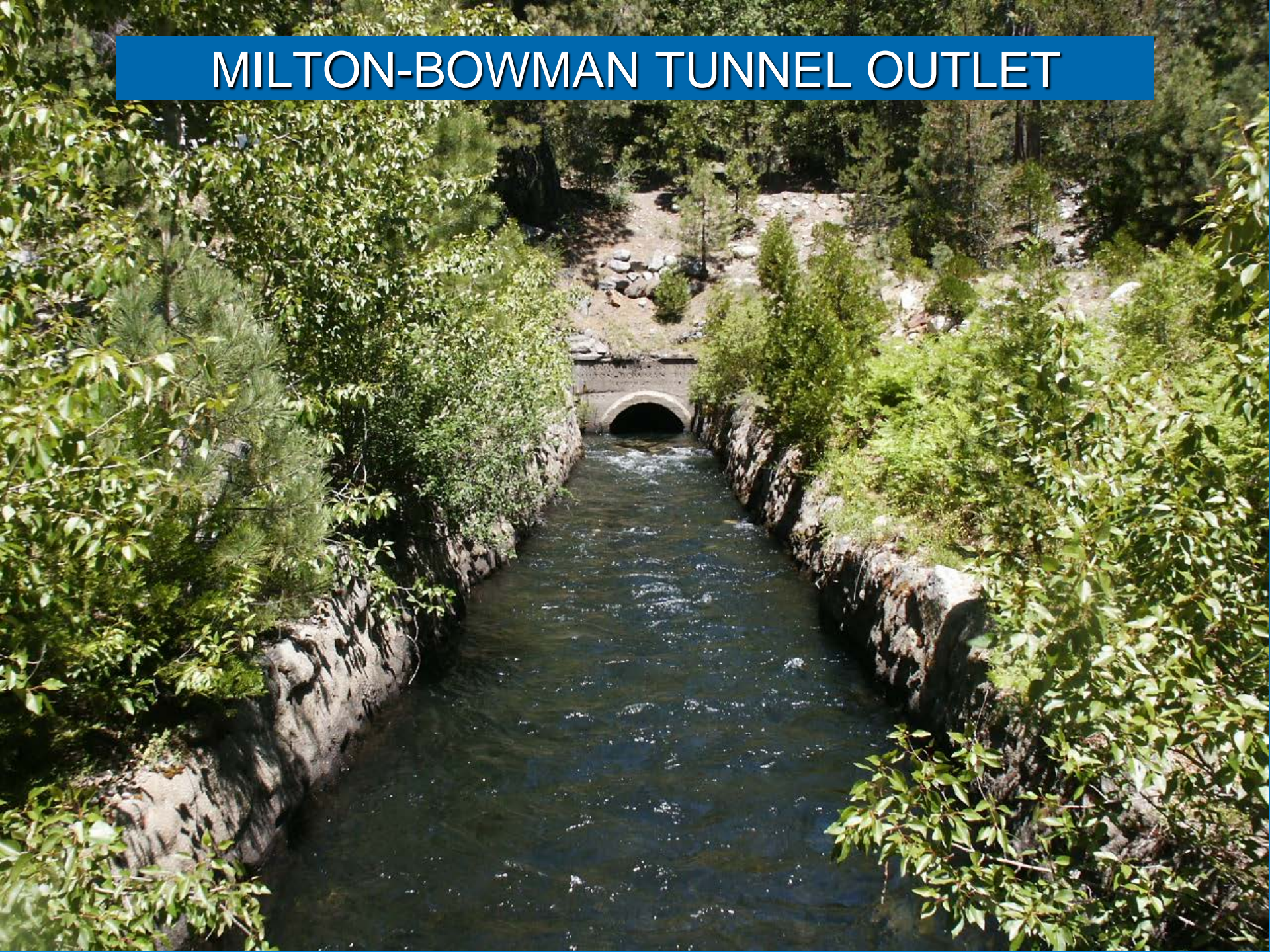
WILSON CREEK DIVERSION

Wilson Creek Gage Station

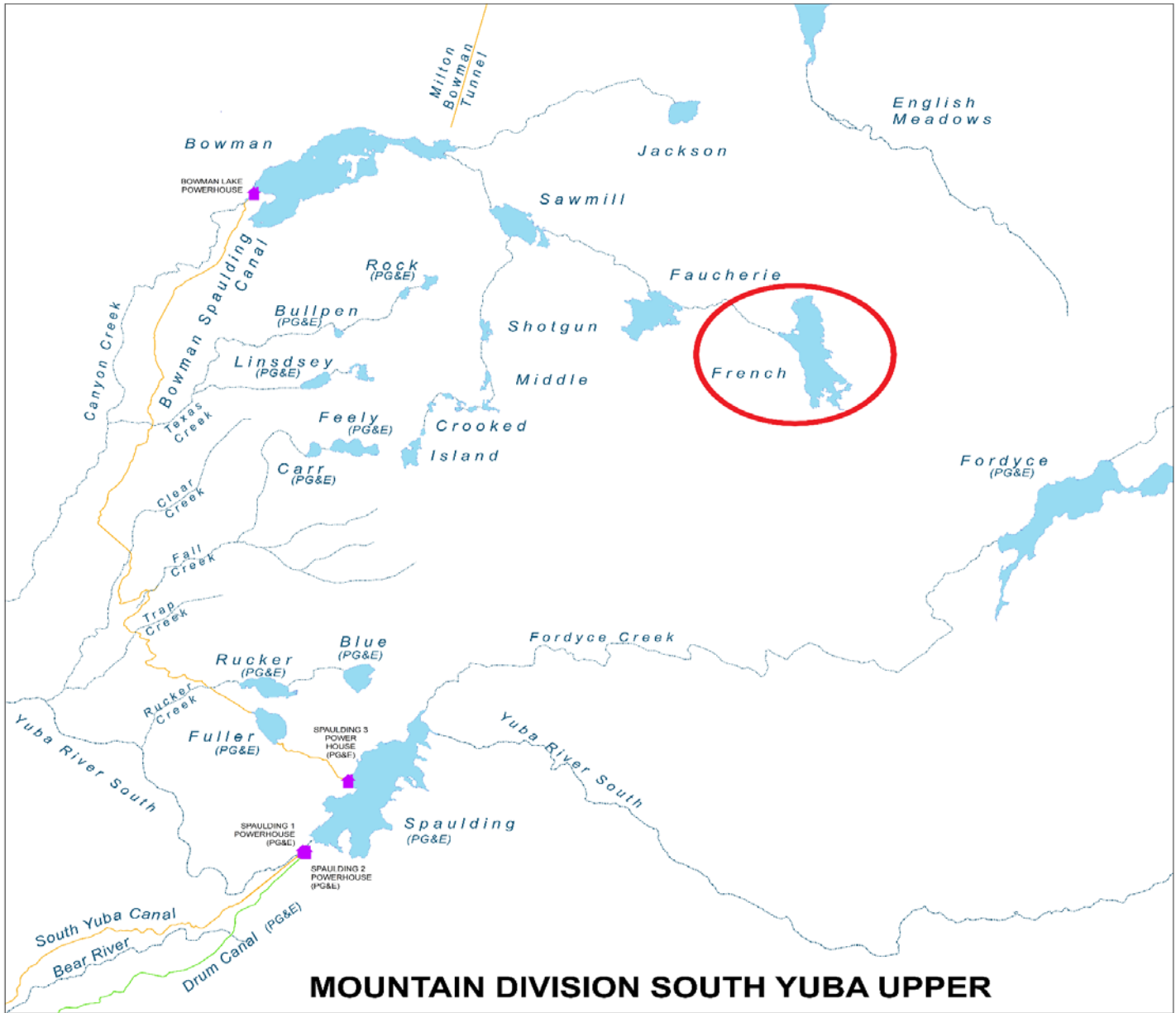
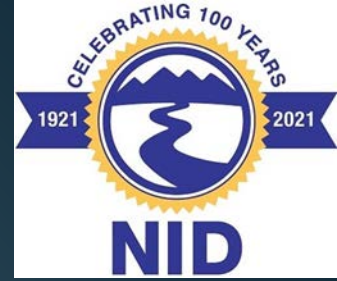


- ▶ Tributary in the Middle Yuba Watershed
- ▶ NID Water Rights Allow Capture of 1,580 Acre Feet into Milton Bowman Pipeline
- ▶ Environmental Flows to Wilson Creek
 - ▶ Current Requirements = None
 - ▶ Post FERC License Renewal = 0.25 CFS or natural flow, whichever is less

MILTON-BOWMAN TUNNEL OUTLET



SOUTH YUBA RIVER SYSTEM

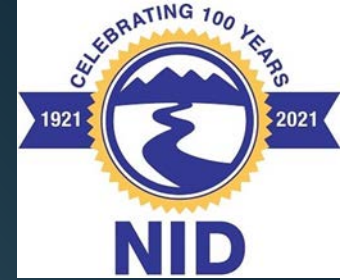


MOUNTAIN DIVISION SOUTH YUBA UPPER

FRENCH RESERVOIR



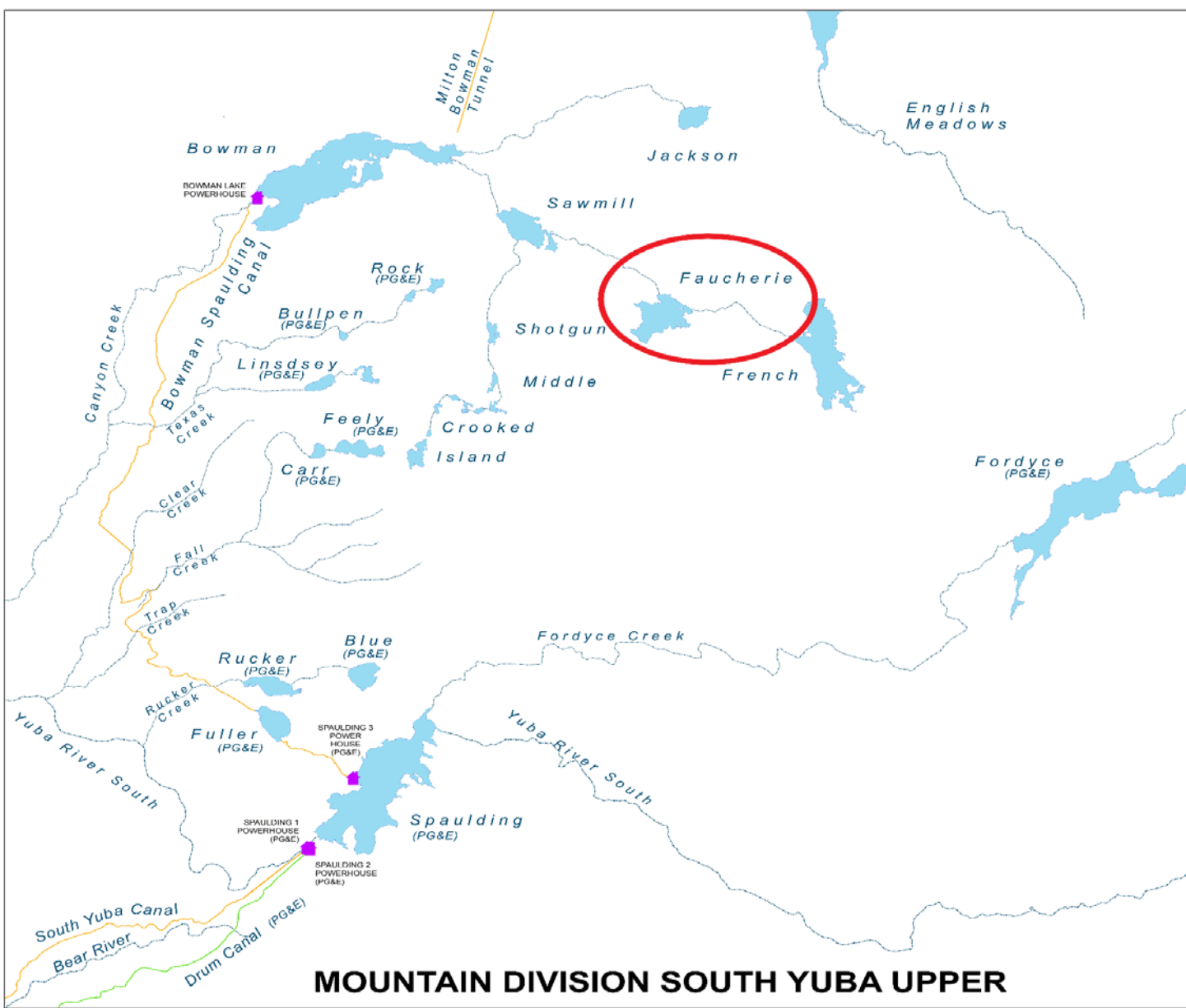
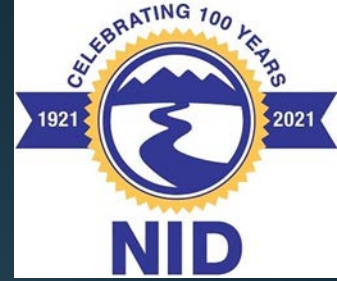
French Reservoir



- ▶ Instream Canyon Creek Reservoir
- ▶ Part South Yuba Watershed
- ▶ Constructed in 1859 – Raised in 1948
- ▶ Concrete Faced Rock fill
- ▶ Maximum Normal Elevation 6,660 feet
- ▶ Capacity = 13,940 Acre Feet
- ▶ Typical Low Level 7,000 Acre Feet
- ▶ Pre-1914 Water Rights Allow for Storage of 13,940 Acre Feet
- ▶ Environmental Flows to Canyon Creek
 - ▶ Current Requirements = 2.5 CFS
 - ▶ Post FERC License Renewal = 5-18 CFS Depending on Month and Water Year Type
- ▶ No Power Generation
- ▶ Supports Walk In Dispersed Camping



SOUTH YUBA RIVER SYSTEM

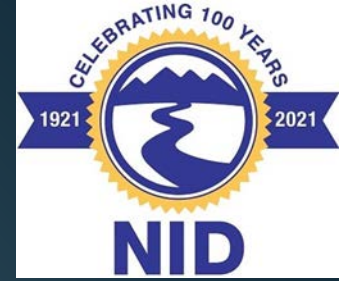


MOUNTAIN DIVISION SOUTH YUBA UPPER

An aerial photograph of Faucherie Reservoir. The reservoir is a large, calm body of water with a deep blue hue, reflecting the surrounding landscape. In the foreground, a prominent dam constructed from grey rocks and gravel stretches across the width of the frame. The background is dominated by steep, rugged mountains with light-colored rock faces and patches of snow. The shoreline is lined with dense evergreen forests. The text "Faucherie Reservoir" is overlaid in white on the left side of the image.

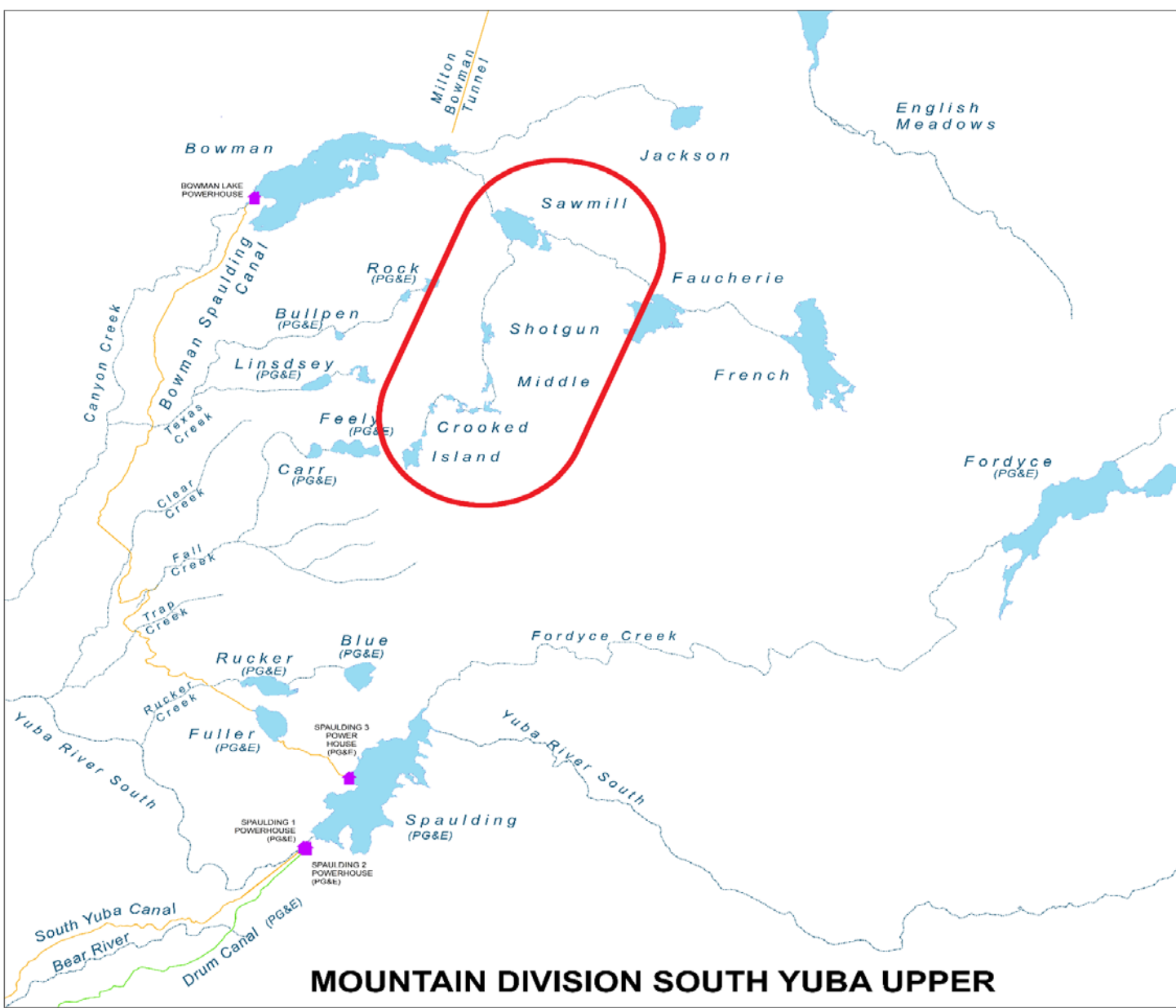
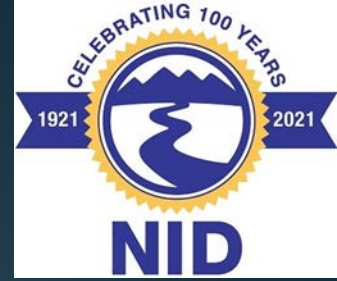
Faucherie Reservoir

Faucherie Reservoir



- ▶ Instream Canyon Creek Reservoir
- ▶ Part of South Yuba Watershed
- ▶ Constructed in 1872 – Reconstructed 1964-65
- ▶ Earth Core, Rock fill
- ▶ Maximum Normal Elevation 6,123 feet
- ▶ Capacity = 3,980 Acre Feet
- ▶ Typical Low Level = 2,200 Acre Feet
- ▶ Pre 1914 Water Rights Allow for Storage of 2,600 Acre Feet
- ▶ Environmental Flow Release to Canyon Creek
 - ▶ Current Requirements = 2.5 CFS
 - ▶ Post FERC Requirements = 5 –18 CFS Depending on Month and Water Year Type
- ▶ No Power Generation
- ▶ Camping, Day Use and Boating Roughly 7,000 Visitors Annually

SOUTH YUBA RIVER SYSTEM

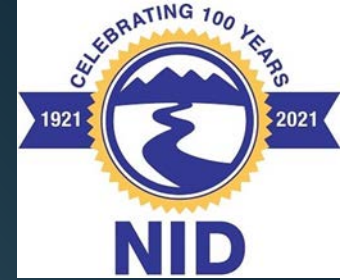


MOUNTAIN DIVISION SOUTH YUBA UPPER

An aerial photograph of a large reservoir surrounded by dense evergreen forests and rocky mountains. The water is calm and reflects the surrounding landscape. A dam is visible in the distance, creating a narrow channel through the center of the reservoir. The text "Sawmill Reservoir" is overlaid in white on the lower part of the image.

Sawmill Reservoir

Sawmill Reservoir



- ▶ Instream Canyon Creek Reservoir
- ▶ Part of South Yuba Watershed
- ▶ Constructed in 1910
- ▶ Stacked Rock Dam
- ▶ Maximum Normal Elevation 5,860 feet
- ▶ Capacity = 3,030 Acre Feet
- ▶ Typical Low Level = 1,600 Acre Feet
- ▶ Pre 1914 Water Rights for Storage of 2,760 Acre Feet
- ▶ Environmental Flow to Canyon Creek
 - ▶ Current Requirement = 2.5 CFS
 - ▶ Post FERC License Renewal = 5 –18 CFS Depending on Month and Water Year Type
- ▶ No Power Generation
- ▶ Dispersed Camping Approximately 5,000 Visitors Annually

SAWMILL DAM

Dam Height: 60 ft

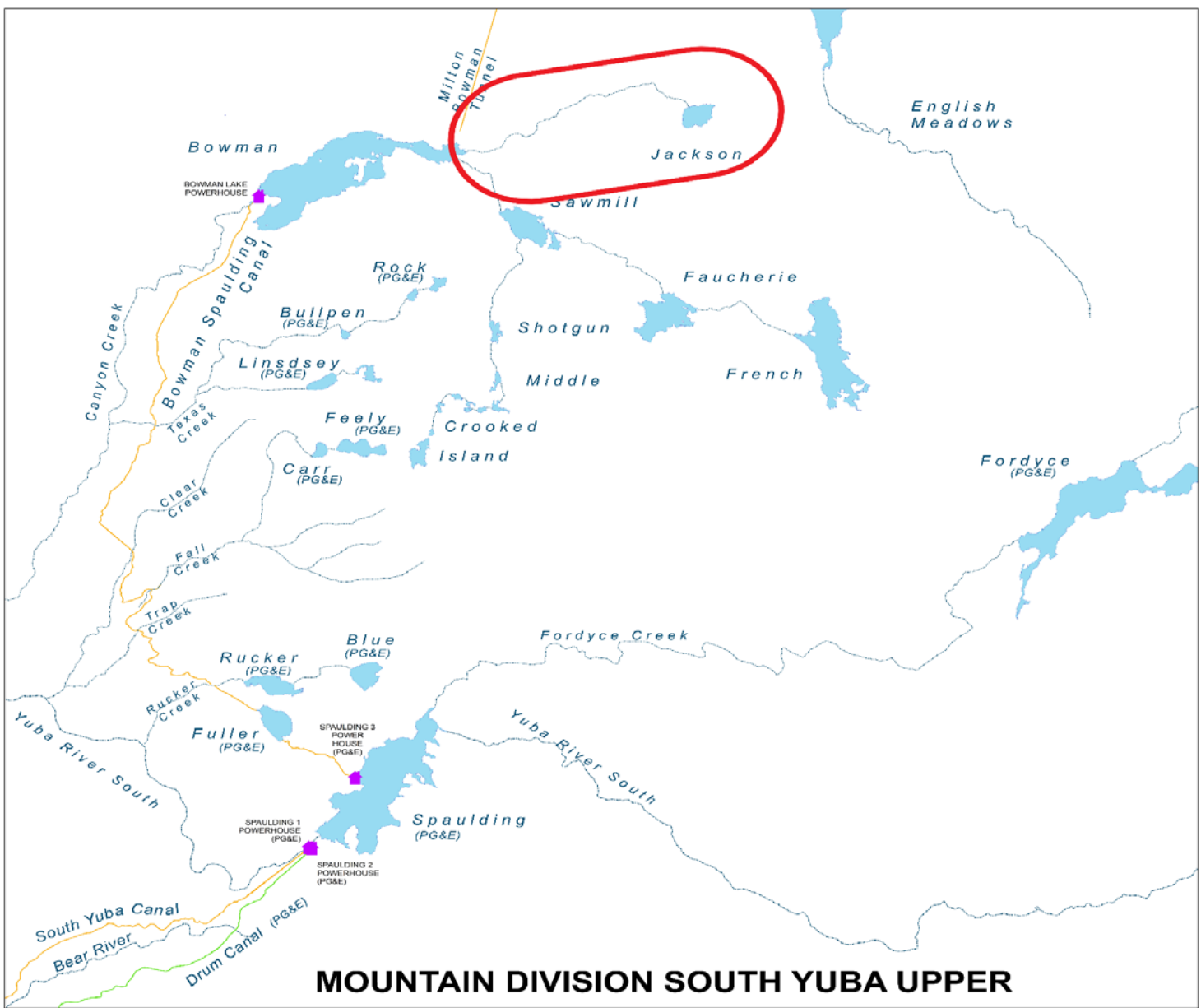
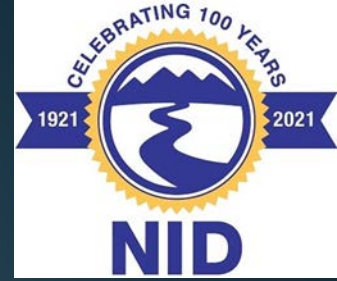
Crest Elevation: 5,865.0 ft

Spillway Type: Ungated



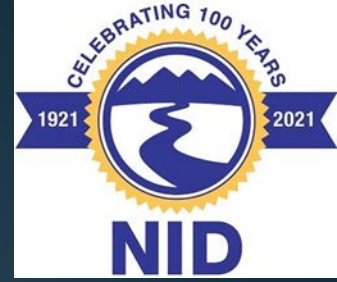
Canyon Creek

SOUTH YUBA RIVER SYSTEM

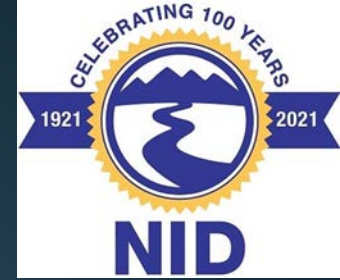


MOUNTAIN DIVISION SOUTH YUBA UPPER

Jackson Reservoir



Jackson Reservoir



- ▶ Instream Reservoir @ Head of Jackson Creek
- ▶ Part of Jackson Creek & South Yuba Watershed
- ▶ Constructed in 1941-42
- ▶ Earthen Dam
- ▶ Max Elevation 6,592 ft.
- ▶ Capacity = 1,330 Acre Feet
- ▶ Typical Low Level = 900 Acre Feet
- ▶ Pre 1914 Water Rights to Store 1,330 Acre Feet
- ▶ Environmental Flow Release to Jackson Creek
 - ▶ Current Requirement = 0.75 CFS
 - ▶ Post FERC License Renewal = 0.5 - 3 CFS Depending on Month and Water Year Type
- ▶ No Power Generation

JACKSON RESERVOIR AND DAM

Dam Height: 28 ft

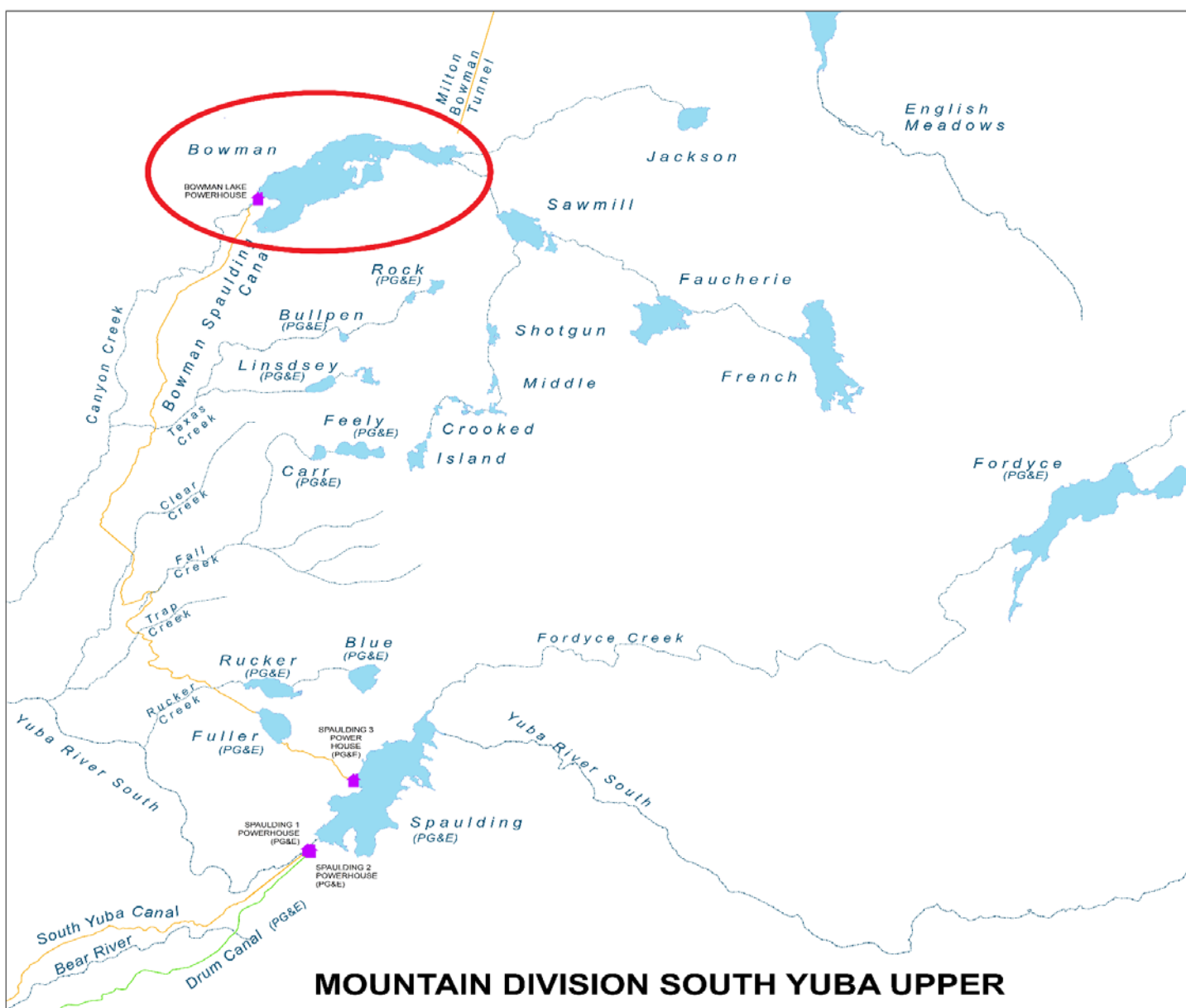
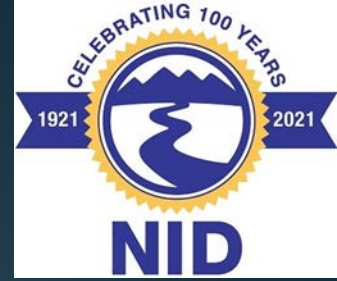
Crest Elevation: 6,596.0 ft

Spillway Type: Ungated

Constructed: 1941-42



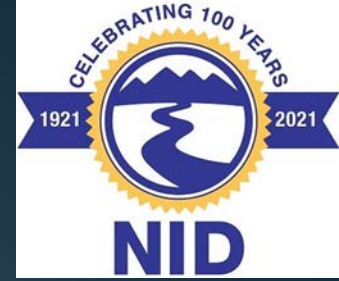
SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

An aerial photograph of Bowman Reservoir in winter. The reservoir is a large, calm body of water with some ice patches. It is surrounded by steep, snow-covered mountains with dense evergreen forests. A concrete dam structure is visible on the right side of the reservoir. The sky is overcast with grey clouds.

BOWMAN RESERVOIR



Bowman Reservoir

- ▶ Instream Canyon Creek Reservoir
- ▶ Part of South Yuba Watershed
- ▶ Constructed in 1869 – Reconstructed 1926-27
- ▶ Earthen & Concrete Dam
- ▶ Maximum Elevation 5,562 ft.
- ▶ Capacity = 68,510 Acre Feet
- ▶ Typical Low Level = 35 to 40,000 Acre Feet
- ▶ Pre 1914 Water Rights to Store 21,350 Acre Feet
- ▶ Supports Dispersed Camping and Boating
- ▶ Supplies Water & Head for Bowman Power House

BOWMAN NORTH DAM

Height: 175 ft

Crest Elevation: 5,567.0 ft



BOWMAN SOUTH ARCH DAM

Height: 135 ft

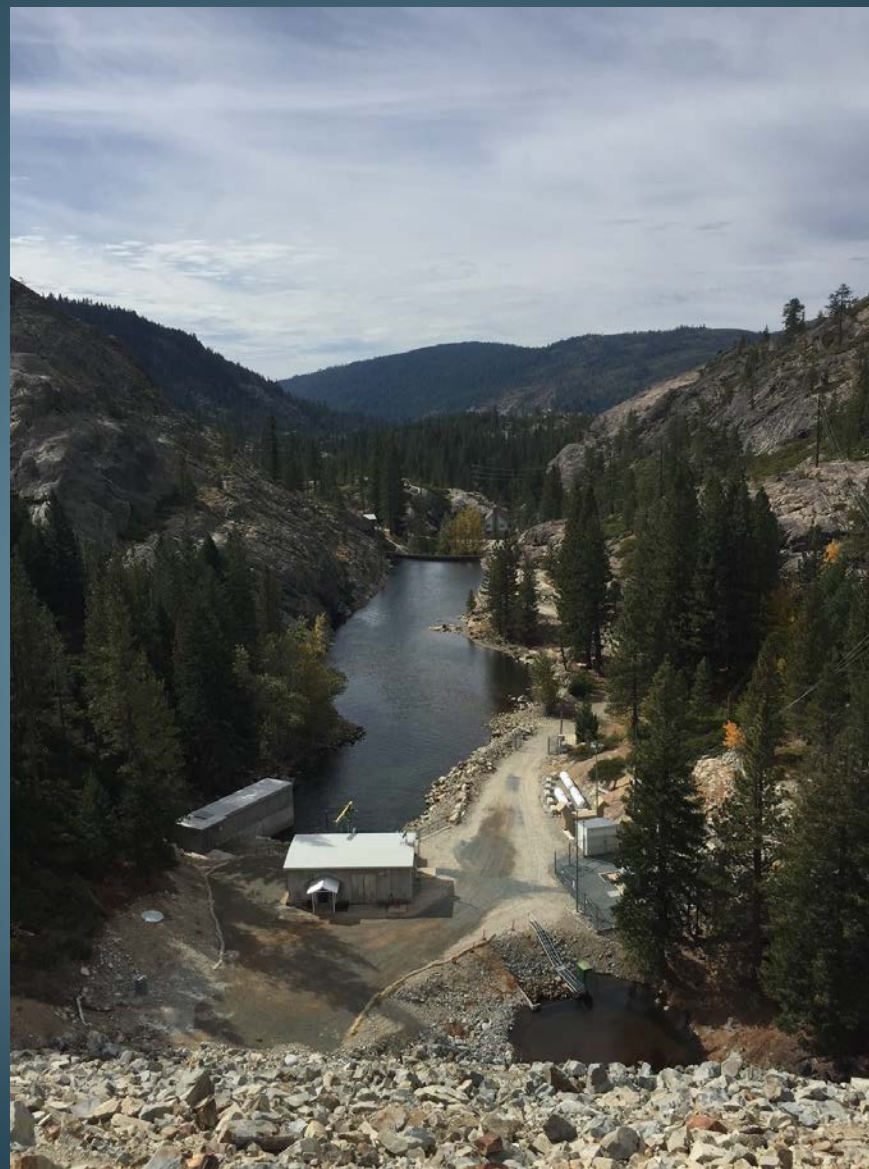
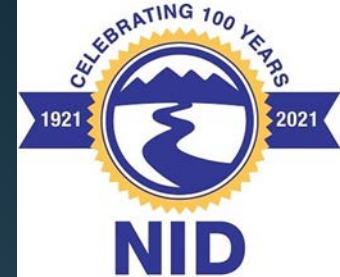
Crest Elevation: 5,563.6 ft



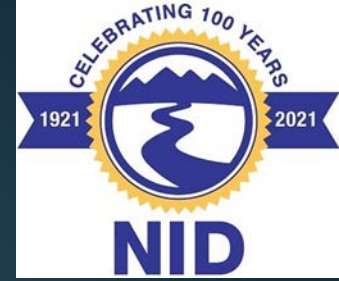
Canyon
Creek



Bowman Powerhouse

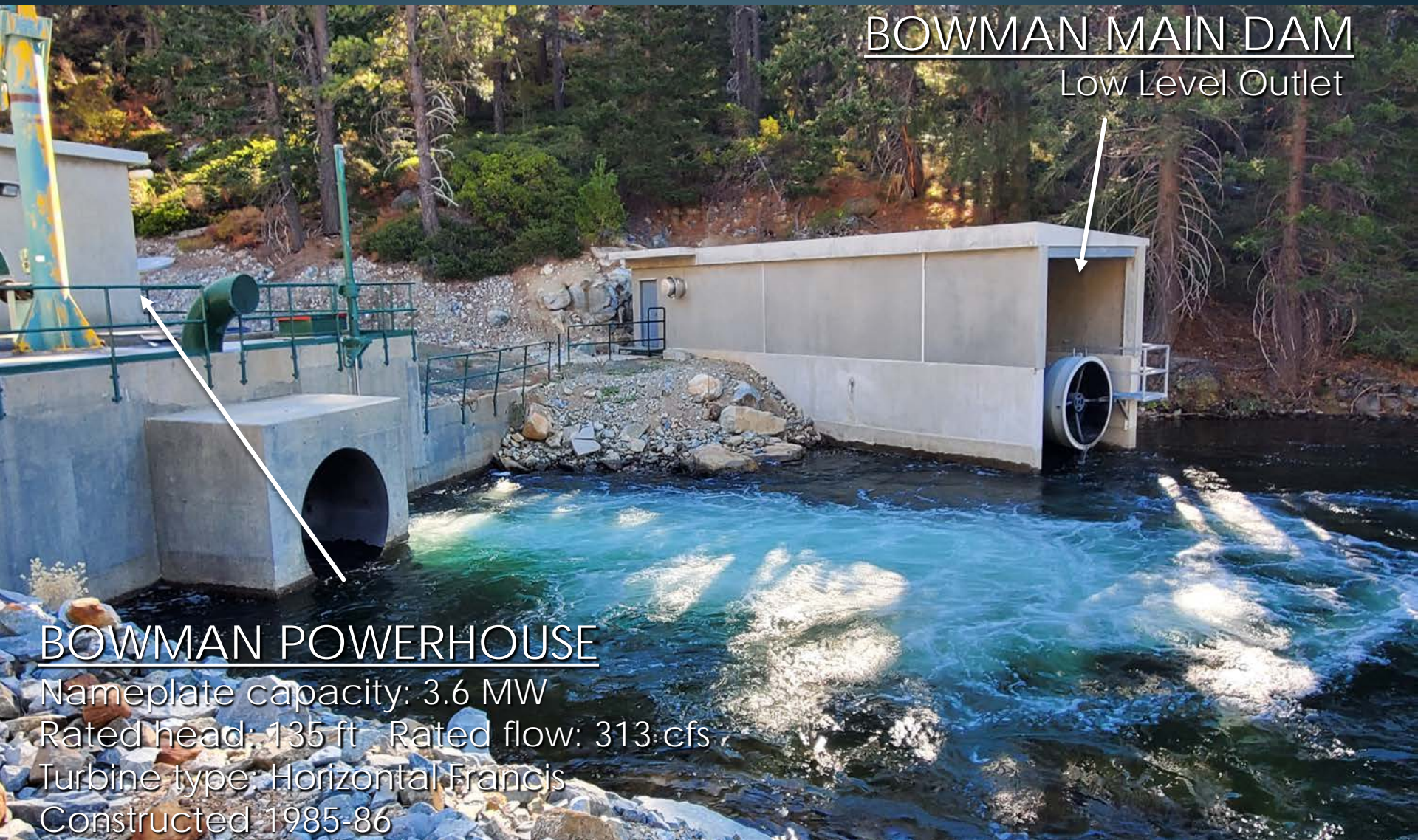


Bowman Powerhouse



- ▶ Instream Canyon Creek Powerhouse
- ▶ Within the South Yuba Watershed
- ▶ Constructed in 1985-86
- ▶ Rated at 3.6 MW
- ▶ Power Generated Via Consumptive & Environmental Demand Flows From Bowman
- ▶ PPA with PG&E Through June 2033
 - ▶ Paid Based on Availability Not Total Generator

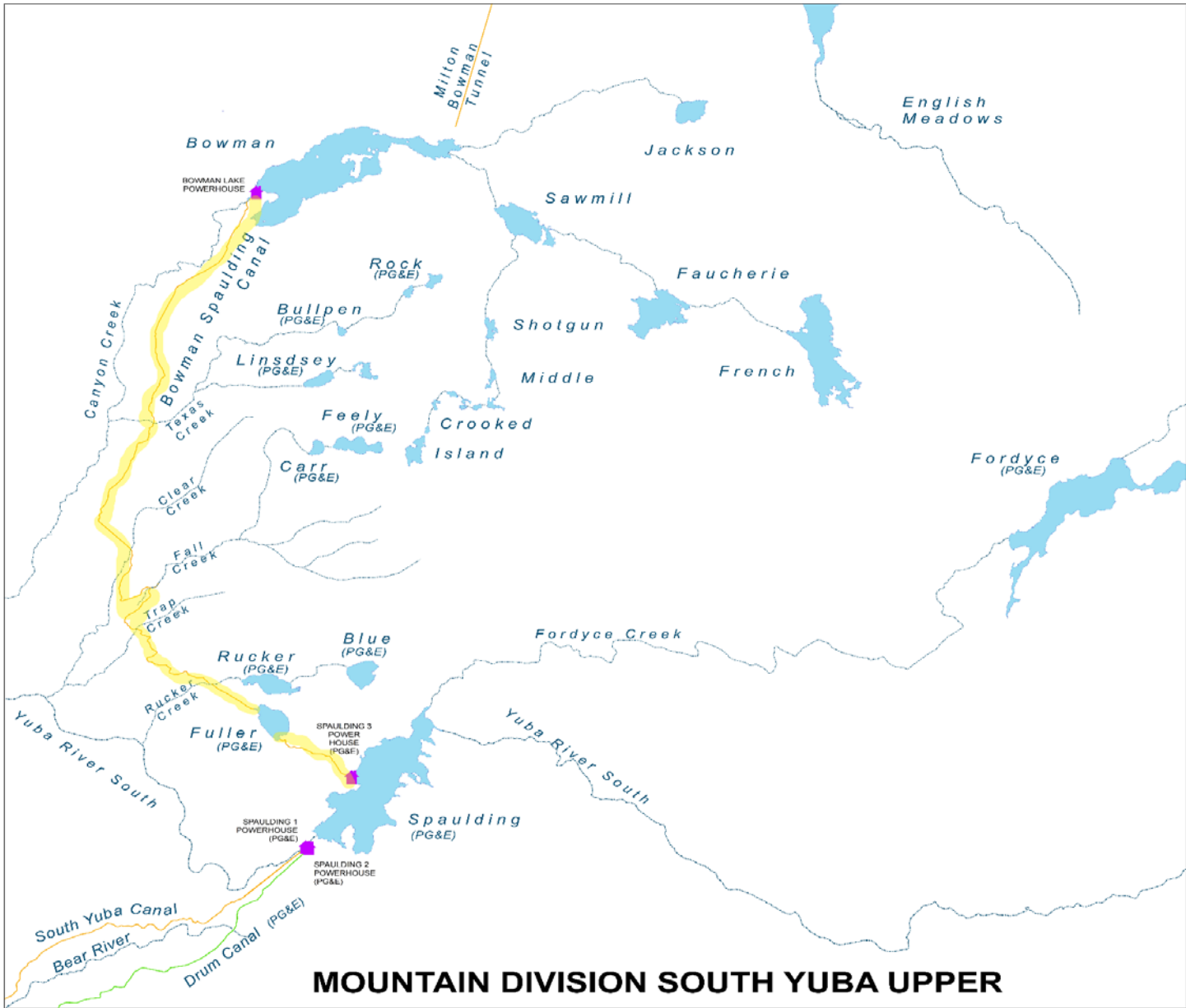
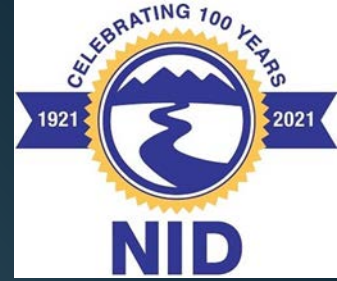
BOWMAN MAIN DAM
Low Level Outlet



BOWMAN POWERHOUSE

Nameplate capacity: 3.6 MW
Rated head: 135 ft Rated flow: 313 cfs
Turbine type: Horizontal Francis
Constructed 1985-86

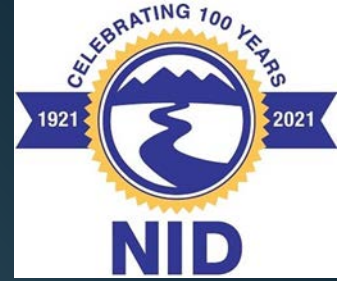
SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

BOWMAN-SPAULDING CANAL





Bowman-
Spaulding
Conduit

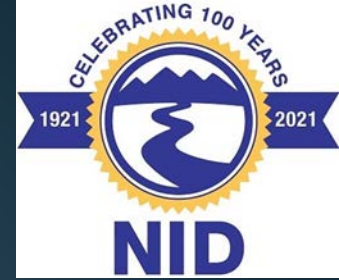


Bowman-
Spaulding
Conduit Diversion



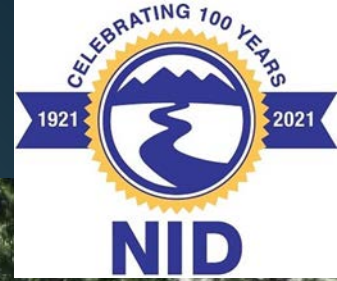
Bowman North
Dam

Bowman Spaulding Canal



- ▶ Transfers Water From Bowman & Canyon Creek to Lake Spaulding
- ▶ Located Within the South Yuba Watershed
- ▶ Constructed 1926 – Capacity Expanded 1964-65
- ▶ 7.7 Miles of Canal and Flume & 3.1 Miles of Tunnel
- ▶ 300-325 CFS Maximum Capacity Depending on Location
- ▶ Typical Summer Flow 280 – 290 CFS
- ▶ Contains 5 Tributaries Along Route to Lake Spaulding
- ▶ Environmental Flow Release to Canyon Creek Below Diversion Dam
 - ▶ Current Requirement = 2-3 CFS
 - ▶ Post FERC License Renewal = 4-60 CFS Depending on Month and Water Year Type

Regulating Gate to the Bowman Spaulding Canal

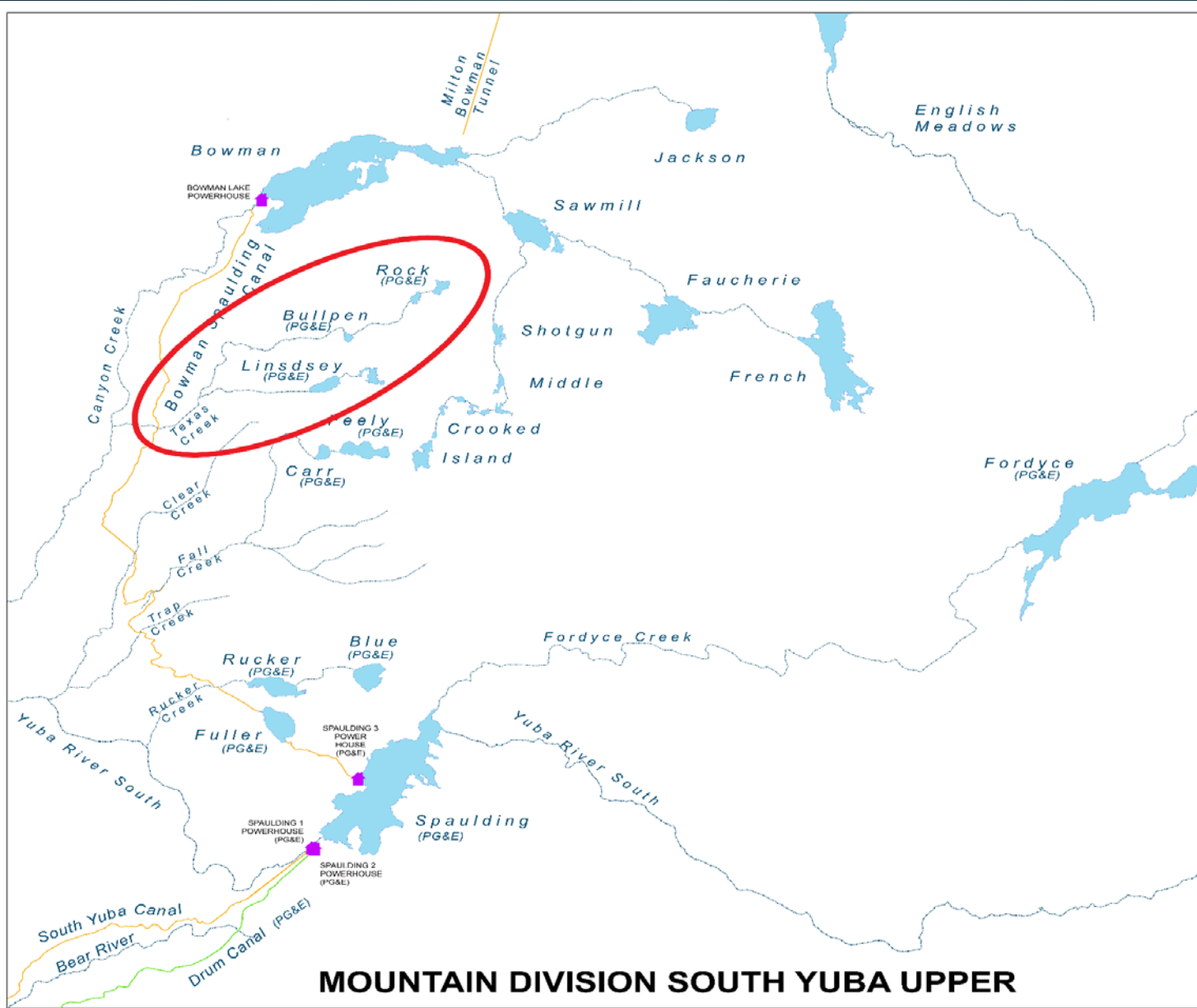
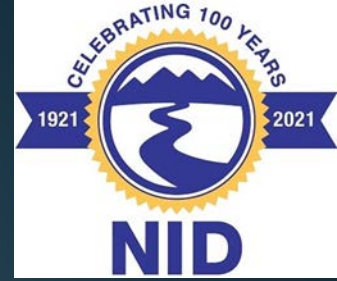


BOWMAN-SPAULDING CONDUIT DIVERSION DAM

Height: 21 ft

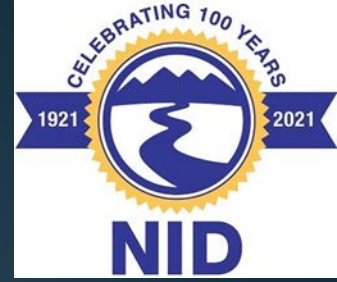
Crest Elevation: 5,400.0 ft

SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

Texas Creek Diversion



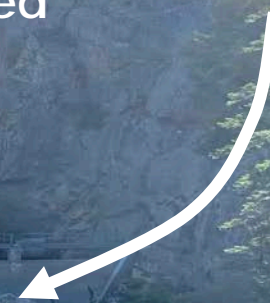
- ▶ Includes NID & PG&E water Rights
- ▶ PG&E's Rock Bullpen and Lindsey Lakes at Head
- ▶ Instream Flows Past BS Canal
 - ▶ Current Flow = 0 CFS
 - ▶ Post FERC Relicense Flow = 0.6-3 CFS depending on month and water year type

TEXAS CREEK DIVERSION DAM

Height: 10 ft. Crest Elevation: 5,385.75 ft.

Spillway: Ungated

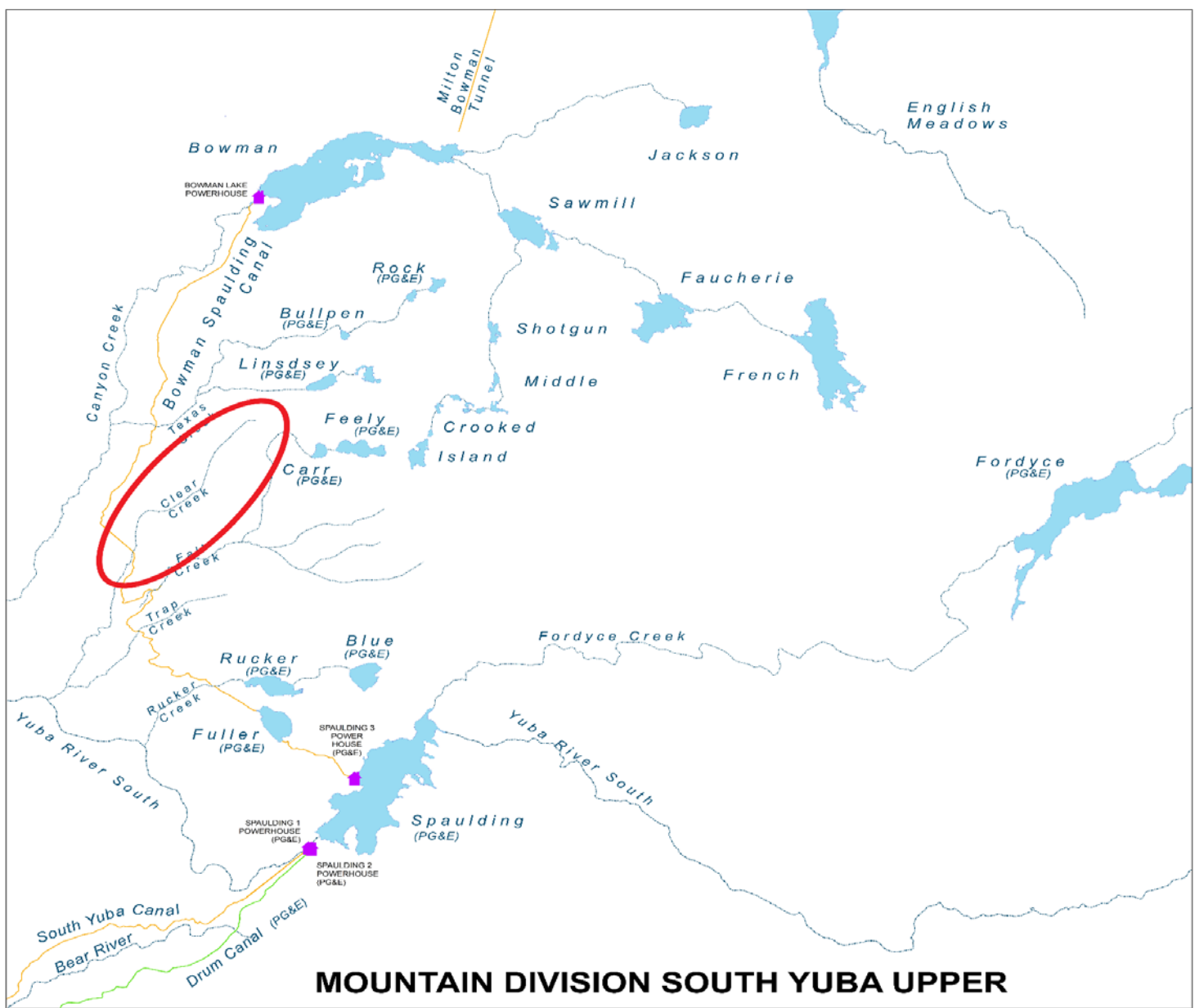
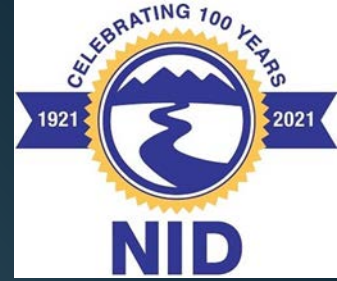
BOWMAN-SPAULDING CONDUIT



TEXAS CREEK



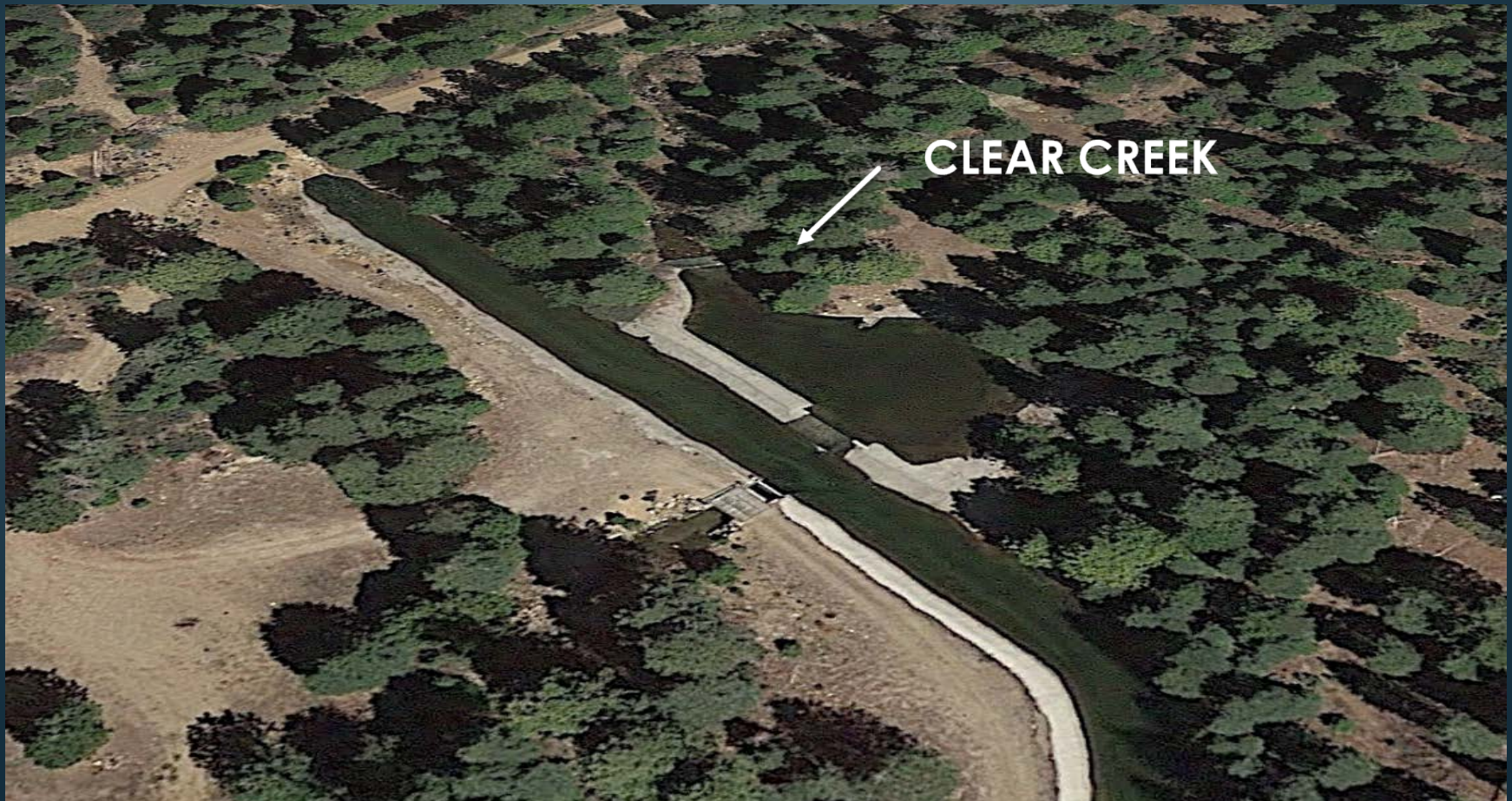
SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

Clear Creek Diversion

- ▶ Instream Flows Past BS Canal
 - ▶ Current Requirement = 0 CFS
 - ▶ Post FERC License Renewal = 1-6 CFS



CLEAR CREEK DIVERSION DAM

Height: 5 ft. Crest Elevation: 5,375 ft

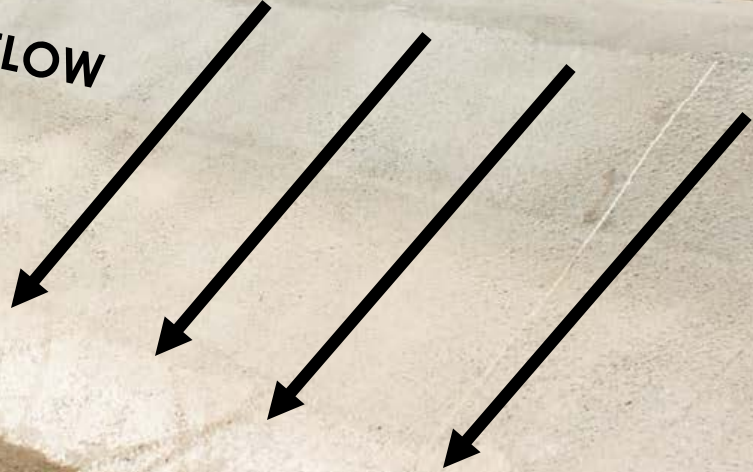
Type: Concrete



CLEAR CREEK



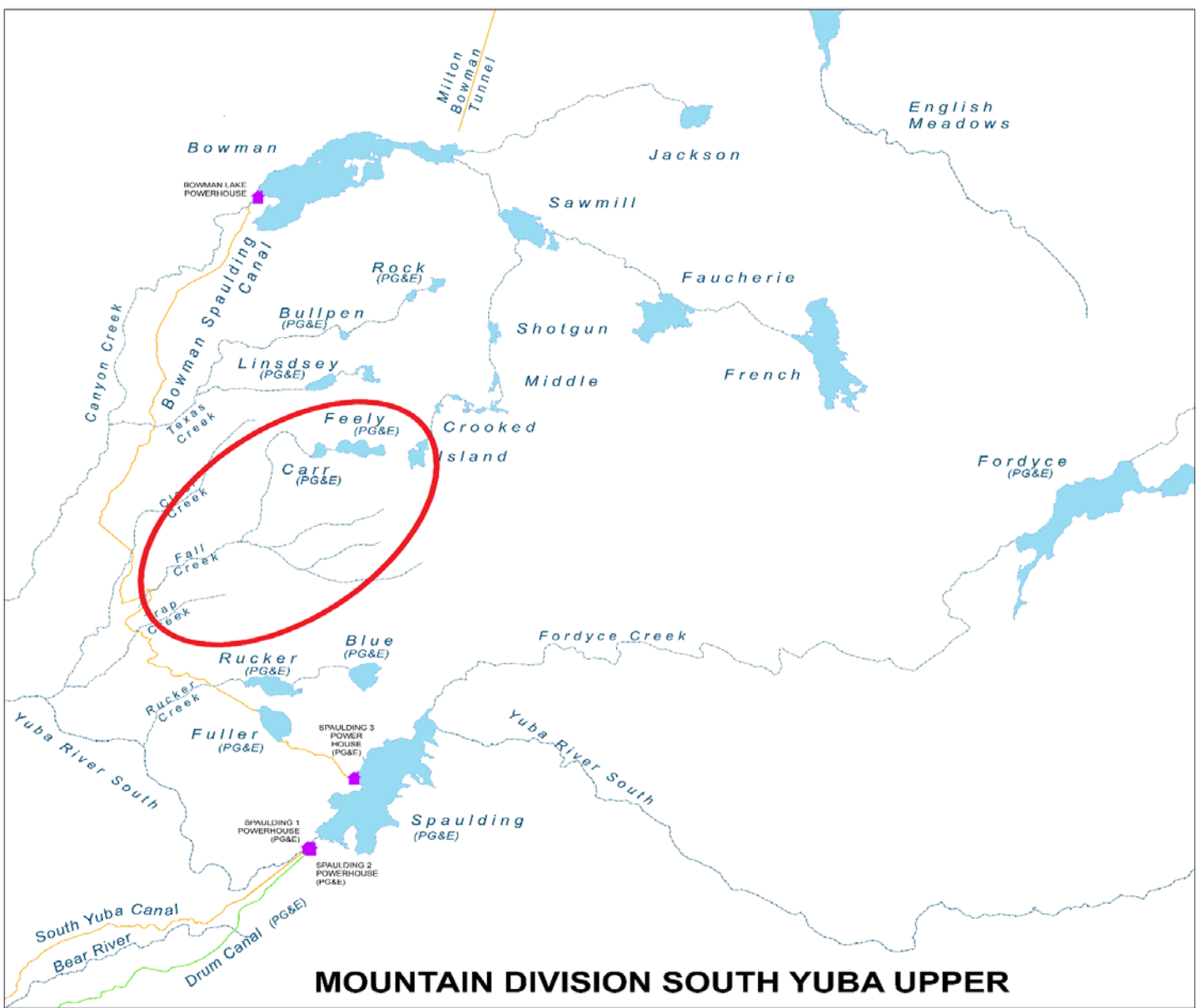
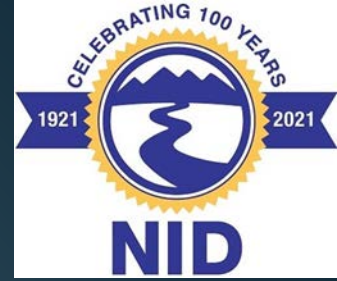
OVERFLOW



BOWMAN-SPAULDING CONDUIT

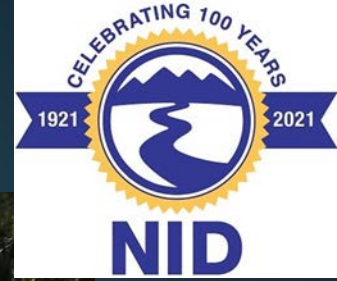


SOUTH YUBA RIVER SYSTEM

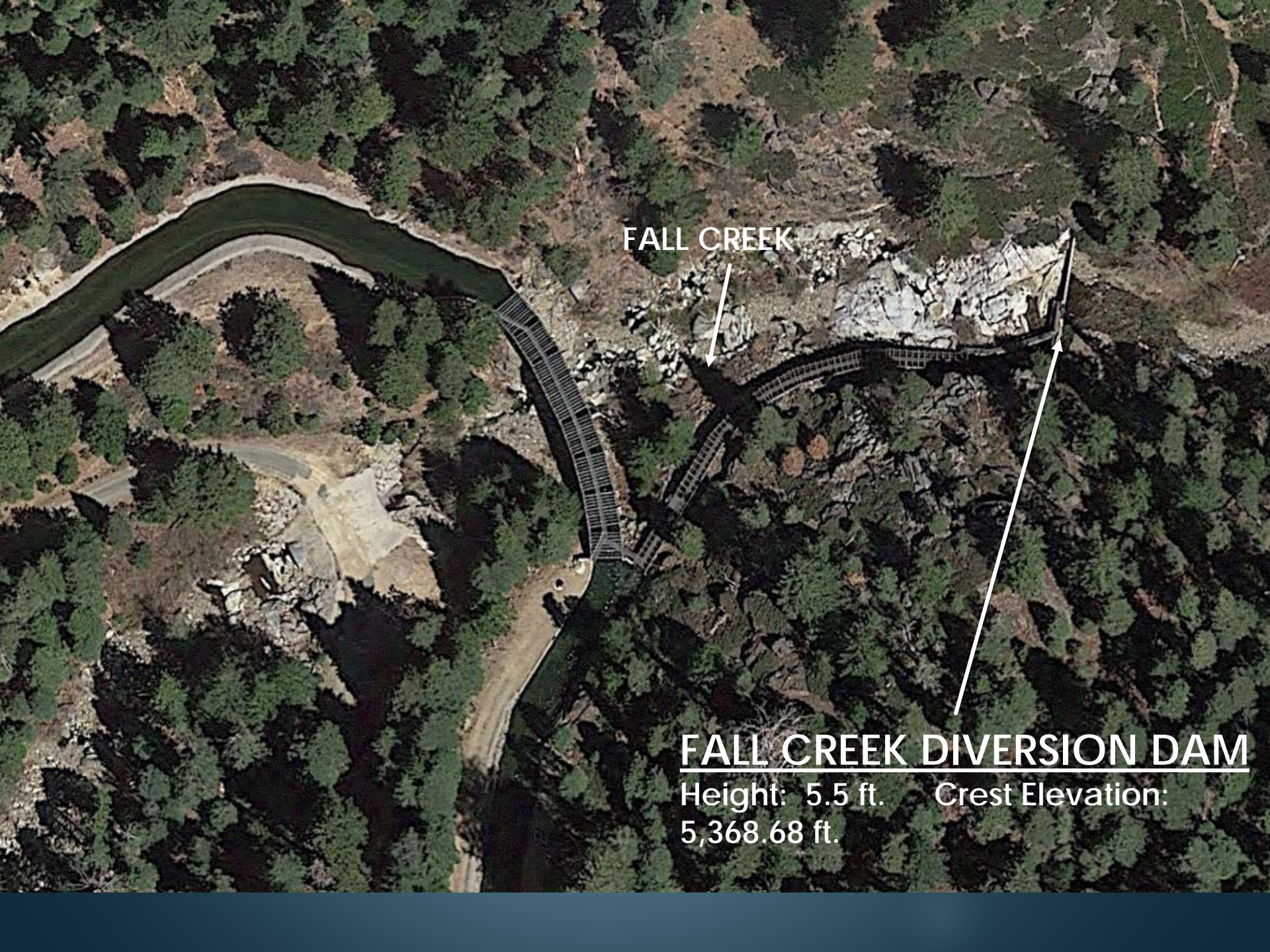


MOUNTAIN DIVISION SOUTH YUBA UPPER

Fall Creek Diversion



- ▶ Includes NID & PG&E water rights
- ▶ PG&E's Carr and Feeley Lake at Head
- ▶ Instream Flows Past BS Canal
 - ▶ Current Flow Requirement = 0 CFS
 - ▶ Post FERC License Renewal = 2-30 CFS or Natural Flow Which Ever is Less



FALL CREEK

FALL CREEK DIVERSION DAM

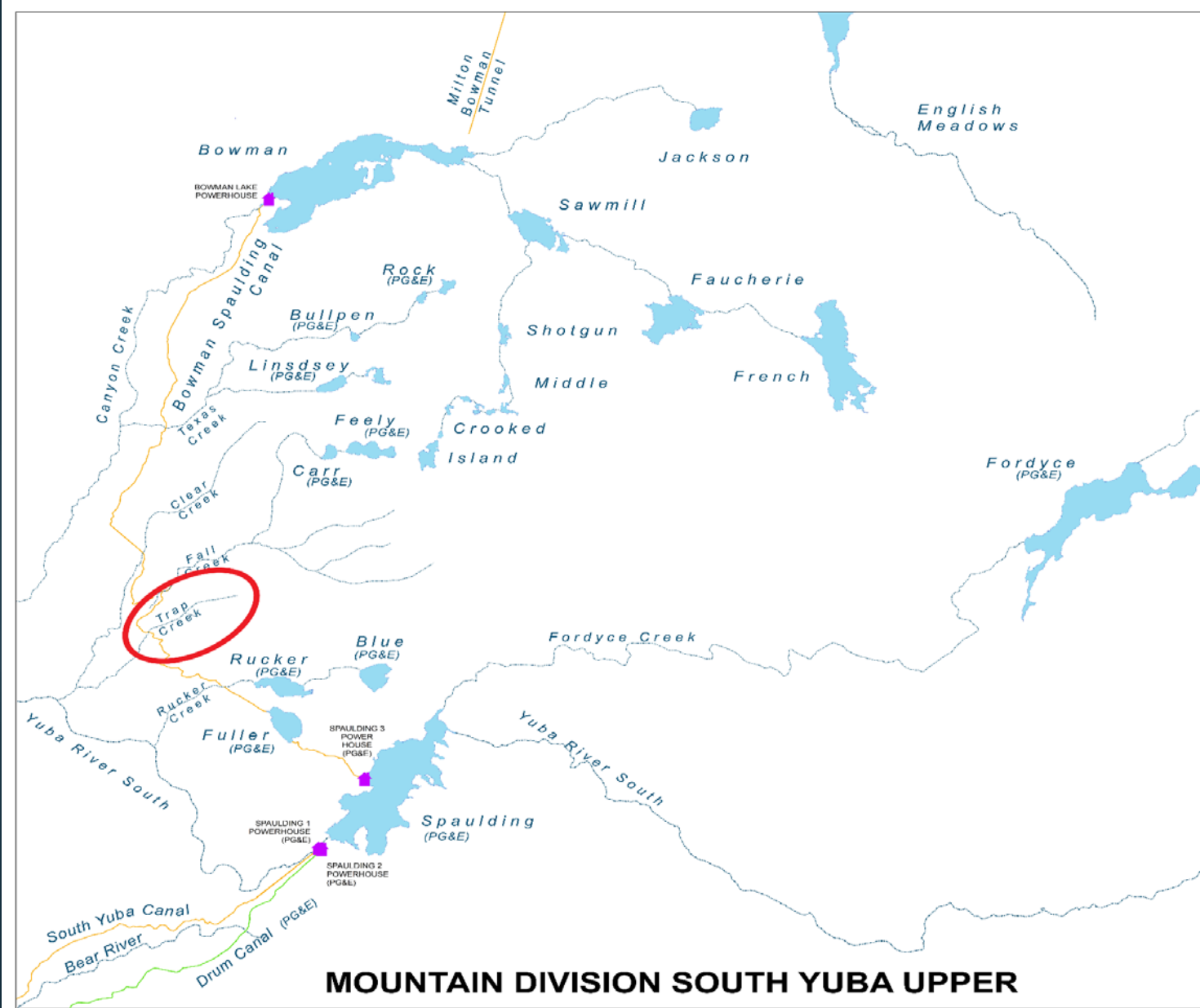
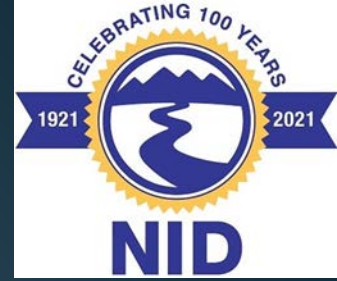
Height: 5.5 ft. Crest Elevation:
5,368.68 ft.



BOWMAN-SPAULDING CONDUIT

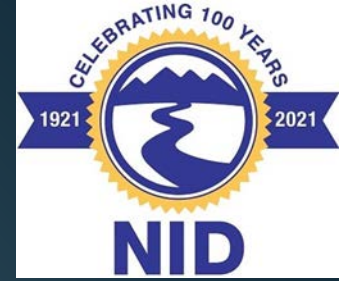
FALL CREEK DIVERSION FLUME

SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

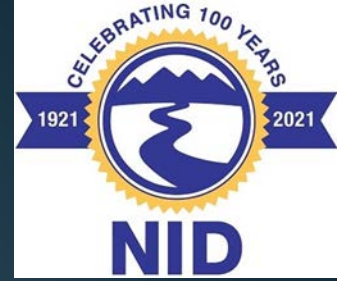
Trap Creek Diversion



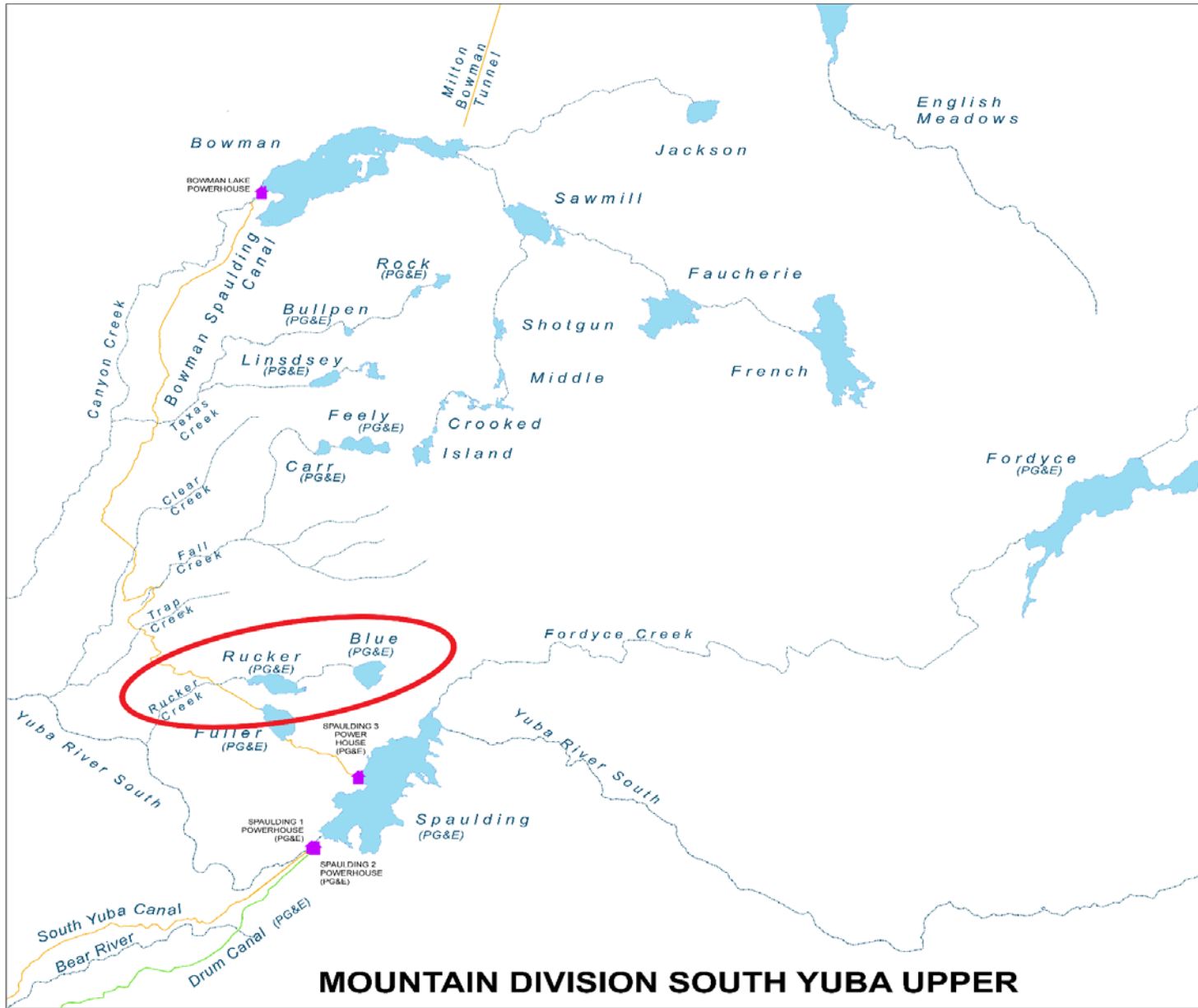
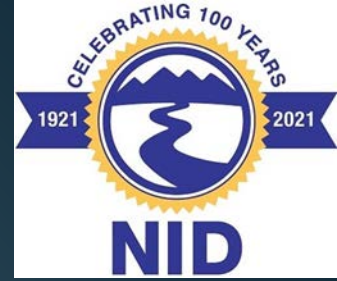
- ▶ Instream Flow Requirement Past BS Canal
 - ▶ Current Flow Requirement = 0 CFS
 - ▶ Post FERC License Renewal = 0.25-3 CFS Depending on Month and Water Year Type

TRAP CREEK DIVERSION DAM

Height: 4 ft Crest Elevation: 5,360 ft



SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

Rucker Creek Diversion



- ▶ Includes NID & PG&E water rights
- ▶ PG&E's Rucker and Blue Lake Provide Supply
- ▶ Instream Flow Past BS Canal
 - ▶ Current Requirement = 0 CFS
 - ▶ Post FERC License Renewal = 0.3-3 CFS Depending on Month and Water Year Type

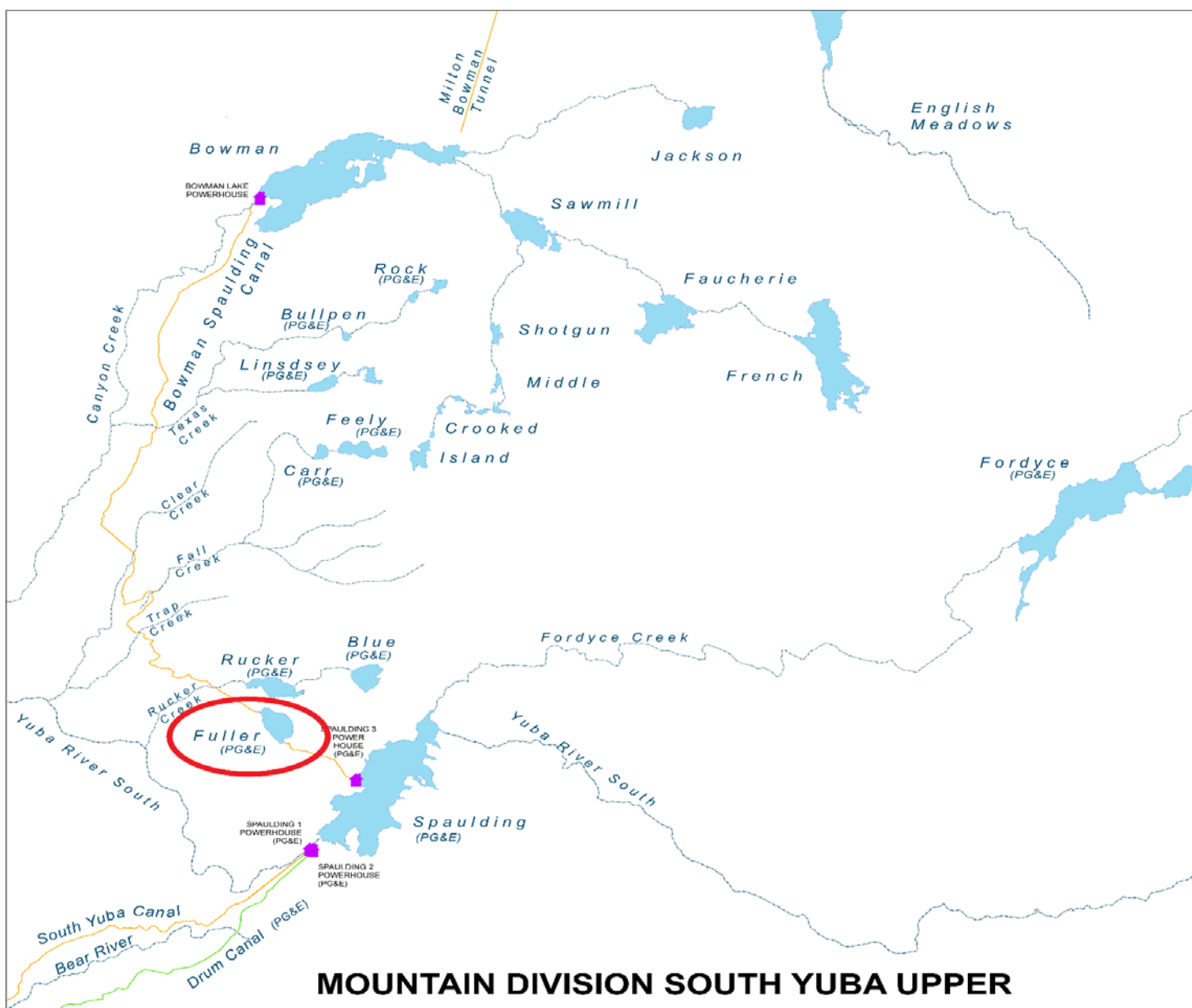
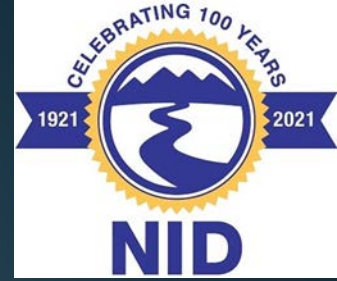
RUCKER CREEK DIVERSION DAM

Height: 3 ft Crest Elevation: 5,350 ft

BOWMAN-SPAULDING CONDUIT

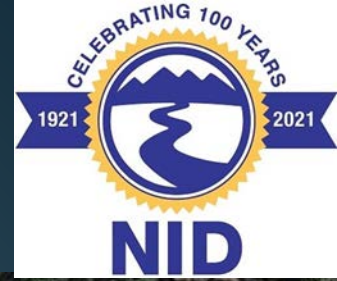


SOUTH YUBA RIVER SYSTEM



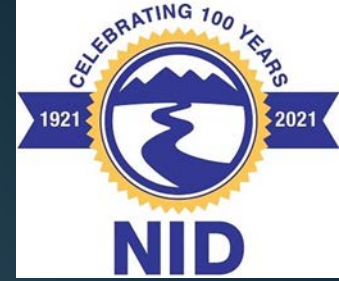
MOUNTAIN DIVISION SOUTH YUBA UPPER

FULLER LAKE (PG&E)



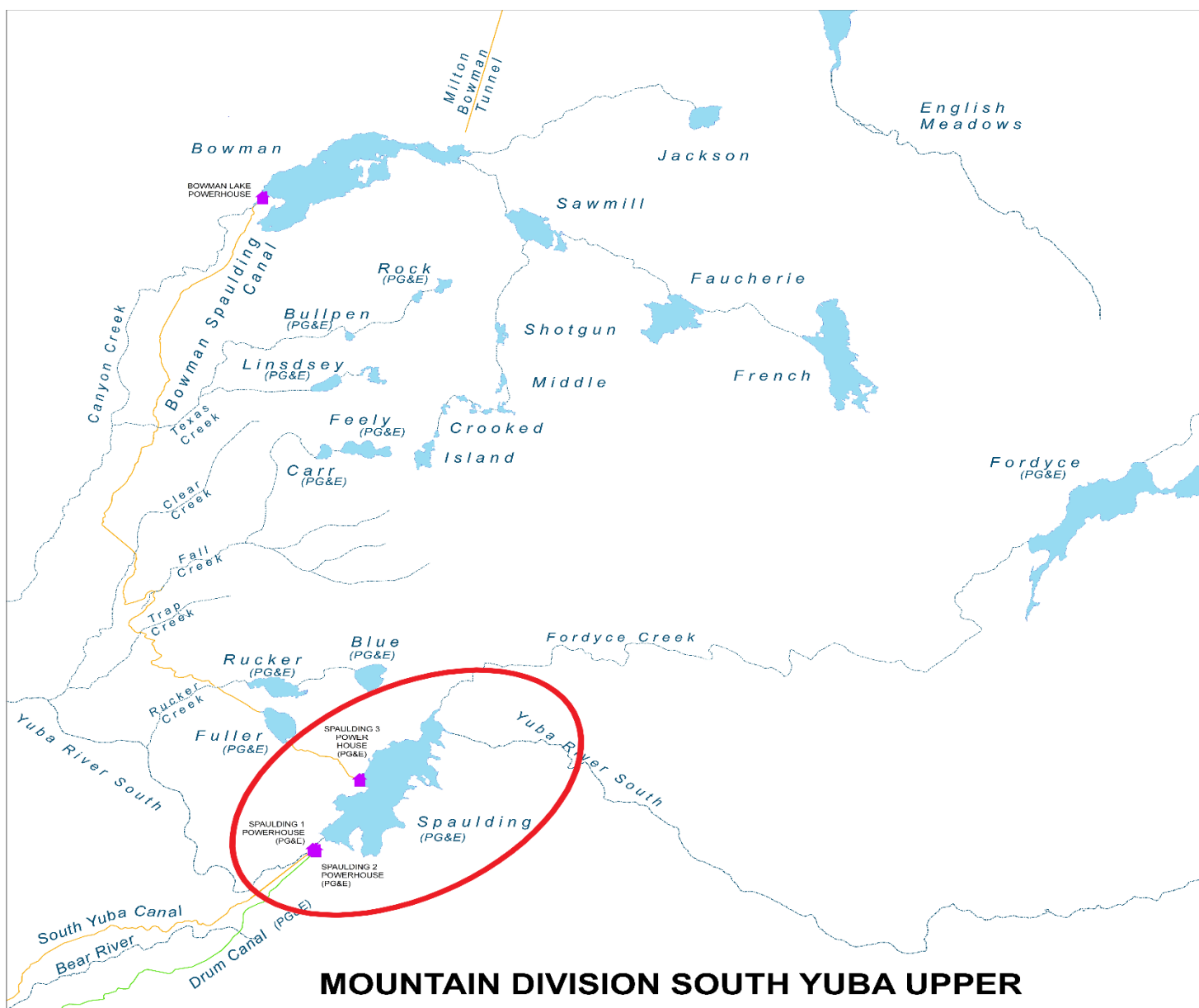
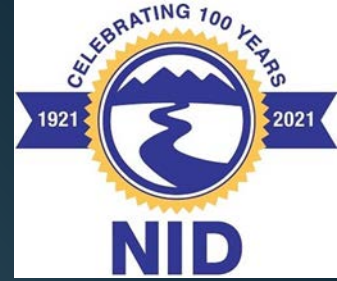
NID BOWMAN-SPAULDING CONDUIT

Fuller Reservoir (PG&E)



- ▶ PG&E Reservoir on BS Canal
- ▶ Passes NID Water to Lake Spaulding
- ▶ Capacity = 1,150 Acre Feet
- ▶ NID is Responsible for Diversion into Bowman-Spaulding Canal

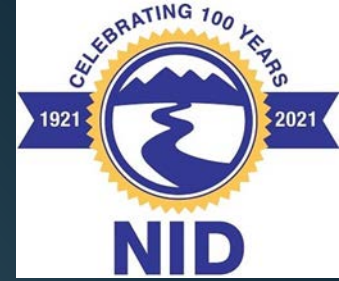
SOUTH YUBA RIVER SYSTEM



MOUNTAIN DIVISION SOUTH YUBA UPPER

Lake Spaulding (PG&E)

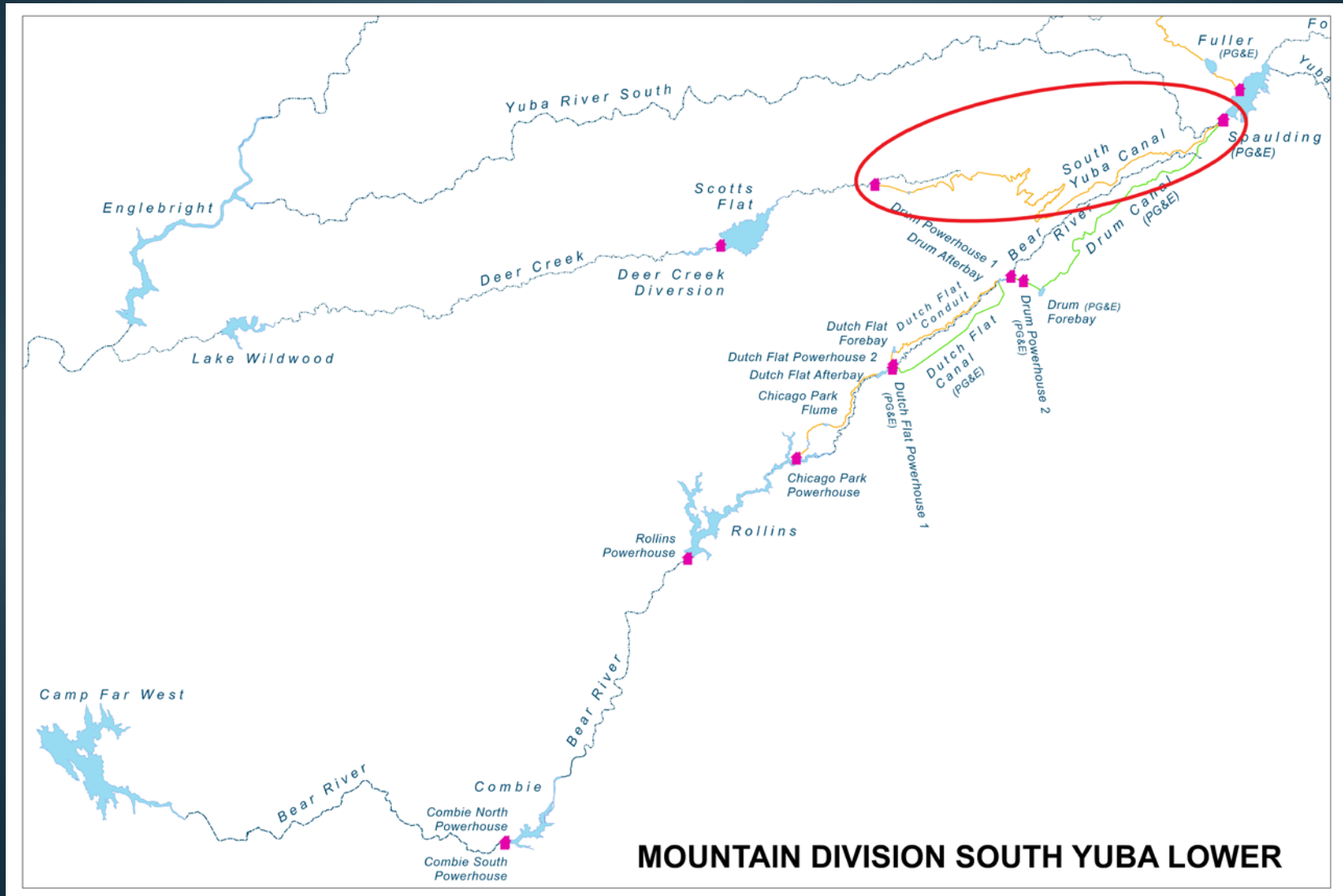
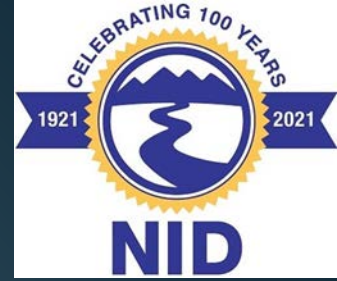




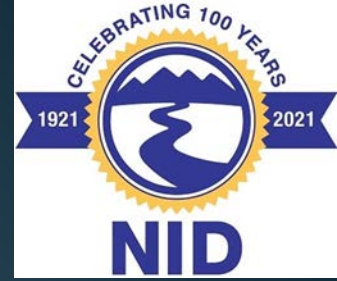
Lake Spaulding (PG&E)

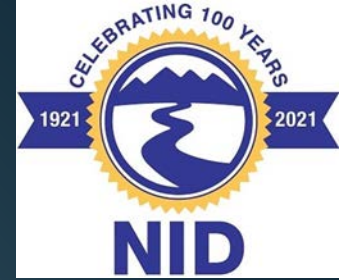
- ▶ Instream Reservoir on South Yuba River
- ▶ Owned & Operated by PG&E
- ▶ Concrete Dam
- ▶ Maximum Capacity of 74,773 Acre Feet
- ▶ Typical Low Elevation 20,000 Acre Feet in Winter
- ▶ Includes 3 Powerhouses; Spaulding 1,2,3
- ▶ Passes NID Water Through PG& E Powerhouses
 - ▶ Done Through the Coordinated Operating Agreement
 - ▶ Includes Weekly Coordination Calls
- ▶ Starting Point for PG&E's South Yuba and Drum Canals

SOUTH YUBA RIVER SYSTEM (LOWER)



South Yuba and Chalk Bluff Canals (PG&E/NID)

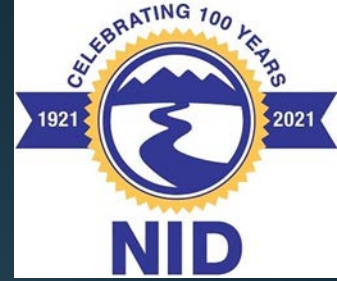




South Yuba and Chalk Bluff Canals (PG&E)

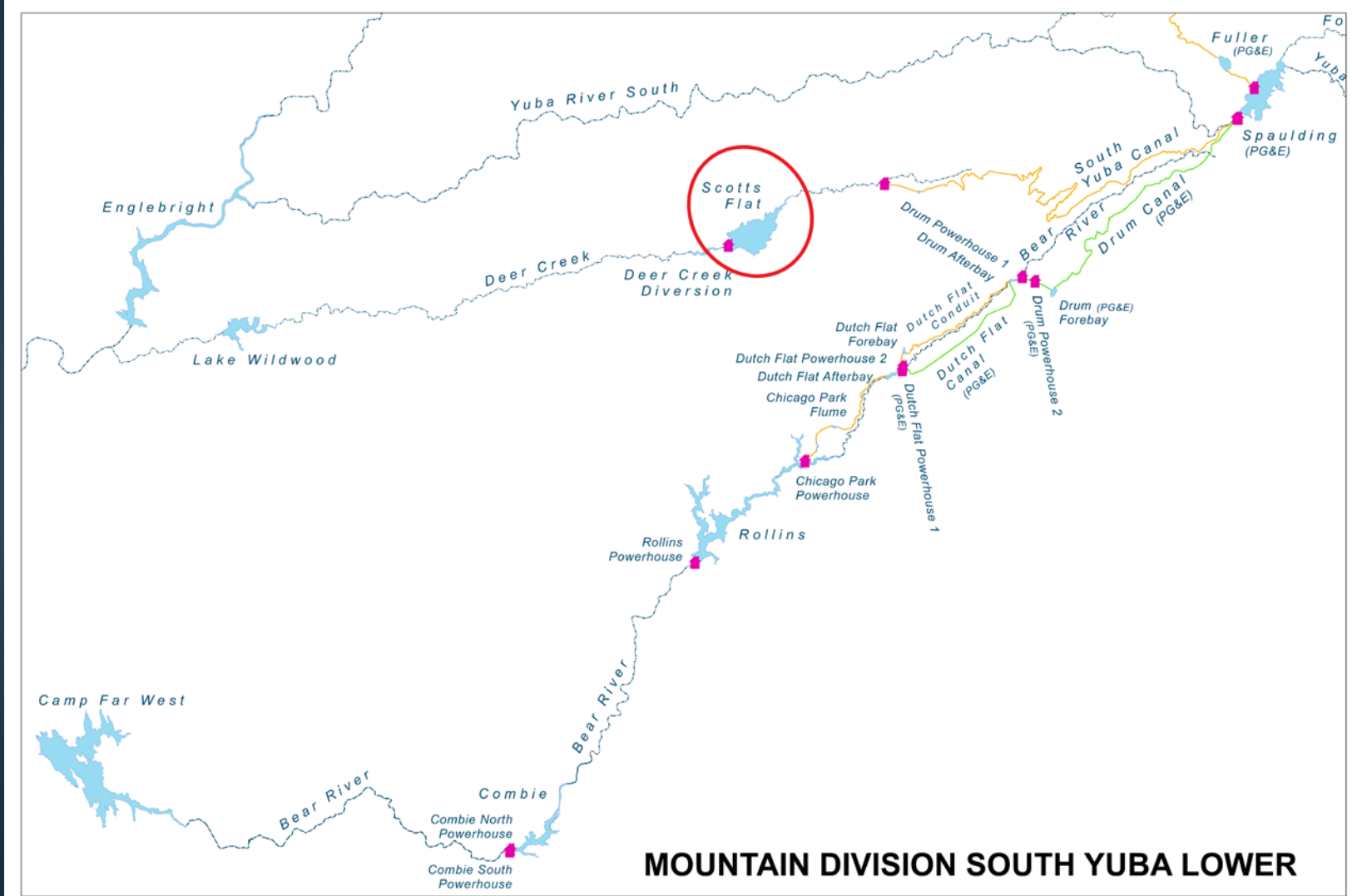
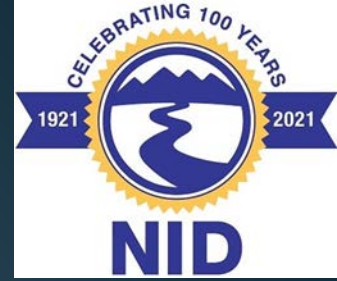
- ▶ Transfers NID Water from Lake Spaulding to Deer Creek (Above Scotts Flat)
- ▶ Currently Owned and Operated by PG&E
 - ▶ NID and PG&E Have Agreed on a Purchase Sale Agreement
 - ▶ Waiting on FERC Approval
- ▶ Hydraulic Design Capacity of 107 cfs, Actual Capacity of Approximately 85 cfs
- ▶ NID portion of South Yuba Canal
 - ▶ 13.98 miles (8.66 miles of open ditch, 4.61 miles of flume, and 0.71 miles of tunnel)
- ▶ Chalk Bluff Canal
 - ▶ 3.24 miles (2.99 miles of open ditch, 0.20 miles of flume, and 0.05 miles of pipe)
- ▶ Terminus of the Canal is the Deer Creek Powerhouse

Dear Creek Powerhouse (PG&E)

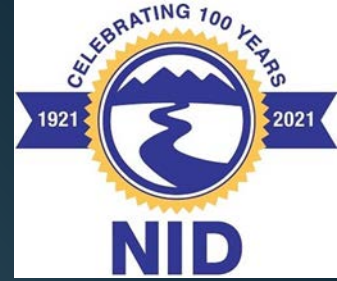


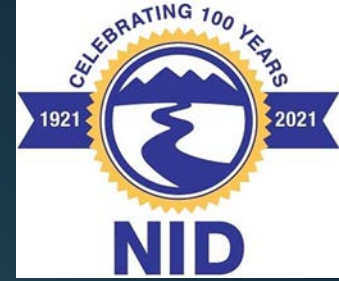
- ▶ Currently a PG&E Asset
 - ▶ Will Become NID's Upon Transfer of SYC
- ▶ Constructed in 1906
- ▶ Capacity = 6.9 MW

SOUTH YUBA RIVER SYSTEM (LOWER)



Scotts Flat Reservoir

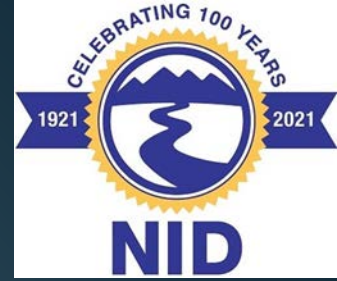




Scotts Flat Reservoir

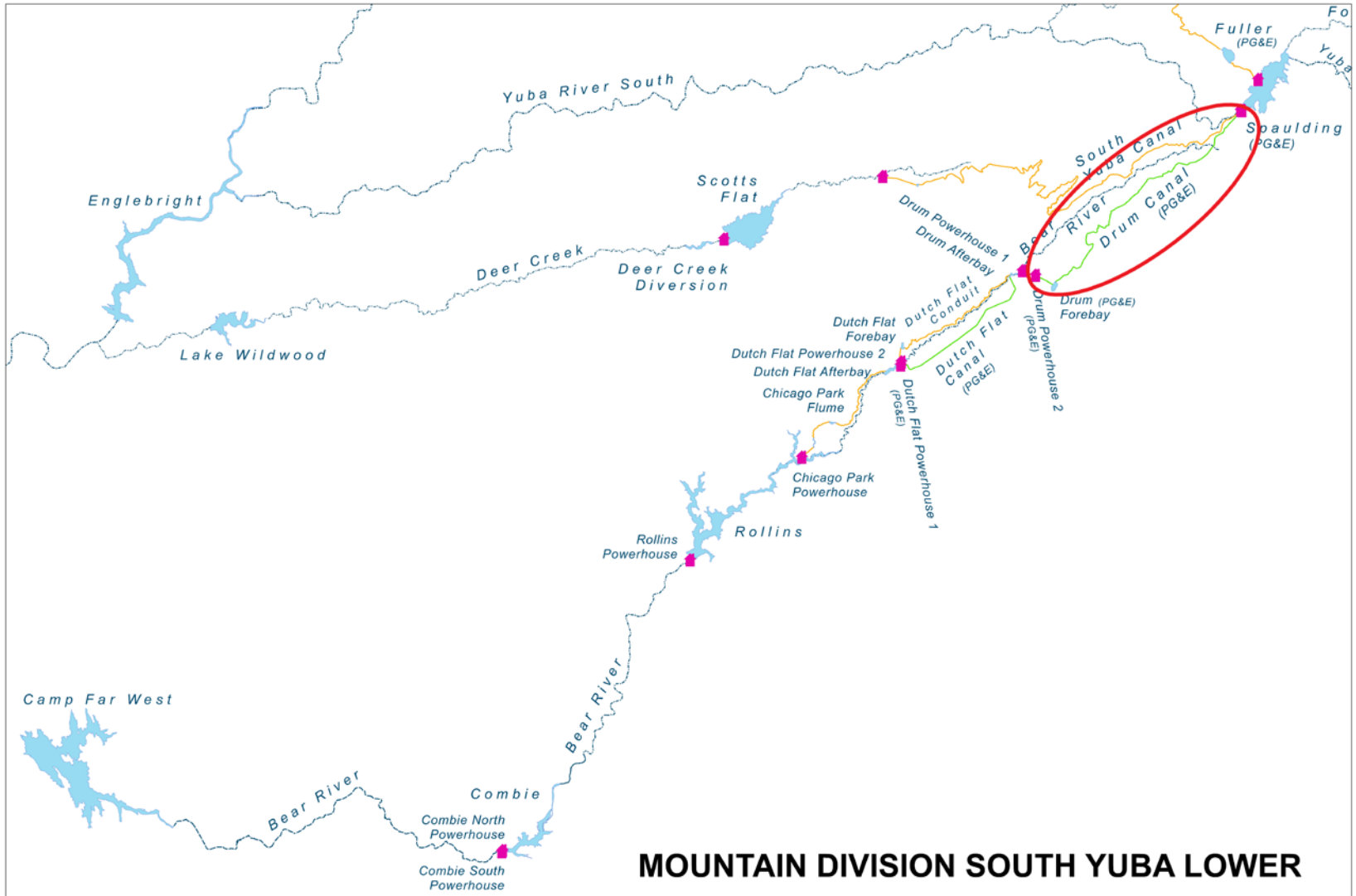
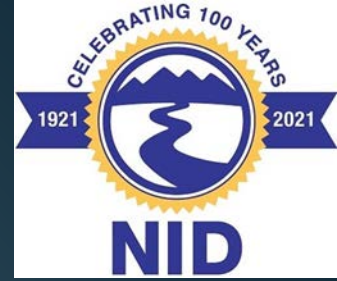
- ▶ Instream Reservoir on Deer Creek
- ▶ Constructed By 1948 Raised in 1962-63
- ▶ Earthen Dam
- ▶ Maximum Capacity of 48,547 Acre Feet
- ▶ Typical Low Level = 33,000 Acre Feet
- ▶ Storage Water Rights include Consumptive and Non-Consumptive Uses
- ▶ Two Campgrounds and Day-Use 110,000 Annual Visitors
 - ▶ Three Boat Launches (one in Cascade Shores)
- ▶ Water Storage Supply for a Majority of Nevada County Canals
- ▶ Is the Forebay for Scotts Flat Powerhouse

Scotts Flat Powerhouse



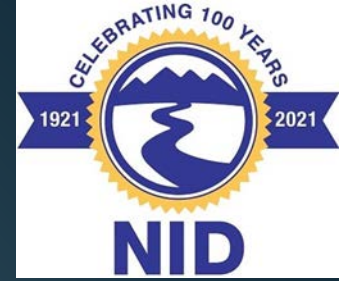
Constructed in 1984
Capacity of 850 kW

SOUTH YUBA RIVER SYSTEM (LOWER)



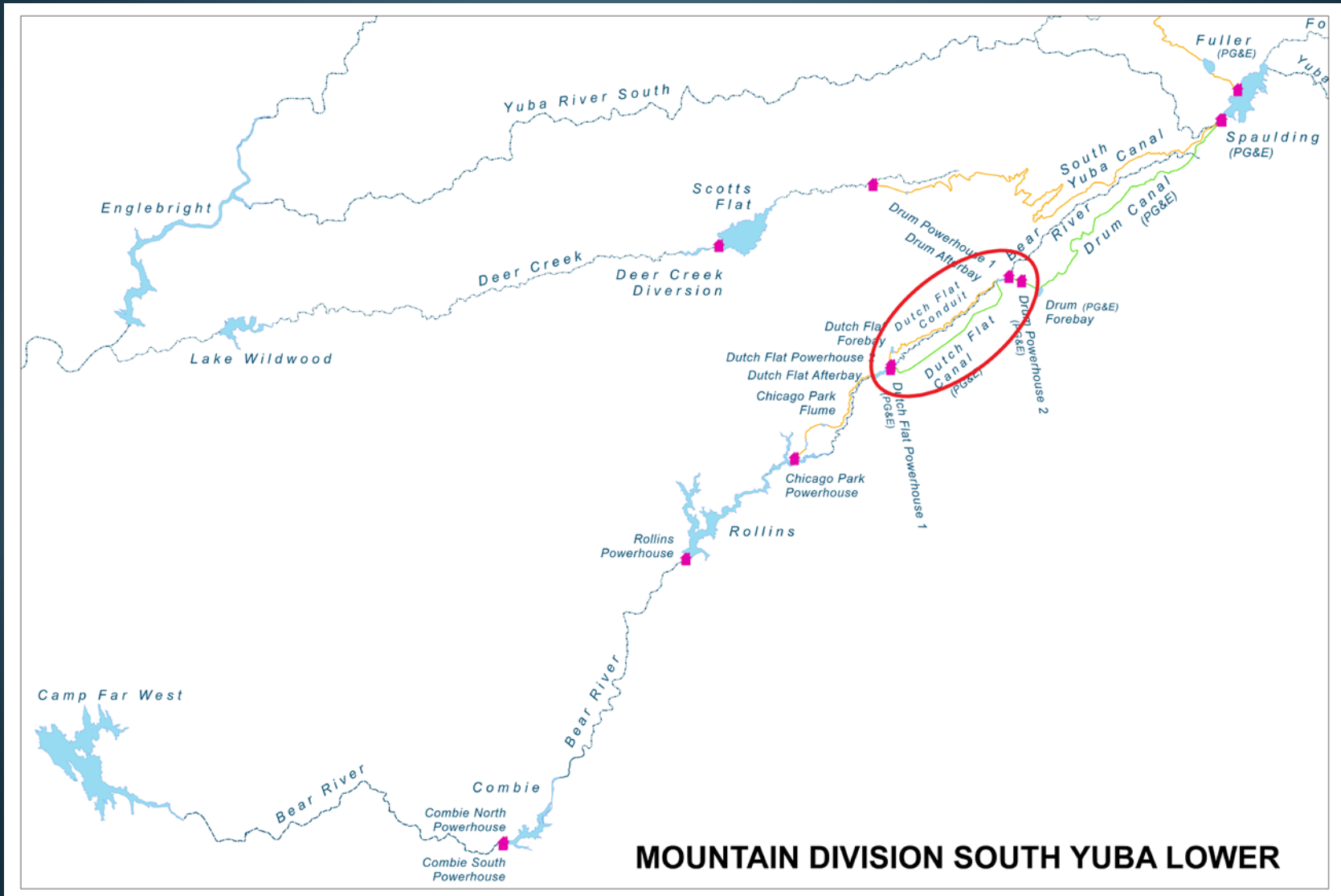
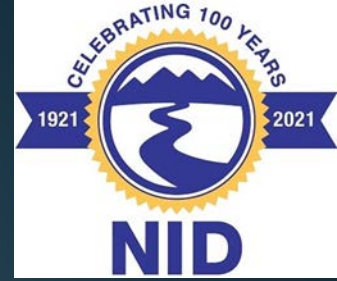
MOUNTAIN DIVISION SOUTH YUBA LOWER

Drum Canal & Powerhouse (PG&E)



- ▶ Drum Canal Transfers Spaulding Water (Yuba System) Through Drum Powerhouse and Into Bear River
- ▶ Discharge Flows into in River Afterbay
 - ▶ Afterbay Provides Head for the Dutch Flat 1 & 2 Canals

SOUTH YUBA RIVER SYSTEM (LOWER)



DUTCH FLAT NO. 2 CONDUIT

Length: 4.7 mi

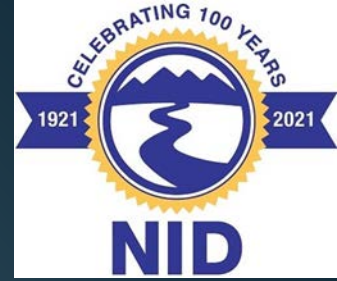
Capacity: 610 cfs

Constructed: 1964-65

Bear River

Drum Afterbay





DUTCH FLAT FOREBAY

Storage: 185 ac-ft

Normal Max Water Surface El.: 3,336.0 ft

Constructed: 1964-65





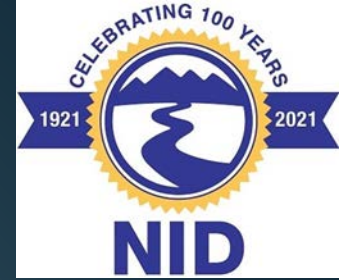
DUTCH FLAT No. 2 POWERHOUSE

Rated head: 581 ft Rated flow: 600 cfs

Turbine type: Vertical Francis

Nameplate Capacity: 24.57 MW

Dutch Flat #2 Powerhouse



- ▶ Off Steam Bear River Powerhouse
- ▶ Constructed in 1964-65
- ▶ Rated at 24.57 MW
- ▶ Power Generated Via Consumptive & Run of River Flows
- ▶ PPA with PG&E Through June 2033
- ▶ Discharges to Dutch Flat Afterbay



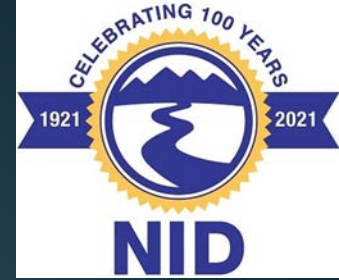
Bear River

DUTCH FLAT AFTERBAY

Height: 165 ft.

Crest Elevation: 2,755.0 ft.

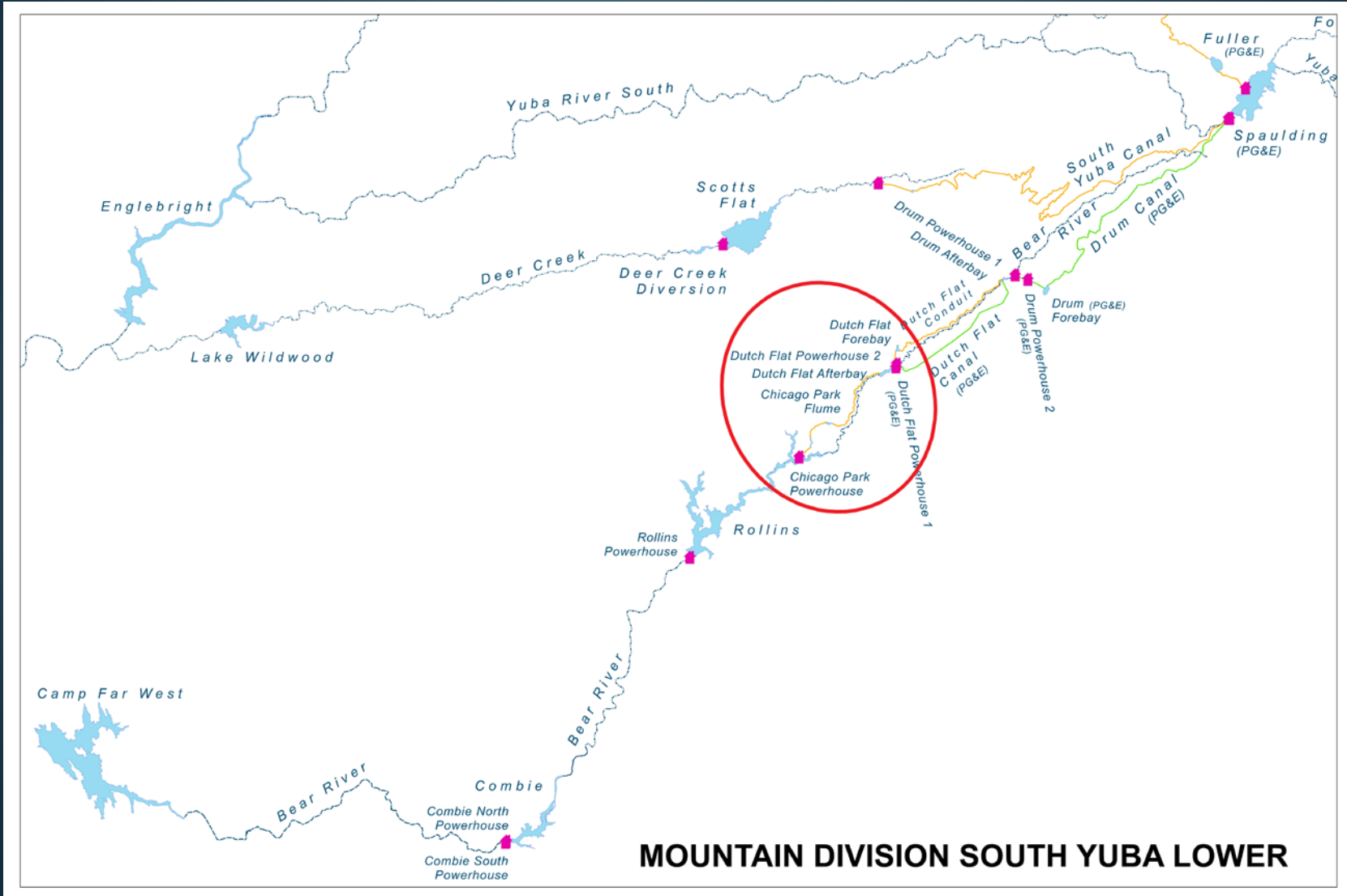
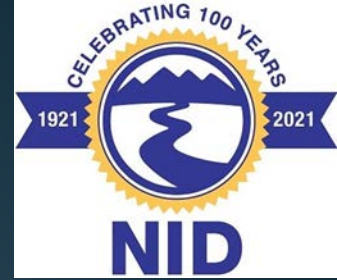
Spillway: Ungated



Dutch Flat Afterbay

- ▶ Instream Reservoir on Bear River
- ▶ Both Dutch Flat #1 & Dutch Flat #2 Powerhouses Discharge to Afterbay
- ▶ Constructed in 1964-65
- ▶ Storage Capacity 2,037 Acre Feet
- ▶ Maximum Elevation 2741 ft.
- ▶ Dutch Flat Afterbay Environmental Flow to Bear River
 - ▶ Current Requirements = 5-10 CFS depending on season
 - ▶ Post FERC License Renewal = 7-45 CFS depending on month and water year type
- ▶ Afterbay Provides the Diversion in Bear River for Chicago Park Conduit

SOUTH YUBA RIVER SYSTEM (LOWER)



CHICAGO PARK CONDUIT

Length: 7.2 mi (Concrete Flume/Gunite-Lined Ditch)

Capacity: 1,100 cfs

Constructed: 1964-65

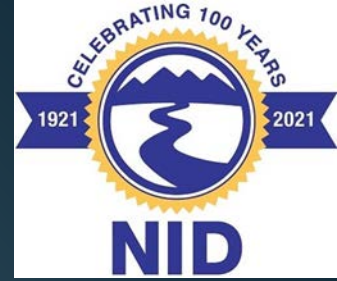
Bear River

Dutch Flat Afterbay



Chicago Park
Flume





CHICAGO PARK FOREBAY

Storage: 117 ac-ft. Surface Area: 7 ac

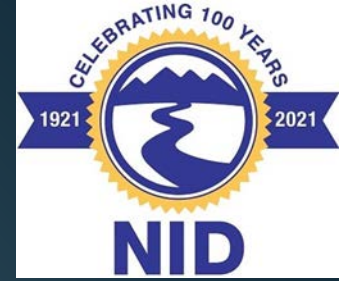
Shoreline Length: 0.7 mi.

Normal Max Water Surface El.: 2,717.3 ft.

Provides Storage and Head for Chicago
Park Powerhouse



Chicago Park Powerhouse



- ▶ Off Steam Bear River Powerhouse
- ▶ Constructed in 1964-65
- ▶ Rated at 39 MW
- ▶ Power Generated Via Consumptive & Run of River Flows
- ▶ PPA with PG&E Through June 2033
- ▶ Discharges to Bear River Upstream of Rollins

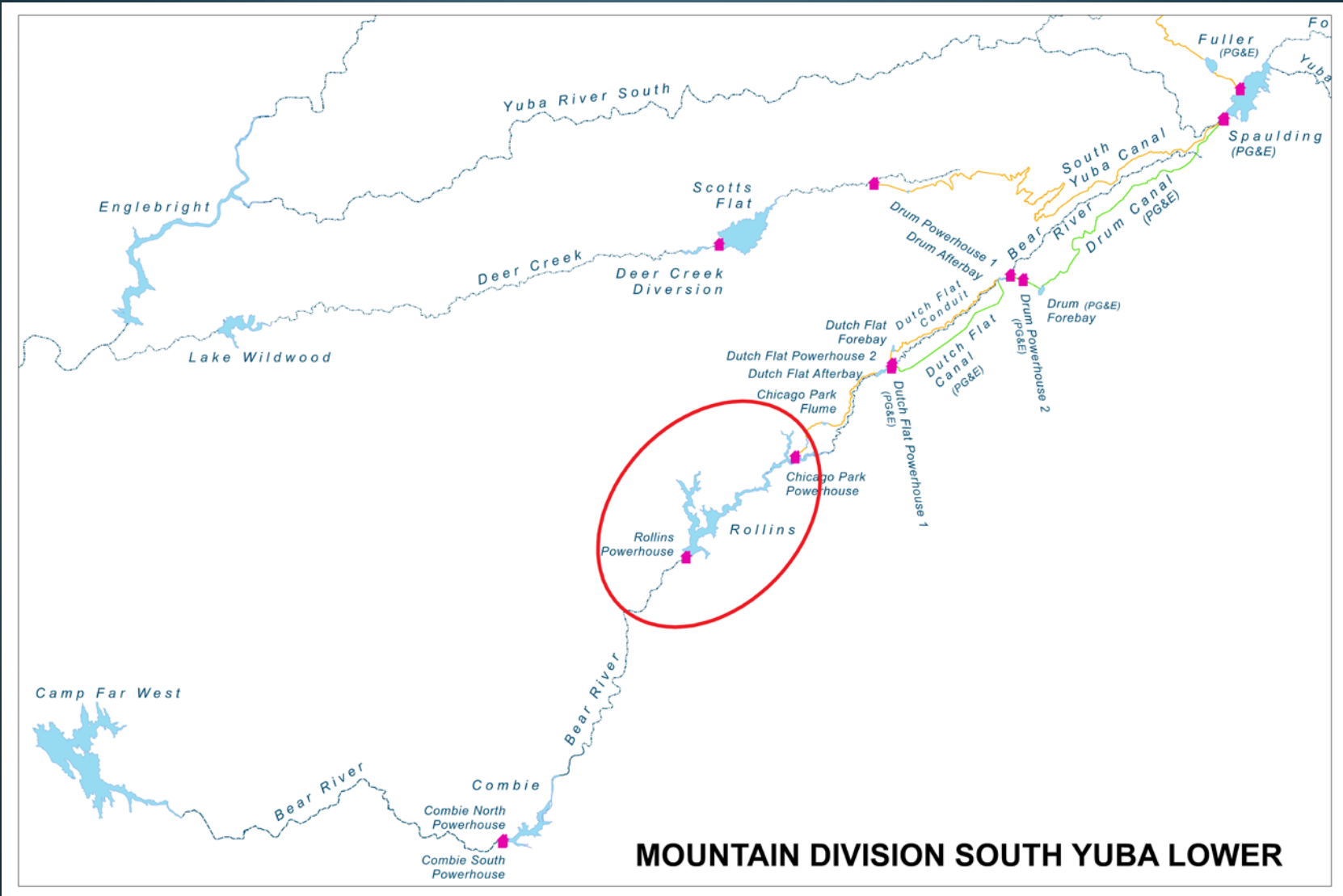
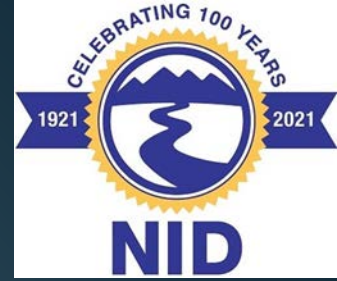
CHICAGO PARK POWERHOUSE

Rated head: 480 ft Rated flow: 1,100 cfs

Turbine type: Vertical Francis

Bear River

SOUTH YUBA RIVER SYSTEM (LOWER)



ROLLINS DAM

Height: 252.5 ft

Crest Elevation: 2,187.5 ft

Spillway: Ungated

Constructed: 1964-5

ROLLINS RESERVOIR

Storage: 65,988 ac-ft Surface Area: 825 ac

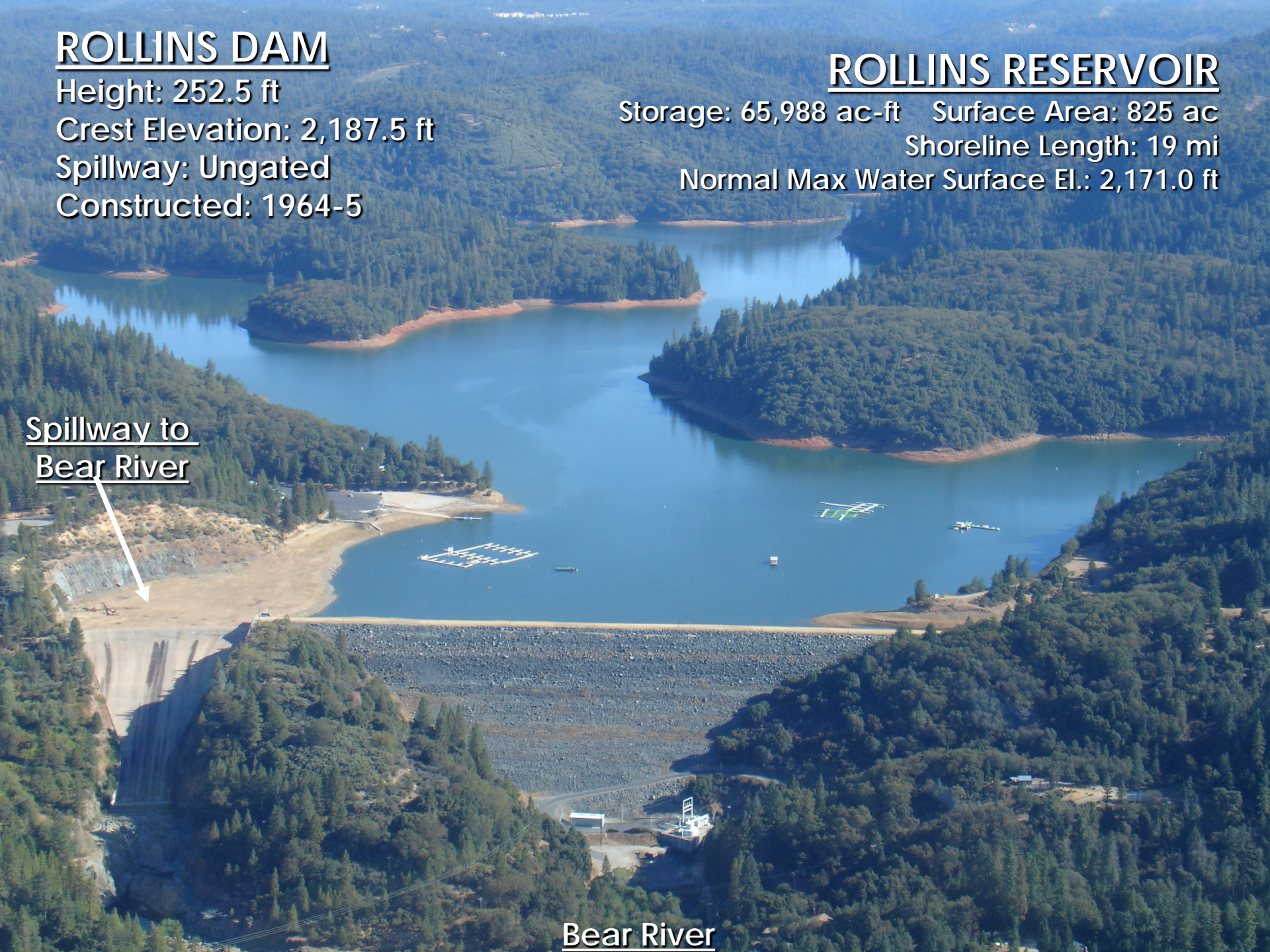
Shoreline Length: 19 mi

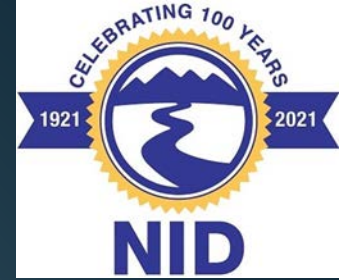
Normal Max Water Surface El.: 2,171.0 ft

Spillway to
Bear River



Bear River



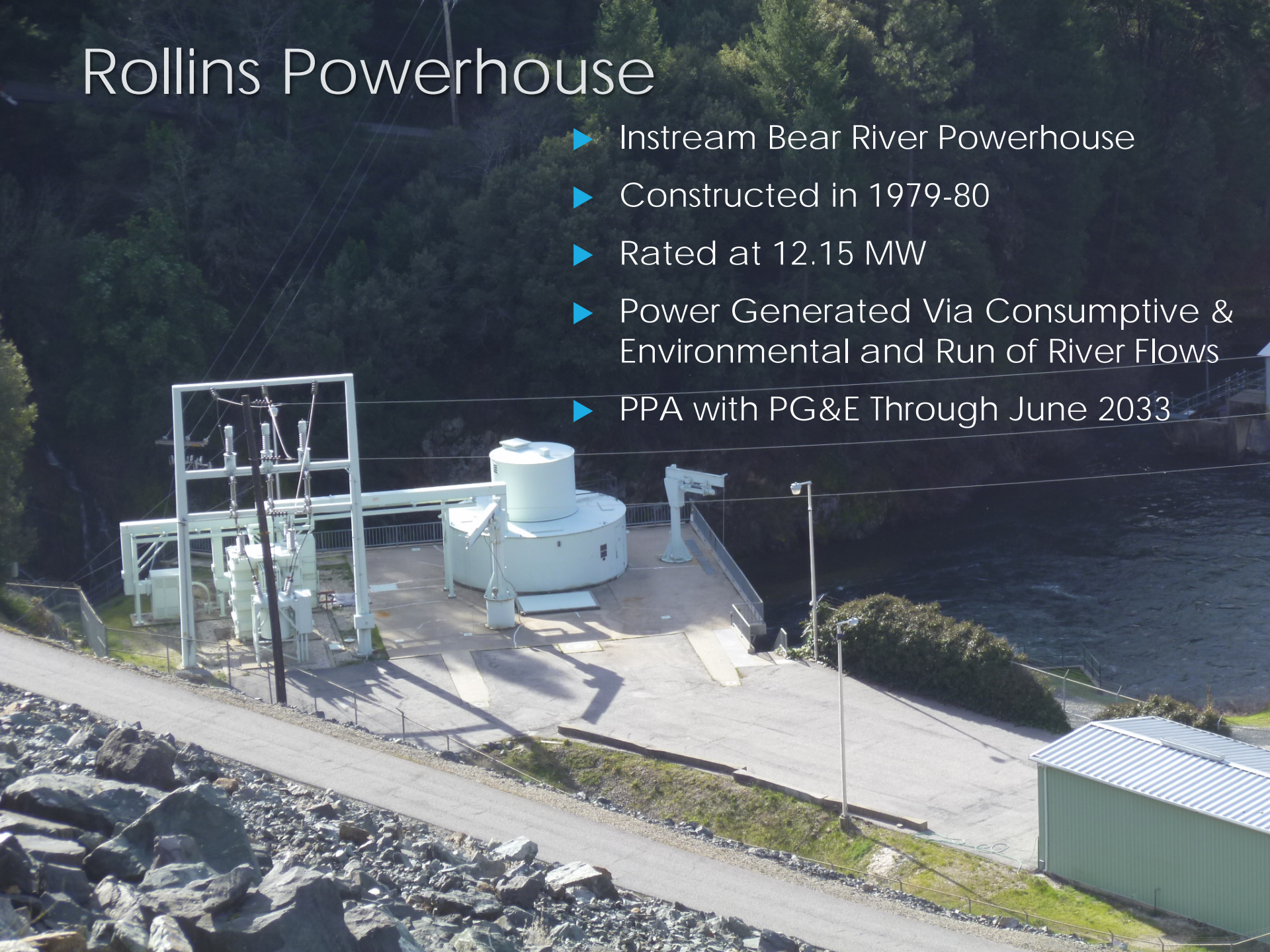


Rollins Reservoir

- ▶ Instream Bear River Reservoir
 - ▶ Includes Greenhorn and Steep Hollow Creeks
- ▶ Constructed in 1964-65
- ▶ Earthen Rock Fill Dam
- ▶ Maximum Capacity of 65,988 Acre Feet
- ▶ Typical Low Level = 40,000 Acre Feet
- ▶ Storage Water Rights include Consumptive and Non-Consumptive uses
 - ▶ Sources include the South Yuba River and Bear River
- ▶ Environmental Flow to Bear River
 - ▶ Current Required Flow = 15-75 Depending on Season and Water Year Type
 - ▶ Post FERC Relicense Renewal = 15-125 Depending on Month and Water Year Type
- ▶ Includes Four Campgrounds, Day Use and Boating
 - ▶ Greenhorn, Orchard Springs, Long Ravine, and Peninsula
 - ▶ Attract Roughly 120,000 Visitors Annually
- ▶ Discharges to Bear River & Rollins Powerhouse

Rollins Powerhouse

- ▶ Instream Bear River Powerhouse
- ▶ Constructed in 1979-80
- ▶ Rated at 12.15 MW
- ▶ Power Generated Via Consumptive & Environmental and Run of River Flows
- ▶ PPA with PG&E Through June 2033



ROLLINS POWERHOUSE

Rated head: 208 ft Rated flow: 840 cfs
Turbine type: Vertical Francis

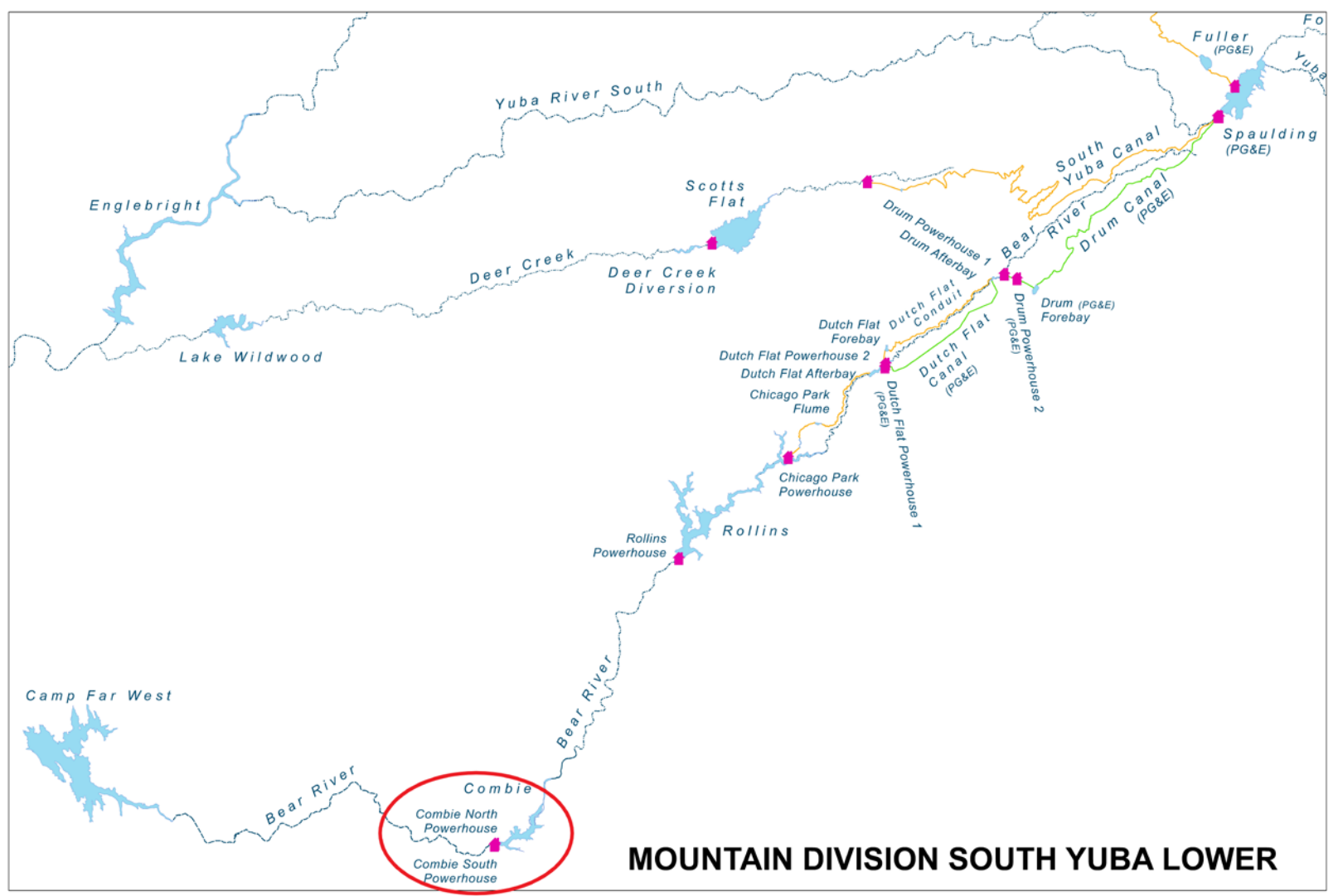
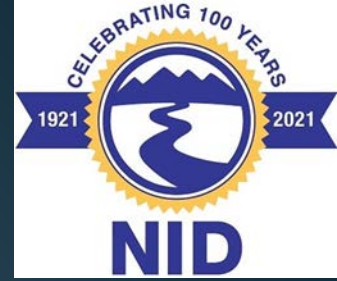


ROLLINS DAM OUTLET

Low Level Outlet: 60" Fixed Cone Valve
(powerhouse bypass)

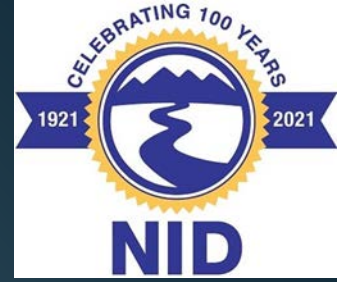


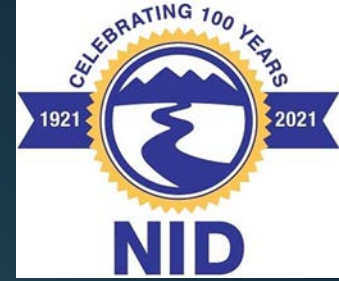
SOUTH YUBA RIVER SYSTEM (LOWER)



MOUNTAIN DIVISION SOUTH YUBA LOWER

Combie Reservoir

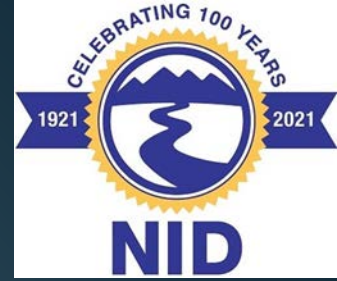




Combie Reservoir (Van Giesen Dam)

- ▶ Instream Bear River Reservoir
- ▶ Constructed in 1928
- ▶ Concrete Arch
- ▶ Maximum Capacity of 5,555 Acre Feet
- ▶ Typical Low Level = 3,000 Acre Feet
- ▶ Water Rights to Store 5,555 Acre Feet
- ▶ Environmental Flow to Bear River
 - ▶ 5 cfs
- ▶ Discharges to Bear River & South Sutter Water District's Camp Far West Reservoir
- ▶ Recreation Includes Boating for Locals

Combie Powerhouses



COMBIE NORTH POWERHOUSE

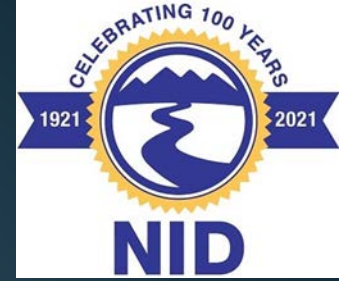
Rated head: 27 ft Rated flow: 180 cfs
Turbine type: Vertical Kaplan



COMBIE SOUTH POWERHOUSE

Rated head: 65 ft Rated flow: 339 cfs
Turbine type: Vertical Kaplan

Combie Powerhouses

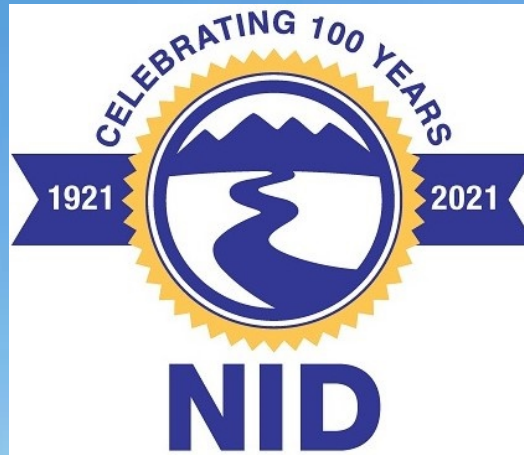


Combie North

- ▶ Constructed in 2010
- ▶ Power Generated Via Consumptive and Run of River Flows
- ▶ PPA with PG&E Through October 5, 2024

Combie South

- ▶ Constructed in 1984
- ▶ Power Generated Via Run of River Flows
- ▶ PPA with City of Lodi via Norther California Power Agency Through December 31, 2023



THANKS FOR ATTENDING