IDAHO FALLS POWER

P | 208.612.8430
F | 208.612.8435

Electronically Filed

August 2, 2023

VIA E-FILING

Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Subject: Gem State Hydroelectric Project (FERC Project No. 2952)
Idaho Falls Hydroelectric Project (FERC Project No. 2842)

Dear Secretary Bose:

Idaho Falls Power (IFP or Licensee), the Licensee of the Idaho Falls Hydroelectric Project (Idaho Falls Project) (FERC No. 2842), and the Gem State Hydroelectric Project (Gem State Project) (FERC No. 2952), herein collectively referred to as the "Projects," electronically files with the Federal Energy Regulatory Commission (Commission or FERC) the Notices of Intent (NOI) and Pre-Application Document (PAD) for the relicensing of the Projects in accordance with the requirements of 18 Code of Federal Regulation (CFR) Part 5. The FERC licenses for Projects expire on July 31, 2029. The Licensee plans to relicense the Projects using the Commission's Integrated Licensing Process (ILP), in accordance with FERC's regulations pursuant to 18 CFR Part 5. Due to the proximity of the Projects to each other, the Licensee proposes to conduct the relicensing processes concurrently, and requests that the Commission do the same. The Licensee is submitting individual NOIs and a single PAD for the Projects.

The 24.6-megawatt (MW) Idaho Falls Project consists of three developments on the Snake River in Bonneville County, Idaho, including: Upper Plant, located at approximately river mile (RM) 815.2; City Plant (RM 810.4); and Lower Plant (RM 808.7). The 22.6 MW Gem State Project consists of one development located at approximately RM 804.2 on the Snake River in Bonneville and Bingham Counties, Idaho. The Idaho Falls Project is located 1.9 miles upstream of the Gem State Project on the Snake River and extends approximately 11.9 miles north through the city of Idaho Falls. The Gem State Project and Idaho Falls Project boundaries are separated by approximately 1.9-miles of free-flowing river between the tailrace of Idaho Falls Project and the headwaters of the Gem State Project.

The PAD consists of two volumes. Volume I contains the public information required by 18 CFR § 5.6. Volume II of the PAD contains drawings of Project works that meet the definition of Critical Energy Infrastructure Information (CEII) pursuant to FERC's June 23, 2003 Order No. 630-A.

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Bear Prairie
General Manager
Idaho Falls Power

Attachments:

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- Volume II (CEII) containing single-line diagrams for the Gem State Project (FERC Project No. 2952, and Idaho Falls Project (FERC No 2842)

Idaho Falls Project (P-2952), Gem State Project (P2842) Hydroelectric Projects Relicensing
Distribution List

Federal Agencies

National Marine Fisheries Service
Boise Regional Office
800 E. Park Blvd, Suite 220 Plaza IV, Suite 220 Boise, ID 83712

U.S. Army Corps of Engineers
Idaho Falls Field Office
900 N Skyline Rd., Suite A Idaho falls ID 83402
CENWW-RD@usace.army.mil

U.S. Bureau of Land Management
Upper Snake Field Office
1405 Hollipark Dr. Idaho Falls, ID 83401
BLM_ID_UpperSnakeOffice@blm.gov

U.S. Environmental Protection Agency
EPA Region 10 1200 Sixth Avenue, Suite 155 Seattle, WA 98101
epa-seattle@epa.gov

U.S. Fish and Wildlife Service
Chris Swanson, State Supervisor
Idaho Fish and Wildlife Office
1387 S. Vinnell Way, Suite 368 Boise, ID 83709
Chris_swanson@fws.gov

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Allyson Turner
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U.S. Forest Service
Palisades Ranger District
3659 E. Ririe Hwy Idaho Falls, ID 83401

U.S. Bureau of Indian Affairs
Northwest Region
911 Northeast 11th Ave Portland, OR 97232

U.S. Bureau of Reclamation
Pacific Northwest Region Snake River Area Office
230 Collins Rd Boise, ID 83702

U.S. Fish and Wildlife Service
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U.S. Geological Survey - Idaho Water Science Center
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dc_id@usgs.gov

U.S. Bureau of Land Management
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dteel@blm.gov

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Tribes

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Calla.Hagle@burnspaiute-nsn.gov

Nez Perce Tribe Water Resource Development
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114 Veterans Dr. Lapwai, ID 83540
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Burns Paiute Tribe
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Fort McDermitt Paiute and Shoshone Tribes of the Fort McDermitt Indian Reservation, Nevada and Oregon
Duane Masters, Sr., Environmental Director
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Shoshone-Bannock Tribal Fish and Wildlife Department
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PO Box 306 Fort Hall, ID 83203
publicaffairs@sbtribes.com

Couer d'Alene Tribe
Chief James Allan, Chairman
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Nez Perce Tribe of Idaho
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Fort Belknap Indian Community of the Fort Belknap Reservation
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Shoshone-Paiute Tribe of the Duck Valley Reservation
Brian Thomas, Tribal Chairman
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Thomas.brian@shopai.org

Kootenai Tribe of Idaho
Jennifer Porter, Chairperson
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jenniffer@kootenai.org

Burns-Paiute Tribe
Diane Teeman, Chairperson
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Eastern Shoshone Tribe of the Wind River Reservation
John St. Clair, Chairman
PO Box 538 Fort Washakie, WY 82514
jstclair@easternshoshone.org

Confederated Tribes of Warm Springs Reservation
Jonathan Smith, Chairman
PO Box C Warm Springs, OR 97761-3001
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Fort Hall Business Council
P.O. Box 306 Pima Drive Fort Hall, ID 83203

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Tildon Smart, Tribal Chairman
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State Agencies

Idaho Department of Environmental Quality
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Idaho Parks and Recreation
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Idaho State Historic Preservation Office
210 Main Street Boise, ID 83702

Idaho State Historical Society
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Tribal Historic Preservation Office
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Idaho Governor's Office of Species Conservation (OSC)
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Idaho Office of the Attorney General
Attorney General
700 W. Jefferson St., Suite 210 P.O. Box 83720 Boise Idaho, 83720-0010

Idaho Soil and Conservation Commission – East Side Soil and Water Conservation District
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Idaho Farm Bureau Federation
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Idaho Office of the Governor
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Idaho Soil & Water Conservation Commission
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Local Agencies

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City of Ammon
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maustin@cityofammon.us

City of Shelley
101 S. Emerson Avenue Shelley, Idaho 83274

City of Idaho Falls
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County of Bingham
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New Sweden Irrigation District
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Snake River Valley Irrigation District
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office@progressiveirrigationdistrict.com

Bonneville County Commission
Roger Christensen, Chairman
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Non-Government Organizations

Bonneville Power Administration

P.O. Box 3621 Portland, OR 97208-3621

Idaho Power Company – Corporate Headquarters
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Trout Unlimited
Cultural Resource Program
Southeast Idaho Trout Unlimited
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Greater Yellowstone Coalition
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gyc@greateryellowstone.org

Snake River Cutthroats
Chapter President, Arn Berglund
Trout Unlimited Chapter 163
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Greater Yellowstone Coalition
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Burgess Canal & Irrigating Co.
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East and West Side Conservation Districts
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American Whitewater
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Licensee
County of Bonneville
Bonneville County Clerk
605 N. Capital, Idaho Falls, Idaho 83402
pmanning@co.bonneville.id.us

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Idaho Falls Power Project No. 2842

NOTICE OF INTENT TO FILE APPLICATION FOR
NEW LICENSE

Pursuant to 18 CFR § 5.5, Idaho Falls Power notifies the Federal Energy Regulatory Commission of its intention to file an Application for a New License for the Idaho Falls Hydroelectric Project, Project No. 2842.

The following information is provided consistent with the requirements of 18 CFR. § 5.5 and 16.6(b):

1. **The exact name and business address of the applicant(s) is:**

Applicant's Name:	Idaho Falls Power
Address:	140 S. Capital Avenue Idaho Falls, ID 83402
Contacts:	Richard Malloy, Regulatory Compliance Manager Idaho Falls Power 140 S. Capitol Avenue Idaho Falls, ID 83402 208-612-8248
Project Number:	Idaho Falls Hydroelectric Project FERC No. 2842;
Expiration Date:	January 31, 2029

2. **Unequivocal Statement of Intent:**

Idaho Falls Power intends to file an application for a new license for the Idaho Falls Hydroelectric Project (Project) located on the Snake River near the city of Idaho Falls in Bonneville County in Idaho utilizing Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP).

3. **Description of Principal Project Works to be Licensed:**

Existing Project features to be relicensed include three developments; Upper Plant, City Plant, and Lower Plant. The Upper Plant consists of two concrete and earth-fill dams and spillways and a powerhouse.

The Upper Plant impoundment is 100 acres at a normal pool elevation of 4,734.7 feet NGVD and extends approximately two miles upstream. The impoundment has a storage capacity of 800 acre-feet at elevation 4,734.7 feet NGVD.

The City Plant development consists of a concrete dam, spillway, trash rack, Bascule gate, maintenance building, and a powerhouse. The City Plant impoundment is 50 acres at a normal pool elevation of 4,700 feet NGVD and extends approximately one mile upstream. The impoundment has a storage capacity of 400 acre-feet at elevation 4,700 feet NGVD.

The Lower Plant Development consists of a concrete dam, spillway, eight radial gates, on pelican gate, and two powerhouses. The Lower Plant impoundment is 100 acres at a normal pool elevation of 4,674 feet NGVD and extends approximately two miles upstream. The impoundment has a storage capacity of 800 acre-feet at elevation 4,674 feet NGVD.

A complete outline of all project facility dimensions is available in Section 4.0 of the Pre-Application Document.

4. **Location of the Project (Dam):** 43.555341, -112.045468 (Upper Plant Dam No. 1)
   43.552838, -112.051053 (Upper Plant Dam No. 2)
   43.496809, -112.042727 (City Plant)
   43.470373, -112.061128 (Lower Plant)
   State or Territory: Idaho
   County: Bonneville
   Township or nearby town: Idaho Falls

5. **The installed capacity of the project is:** 24.6 megawatts

6. **Names and Mailing Addresses of Entities Listed in 18 CFR § 5.5(b)(8):**

(a) The County in which the Project is located, and in which any Federal Facility that is used or to be used by the Project is located:

Bonneville County
605 N Capital Avenue
Idaho Falls, Idaho 83402
(208) 529-1350

There are no federal facilities used by the Idaho Falls Hydroelectric Project.

(b) Each city or town in which any part of the Project is located, and in which any Federal facility that is used or to be used by the Project is located.

City of Idaho Falls
308 Constitution Way
Idaho Falls, ID 83402
(208) 612-8100

There are no federal facilities used by the Idaho Falls Hydroelectric Project.

(c) Each city or town that has a population of 5,000 or more people and is located within 15 miles of the existing Project dams:

Other than Idaho Falls, (listed above) there are no cities or towns with populations of 5,000 or more people and which are located within 15 miles of the existing Project dams. There are, however, a number of unincorporated communities and cities with small populations of residents. These include the Cities of Iona and Rigby, and the unincorporated communities of New Sweden, Ammon, Beachs Corner, Payne, Osgood, Bassett, and Grant.

(d) Each irrigation district, drainage district, or similar special purpose political subdivision in which any part of the Project is located, and in which any Federal facility that is used or to be used by the Project is located.

Idaho Irrigation District Richard Lockyer, Manager 496 E 14th Street Idaho Falls, ID 83404 (208) 522-2356 idahowatermap@gmail.com	Progressive Irrigation District Ray Suitter, Manager 2585 N Ammon Road Idaho Falls, ID 83401 (208) 522-5898 office@progressiveirrigationdistrict.com
New Sweden Irrigation District Kail Sheppard, District Manager 2350 W 17th Street S Idaho Falls, ID 83402 (208) 523-0175 newswedenirr@gmail.com	Burgess Canal & Irrigating Co. PO Box 536 Rigby, ID 83442 Mark Boam, President burgesscanal@yahoo.com
East and West Side Conservation Districts 1120 E Lincoln Road, Suite A Idaho Falls, ID 83401 (208) 522-6250	

(e) Each irrigation district, drainage district, or similar special purpose political subdivision that owns, operates, maintains, or uses any Project facility or any Federal facility that is or is proposed to be used by the Project.

No irrigation district, drainage district, or similar special purpose political subdivision owns operates, maintains, or uses any Project facility or any federal facility that is or is proposed to be used by the Project.

(f) Every other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, this notification.

Bonneville County Commission Roger Christensen, Chairman 605 N Capital Avenue Idaho Falls, ID 83402 (208) 529-1350	

(g) Affected Indian Tribes

Shoshone-Bannock Tribes of the Fort Hall Reservation Nathan Small, Chairman PO Box 306 Fort Hall, ID 83203 208-478-3700 publicaffairs@sbtribes.com	Shoshone-Paiute Tribe of the Duck Valley Reservation Brian Thomas, Tribal Chairman 1036 Idaho State Highway 51 Owyhee County, ID 83604 (208) 759-3100 ext. 1231 Thomas.brian@shopai.org
Couer d'Alene Tribe Chief James Allan, Chairman 850 A Street PO Box 408 Plummer, ID 83851 jfletcher@cdatribe-nsn.gov	Kootenai Tribe of Idaho Jennifer Porter, Chairperson 100 Circle Drive Bonners Ferry, ID 83805 (208) 267-2960 jenniffer@kootenai.org
Nez Perce Tribe of Idaho Samuel Penney, Chairman 100 Agency Road Lapwai, ID 83540 (208) 843-2253 nptec@nezperce.org	Burns-Paiute Tribe Diane Teeman, Chairperson 100 Pasigo Street Burns, OR 97720 (541) 573-8096 Dteeman.burns.paiute@gmail.com
Fort McDermitt Paiute-Shoshone Tribe Maxine Redstar, Chairman 111 North Reservation Road McDermitt, NV 89421 (775) 532-8259	Eastern Shoshone Tribe of the Wind River Reservation John St. Clair, Chairman PO Box 538 Fort Washakie, WY 82514 (307) 332-4932 jstclair@easternshoshone.org
Northwestern Band of Shoshone Nation Dennis Alex, Chairman 2575 Commerce Way Ogden, UT 84401 (435) 734-2286 ggover@nwbshoshone.com	Confederated Tribes of Warm Springs Reservation Jonathan Smith, Chairman PO Box C Warm Springs, OR 97761-3001 (541) 553-1161 info@warmsprings.com

Fort Belknap Indian Community of the Fort Belknap Reservation Jeffery Stiffarm, Chairman RR1, Box 66 Harlem MT 59526 (406) 353-2205 jeffery.stiffarm@ftbelknap.org	

7. Whether the Application is for a Power or a Non-Power License

The Idaho Falls Hydroelectric Project license application is for a power license.

8. Designation as Non-Federal Representative and Authorization to Initiate Consultation

Pursuant to 18 CFR § 5.5(e), Idaho Falls Power requests that FERC designate it as the non-federal representative for purposes of consultation under Section 7 of the Endangered Species Act and the joint agency regulations thereunder at 50 CFR Part 402, section 305(b) of the Magnuson-Stevens Fishery and Conservation and Management Act and the implementing regulations at 50 CFR 600.920. In addition, Idaho Falls Power requests authorization to initiate consultation under Section 106 of the National Historic Preservation Act and to implement regulations at 36 CFR Section 800.2(c)(4).

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Idaho Falls Power FERC Project No. 2952

NOTICE OF INTENT TO FILE APPLICATION FOR NEW LICENSE

Pursuant to 18 C.F.R. § 5.5, Idaho Falls Power notifies the Federal Energy Regulatory Commission of its intention to file an Application for a New License for the Gem State Hydroelectric Project, FERC Project No. 2952.

The following information is provided consistent with the requirements of 18 CFR § 5.5 and 16.6(b):

1. The exact name and business address of the applicant(s) is:

Applicant's Name: Idaho Falls Power
Address: 140 S. Capital Avenue
Idaho Falls, ID 83402

Contacts: Richard Malloy, Regulatory Compliance Manager
Idaho Falls Power
140 S. Capitol Avenue
Idaho Falls, ID 83402
208-612-8248

Project Number: Gem State Hydroelectric Project FERC No. 2952

Expiration Date: January 31, 2029[1]

2. Unequivocal Statement of Intent:

Idaho Falls Power (licensee) intends to file an application for a new license for the Gem State Hydroelectric Project (Project) located on the Snake River near the city of Idaho Falls in Bonneville and Bingham counties in Idaho utilizing Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP).

3. Description of Principal Project Works to be Licensed:

[1] On August 12, 2020 Idaho Falls Power filed an application with FERC to accelerate the license term for the Gem State Hydroelectric, FERC Project No. 2952. Specifically, Idaho Falls Power requested that FERC accelerate the license term from November 30, 2033 to January 31, 2029. On October 12, 2021, FERC approved the new expiration for the Gem State Project to be January 31, 2029 to align with the Idaho Falls Project, FERC Project. No. 2842.

Existing Project features to be relicensed include an earth and rock fill dam, spillway, power canal, tailrace, two earth fill dikes, irrigation control structures, powerhouse, and transmission lines. The Gem State impoundment is 305 acres at a normal pool elevation of 4,655 feet NGVD and extends approximately 3.7 miles upstream. The impoundment has a storage capacity of 5,000 acre-feet at elevation 4,655 feet NGVD.

A complete outline of all project facility dimensions is available in Section 4.0 of the Pre-Application Document.

4. **Location of the Project (Dam):** 43.555341, -112.045468
   State or Territory: Idaho
   County: Bonneville; Bingham
   Township or nearby town: Idaho Falls

5. **The installed capacity of the project is:** 22.6 megawatts

6. **Names and Mailing Addresses of Entities Listed in 18 C.F.R. § 5.5(b)(8):**

(a) The County in which the Project is located, and in which any Federal Facility that is used or to be used by the Project is located:

Bonneville County
605 N Capital Avenue
Idaho Falls, Idaho 83402
(208) 529-1350

Bingham County
501 N Maple
Blackfoot, ID 83221
(208) 785-8040

There are no federal facilities used by the Gem State Hydroelectric Project.

(b) Each city or town in which any part of the Project is located, and in which any Federal facility that is used or to be used by the Project is located.

City of Idaho Falls
308 Constitution Way
Idaho Falls, ID 83402
(208) 612-8100

(c) Each city or town that has a population of 5,000 or more people and is located within 15 miles of the existing Project dams:

Other than Idaho Falls (listed above) there are no cities or towns with populations of 5,000 or more people and which are located within 15 miles of the existing Project dams. There are, however, a number of unincorporated communities and cities with small populations of residents. These include the City of Shelley, and the unincorporated communities of Mitchell, Woddville, and Cotton.

(d) Each irrigation district, drainage district, or similar special purpose political subdivision in which any part of the Project is located, and in which any Federal facility that is used or to be used by the Project is located.

Idaho Irrigation District Richard Lockyer, Manager 496 E 14th Street Idaho Falls, ID 83404 (208) 522-2356 idahowatermap@gmail.com	Progressive Irrigation District Ray Suitter, Manager 2585 N Ammon Road Idaho Falls, ID 83401 (208) 522-5898 office@progressiveirrigationdistrict.com
New Sweden Irrigation District Kail Sheppard, District Manager 2350 W 17th Street S Idaho Falls, ID 83402 (208) 523-0175 newswedenirr@gmail.com	Burgess Canal & Irrigating Co. PO Box 536 Rigby, ID 83442 Mark Boam, President burgesscanal@yahoo.com
East and West Side Conservation Districts 1120 E Lincoln Road, Suite A Idaho Falls, ID 83401 (208) 522-6250	

(e) Each irrigation district, drainage district, or similar special purpose political subdivision that owns, operates, maintains, or uses any Project facility or any Federal facility that is or is proposed to be used by the Project.

No irrigation district, drainage district, or similar special purpose political subdivision owns, operates, maintains, or uses any Project facility or any federal facility that is or is proposed to be used by the Project.

(f) Every other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, this notification.

Bonneville County Commission Roger Christensen, Chairman 605 N Capital Avenue Idaho Falls, ID 83402 (208) 529-1350	Bingham County Commission Whitney Manwaring, Chairman 501 N Maple #204 Blackfoot, ID 83221 (208) 782-3013

(g) Affected Indian Tribes

Shoshone-Bannock Tribes of the Fort Hall Reservation Nathan Small, Chairman PO Box 306 Fort Hall, ID 83203 208-478-3700 publicaffairs@sbtribes.com	Shoshone-Paiute Tribe of the Duck Valley Reservation Brian Thomas, Tribal Chairman 1036 Idaho State Highway 51 Owyhee County, ID 83604 (208) 759-3100 ext. 1231 Thomas.brian@shopai.org
Couer d'Alene Tribe Chief James Allan, Chairman 850 A Street PO Box 408 Plummer, ID 83851 jfletcher@cdatribe-nsn.gov	Kootenai Tribe of Idaho Jennifer Porter, Chairperson 100 Circle Drive Bonners Ferry, ID 83805 (208) 267-2960 jenniffer@kootenai.org
Nez Perce Tribe of Idaho Samuel Penney, Chairman 100 Agency Road Lapwai, ID 83540 (208) 843-2253 nptec@nezperce.org	Burns-Paiute Tribe Diane Teeman, Chairperson 100 Pasigo Street Burns, OR 97720 (541) 573-8096 Dteeman.burns.paiute@gmail.com
Fort McDermitt Paiute-Shoshone Tribe Maxine Redstar, Chairman 111 North Reservation Road McDermitt, NV 89421 (775) 532-8259	Eastern Shoshone Tribe of the Wind River Reservation John St. Clair, Chairman PO Box 538 Fort Washakie, WY 82514 (307) 332-4932 jstclair@easternshoshone.org
Northwestern Band of Shoshone Nation Dennis Alex, Chairman 2575 Commerce Way Ogden, UT 84401 (435) 734-2286 ggover@nwbshoshone.com	Confederated Tribes of Warm Springs Reservation Jonathan Smith, Chairman PO Box C Warm Springs, OR 97761-3001 (541) 553-1161 info@warmsprings.com
Fort Belknap Indian Community of the Fort Belknap Reservation Jeffery Stiffarm, Chairman RR1, Box 66 Harlem MT 59526 (406) 353-2205 jeffery.stiffarm@ftbelknap.org	

7. Whether the Application is for a Power or a Non-Power License

The Gem State Hydroelectric Project license application is for a power license.

8. Designation as Non-Federal Representative and Authorization to Initiate Consultation

Pursuant to 18 CFR § 5.5(e), Idaho Falls Power requests that FERC designate it as the non-federal representative for purposes of consultation under Section 7 of the Endangered Species Act and the joint agency regulations thereunder at 50 CFR Part 402, section 305(b) of the Magnuson-Stevens Fishery and Conservation and Management Act and the implementing regulations at 50 CFR 600.920. In addition, Idaho Falls Power requests authorization to initiate consultation under Section 106 of the National Historic Preservation Act and to implement regulations at 36 CFR Section 800.2(c)(4).

PRE-APPLICATION DOCUMENT

FINAL
IDAHO FALLS AND GEM STATE HYDROELECTRIC PROJECTS
FERC PROJECT NO. 2842 AND 2952

IDAHO FALLS POWER
140 S CAPITAL AVE
IDAHO FALLS, ID 83402

AUGUST 2023

IDAHO FALLS AND GEM STATE HYDROELECTRIC PROJECTS (FERC PROJECT NO. 2842 AND 2952)

PRE-APPLICATION DOCUMENT

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LIST OF ACRONYMS

A	
ac-ft	acre-feet
AC	alternating current
ADA	Americans with Disabilities Act
APE	Area of Potential Effects
B	
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	United States Bureau of Land Management
BOR	United States Bureau of Reclamation
C	
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
cfs	cubic feet per second
CDT	Continental Divide Trail
CMC	criterion continuous concentration
CTWS	Confederated Tribes of Warm Springs
D	
DC	direct current
District	Idaho Water District No. 1
DO	dissolved oxygen
DOE	United States Department of Energy
DPS	Distinct Population Segment
E	
EA	Environmental Assessment
EDRR	Early Detection Rapid Response
EIS	Environmental Impact Statement
EAP	Equity Action Plan
EPA	United States Environmental Protection Agency
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESRP	Eastern Snake River Plain
F	
FAA	Federal Aviation Association
FERC	Federal Energy Regulatory Commission
FGDC	Federal Geographic Data Committee
FLA	Final License Application

FOIA	Freedom of Information Act
FPA	Federal Power Act
FWPA	Federal Water Power Act

G

Gem State Project	Gem State Hydroelectric Project
GIS	geographic information system
GLO	General land Office
GPS	global positioning system

H

HAER	Historic American Engineering Record
hp	horsepower
HUC	Hydrologic Unit Code
Hz	Hertz

I

Idaho Falls Project	Idaho Falls Hydroelectric Project
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDPR	Idaho Department of Parks and Recreational
IDWR	Idaho Department of Water Resources
IFP	Idaho Falls Power
IFPR	Idaho Falls Parks and Recreation Department
IHSI	Idaho Historic Sites Inventory
IID	Idaho Irrigation District
ILP	Integrated Licensing Process
IBEW	International Brotherhood of Electrical Workers
IPaC	Information for Planning and Consultation
ISDA	Idaho State Department of Agriculture
ISI	Invasive Species of Idaho
ITD	Idaho Transportation Department;
IWRB	Idaho Water Resource Board

K

kV	kilovolt
kVA	kilovolt amps
kW	kilowatt
kWh	kilowatt hour
kya.	thousand years ago

L

LMEI	labor market engagement index
LMP	Land Management Program

M

MFP	Management Framework Plan
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
MRDS	Mineral Resources Data System
MRLC	Multi-resolution Land Characteristics Consortium
MVA	mega volt-amp
MW	megawatt
MWh	megawatt-hour

N

NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NGO	non-governmental organization
NGVD 29	National Geodetic Vertical Datum 1929
NMFS	National Marine Fisheries Service
NNI	No Net Impact
NOAA	National Oceanic and Atmospheric and Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSID	New Sweden Irrigation District
NTU	nephelometric turbidity unit
NWF	National Wildlife Federation
NWI	National Wetland Inventory
NWS	National Weather Service

P

PAD	Pre-Application Document
PCB	Polychlorinated Biphenyl
pdf	portable document format
PHS	Priority Habitat and Species
Projects	Idaho Falls and Gem State Hydro Projects FERC No. 2842 & 2952
psi	pounds per square inch
psig	pound per square inch gage

R

RM	river mile

RMP	Rocky Mountain Power
rpm	revolutions per minute
RTE	Rare, threatened and endangered
S	
SCADA	supervisory control and data acquisition
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SQRU	scenic quality rating unit
SD	Scoping Document
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SMP	Shoreline Master Program
STV	statistical threshold value
SWAP	State Wildlife Action Plan
T	
TCP	Traditional Cultural Property
TDG	total dissolved gas
TLP	Traditional Licensing Process
TMDL	total maximum daily load
TWG	Technical Working Group
U	
UCUT	Upper Columbia United Tribes
UP&L	Utah Power and Light
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
U.S.	United States
V	
VRI	Visual Resource Inventory
VRM	Visual Resource Management
W	
WHEG	Wildlife Habitat Evaluation Guide
WY	water year
Y	
YBC	Yellow-billed Cuckoo

Geographic Scope

The following terms related to the geographic scope should be used when discussing the relationship between an area and the Project.

Project Boundary	The boundary defined in the Projects' licenses issued by FERC outlining the geographic area needed for project operations and maintenance. Project Boundary includes all structures (e.g., dams, powerhouses, or other structure used for generation of electricity), and all lands and waters necessary for the operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources, as designated in the project license. Project boundaries are used to designate the geographic extent of the hydropower project that FERC determines a licensee must own or control on behalf of its licensed hydropower project. For the purposes of this document, the Project Boundary is defined as all lands and waters within the existing FERC Project Boundary for the Idaho Falls and Gem State Hydroelectric Projects No. 2842 & 2952, as denoted on the Projects' Exhibit G.
Project area	The geographic area comprised of the lands and waters within the Project Boundary and those lands immediately adjacent to the Project Boundary. For the purposes of this document, the Project area is the area which contains all Project features (encompassing the Project Boundary as defined above), and which extends out for the purposes of characterization and analysis from the edge of the Project Boundary plus a **0.5-mile buffer**.
Project vicinity	Refers to a larger geographic area near a project. For the purposes of this document, the Project vicinity is the area which contains all Project features (encompassing the Project Boundary as defined above), and which extends out for the purposes of characterization and analysis from the edge of the Project Boundary plus a **5-mile buffer**. A 5-mile buffer may not be applicable to all resource sections; for some, an alternative geographic scope, such as a county, will be used for characterization and analysis.

1.0 INTRODUCTION

1.1 APPLICANT AND PROJECT BACKGROUND

Idaho Falls Power (IFP) is a municipal electric utility that serves the city of Idaho Falls, Idaho. IFP, the current licensee, owner, and operator, plans to file a new application for relicensing of two major projects, the Idaho Falls Hydroelectric Project (Idaho Falls Project), Federal Energy Regulatory Commission (FERC) Project No. 2842 and the Gem State Hydroelectric Project (Gem State Project), FERC Project No. 2952, herein collectively referred to as the "Projects".

The 24.6-megawatt (MW) Idaho Falls Project consists of three developments on the Snake River in Bonneville County, Idaho, including: Upper Plant, located at approximately river mile (RM) 815.2; City Plant (RM 810.4); and Lower Plant (RM 808.7). The 22.6 MW Gem State Project consists of one development located at approximately RM 804.2 on the Snake River in Bonneville and Bingham Counties, Idaho. The Idaho Falls Project is located 1.9 miles upstream of the Gem State Project on the Snake River and extends approximately 11.9 miles north through the city of Idaho Falls. The Idaho Falls Project and Gem State Project Boundaries are separated by approximately 1.9 miles of free-flowing river between the tailrace of Idaho Falls Lower Plant Project and the headwaters of the Gem State Project. Land ownership in the Projects is a mix of federal, non-federal, and municipally owned lands. The United States Bureau of Land Management (BLM) administers 27.24 acres of lands within the Idaho Falls Project Boundary and 5.78-acres of lands within the Gem State Project Boundary.

FERC issued a 50-year license for both Projects. The existing Idaho Falls Project license was issued on February 8, 1979 and expires January 31, 2029, and the existing Gem State Project license was issued on December 12, 1983 and was originally set to expire on November 30, 2033. Because the two Projects are located in succession along the Snake River, and share similar resource issues and stakeholders, IFP intends to license the Projects concurrently to efficiently combine the relicensing process and studies for both Projects, as appropriate. In support of this approach, IFP requested FERC to shorten the Gem State Project license term to align with the

Idaho Falls Project license expiration date of January 31, 2029[1]. Prior to filing this request, IFP consulted with various stakeholders including, Greater Yellowstone Coalition, BLM, Idaho Department of Parks and Recreation, Idaho Rivers United, United States Army Corps of Engineers, and Burns Paiute Tribe, regarding the license acceleration. None of the stakeholders objected to the request, and FERC granted this extension per Order dated October 12, 2021.[2]

IFP intends to file applications for new licenses for both Projects two years before the license expiration date, as required by Title 18 Code of Federal Regulations (CFR) Section (§) 5.17(a). Prior to filing the Draft License Applications, IFP will make a determination if a combined, single license for all developments is in the best interest of the utility. Reasons for a single license include administrative efficiencies, and a streamlined compliance environment.

IFP has elected to use the Integrated Licensing Process (ILP), as defined in 18 CFR Part 5. IFP has drafted this combined Pre-Application Document (PAD) pursuant to the content requirements of 18 CFR Part 5 and which will accompany IFP's Notice of Intents (NOIs) to seek new licenses for the Projects.

1.2 DOCUMENT PURPOSE

This PAD was prepared in compliance with 18 CFR Part 5, which defines the form and content requirements of the document. The purpose of the PAD is to provide FERC, federal and state agencies, and other interested stakeholders with existing background information related to facilities and engineering, operational, economic, and environmental aspects of the Projects. The PAD defines pertinent issues and potential study needs related to the Projects. In accordance with the regulations, the PAD and associated NOI will be filed with FERC and distributed to federal and state resource agencies, local governments, relevant tribal entities, non-governmental organizations (NGOs) and other interested parties.

[1] By letter dated August 12, 2021, IFP filed an application with FERC to accelerate the license term for the Gem State Hydroelectric Project from November 30, 2023 to January 31, 2029 (FERC 2021).
[2] FERC Order Accelerating License Term, Gem State Hydroelectric Project No 2952, issued October 12, 2021, 177 FERC ¶ 62,023.

By filing the NOI and PAD with FERC, IFP is initiating the FERC ILP relicensing process for the Idaho Falls and Gem State Projects. The purpose of this PAD is to describe the existing facilities and current and proposed operations at both Projects and to summarize existing information relevant to the evaluation of relicensing. In addition, the PAD is intended to assist resource agencies, municipalities, Native American tribes, NGOs and interested parties in identifying potential resource issues and related informational needs, and to develop potential study requests (18 CFR § 5.6(b)).

FERC's regulations require that a licensee exercise due diligence to obtain and include existing relevant and reasonably available information about the Project and related resources. To fulfill this requirement, IFP reviewed its own files for relevant information and contacted appropriate resource agencies requesting information and data they may have about the Projects or Project-related resources. In addition, IFP conducted searches of other potential information sources, including peer-reviewed journal articles, reference books, and the internet. Information sources cited in this PAD are referenced in the associated chapters where they are used.

1.3 AUTHORIZED AGENTS

The following persons are authorized to act as agents for the applicant pursuant to 18 CFR § 5.6(d)(2)(i):

Richard Malloy
Regulatory Compliance Manager
Idaho Falls Power
140 S. Capital Avenue
Idaho Falls, ID 83402
208-612-8428
RMalloy@IFPower.org

Travis (Bear) Prairie
General Manager
Idaho Falls Power
140 S. Capital Avenue
Idaho Falls, ID 83402
208-612-8429
BPrairie@IFPower.org

1.4 PRE-APPLICATION DOCUMENT CONTENT

This PAD contains all information required by 18 CFR § 5.6(c) and (d) for distribution to federal and state resource agencies, local governments, Native American tribes, members of the public, and others likely to be interested in the relicensing proceeding.

Volume I of this PAD is organized as follows:

- Table of Contents; List of Tables; List of Figures; List of Appendices; List of Photographs; Definitions of Terms, Acronyms, and Abbreviations
- Section 1.0 – Introduction and Background Information
- Section 2.0 – Process Plan and Schedule, per 18 CFR § 5.6(d)(1)
- Section 3.0 – General Description of the River Basin, per 18 CFR § 5.6(d)(3)(xiii)
- Section 4.0 – Projects Locations, Facilities, and Operations, per 18 CFR § 5.6(d)(2)
- Section 5.0 – Description of Existing Environment, per 18 CFR §5.6(3)(ii)-(xii)
- Section 6.0 – Preliminary Listing of Potential Issues, Information Needs, and Mitigation per 18 CFR § 5.6(d)(3) and (4)
- Section 7.0 – Description of Relevant Comprehensive Management Plans, per 18 CFR § 5.6(d)(4)(iii-iv);
- Appendices
    - Appendix A – Project Mapset
    - Appendix B – Flow Duration Curves
    - Appendix C – Historic Architectural Resources
    - Appendix D – Stakeholder Consultation

Volume II (CEII) of the PAD is organized as follows:

- Single-line Diagrams

2.0 PROCESS PLAN AND SCHEDULE

2.1 PROCESS PLAN AND SCHEDULE

The process plan and schedule outline actions by FERC, IFP, and other participants in the relicensing process, beginning with the NOI and PAD and continuing through the filing of the Final License Application (FLA). This proposed relicensing process plan and schedule for the Projects was developed consistent with the regulations provided in 18 CFR Part 5. IFP's proposed schedule (Table 2-1) provides each of the major relicensing activities in the ILP, the associated CFR references, the party responsible for implementation of the activity, and the deadline for each activity. All dates provided in Table 2-1 are derived from the NOI and PAD filing date of August 2, 2023, with an FLA filing date of January 29, 2027. IFP is also including timeframes for a Formal Dispute Resolution (18 CFR § 5.14), with the goal of working to resolve any study disputes that may through informal dispute resolution. Relicensing activities may be completed earlier than the deadline indicated below, and in many instances, the initiation of an activity is dependent up on the completion date of other activities. Accordingly, the schedule may change and as necessary, IFP will revise and maintain the updated version of the process plan and schedule on the Project website, as appropriate, which is available at: https://www.ifpower.org/about-us/relicensing.

2.2 COMBINED LICENSING PROCEEDING

In electing to align license expiration dates of the Idaho Falls Power Project and the Gem State Project, IFP anticipates the many steps of the licensing process will be combined into a single proceeding. However, for purposes of adhering to the licensing requirements of Part 1 of the Federal Power Act (FPA), the Administrative Record for each of the current licenses will be maintained separately, preserving the separate dockets at FERC. IFP's licensing documents will clearly identify whether content is applicable to one or both Projects. For example, it is anticipated that a single Study Plan will be filed, which may include some studies that are only applicable to one Project or the other. Stakeholders will also need to apply this treatment for the two dockets to ensure that their comments, recommendations, or proposed measures appropriately identify the intended Project. IFP is committed to assisting stakeholders in this process to minimize confusion.

TABLE 2-1 TIMELINE OF PROCESS PLAN AND SCHEDULE

PRE-FILING MILESTONE	PROPOSED DATE	FERC REGULATION	RESPONSIBLE PARTY
Issue Public Notice for NOIs/PAD	August 2, 2023	5.3(d)(2)	IFP
File NOIs/PAD	August 2, 2023	5.5, 5.6	IFP
Tribal Consultation Meeting	August 30, 2023	5.7	FERC
Issue Notice of Commencement of Proceeding and SD1	September 29, 2023	5.8(a)(c)	FERC
Scoping Meetings and Projects Site Visit	October-November, 2023*	5.8(b)(viii)	FERC
File Comments on PAD/SD1 and Study Requests	November 28, 2023	5.9(a)(b)	Stakeholders
Issue SD2 (if necessary)	January 12, 2024	5.10	FERC
File Proposed Study Plan	January 12, 2024	5.11(a)	IFP
Host Proposed Study Plan Meeting	February 09, 2024	5.11(e)	IFP
File Comments on Proposed Study Plan	April 11, 2024	5.12	Stakeholders
Issue Study Plan Determination	June 10, 2024	5.13(c)	FERC
File Any Study Disputes	June 28, 2024	5.14(a)	Mandatory Conditioning Agencies
Select Third Dispute Resolution Panel Member	July 5, 2024	5.14(d)	Dispute Panel
Convene Dispute Resolution Panel	July 15, 2024	5.14(d)(3)	Dispute Panel
File Comments on Study Disputes	July 25, 2024	5.14(i)	Dispute Panel
Dispute Resolution Panel Technical Conference	August 5, 2024	5.14(j)	Dispute Panel
Issue Dispute Resolution Panel Findings	August 19, 2024	5.14(k)	Dispute Panel
Issue Director's Study Dispute Determination	September 6, 2024	5.14(l)	FERC
First Study Season and Study Review	June 10, 2025	5.15(a)	IFP
File Initial Study Report	June 10, 2025	5.15(c)(1)	IFP
Initial Study Report Meeting	June 25, 2025	5.15(c)(2)	Stakeholders
File Initial Study Report Meeting Summary	July 10, 2025	5.15(c)(3)	IFP
Second Study Season and Study Review	June 10, 2026	5.15(a)	IFP
File Updated Study Report	June 10, 2026	5.15(c)(1)	IFP
Updated Study Report Meeting	June 25, 2026	5.15(c)(2)	Stakeholders

PRE-FILING MILESTONE	PROPOSED DATE	FERC REGULATION	RESPONSIBLE PARTY
File Updated Study Report Meeting Summary	July 10, 2026	5.15(c)(3)	IFP
File Draft License Application[3]	September 4, 2026	5.16(a)-(c)	IFP
File comments on Draft License Application	December 3, 2026	5.16(e)	Stakeholders
File Final License Application	February 1, 2027	5.17, 5.18	IFP
Issue Tending Notice and Decision on AIRs	February 15, 2027	5.19	FERC
Issue Notice of Acceptance and Ready for EA	February 15, 2027	5.22	FERC
Comments/Interventions and Preliminary Terms and Conditions	April 16, 2027	5.23	Stakeholders
Issue Non-Draft EA	June 15, 2027	5.24	FERC
Issue Modified Terms and Conditions	June 15, 2027	5.24	FERC
Issue Final License Order	September 13, 2027	2.25	FERC

Activities in shaded rows are not necessary if there are no study disputes.
*Dates show for the FERC Scoping meeting are tentative and subject to FERC planning and approval.

2.3 HOW TO PARTICIPATE IN RELICENSING

2.3.1 FERC RELICENSING PROCESS AND PARTICIPATION

Relicensing documents are available to the public through FERC's eLibrary, a records information system on the internet that contains documents submitted to and issued by FERC. The eLibrary can be accessed through FERC's home page, at http://www.ferc.gov, or directly at https://elibrary.ferc.gov/idmws/search/fercgensearch.asp. Anyone with internet access can open the public documents on FERC's eLibrary website or be provided with a description of non-public records. There is no registration or login required to use eLibrary. eLibrary contains most of FERC's documents, including microfilm records from 1981 forward. Most records after 1989 are in portable document format (PDF), which can be opened, copied, and downloaded to a computer. Documents only available in microfilm form can be requested from FERC's Public Reference

[3] The ILP regulations typically require the filing of a Preliminary Licensing Proposal at this stage; however, applicants can opt to submit a draft license application instead. IFP plans to utilize this option.

Room (https://www.ferc.gov/public-reference-room). Documents filed with FERC as part of the Projects' relicensing process are available for viewing and printing via eLibrary by searching under the Projects' docket numbers; the Idaho Falls Project number is P-2842 and the Gem State Project number is P-2952. Once relicensing begins, it is likely FERC will provide a sub-docket number for all relicensing-related filings and issuances. As described above, IFP anticipates that most filings will reference both docket numbers and encourages stakeholders to (1) be specific where their comments relate to only one Project, and (2) reference both docket numbers where applicable.

To facilitate communication during the relicensing process, IFP has established a publicly accessible website for the relicensing of the Projects which contains information regarding past and current relicensing activities, including relevant meeting materials, key decisions, and links to applicable information sources. IFP's website for the Idaho Falls and Gem State Projects relicensing is available at: https://www.ifpower.org/about-us/relicensing.

2.3.1.1 FERC COMMUNICATION

FERC has assigned a Project Manager to participate in relicensing meetings and provide guidance during the relicensing process in accordance with rules and regulations for the ILP. Kristin Sinclair is the current FERC Project Manager, who may be reached at 202-502-6587 (or email at kristen.sinclair@ferc.gov) to address questions related to FERC communication.

2.3.1.2 RESTRICTED DOCUMENTS

Certain Project-related documents known as Critical Energy Infrastructure Information (CEII) are restricted from public viewing in accordance with FERC Regulation 18 CFR § 388.113. CEII documents related to the design and safety of dams and its appurtenant facilities, as well as information that is necessary to protect national security and public safety are restricted. Anyone seeking CEII information from FERC must file a CEII request. FERC's website at www.ferc.gov/help/how-to/file-ceii.asp contains additional details related to CEII.

Information related to protecting sensitive archaeological or other culturally significant information is restricted under Section 106 of the National Historic Preservation Act (NHPA). Some information related to threatened and endangered species may be protected under Section 7 of the Endangered Species Act (ESA). Anyone seeking confidential or privileged information from

FERC must file a Freedom of Information Act (FOIA) request. Instructions for FOIA are available on the FERC website at www.ferc.gov/legal/ceii-foia/foia.asp.

2.3.1.3 SCOPING MEETING AND SITE VISIT

As set forth in the ILP regulations, FERC will issue Scoping Document 1 (SD1) within 60 days of the filing date of the NOIs and PAD. In addition, pursuant to 18 CFR § 5.8(b), FERC will hold scoping meetings and site visits to the Projects within 30 days of issuing notice of the NOI and PAD in accordance with its responsibilities under NEPA. FERC will provide public notice and schedule public scoping meetings and site visits to the Projects, to be held within 30 days of issuing SD1. IFP assumes that FERC will hold the scoping meetings concurrently for the Projects in late October or early November 2023. FERC will notice the dates, times, and location of the scoping meetings and publish that information in local papers after the filing the NOIs and PAD.

3.0 GENERAL DESCRIPTION OF THE RIVER BASIN

Per 18 CFR § 5.6(d)(3)(xiii), the following section provides a general description of the river basin or subbasin, in which the Projects are located.

3.1 SNAKE RIVER BASIN

The Snake River is a 1,076-mile-long river with headwaters in the Rocky Mountains of northwestern Wyoming. The Snake River flows through the state of Idaho, before turning north along the Idaho-Oregon border, and then into eastern Washington, before emptying into the Columbia River (Shallat 2022) as shown in Figure 3-1 The Snake River is the 13th longest river in the United States and is the largest tributary of the Columbia River (Shallat 2022), which itself is the nation's fourth largest river by volume (Kammerer 1990). The Snake River adds just over 30 percent to the Columbia River's volume. The watershed of the Snake River includes 41 percent of the Columbia River Basin (Shallat 2022).

The Snake River likely got its name from the first European explorers who misinterpreted the sign made by the Shoshone people who identified themselves in sign language by moving the hand in a swimming motion which may have appeared to be a snake; it actually signified that they lived near the river with many fish (USFWS n.d.). In 1811, Canadian explorer David Thompson referred to the Snake River by the Native American name of Shawpatin (Nisbet 2009). Between 1800 and 1912, the Snake River was given at least 15 different names by European explorers and settlers; in 1912 the United States Geographic Board officially named the river, Snake River (Hansen Whitewater n.d.).

The Snake River watershed encompasses 107,904 square miles and six states: Wyoming, Idaho, Oregon, Washington, Nevada, and Utah (Figure 3-1). The terrain of the Snake River basin is varied, from its headwaters in the Rocky Mountains, to the mile-deep Hells Canyon, and the Columbia River plateau (Shallat 2022). The area includes rugged mountains, semi-arid desert, fertile agricultural land (primarily irrigated), and barren outcrops of lava flows (University of Idaho 1998).

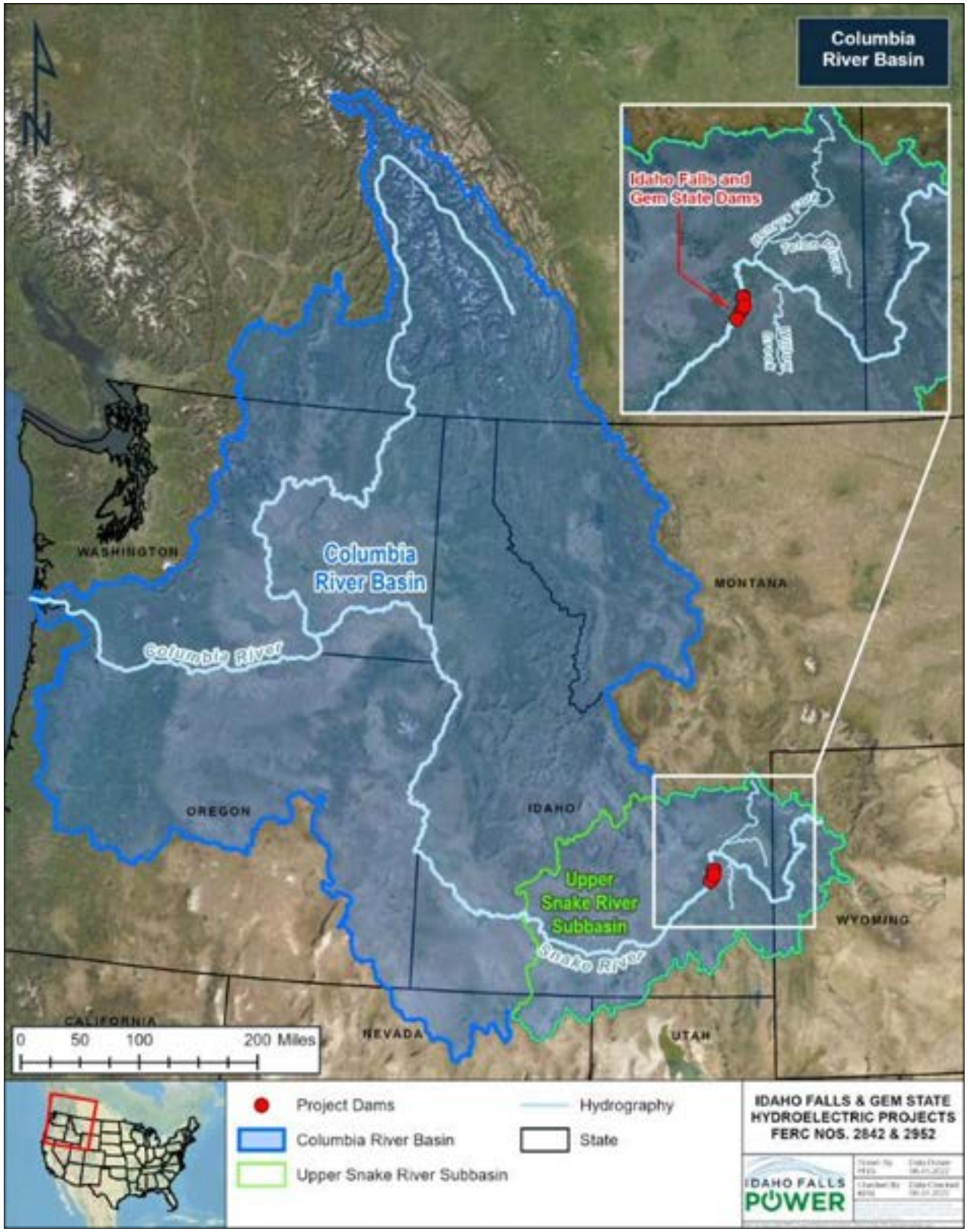

FIGURE 3-1 COLUMBIA RIVER BASIN

The Projects are located in the Upper Snake River Subbasin (Subbasin or Upper Snake), a 35,873-square-mile area in Idaho, Montana, Wyoming, Utah, and Nevada (BOR 2022) (Figure 3-2). Outside the developed urban area of the city of Idaho Falls, the general visual character of the Snake River in the area around the Idaho Falls and Gem State Projects is that of a wide, slow, meandering river passing through flat, irrigated cropland (FERC 1983a).

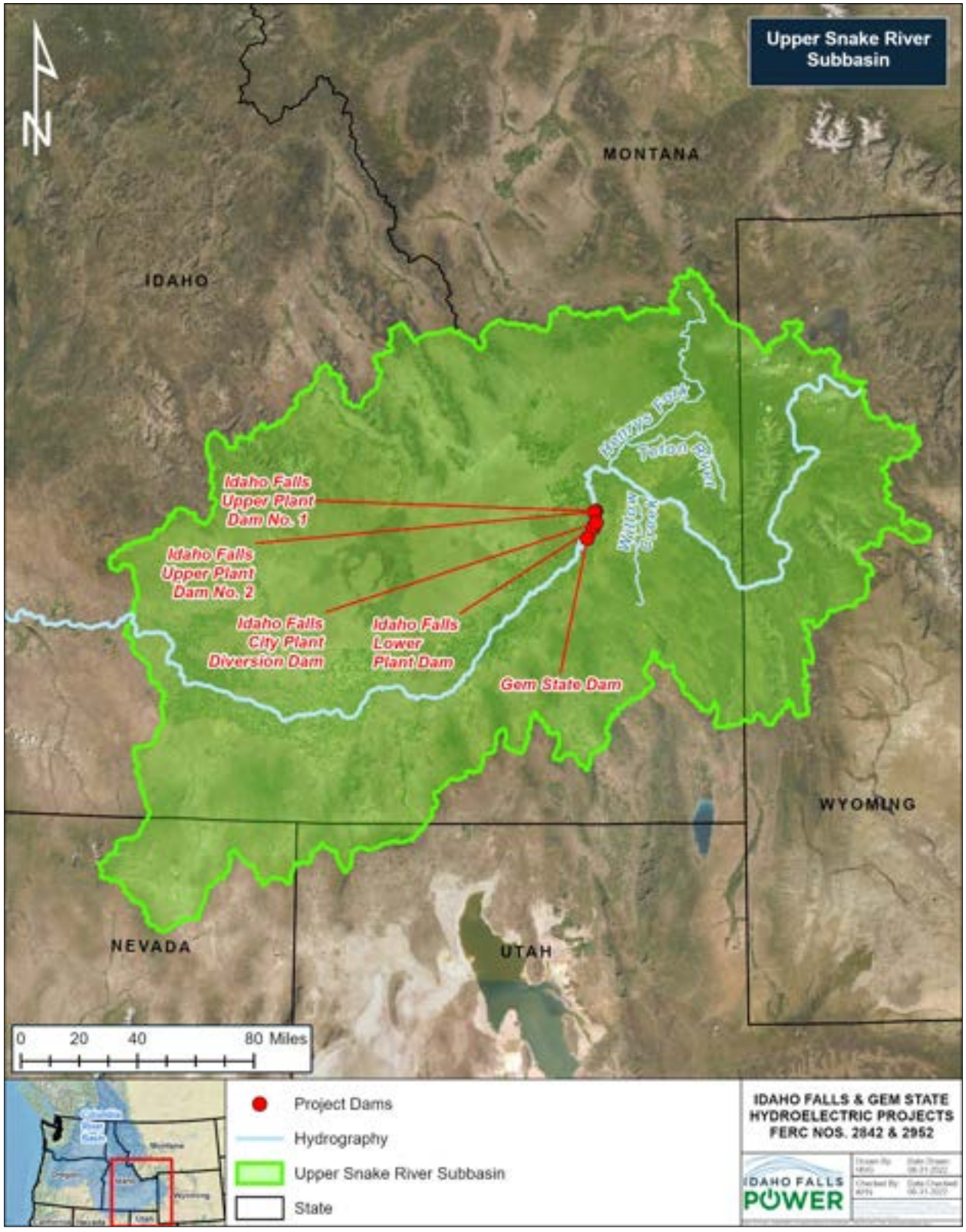

FIGURE 3-2 UPPER SNAKE RIVER SUBBASIN

3.2 MAJOR LAND AND WATER USES

The Snake River and its tributaries support many land uses including agricultural, municipal, industrial, and domestic, as well as recreation, Native American cultural uses and needs, and habitat for fish and wildlife (University of Idaho 1998).

Agriculture, Idaho's leading industry, is the largest water user in the state (University of Idaho 2010). The Snake River discharge in the Idaho Falls area is used extensively for irrigation purposes (FERC 1983a). Agricultural crops dominate this region of Idaho, including alfalfa, potatoes, and small grains (FERC 1983a). Two canal companies (Woodville Canal Company and the Snake River Irrigation Company) have water rights to divert a total of 1,604 cubic feet per second (cfs) from the Snake River via canals off the Gem State Project reach. This use is primarily restricted to the April through October growing season, with peak diversions occurring in June. There are no other diversions from the Snake River between the Gem State Project and the United States Geological Survey (USGS) gaging station at Shelley, Idaho, which is located at RM 802.3 (FERC 1983a). IFP is a department of the city of Idaho Falls, who has a year-round non-consumptive water right for 24,540 cfs authorized for a power beneficial use associated with the Projects (IDWR 2022).

In addition to agriculture, food processing, lumber, fertilizers, and concrete manufacturing also utilize high annual withdrawals of water from the Snake River. Food-processing industries withdraw relatively large volumes of water for meatpacking; fruit, vegetable and fish preparation and preservation; and beet sugar refining. Withdrawals for food processing follow a distinct seasonal pattern, with water use for sugar refining and potato processing being highest from September through March; water for canning and freezing of fruits and vegetables peaks from July through October; and water use for milk and meat processing industries is relatively constant throughout the year (Goodell 1988). Fish farms and hydroelectric power facilities are the primary non-consumptive[4] uses of water in the Upper Snake (Clark et al. 1998).

[4] Non-consumptive use is a term for water that is captured, treated, and may be reused, because it is not removed from the system. Once the water is used it may then be discharged back into the surface water or groundwater systems for recycling of supply (Arthur and Saffer n.d.).

3.2.1 MUNICIPAL AND DOMESTIC USE

The potable water for the city of Idaho Falls is supplied solely by groundwater sources derived from 19 water wells distributed across the city's service boundary. The water supply comes from the lower zone of the East Snake River Plain Aquifer, which stretches from St. Anthony, Idaho to Thousand Springs, near Twin Falls, Idaho (City of Idaho Falls 2015). More than 95 percent of public supply in the Snake River Plain is groundwater (Goodell, 1988). No municipal or domestic water is withdrawn from either the Idaho Falls Project or Gem State Project waters.

Additional details about water and land uses in the Project areas and vicinities are provided in Section 5.0, *Existing Environment* of this PAD.

3.2.2 RECREATION

The Snake River is a major feature in the city of Idaho Falls and as such, the city has developed several recreational facilities not relating to the hydro Projects providing residents and visitors access to the river. These include the Idaho Falls River Walk[5] (Photo 3-1), a 5-mile paved trail on both sides of the Snake River (City of Idaho Falls, n.d.). Separately, IFP manages recreation facilities as part of its existing licenses for the Idaho Falls Project and the Gem State Project (FERC 1979, 1983b). Detailed descriptions of recreational facilities associated with the Idaho Falls and Gem State Projects, as well as regional recreation access areas are provided in Section 5.7, *Recreation and Land Use*, of this PAD.

[5] While the river walk shares the Idaho Falls name, it is not associated with the Idaho Falls Hydroelectric Project as a FERC designated recreation facility.

Source: Kleinschmidt 2019

PHOTO 3-1 IDAHO FALLS RIVER WALK

3.3 OTHER DAMS AND DIVERSIONS

A hydropower dam built at RM 460.7 in 1901 at Swan Falls became the first to impound the mainstem of the Snake River. This was followed by Milner Dam at RM 647.2 in 1905, and Minidoka Dam at RM 682.2, completed in 1906 (Shallat 2022). The IFP dams were originally built between 1913 and 1946 and were rehabilitated in 1978 and 1982 (City of Idaho Falls 1978; IFP 2021). The Gem State Project Dam completed construction in 1988. The next dam upstream of the Idaho Falls Project on the Snake River is Palisades Dam; 92.9 miles upstream of the IFP Upper Plant. The Bureau of Reclamation's American Falls Dam is located 79.0 miles downstream from the Gem State Project (Table 3-1).

On the lower Snake River, 699.2 miles downstream of the IFP Projects, upstream of its confluence with the Columbia River, are four United States Army Corps of Engineers (USACE) operated hydropower dams including the 603-megawatt (MW) Ice Harbor Lock and Dam at RM 8.6, 810-MW Lower Monumental Lock and Dam at RM 39.2, 810-MW Little Goose Lock and Dam at RM 67.8, and 810-MW Lower Granite Lock and Dam at RM 104.9 (Shallat 2022). Figure 3-3, below, shows all dams and diversions present on the Snake River.

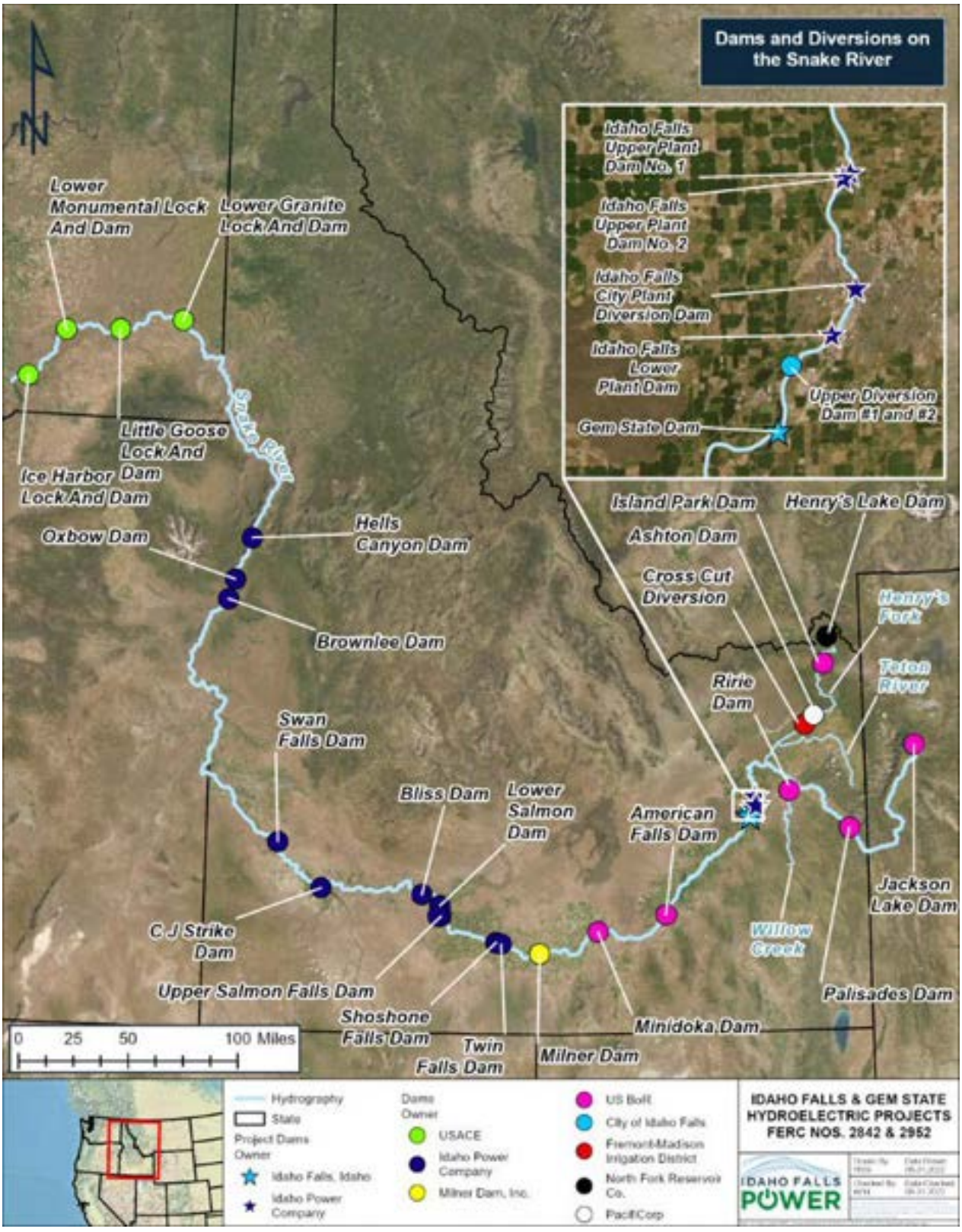

FIGURE 3-3 DAMS AND DIVERSIONS ON THE SNAKE RIVER

TABLE 3-1 NON-PROJECT DAMS ALONG THE SNAKE RIVER

Dam	River Mile	Owner
Swan Falls Dam	460.6	Idaho Power Company
Shoshone Falls Dam	622.4	Idaho Power Company
Twin Falls Dam	624.9	Idaho Power Company
Lower Salmon Dam	579.6	Idaho Power Company
Bliss Dam	566.7	Idaho Power Company
C J Strike Dam	497.7	Idaho Power Company
Hells Canyon Dam	246.1	Idaho Power Company
Brownlee Dam	282.8	Idaho Power Company
Oxbow Dam	271.7	Idaho Power Company
Upper Salmon Falls Dam	588.2	Idaho Power Company
Palisades Dam	908.6	BOR
American Falls Dam	725.1	BOR
Minidoka Dam	682.2	BOR
Milner Dam	647.2	Milner Dam, Inc.
Lower Monumental Lock and Dam	39.0	USACE
Little Goose Lock and Dam	67.8	USACE
Ice Harbor Lock and Dam	8.6	USACE
Lower Granite Lock and Dam	104.9	USACE
Jackson Lake Dam	1007.5	BOR

Source: Goodell 1988
BOR = United States Bureau of Reclamation, USACE = United States Army Corps of Engineers

3.3.1 TRIBUTARY RIVERS AND STREAMS

The Snake River has many tributary streams that provide a means of collecting the precipitation that accumulates in the mountains surrounding the Snake River Plain (University of Idaho 1998). The main tributaries that enter the Upper Snake Subbasin are Henry's Fork, Teton River, and Willow Creek. North of the city of Idaho Falls, the Snake River is joined by Henry's Fork and the Teton River, and Willow Creek from the south (City of Idaho Falls 1978) (Figure 3-4).

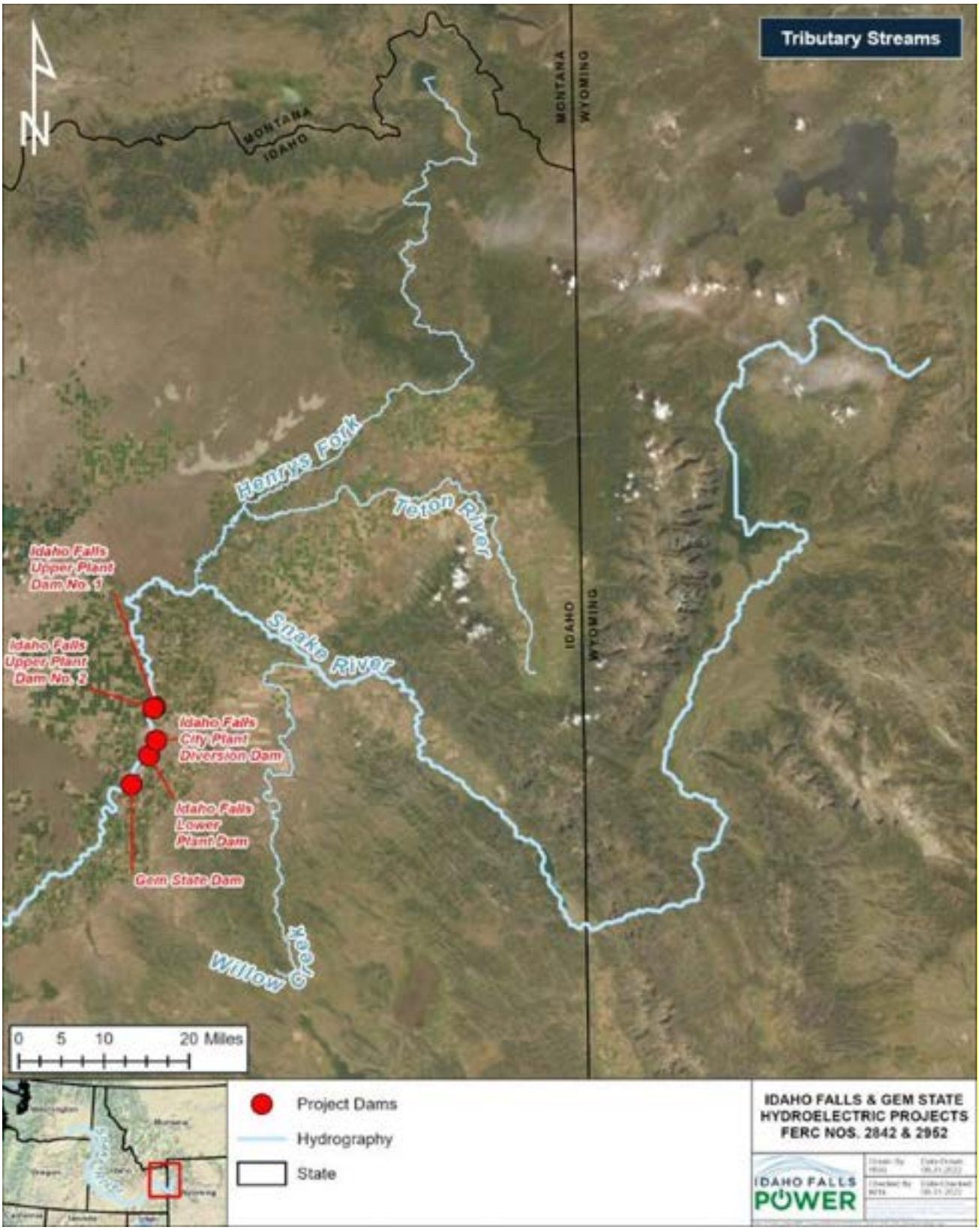

FIGURE 3-4 MAJOR TRIBUTARIES TO THE SNAKE RIVER IN THE UPPER SNAKE SUBBASIN

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4.0 PROJECTS LOCATIONS, FACILITIES, AND OPERATIONS

Per 18 CFR § 5.6(d)(2), the following sections describe the location, facilities, and operations of the Idaho Falls Project and the Gem State Project. Please note that measurements reported from the 1978 City of Idaho Falls License Application (Idaho Falls 1978) and 1979 FERC License (FERC 1979) are assumed to be in National Geodetic Vertical Datum (NGVD) unless referenced otherwise.

4.1 PROJECTS' LOCATIONS

The Projects are located on the Snake River near the city of Idaho Falls, in Bingham and Bonneville counties, Idaho (Figure 4-1). The three-development Idaho Falls Project facilities are located between RM 808.7 and 815.2, and the single-development Gem State Project is located at RM 804.2 (Figure 4-2). The Idaho Falls FERC Project Boundary is depicted in Figure 4-3 and the Gem State FERC Project Boundary is depicted in Figure 4-4. There are 27.6 acres of federal lands associated with the Idaho Falls Project and 5.78 acres of federal lands associated with the Gem State Project. A complete set of detailed maps showing lands and waters within the Project Boundary of each Project, as well as the township, range and section, state, county, river, river mile, and closest town, and the specific locations of any federal and tribal lands, are included in Appendix A of this PAD.

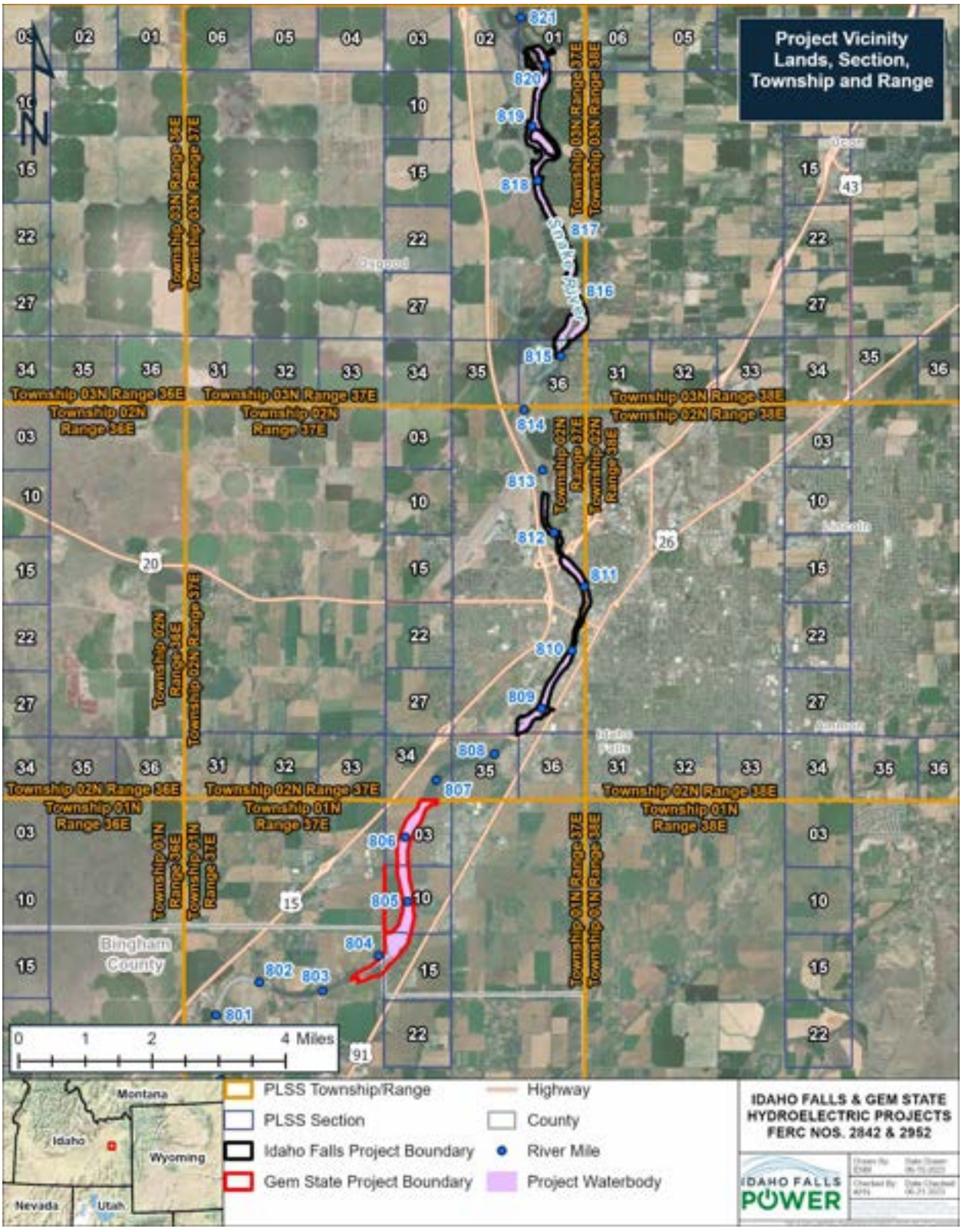

FIGURE 4-1 IDAHO FALLS AND GEM STATE PROJECT BOUNDARIES

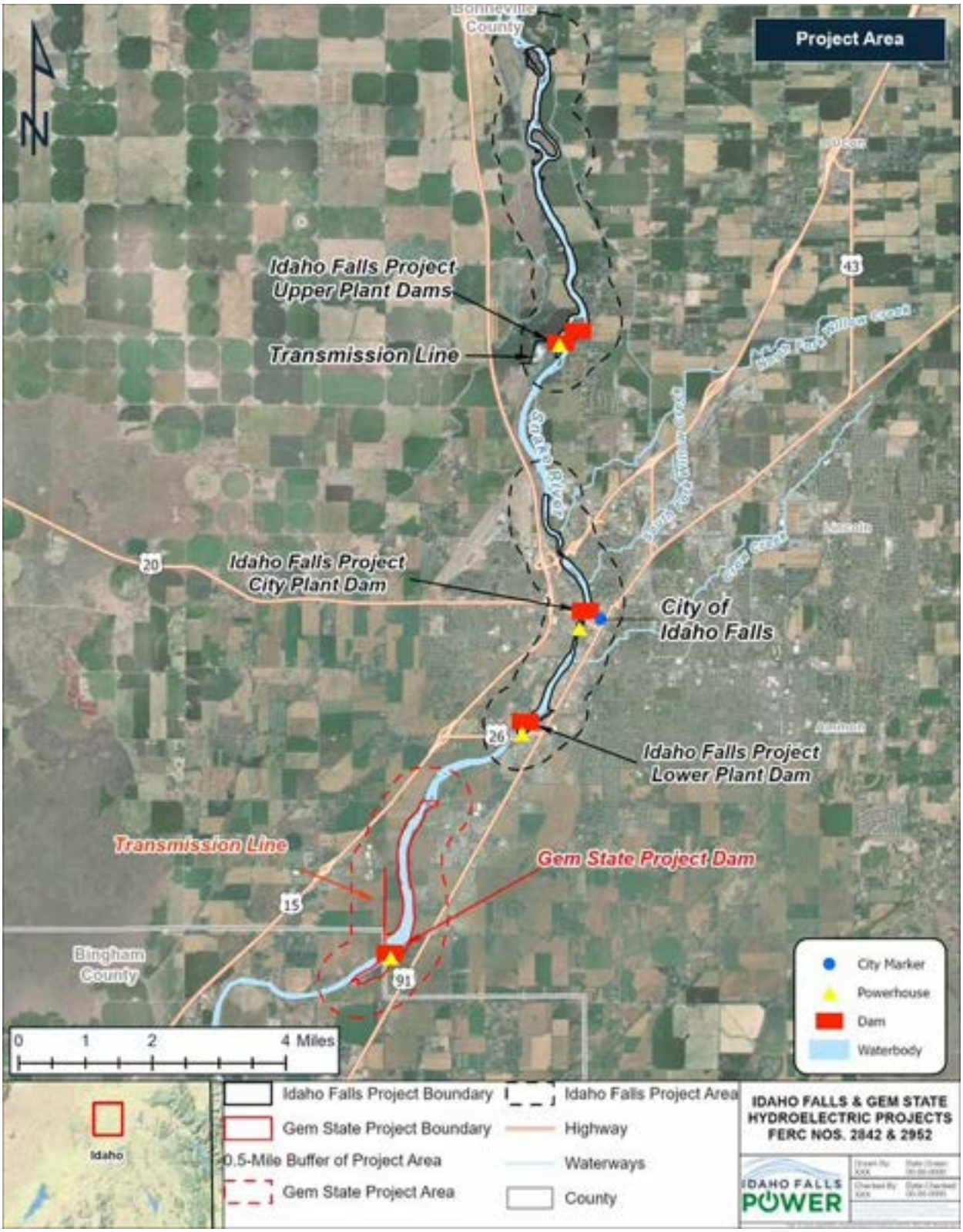

FIGURE 4-2 IDAHO FALLS PROJECT AND GEM STATE PROJECT LOCATIONS

4.2 PROJECTS' FACILITIES

4.2.1 IDAHO FALLS PROJECT FACILITIES

The Idaho Falls Project is a run-of-river facility consisting of three plants which all began commercial operation in 1982. The 24.6 MW Idaho Falls Project consists of three developments (Upper Plant, City Plant, and Lower Plant), located directly upstream of the Gem State Project on the Snake River in Bonneville County and extending approximately 7 miles upstream through and north of the city of Idaho Falls (Figure 4-2). Recreation facilities are described in Section 5.7, *Recreation and Land Use*, of this PAD. From north to south, the Idaho Falls Upper Plant is located in Township 03N, Range 37E and Township 03N, Range 38E, and the City and Lower Plant are located in Township 02N, Range 37E and Township 02N, Range 38E (Figure 4-2).

FIGURE 4-3 IDAHO FALLS FERC PROJECT BOUNDARY

4.2.1.1 TURBINES AND GENERATORS AT IDAHO FALLS PROJECT POWERHOUSES

The generating units at Upper, City, and Lower Plants are comprised of three identical axial-flow, horizontal bulb turbine generator with Kaplan runner and adjustable wicket gates (one at each plant) (FERC 1986). In each plant the generator is installed upstream of the turbine in a bulb-shaped steel casing. Table 4-1 provides the turbines capacity. The bulb unit is placed in the water flow at the center of the water passage, the shape and dimensions of which are dictated by the unit. The generator bulb provides a watertight casing for the assembled parts of the immersed equipment and give necessary access for inspection and maintenance. The turbine runner and generator rotor are mounted on a horizontal shaft with two guide bearings and a two-way thrust bearing (FERC 1986).

The loads and thrusts affecting the bulb are transferred to the concrete structure through a fixed vertical pedestal below the bulb and a fixed vertical column above the bulb. The column provides two access means into the turbine shaft and bearing area downstream of the generator. A separate shaft upstream of the generator carries the outgoing electrical bus duct, piping, and control able as well as providing maintenance access to the generator. The wicket gate operating ring is equipped with a counterweight to ensure emergency closure (FERC 1986).

An electronic-hydraulic governor controls the speed and load according to the forebay water level. Each governor includes a steel oil reservoir with an air-over-oil pressure tank accumulator; oil pumping equipment; an air compressor; and speed-sensing equipment with a speed signal generator mounted on the turbine generator shaft (FERC 1986).

TABLE 4-1 IDAHO FALLS PROJECT RATED CAPACITY OF TURBINES

Rated Capacity (hp)	Rated Capacity (MW)	Rated Head (ft)	Rated Speed (rpm)	Max. Net Head (ft)	Min. Net Head (ft)	Runner Diameter (ft)
11,130	8.3	18	94.7	20.1	13.3	15.91

Source: FERC 1986

The generators at the Upper, City, and Lower Plants are three-phase synchronous machines, forced air cooled, complete with static exciters. Table 4-2 provides their characteristics. An indoor-type,

5 kV generator circuit breaker is provided for all plants. The circuit breakers for all plants are installed in the control room of each plant (FERC 1986).

TABLE 4-2 IDAHO FALLS PROJECT GENERATOR CAPACITIES

Continuous Rating (kVA)	Voltage, Phase-to-Phase	Power Factor	Frequency (Hz)	Rated Speed (rpm)
8,900	4.16	0.80	60	94.7

Source: FERC 1986, Personal Communication 2023

Two upstream bulkheads and two downstream draft-tube bulkheads are provided for each unit. The turbine inlet has a central pier with two openings; each is provided with a steel bulkhead in four sections to enable the entrance to the unit to be closed completely. The draft-tube with two openings has two similar bulkheads. Each opening has side slots with fixed metal guide frames. One lifting beam with an automatic hooking device is used for removing and storing bulkheads.

4.2.1.2 UPPER PLANT FACILITIES

The Upper Plant Development facilities consist of two concrete and earthfill dams (Dam No. 1 and Dam No. 2), spillways and a powerhouse (Photo 4-1). Details of Upper Plant Facilities are described in Table 4-3.

Source: Kleinschmidt 2019

PHOTO 4-1 UPPER PLANT DAM NO. 1

TABLE 4-3 IDAHO FALLS UPPER PLANT DAM NO. 1 COMPONENTS SUMMARY

UPPER PLANT DAM NO. 1 FACILITIES	
ITEM	**DESCRIPTION**
Upper Plant Dam No. 1 Dependable Capacity	6.4 MW
Upper Plant Dam No. 1 River Mile (RM)	805 RM
Reservoir	
Normal Surface Area	100 acres
Normal Surface Elevation	4734.7 feet
Usable Storage Capacity	N/A
Gross Storage Capacity	800 acre-feet
Dams	
Height	23 feet
Normal Crest Elevation	4,740.5 feet
Length	600 feet
Layout (Composition & Configuration)	Low, concrete, earthfill, diversion structure with 150 feet by 10 feet hydraulically operated Pelican flap gates (for flood, ice-jam, and debris protection) and an uncontrolled concrete overflow spillway
Overflow Dam Dimensions	23 feet high, 600 feet long, 430 feet wide
Spillway Crest Elevation	4,734.7 feet
Intake	
Intake Construction	Installed for maximum flood discharge of 61,000 cfs with temporary surcharge upstream to elevation 4,378.7 feet
Intake Dimensions	39 feet 5.25 inches tall by 14 feet wide
Trashrack Dimensions	44 feet tall by 14 feet wide
Transmission Lines	
Number	N/A
Length	N/A
Voltage	N/A
Interconnections	Travels west into the Paine Substation and connects directly to the existing city of Idaho Falls 46 kV and 161 kV transmission system. The Upper Plant is connected to a 4.16 kV – 46 kV transformer rated at 7 mega volt ampere

Source: FERC 1978, IFP 2022, Personal Communication 2023

TABLE 4-4 IDAHO FALLS UPPER PLANT DAM NO. 2 COMPONENTS SUMMARY[6]

UPPER PLANT DAM NO. 2 FACILITIES	
ITEM	**DESCRIPTION**
Upper Plant Dam No. 2 Capacity	6.4 MW
Upper Plant Dam No. 2 River Mile (RM)	805 RM
Average Annual Energy Production	50,413.21 MWh
Average Annual Monthly Production	5.75 MWh
Reservoir	
Normal Surface Area	N/A
Normal Surface Elevation	N/A
Usable Storage Capacity	N/A
Gross Storage Capacity	N/A
Dams	
Height	33 feet
Normal Crest Elevation	4,734 feet
Length	470 feet
Layout (Composition & Configuration)	Concrete and earthfill diversion structure with a 40-foot by 11-foot pelican gate and concrete uncontrolled overflow spillway
Overflow Dam Dimensions	23 feet high, 600 feet long,430 feet wide
Spillway Crest Elevation	4,734 feet
Intake	
Intake Construction	Installed on the left side of the powerhouse with temporary surcharge in the forebay up to 4,739 feet for maximum flood discharge to 16,200 cfs.
Intake Dimensions	39 feet 5.25 inches tall by 14 feet wide
Trashrack Dimensions	44 feet tall by 14 feet wide
Powerhouse	
Year Built	1982

[6] Idaho Power 1978, Personal Communication 2023

UPPER PLANT DAM NO. 2 FACILITIES	
ITEM	**DESCRIPTION**
Construction Type	Concrete
Dimensions	140 feet long, 38 feet wide, 62 feet tall
Penstock	N/A
Tailrace	Extends 1,000 feet downstream from the powerhouse
Capacity of Generator	One 7,200 kW, 0.8 power factor, 4.16 kV, three-phase, synchronous machine, forced air cooled, complete with statis exciters installed
Installed (Rated) Capacity of Generator	One 7,200 kW, 0.8 power factor, 4.16 kV, three-phase, synchronous machine, forced air cooled, complete with statis exciters installed
Turbines	
Number	1
Type	Axial-flow, horizontal bulb, Kaplan runner and adjustable wicket gates
Estimated Hydraulic Capacity	6,000 cfs
Capacity of Turbine	8.3 MW
Installed (Rated) Capacity of Turbine	8.3 MW
Transmission Lines	
Number	One 3 phase
Length	0.5 miles
Voltage	46 kV
Interconnections	Travels west into the Paine Substation and connects directly to the existing city of Idaho Falls 46 kV and 161 kV transmission system. The Upper Plant is connected to a 4.16 kV – 46 kV transformer rated at 7 mega volt ampere

UPPER PLANT DAMS AND SPILLWAY

Located at RM 805 on the Snake River, Dam No. 1 is a 600-foot-long and 23-foot-high concrete and earthfill structure containing a 30-inch square sluice gate and two 150-foot by 10-foot pelican gates with a spillway crest elevation of 4,734.7 feet (United States Geological Survey [USGS] datum). Dam No. 1 diverts Snake River flows into the west channel for power generation at the powerhouse. This unlined channel extends about 3,000 feet downstream from the Snake River to the powerhouse.

Dam No. 2 is a 470-foot-long and 33-foot-high concrete and earthfill structure across the west channel of the river about 1,800 feet downstream of Dam No. 1, containing a 40-foot by 11-foot pelican gate with a spillway crest elevation of 4,734.0 feet (USGS datum) and an integral powerhouse containing a 7,200 kilowatt horizontal Kaplan bulb turbine generator; and appurtenant

facilities including generator leads, step-up transformers and approximately 300 feet of cable extending to IFP's distribution system (FERC 1979). The forebay channel extends downstream from the end of the diversion dam to the powerhouse for approximately 2,000 feet, passing under the Broadway Bridge.

RESERVOIR

The Dam No. 1 reservoir is a two-mile-long, 800-acre-foot gross capacity reservoir with a normal surface area of 100 acres (FERC 1979) and no usable storage capacity as the Project is considered run-of-river. The normal maximum water surface elevation is 4,734.7 feet. There is no reservoir associated with Dam No. 2 (City of Idaho Falls 1978).

POWERHOUSE

The Upper Plant Powerhouse is a 140-foot-long by 38-foot wide and 62-foot-tall concrete structure, flanked on both sides by concrete overflow dams and non-overflow earthfill dikes (Dam No. 2). A concrete deck provides access to the powerhouse (City of Idaho Falls 1978). The powerhouse contains a 7,200-kilowatt axial-flow horizontal Kaplan bulb turbine generator; and appurtenant facilities including generator leads, step-up transformers and approximately 300 feet of cable extending to IFP's overhead distribution system located on the east side of the powerhouse (FERC 1979).

TAILRACE

The tailrace channel at the Upper Plant extends about 1,000 feet downstream from the powerhouse to the river. The channel is excavated basalt bedrock for the deeper setting of the bulb turbine generator (City of Idaho Falls 1978).

TRANSMISSION LINES

One 3 phase 46 kV radial transmission line of approximately 0.5 miles in length, heading west into the Paine Substation and connects directly to the existing city of Idaho Falls 46 kV and 161 kV transmission system. The Upper Plant is connected to a 4.16 kV – 46 kV transformer rated at 7 mega volt ampere (MVA) /8.15 MVA (Oil and Air cooled [OA]/Forced Air [FA]) (City of Idaho Falls 1978).

4.2.1.3 CITY PLANT FACILITY

The City Plant Facility is located at RM 800 within the city of Idaho Falls (Photo 4-2). Components of the City Plant Facility are detailed in Table 4-5.

Source: Kleinschmidt 2019

PHOTO 4-2 CITY PLANT DAM

TABLE 4-5 CITY PLANT COMPONENTS SUMMARY TABLE[7]

CITY PLANT	
ITEM	**DESCRIPTION**
City Plant Dam Capacity	5.6 MW
City Plant Dam River Mile (RM)	RM 800
Average **Annual** Energy Production	47784.68 MWh
Average **Monthly** Energy Production	5.45 MWh
Reservoir	
Normal Surface Area	50 acres
Normal Surface Elevation	4,694 feet
Usable Storage Capacity	N/A
Gross Storage Capacity	400 acre-feet
City Plant Dam	
Height	7 feet on average, 20-30 feet at upstream section, and 18 feet at downstream section
Normal Crest Elevation	4,694.7 feet
Length	1,970 feet (1,870-foot-long section and 100-foot-long section)
Layout (Composition & Configuration)	Concrete gravity diversion dam with a 40-foot by 5-foot Bascule gate near the right abutment
Overflow Dam Dimensions	7-foot-tall main concrete section, 1,757-foot-long, and overflow section approximately 70 feet long
Spillway Crest Elevation	4,694.75 feet
Intake	
Intake Construction	Reinforced concrete 1980

[7] Idaho Power 1978, Personal Communication 2023

CITY PLANT	
ITEM	**DESCRIPTION**
Intake Dimensions	39 feet 5.25 inches tall by 14 feet wide
Trashrack Dimensions	44 feet tall by 14 feet wide
Powerhouse	
Year Built	1982
Construction Type	Concrete
Dimensions	140 feet long, 38 feet wide, maximum height of 62 feet with an adjacent control building-maintenance shop that is 50 feet by 115 feet
Penstock	N/A
Tailrace	350 feet downstream from powerhouse
Capacity of Generator	One 7,200 kW horizontal bulb turbine generator
Installed (Rated) Capacity of Generator	One 7,200 kW horizontal bulb turbine generator
Turbines	
Number	1
Type	Axial-flow, horizontal bulb, Kaplan runner and adjustable wicket gates
Estimated Hydraulic Capacity	6,000 cfs
Capacity of Turbine	8.3 MW
Installed (Rated) Capacity of Turbine	8.3 MW
Transmission Lines	
Number	N/A
Length	N/A
Voltage	N/A
Interconnections	Power output will be transmitted by a 300-foot cable to the existing 44/12.5-kV City substation

CITY PLANT DAM AND SPILLWAY

The City Plant Dam is a 1,970-foot-long and 30-foot-high concrete dam containing a 40-foot by 5-foot Bascule gate with a spillway crest elevation of 4,694.7 feet (USGS datum), located at RM

800. The City Plant Dam contains a 126-foot by 20-foot trashrack with a 20-foot-wide by 5-foot-high gated spillway that has a discharge capacity of 2,500 cfs and water surface elevation of 4,699 feet and is located across the east channel of the river about 600 feet upstream of the powerhouse.

RESERVOIR

The reservoir at the City Plant extends approximately one mile upstream from the City Plant Dam. It covers an area of approximately 50 acres at the normal water surface elevation of 4,694 feet. The gross storage capacity is 400 ac-ft (City of Idaho Falls 1978). There is no usable storage capacity associated with the Project as it is run-of-river.

POWERHOUSE

The City Plant Powerhouse is a 140-foot-long, 38-foot-wide, and 62-foot-tall concrete structure (FERC 1979), with a 50-foot-long by 115-foot-wide control building-maintenance shop adjacent to the powerhouse (City of Idaho Falls 1978). The powerhouse contains one axial-flow horizontal bulb Kaplan runner turbine with adjustable wicket gates. The proposed turbine has an installed (rated) capacity of 8.3MW (City of Idaho Falls 1978). The powerhouse also contains a 7,200-kW horizontal bulb turbine generator, and appurtenant facilities including generator leads, step-up transformers and about 200 feet of cable extending to the City Plant Substation (FERC 1979).

TAILRACE

The City Plant tailrace extends 350 feet downstream from the powerhouse to the river, and the channel is excavated basalt bedrock. Additional excavation was needed to deepen the setting for a new bulb turbine generator but did not pose any special problems. A 15-foot-wide ramp along the east side of the tailrace channel provides access to the top of the powerhouse draft-tube deck.

TRANSMISSION LINES

The City Plant does not have an associated transmission line. The power output of the City Plant is transmitted by a 46 kV cable approximately 300 feet in length which connects directly to the existing city of Idaho Falls 44/12.5-kV substation (City of Idaho Falls 1983). The City Plant generator is connected to a 4.16 – 46 kV -12.47/7.3kV transformer rated at 7.75/25/25 MVA (Forced Oil and Forced Air). This generator can be replaced by the IFP standard spare without the

12.47kv winding. Low voltage connections to the power transformer are by insulated cable. High voltage connections to the transformer are by uninsulated overhead conductors (City of Idaho Falls 1983). A single line drawing for the City Plant can be found in Volume II of this PAD.

4.2.1.4 LOWER PLANT FACILITY

Source: Kleinschmidt 2019

PHOTO 4-3 LOWER PLANT DAM AND POWERHOUSE

TABLE 4-6 LOWER PLANT COMPONENTS SUMMARY TABLE

LOWER PLANT	
ITEM	**DESCRIPTION**
Lower Plant Dam Capacity	6.1 MW
Lower Plant Dam River Mile (RM)	798 RM
Average Annual Energy Production	40,223.58 MWh
Average Monthly Energy Production	4.58 MWh
Reservoir	
Normal Surface Area	100 acres
Normal Surface Elevation	4,674 feet
Usable Storage Capacity	N/A
Gross Storage Capacity	800 acre-feet

LOWER PLANT	
ITEM	**DESCRIPTION**
Dam	
Height	14.0 feet
Normal Crest Elevation	4,674.5 feet
Length	930 feet
Layout (Composition & Configuration)	Concrete uncontrolled spillway section with eight 20 feet by 14 feet radial gates (one radial gate with concrete non-overflow section and seven radial gates with a gated spillway section), one 42 feet by 12 feet pelican flap gate, an intake/powerhouse section, and a new intake/powerhouse section.
Overflow Dam Dimensions	638 feet long with a non-overflow dam on the left side of the overflow dam and overflow section on right side of the existing overflow dam (both sides rebuilt in 1977)
Spillway Crest Elevation	4,674.5 feet
Intake	
Intake Construction	Reinforced concrete
Intake Dimensions	39 feet 5.25 inches tall by 14 feet wide
Trashrack Dimensions	Two 44 feet tall by 14 feet wide intakes
POWERHOUSE	
Year Built	1982
Construction Type	Reinforced concrete
Dimensions	Two concrete structures across the east channel (powerhouse one is 85 feet by 80 feet with two 1,500 kW generating units and powerhouse 2 is 140 feet by 38 feet with a 7,200-kW horizontal bulb turbine generator)
Penstock	N/A
Tailrace	Extends 80 feet downstream from the powerhouse
Capacity of Generators	Two generators with 2.4kV, 0.8 power factor, each are three-phase with nameplate rating of 1875 kVA
Installed (Rated) Capacity of Generators	Two generators with 2.4kV, 0.8 power factor, each are three-phase with nameplate rating of 1875 kVA
Turbines	
Number	2
Type	Standby Morgan Smith turbines with axial-flow, horizontal bulb, a Kaplan runner and adjustable wicket gates
Estimated Hydraulic Capacity	6,000 cfs
Capacity of Turbines	8.3 MW

LOWER PLANT	
ITEM	**DESCRIPTION**
Installed (Rated) Capacity of Turbines	8.3 MW
Transmission Lines	
Number	N/A
Length	N/A
Voltage	N/A
Interconnections	Connected by underground cable to the Rack Substation, the city of Idaho Falls kV transmission system, and to a 4.16 kV – 46 kV transformer rated at 7 mega volt ampere (MVA)/ 8.15 MVA.

LOWER PLANT DAMS AND SPILLWAY

The Lower Plant Dam is a 930-foot-long concrete dam with a crest elevation of 4,674.5 feet (USGS datum) across the west channel of the river at RM 798. The Lower Plant Dam has a spillway with a crest elevation of 4,674.5 feet (USGS datum) containing eight 20-foot by 14-foot radial gates and a 42-foot by 12-foot pelican gate (FERC 1979).

RESERVOIR

The Lower Plant reservoir is 2 miles long and covers an area of approximately 100 acres at the normal water surface elevation of 4,674 feet and has a minor effect on the tailwater at the City Plant. The gross storage capacity of the Lower Plant reservoir is approximately 800 acre-feet. There is no usable storage capacity associated with the Project as it is run-of-river.

POWERHOUSE

The Lower Plant began commercial operation in April 1982, although the two old Lower Plant units were installed and have been operational since 1942. There are two concrete powerhouse structures, which collectively constitute the structure across the east channel of the river. One powerhouse is an 85-foot by 80-foot powerhouse containing two 1,500 kW generating units, and the other is a 140-foot by 38-foot concrete powerhouse containing a 7,200-kW horizontal bulb turbine generator (FERC 1979).

STANDBY TURBINES AND GENERATORS

The Lower Power Plant has two Standby Morgan Smith turbines. One unit was installed in 1940 and the other in 1946 and are adjustable-blade (Kaplan) and fixed-blade propeller type, respectively. Each unit has a nameplate rating of 2,300 hp at 18-foot head and 138.5 rpm and an installed (rated) capacity of 8.3MW. The generators are 2.4 kV, 0.8 power factor, three-phase having nameplate rating of 1875 kVA each. Both generators are connected through generator circuit breakers to one three-phase 3750 kVA, 2.4-12.5 kV power transformer. The power plant is connected by an underground cable to a 12.5 kV circuit breaker position at the existing Rack Substation approximately 1,000 feet from the existing powerhouse (FERC 1979).

TAILRACE

The basalt bedrock tailrace channel at the Lower Plant extends 80 feet downstream from the powerhouse to the Snake River.

TRANSMISSION LINES

The Lower Plant is connected to the 46 kV system at the Rack Substation located approximately 1,000 feet upstream of the powerhouse. Like the Upper and City plants, the Lower Plant is also connected directly to the city of Idaho Falls kV transmission system. The Lower Plant is connected to a 4.16 kV – 46 kV transformer rated at 7 mega volt ampere (MVA) /8.15 MVA (Oil and Air cooled [OA]/Forced Air [FA]).

4.2.1.5 IDAHO FALLS PROJECT APPURTENANT FACILITIES

Electrical auxiliary equipment is located at the upper level of each power plant. This equipment is comprised of control switchboards, a station service transformer, station batteries and charger, low voltage alternating current (AC) and direct current (DC) switchgear, and other auxiliary and control equipment.

A 12-foot-wide service road downstream from the Upper Plant Powerhouse on the right bank provides access to the top of the draft-tube deck.

Two trashracks, composed of several panels of flat bars supported on cross beams, are provided for each unit; one for each turbine inlet opening.

4.2.2 GEM STATE PROJECT FACILITIES

The 22.6 megawatt (MW) Gem State Project is a run-of-river generating facility consisting of one development, built in 1987, and is located on the Snake River at RM 804.2, in Bingham and Bonneville counties, Idaho, approximately 5.5 miles southwest of the city of Idaho Falls (Figure 4-3). The Gem State Project is located in Township 02N, Range 37E and Township 01N, Range 37E (Figure 4-4). All facilities associated with the Gem State Project are described in Table 4-7.

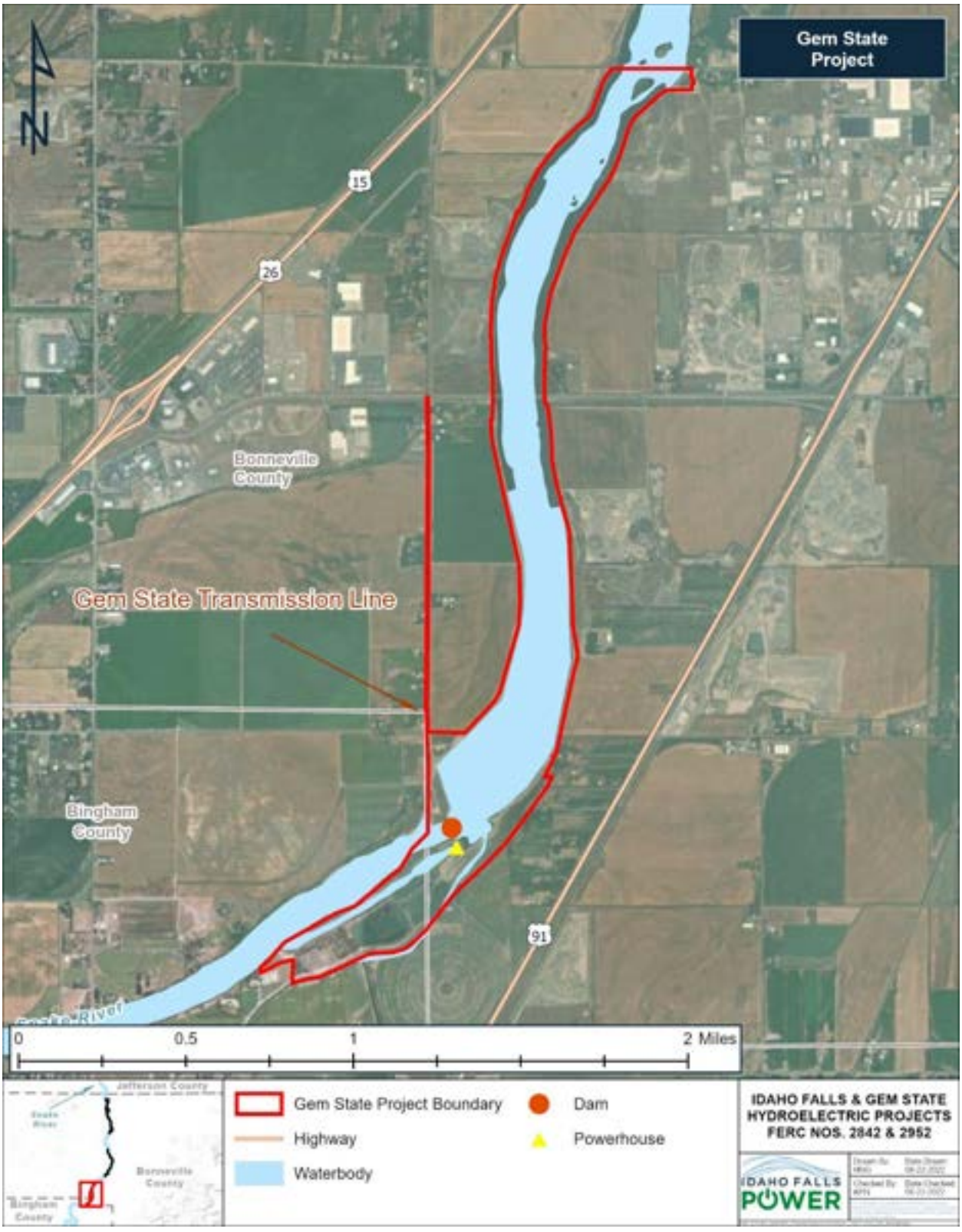

FIGURE 4-4 GEM STATE FERC PROJECT BOUNDARY

Source: Kleinschmidt 2019

PHOTO 4-4 GEM STATE DAM

TABLE 4-7 GEM STATE PROJECT COMPONENTS SUMMARY

ITEM	DESCRIPTION
Gem State Dam Capacity	22.3 MW
Gem State Dam River Mile	RM 790
Average **Annual** Energy Production	132,113.27 MWh
Average **Monthly** Energy Production	15.05 MWh
Reservoir	
Normal Surface Area	305 acres
Normal Surface Elevation	4,655.0 feet
Usable Storage Capacity	N/A
Gross Storage Capacity	Approximately 5,000 acre-feet
Dam	
Height	40 feet
Normal Crest Elevation	4,600 feet
Length	900 feet
Layout (Composition & Configuration)	900-foot-long earth and rock fill dam with a maximum height of approximately 60 feet, a 7,300-foot-long earth fill dike on right bank and a 10,400-foot-long earth fill dike on left bank
Spillway Crest Elevation	4,625 feet
Intake	

ITEM	DESCRIPTION
Intake Construction	Reinforced concrete
Intake Dimensions	Two 45 feet tall by 25 feet and 2 inch wide
Trashrack Dimensions	30 feet 10 inches tall by 25 feet by 2 inches wide
Powerhouse	
Year Built	1988
Construction Type	Reinforced concrete
Dimensions	66 feet wide by 152 feet long by 110 feet high
Penstock	N/A
Tailrace	3,300 feet long and 100 feet wide located between the powerhouse and river
Capacity of Generator	One vertical-axis Kaplan unit with adjustable-blade runner and wicket gates
Installed (Rated) Capacity of Generator	One vertical-axis Kaplan unit with adjustable-blade runner and wicket gates
Turbines	
Number	1
Type	Single Kaplan Vertical
Estimated Hydraulic Capacity	7,000 cfs
Capacity of Turbine	22.3 MW
Installed (Rated) Capacity of Turbine	22.3 MW
Transmission Lines	
Number	1
Length	1.4 miles
Voltage	161-kV
Interconnections	Connect from the powerhouse across the spillway discharge channel to the Utah Power and Light existing distribution line and then ties into the city of Idaho Falls' existing 161-kV south loop transmission line

4.2.2.1 DAM

The Gem State Project Dam is a 900-foot-long, 40-foot-high earthfill, concrete, and rockfill dam (Photo 4-4). The crest elevation is 4,600 feet; the top width is 20 feet, including riprap. The dam embankment is zoned and includes an impervious core, sand filter, and gravel shells. The upstream face is protected from erosion using rock riprap (FERC 1990).

4.2.2.2 RESERVOIR

The Gem State Project reservoir extends 20,000 feet upstream. The normal reservoir water surface elevation is 4,655 feet. At normal pool elevation, the reservoir has a surface area of 305 acres and

gross storage capacity of 5,000 ac-ft. There is no usable storage capacity associated with the Project as it is run-of-river (FERC 1990).

4.2.2.3 POWERHOUSE

The Gem State Project powerhouse is located adjacent to the spillway. The dimensions of the powerhouse are 152 feet long, 66 feet wide, and 107 feet deep measured from rock beneath the draft-tube to roadway deck (FERC 1990).

4.2.2.4 SPILLWAY

The Gem State Project spillway has five radial gates with the spillway crest at elevation 4,625 feet. In the fully closed position, the top of the gates is at elevation 4,656 feet. With all spillway gates in the fully opened position, the hydraulic capacity is 11,300 cfs, which approaches the Probable Maximum Flood (PMF). Each bay is 46 feet wide and 31 feet high. A 20-foot-wide roadway has been provided over the spillway (FERC 1990).

4.2.2.5 TAILRACE

The 3,300-foot-long tailrace is located between the powerhouse and the river with a constant width of 100 feet, excavated from native basalt rock and includes one 700-foot riprapped section. The tailrace enters the river via flared and curved section that raises the invert elevation from elevation 4,595 feet to the riverbed elevation of 4,607 feet. Access to the area between the tailrace and the river is provided from the gravity wall between the powerhouse and the spillway (FERC 1990).

4.2.2.6 DRAINAGE FACILITIES

Earthfill dikes (river-right and river-left) are constructed so that surrounding area drainage does not collect at their toes. The left dike has an open-jointed reinforced concrete collection pipe beneath its landward toe to intercept any seepage coming through the dike. The diameter varies from 24 inches to 36 inches discharging into the tailrace. In addition to dike seepage, this drain also accommodates excess irrigation water form three adjacent landowners by means of strategically located catch basins. The right bank dike also has a seepage collector drain beneath is landward toe, made of perforated corrugated PVC pipe varying in diameter from 12 inches to

24 inches. Its discharge point is slightly beneath ground surface on the right abutment (FERC 1990).

4.2.2.7 TURBINES AND GENERATORS

The Gem State Project consists of one conventional vertical-axis Kaplan turbine and generator. The unit has an adjustable-blade runner with wicket gates. Characteristics are provided in Table 4-8 below. An outdoor-type, 161-kV circuit breaker is provided (FERC 1990).

TABLE 4-8 GEM STATE TURBINE CAPACITY

Rated Discharge (cfs)	Output at Rated Head (hp)	Output at Rated Head (kW)	Rated Head (ft)	Max. Head (ft)	Runner Diameter (ft)
7,000	31,258	22,600	42	42	18.37

Source: FERC 1990

The Gem State Project generator is a three-phase synchronous machine, forced air collect, with static exciter (FERC 1990). The generator specifications are included in Table 4-9 below.

TABLE 4-9 GEM STATE GENERATOR CHARACTERISTICS

Continuous Rating (kVA)	Rated Armature Voltage	Power Factor	Frequency (Hz)	Synchronous Speed (rpm)
26,000	13,800	0.8	60	100

Source: FERC 1990

An electronic-hydraulic governor controls the turbine load according to the forebay water level. The governor includes a steel oil reservoir with an air-over-oil pressure tank accumulator, oil pumping equipment, air compressor, and speed-sensing equipment with a speed signal generator mounted on the turbine generator shaft (FERC 1990).

One set of two upstream bulkheads and two downstream draft-tube bulkheads have been provided. The upstream bulkheads intake gates are roller-mounted and are stored in their slots. The downstream bulkheads, draft-tube gates, are slide gates and are also stored in their slots. All gates are serviced by rubber-tired mobile cranes (FERC 1990).

4.2.2.8 PRIMARY TRANSMISSION LINES

The Gem State Project transmission line is a 1.4-mile-long, 161-kV overhead line from the powerhouse across the spillway discharge channel, immediately downstream of the gates, to an intersection with the Rocky Mountain Power (RMP), formerly Utah Power & Light, existing distribution line. From that point it replaces RMP poles to a point on the north side of Highway 26, where it ties into the city of Idaho Fall's existing 161-kV south loop transmission line. The previously existing RMP distribution line is now underbuilt on the Project 161-kV poles (FERC 1990).

Power generated at the Gem State Plant is stepped up to transmission voltage at a substation located at the powerhouse. The transmission line leaves this substation via a takeoff tower (FERC 1990).

One three-phase 13.8-161 kV, 15/20-250 MVA OA/FA power transformer is provided to step up the voltage. Primary and secondary connections to the power transformer are by insulated cable (FERC 1990).

4.2.2.9 GEM STATE PROJECT APPURTENANT FACILITIES

Electrical auxiliary equipment is located on the operating level of the power plant. This equipment is comprised of control switchboards, a station service transformer, station batteries and charger, low voltage AC and DC switchgear, and other auxiliary and control equipment.

Gravel surface access roads have been provided at the spillway and powerhouse. Access from the right bank to the spillway is from improved gravel access via the top of the dam. Access to the left bank and powerhouse is from Canyon Road, a county line road, via an access road to the site.

4.2.3 PROJECTS' OPERATIONS

Both the Idaho Falls and Gem State Projects are run-of-river projects. Flows through each powerhouse (in cfs) are displayed in the IFP control room to ensure operators are aware of the flow rate at all times. A single supervisory control and data acquisition (SCADA) system is run from the control room at the IFP main office located adjacent to the City Plant bulb turbine unit. This system is used for all three bulb projects (Idaho Falls Project) as well as the Gem State Project (IFP 2018).

More information is provided below on the Projects. Additional information concerning water quantity and quality, water rights, and usage of water is provided in Section 5.2, *Water Resources*, of this PAD.

4.2.3.1 IDAHO FALLS PROJECT OPERATIONS

During normal operations, all three of the Idaho Falls Project's hydroelectric plants are controlled remotely from a central room located in the control and maintenance building at the City Plant. The master station of the SCADA system is installed in this room. Local controls are also provided at each plant.

Pursuant to the current Idaho Falls Project license, Article 40 requires IFP to discharge a continuous minimum flow of 100 cfs at the Upper Plant diversion dam, and reserves FERC's authority to order an increase in minimum flows if 100 cfs proves to be inadequate to maintain water quality.

The water rights for the Project include existing prior rights plus additional claims and applications on file with the state of Idaho Department of Water Resources (IDWR). The sum of these existing rights, claims, and applications total 6,000 cfs for the Upper Plant; 6,000 cfs for the City Plant; and 8,440 cfs for the Lower Plant. The right to use these flow volumes at each site allows operation of the plants at full design capacity (City of Idaho Falls 1978).

4.2.3.2 GEM STATE PROJECT OPERATIONS

The Gem State Project is a run-of-river project with no draw down and fill operations. Flow forecasting is done with a combination of upstream gates and releases scheduled from upstream storage reservoirs not controlled by IFP. All river flows, except for the license required bypass flow of approximately 20 cfs, are passed through the turbine for flows up to 7,000 cfs, which is the hydraulic capacity of the turbine. The powerhouse wicket gates are adjusted to maintain plant intake/forebay elevation between 4,654.9 and 4,655.2 feet. Spillway radial gates are to be opened gradually at flows greater than 7,000 cfs to maintain the normal pool elevation (IFP 2018).

If the powerplant trips offline or is taken offline for maintenance and flow through the powerhouse is interrupted, Radial Gates 1 and/or 2 are opened to pass the flow and maintain the forebay level. The gates are also opened to pass flows that exceed 7,000 cfs (IFP 2018).

Flood flows greater than turbine capacity (7,000 cfs) are routed through the spillway. Gates can be opened manually or automatically from the central control room. Normal operation is sequential rather than partial opening of multiple gates. Should flows in excess of 70,000 cfs occur, Radial Gates 3, 4, or 5 would be opened accordingly to maintain the forebay elevation parameters defined in the existing license. The powerhouse will be shut down and protected against high tailwater by placing stoplogs in the tailrace at flows above 70,000 cfs. All flows will then pass through the spillway. The capacity of the spillway at the normal reservoir elevation, with all gates open, is 114,000 cfs (IFP 2018).

Additional information concerning water quantity and quality, water rights, and usage of water is provided in Section 5.2, *Water Resources*, of this PAD.

4.2.4 DEPENDABLE CAPACITY

The dependable capacity, in MWs, and the average annual, and average monthly energy production in kilowatt hours (kWh) for the Idaho Falls and Gem State Projects are provided in Table 4-10.

TABLE 4-10 DEPENDABLE CAPACITY OF PROJECTS FROM 2017-2021

Project	Dependable Capacity (MW)	Average Annual Energy Production (kWh)	Average Monthly Energy Production (kWh)
Idaho Falls Upper Plant	8.2	50,413.21	5.75
Idaho Falls City Plant	8.2	47,784.68	5.45
Idaho Falls Lower Plant	8.2	40,223.58	4.58
Total Idaho Falls Project	24.6	138,421.47	5.25
Gem State Project	22.6	132113.27	15.05

Source: Idaho Falls Power

4.2.5 EXISTING LICENSE

Per 18 CFR § 5.6(d)(2)(v), the following text describes information required to be included in the Pre-Application Document for an existing license.

4.2.5.1 IDAHO FALLS PROJECT CURRENT LICENSE REQUIREMENTS

The Idaho Falls Project license is subject to FERC's standard terms and conditions designated Articles 1 through 19 and 21 through 37 set forth in Form L-6 (revised October 1975), entitled Terms and Conditions of License for Unconstructed Major Project Affecting Navigable Waters and Lands of the United States. Additional, Project-specific license articles are stated in the 1979 Order Issuing License (Major) and are summarized in Table 4-11.

TABLE 4-11 IDAHO FALLS PROJECT LICENSE REQUIREMENTS

Article	Requirement
Article 38	Before beginning construction of any project work, the Licensee shall submit and obtain approval by the Director, Office of Electric Power Regulation, revised Exhibit L drawings conforming to the Commission's Regulations and showing the final designs of that project work. The project works shall be designed to be stable, structurally sound, and safe, to the satisfaction of the Director.
Article 39	Within one year from the date of issuance of this license, the licensee shall submit for approval by the Director, Office of Electric Power Regulation, a plan and schedule for replacing the concrete in the radial gate portion of the Lower Plant development.
Article 40	Pending further order by the Commission, on its own motion or at the request of others, the Licensee shall discharge a continuous minimum flow of 100 cfs at Dam No. 1 at the Upper Plant. This flow may be modified temporarily if required: (1) by operating emergencies beyond the control of the Licensee; or (2) for fishery management purposes, upon mutual agreement between the Licensee and the Idaho Department of Fish and Game.
Article 41	The licensee shall dispose of, in a suitable location, all waste material generated from demolition of existing and temporary structures at each plant site, dredged or excavated material, unused timber, brush, refuse, or other unneeded material resulting from construction, from clearing land, or from the maintenance or alteration of project works. All clearing of lands and disposal of waste material shall be carried out with due diligence in a manner that will preserve the environmental values of the project area, to the satisfaction of the authorized representative of the Commission, and in accordance with appropriate Federal, state, and local laws and regulations. All material accumulated behind cofferdams installed to facilitate project construction and development shall be removed for disposal before the cofferdams are removed.
Article 42	Within one year from the date of issuance of this order the Licensee shall file for approval a revised Exhibit R that conforms to the requirements of the Commission's Regulations. The revised Exhibit R shall include, among other things: a description, schedule, and estimated costs for developing the potential recreational resources on the Upper Plant Island, at the boat access area near the Upper Plant diversion dam, and on Keefer Island in the reservoir of the City Plant development; revised Exhibit R drawings (with appropriate references to Exhibit K), to include within the project boundary: (a) all lands currently designated by the Licensee (in its master plan or elsewhere) as existing or future recreation sites at the project for boat ramps, docks, and

Article	Requirement
	swimming areas; and (b) all islands or parts of islands in project waters that are owned by the Licensee; and detailed site development drawings of all existing and future project recreational areas.
Article 43	If any previously unrecorded archeological or historical sites are discovered during the course of construction or development of any project works or other facilities, construction activity shall be halted in the vicinity, a qualified archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the State Historic Preservation Officer (SHPO) to develop a mitigation plan for the protection of significant archeological or historic resources. The Licensee shall provide funds in a reasonable amount for such activity. If the Licensee and SHPO cannot agree on the amount of money to be expended on archeological or historic work related to the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any such work found necessary.
Article 44	Within one year of completion of project construction, the Licensee shall file a revised Exhibit F and, for approval, 'as built' Exhibits K, L and M, to show and describe the project works and equipment and appurtenances as finally constructed and located, including the project generator leads, step-up transformers, and cables extending to the Licensee's distribution system.
Article 45	Licensee shall file with the Commission, implement, and modify when appropriate, an emergency action plan designed to provide an early warning to upstream and downstream inhabitants and property owners if there should be an impending or actual sudden release of water caused by an accident to, or failure of, project works. That plan shall be submitted prior to initial operation of the project and shall include: instructions to be provided on a continuing basis to operators and attendants for actions they are to take in the event of an emergency; detailed and documented plans for notifying law enforcement agents, appropriate Federal, state, and local agencies, operators of water-related facilities, and those residents and owners of properties that could be endangered; actions that would be taken to reduce the inflow to the reservoir, if possible, by limiting the outflow from upstream dams or control structures; and actions to reduce downstream flows by controlling the outflow from dams located on tributaries to the stream on which the project is located. Licensee shall also submit a summary of the study used as a basis for determining the areas that may be affected by an emergency, including criteria and assumptions used. Licensee shall monitor any changes in upstream or downstream conditions which may influence possible flows or affect areas susceptible to damage and shall promptly make and file with the Commission appropriate changes in the emergency action plan. The Commission reserves the right to require modifications to the plan.

Article	Requirement
Article 46	In the interests of protecting and enhancing the scenic, recreational and other environmental values of the project, the Licensee: (1) shall supervise and control the use and occupancy of project lands and waters; (2) shall prohibit, without further Commission approval, the further use and occupancy of project lands and waters other than as specifically authorized by this License; (3) may authorize, without further Commission approval, the use and occupancy of project lands and waters for landscape plantings and the construction, operation, and maintenance of access roads, power and telephone distribution lines, piers, landings, boat docks, or similar structures and facilities, and embankments, bulkheads, retaining walls, or other similar structures for erosion control to protect the existing shoreline; (4) shall require, where feasible and desirable, the multiple use and occupancy of facilities for access to project lands and waters; and (5) shall ensure to the satisfaction of the Commission's authorized representative that all authorized uses and occupancies of project lands and waters (a) are consistent with shoreline aesthetic values, (b) are maintained in a good state of repair, and (c) comply with state and local health regulations. Under item (3) of this article, the Licensee may, among other things, institute a program for issuing permits to a reasonable extent for the authorized types of use and occupancy of project lands and waters. Under appropriate circumstances, permits may be subject to the payment of a fee in a reasonable amount. Before authorizing the construction of bulkheads or retaining walls, the Licensee shall: (a) inspect the site of the proposed construction, (b) determine that the proposed construction is needed, and (c) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site. If an authorized use or occupancy fails to comply with the conditions of this article or with any reasonable conditions imposed by the Licensee for the protection of the environmental quality of project lands and waters, the Licensee shall take appropriate action to correct the violations, including, if necessary, cancellation of the authorization and removal of any non-complying structures or facilities. The Licensee's consent to an authorized use or occupancy of project lands and waters shall not without its express agreement, place upon the Licensee any obligation to construct or maintain any associated facilities.
Article 47	Requires the licensee to install and operate signs, lights, sirens, or other safety devices that may reasonably be needed to warn public of fluctuations in flow from the project and protect the public in its recreational use of project lands and waters.

Article	Requirement
	The Licensee shall, to the satisfaction of the Commission's authorized representative, install and operate any signs, lights, sirens, or other safety devices that may reasonably be needed to warn the public of fluctuations in flow from the project and protect the public in its recreational use of project lands and waters.
Article 48	Requires the licensee to continue to consult and cooperate with U.S. Fish and Wildlife Service (FWS) and other appropriate agencies, during the period of the license, for the protection and enhancement of natural values and resources of the project area. During the period of this license, the Licensee shall continue to consult and cooperate with the U.S. Fish and Wildlife Service of the Department of the Interior, and other appropriate Federal, state, and local agencies for the protection and enhancement of the natural resources and values of the project area.
Article 49	The Licensee shall commence construction of the project within two years from the effective date of this license and, in good faith and with due diligence, shall prosecute and complete construction of the project works within six years of the effective date of this license.
Article 50	During the construction of project works, Licensee shall take all necessary precautions to prevent accidental spillage of chemical, toxic, or other polluting materials into project waters. If spillage of such materials should occur, Licensee shall take all practicable measures to clean up and dispose of those materials to preserve the ecosystem in the vicinity of the project.
Article 51	*FERC's January 26, 1993 Order Amending License and Revising Annual Charges Revised Article 51 to read as follows:* The Licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued: (i) For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable annual charge as determined by the Commission in accordance with the provisions of its Regulations in effect from time to time. The authorized installed capacity for that purpose is 32,800 horsepower;

Article	Requirement
	(ii) For the purpose of recompensing the United States for the use, occupancy, and enjoyment of its lands, an amount as may be determined from time to time pursuant to the Commission's regulations. The acreage of land for such purpose is as follows: a. The acreage for land other than for transmission line right-of-way is 9.61. b. The acreage for land for transmission line right-of-way is 0.25.

Source: FERC 1979

4.2.5.2 GEM STATE PROJECT CURRENT LICENSE REQUIREMENTS

The Gem State Project license is subject to FERC's standard terms and conditions set forth in Form L-6 (revised October 1975), entitled Terms and Conditions of License for Unconstructed Major Project Affecting Navigable Waters and Lands of the United States. Additional, Project-specific license articles are stated in the 1983 Order Issuing License (Major) and summarized in Table 4-12.

TABLE 4-12 GEM STATE PROJECT LICENSE REQUIREMENTS

Article	Requirement
Article 38	The Licensee shall, within 90 days of completion of construction file, for approval by the Director, Office of Electric Power Regulation, revised Exhibits F, G, and A to describe the project as-built.
Article 39	The Licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to start of construction and shall ensure that construction of cofferdams and deep excavations are consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the Licensee shall file with the Commission's Regional Engineer and Director, Office of Electric Power Regulation, one copy of the approved cofferdam construction drawings and specifications and a copy of the letter(s) of approval.
Article 40	The Licensee shall commence construction of the project works within two years from the issuance date of the license and shall complete construction of the project within five years from the issuance date of the license.
Article 41	The Licensee shall file with the Commission's Regional Engineer and the Director, Office of Electric Power Regulation, one copy each of the contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse and water conveyance structures, at least 60 days prior to the start of construction. The Director, Office of Electric Power Regulation, may require changes in the plans and specifications to assure a safe and adequate project.
Article 42	The Licensee shall retain a Board of three or more qualified; independent, engineering consultants to review the design, specifications and construction of the project for safety and adequacy, inter alia: (l) possible foundation problems in the basalt bedrock; (2) potential groundwater problems; (3) length of earthfill dam and dikes and slurry cutoff wall; (4) lack of PMF determination; and (5) possible inadequate spillway capacity.
Article 43	The Licensee shall file revised Exhibit F drawings showing the final design of the project structures for approval by the Director, Office of Electric Power Regulation. The revised Exhibit F drawings shall be filed at least 60-days prior to start of construction and shall be accompanied by a supporting design report. The Licensee shall not commence construction of any project structure until the revised Exhibit F therefore has been approved.

Article	Requirement
Article 44	(a) In accordance with the provisions of this article, the Licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The Licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the Licensee shall also have continued responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the Licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or, if a covenant of a conveyance made under the authority of this article is violated, the Licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities. (b) The type of use and occupancy of project lands and waters for which the Licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) noncommercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; (4) food plots and other wildlife enhancements. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the Licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The Licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the Licensee shall: (1) inspect the site of the proposed construction; (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the Licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the Licensee's costs of administering the permit program. The Commission reserves the right to require the Licensee to file a description

Article	Requirement
	of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures. (c) The Licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and Federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69 kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the Licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. (d) The Licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and Federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary Federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary Federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the Licensee must submit a letter to the Director, Office of Energy Projects, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any Federal or state agency official

Article	Requirement
	consulted, and any Federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the Licensee to file an application for prior approval, the Licensee may convey the intended interest at the end of that period. (e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article: (1) Before conveying the interest, the Licensee shall consult with Federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer. (2) Before conveying the interest, the Licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value. (3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters. (4) The Commission reserves the right to require the Licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values. (f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

Article	Requirement
Article 45	*FERC's July 23, 1990 Order Amending Articles 45 and 46 and Approving and Modifying a Revised Water Quality Monitoring Plan Revised Article 45 to read as follows:* The licensee shall conduct water quality monitoring according to the plan approved by the Commission. Monitoring results shall be maintained by the licensee and provided to the U.S. Fish and Wildlife Service, the Idaho Department of Fish and Game, and the Environmental Protection Agency upon completion of the monitoring study. The Licensee shall file a report regarding project-induced changes in water quality with the Commission by November 30, 1990. The report shall include, but be not limited to, plots of water temperatures and dissolved oxygen concentrations versus sampling date for each of the test flows, a summary of the water quality monitoring data in tabular form, and the aforementioned resource agency comments. Based on this report, the Commission reserves the right to change project operations and or require additional monitoring to ensure maintenance of the dissolved oxygen concentrations and water temperatures necessary to protect the fish resources of the Snake River.
Article 46	*FERC's July 23, 1990 Order Amending Articles 45 and 46 and Approving and Modifying a Revised Water Quality Monitoring Plan Revised Article 46 to read as follows:* The licensee shall maintain in the reach between the toe-of-the-dam and backwater reach of the Snake River a continuous minimum flow of 20 cubic feet per second, as measured immediately downstream from the dam, or inflow to the reservoir, whichever is less, for the purpose of maintaining state water quality standards and protecting aquatic resources. The flow may be temporarily modified if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between Licensee, the Idaho Department of Fish and Game, and the U.S. Fish and Wildlife Service.
Article 47	The Licensee shall, after consultation with the U.S. Environmental Protection Agency and the Idaho Department of Health and Welfare, and prior to any sediment disturbing activity, survey the Snake River bottom in the project construction area, to ensure that no containers of hazardous materials exist, and sample the bottom sediments to determine whether detectable levels of hazardous materials are present. The results of the surveys and sampling shall be provided to the consulted agencies. Should the results of the survey or sampling indicate the need for hazardous material removal, the Licensee shall in cooperation with the consulted agencies develop a removal plan, to be filed with the Commission, for approval.

Article	Requirement
	Hazardous material removal, if needed, shall be completed prior to any project construction or operation related sediment disturbing activity.
Article 48	The Licensee, after consultation with the U.S. Fish and Wildlife Service, Bureau of Land Management, and Soil Conservation Service, and the Idaho Department of Fish and Game, shall prepare and file with the Commission's Regional Engineer in Fort Worth, Texas, and the Director, Office of Electric Power Regulation, at least 60 days prior to any ground disturbing activity at the Gem State Project, a detailed plan to control erosion, dust, and slope stability and to minimize the quantity of inorganic sediment or other potential water pollutants resulting from construction and operation of project facilities.
Article 49	*FERC's November 5, 1985 Order Amending License Revised Article 49 to read as follows:* The Licensee, after consultation with the Idaho Department of Fish and Game, U.S. Fish and Wildlife Service, Bureau of Land Management, and soil conservation Service, shall prepare and file for Commission approval, by March 31, 1986, a mitigation plan (Plan) for wildlife and botanical resources. The Plan shall include, but not be limited to a schedule of implementation; the location and number of acres of riparian habitat to be acquired outside the project boundary; number of acres and location of the riparian habitat, including the goose nesting islands to be replaced within the project boundary; and specific construction and maintenance techniques to be used for on-site mitigation of riparian habitat. Documentation of agency consultation on the report and recommendations shall be included in the filing.
Article 50	The Licensee shall, after consultation with BLM, the National Park Service, and the Idaho Department of Parks and Recreational (IDPR), prepare a revised Report on Recreation Resources for Project No. 2952, which shall include, but not be limited to (1) the location of appropriate facilities to be developed for Recreational Sites, A,G, and H, as designated in the application, filed September 11, 1981; (2) a plan for removal of rock outcroppings and submerged features that could pose a boating hazard; (3) the location and type of markers to warn boaters of hazardous areas that would remain within the project reservoir; (4) compatible treatment of the shoreline greenbelt and BLM river trail; (5) a schedule for the development, operation, and maintenance of the proposed recreational facilities; and (6) copies of any letters received from consulted agencies and any agreement entered into for the development and operation of the project recreation facilities. Further, the Licensee shall coordinate with IDPR in the preparation of a reservoir zoning plan that would designate areas for specific recreational uses. Further, the Licensee shall, within l year from the date of issuance of this license, file with the Commission a copy of the zoning plan for the project reservoir, and for approval, the revised Report on Recreational Resources.

Article	Requirement
Article 51	The Licensee shall, prior to the initiation of any construction that will impact the historic Woodville Canal and the Snake River Valley Canal, and after consultation with the Idaho State Historic Preservation Officer (SHPO) and the Historic American Engineering Record (HAER) of the U.S. Department of the Interior implement a cultural resources management plan to avoid and mitigate impacts to these properties. The plan shall consist of the followings (1) documentation of the impact areas of the canals according to the standards of the HAER, and (2) filing of copies of any existing engineering drawings or photographs of these facilities with the SHPO. A report documenting the mitigation, and its acceptance in writing by the SHPO and HAER, shall be filed with the Commission at least 60 days prior to any construction at the project that would impact the significant historical attributes of these canals. The Licensee shall make available funds in a reasonable amount for any such work as required. If any previously unrecorded archeological or historical sites are discovered during the course of construction or development of any project works or other facilities at the project, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archeological or historical resources. If the Licensee and the SHPO cannot agree on the amount of money to be expended on archeological or historical work related to the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any such work found necessary.
Article 52	*FERC's January 2, 1992 Order Amending License and Revising Annual Charges Revised Article 52 to read as follows:* The licensee shall pay the United States the following annual charges effective the first day of the month in which the license was issued: (a) For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount, as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 30,130 horsepower. (b) For the purpose of recompensing the United States for the use, occupancy, and enjoyment of 3.13 acres of its lands other than for transmission line right-of-way, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time.

Article	Requirement
Article 53	The Commission reserves the authority to order, upon its own motion or upon the recommendation of Federal or State fish and wildlife agencies or affected Indian Tribes, alterations of project structures and operations to take into account to the fullest extent practicable at each stage of the decision-making process the regional fish and wildlife program developed and amended pursuant to the Pacific Northwest Electric Power Planning and Conservation Act.

Source: FERC 1983

4.2.6 PROJECT GENERATION AND OUTFLOW RECORDS

IFP's system of electric generating facilities consist of the Idaho Falls and Gem State Projects. At the Idaho Falls Projects, each of the three plants (Lower, Upper, and City) channel up to 6,000 cfs of water through the turbines and have a nameplate generating capacity of 8 MW; the Lower Plant also provides an additional 3 MW of generating capacity. In total, the three plants produce an average of 145 million kWh of electricity annually (IFP 2020).

The generating capacity of the Gem State Project is nearly as large as the combined capacity of the Idaho Falls Project. The powerhouse contains one turbine generator with an installed capacity of 22.6 MW and produces an average of 130 million kWh of electricity annually. The city of Idaho Falls sells 39 percent of the output of the Gem State Project to PacifiCorp (a successor to the Utah Power & Light Company) under a cost-based power sales agreement entered into in 1985. Under this power sales contract, PacifiCorp is entitled to its annual share of the output of the Gem State Project in the months of May through August, and the city of Idaho Falls receives output from the Gem State Project from September through April. This power sales agreement contract ends early 2023, after which, IFP will be utilizing all of the power from the Gem State Project.

Table 4-13 provides the five-year system generation for the Upper, City, and Lower Plants as well as the Gem State Project. Table 4-14 provides the five-year average annual project total outflow as recorded by USGS Gage No. 13060000 near Shelley, ID.

TABLE 4-13 TOTAL SYSTEM GENERATION FROM 2017 TO 2021 (MWH)

Plant	2017	2018	2019	2020	2021
Upper Plant	45,797	56,221	50,597	49,946	42,625
City Plant	46,149	49,788	46,722	48,028	40,568
Lower Plant	48,597	58,216	51,380	49,266	30,486
Gem State	131,734	157,674	130,683	126,444	111,083
Total Generation	**272,277**	**321,899**	**279,382**	**273,684**	**224,762**

Source: IFP 2020, IFP 2021

TABLE 4-14 AVERAGE ANNUAL SYSTEM OUTFLOW RECORDS FROM 2017 TO 2021 (CFS)

Plant	2017	2018	2019	2020	2021
Total Outflow	**9,183**	**8,255**	**5,931**	**6,080**	**4,609**

Source: USGS Gage No. 13060000, Snake River near Shelley, ID

4.2.6.1 CURRENT NET INVESTMENT

As of December 31, 2022, IFP has incurred an original cost investment of $258,186,227.02, accumulated depreciation of $160,675,427.32, with a net book value of $97,510,800.16 for the Idaho Falls Project. For the Gem State Project, IFP has incurred an original cost investment of $48,910,778.98, accumulated depreciation of $40,047,092.51, with a net book value of $8,863,686.47.

4.2.6.2 COMPLIANCE HISTORY[8]

IFP has developed a sound compliance and dam safety program and has only encountered one violation that was corrected on the record. Seven potential violations have been noted by FERC but have been either corrected or dismissed.

On August 28, 1989, IFP failed to properly notify and receive authorization from FERC to perform construction at the Upper Development Dam No. 2 per license conditions outlined in Article 3 and 4. IFP was given 15 days to respond and outline steps to correct the issue. The potential violation was corrected but was recorded by FERC to reference for potential future violations.

Inspections are conducted at the Projects by FERC's Portland Regional Office on a regular basis, and IFP completes all necessary corrective actions to address comments and recommendations arising from FERC inspections in a timely manner.

4.2.7 POTENTIAL FOR NEW FACILITIES OR CHANGES IN PROJECT OPERATION

IFP does not propose the addition of any new facilities or components to be constructed at either the Idaho Falls Project or Gem State Project. There are no plans for future development or rehabilitation of either Project, nor are there any proposed changes to the Project operations at either Project.

[8] FERC eLibrary Accession Number: 19980909-0235, Accession Number: 19990216-0638

4.3 REFERENCES

City of Idaho Falls. 1978. Application for License: Idaho Falls Hydroelectric Project.

City of Idaho Falls 1983. Application For Amended License: Exhibit M.

Federal Energy Regulatory Commission. (FERC). 1979. Order Issuing License (Major) Idaho Falls Hydroelectric Project No. 2842.

Federal Energy Regulatory Commission. (FERC). 1983. Order Issuing License (Major) Gem State Hydroelectric Project No. 2952

Federal Energy Regulatory Commission. (FERC). 1986. Order Approving Exhibit M.

Federal Energy Regulatory Commission. (FERC). 1990. Order Approving Revised Exhibit A.

Federal Energy Regulatory Commission (FERC). 1998. Violation Notification. Accession Number: 19980909-0235, Available online: eLibrary | File List (ferc.gov)

Federal Energy Regulatory Commission (FERC). 1999. Violation Correction. Available online: eLibrary | File List (ferc.gov)

Idaho Falls Power. (IFP). 2018. Gem State Hydroelectric Project Supporting Technical Information.

IFP. 2020. Idaho Falls Power 2020 Annual Report. Available online: https://www.ifpower.org/gopower/resources/content/21-0601ifp-arr2digital.pdf. Accessed June 8, 2022.

_____. 2021. Idaho Falls Power 2021 Annual Report. Available online: https://www.ifpower.org/gopower/resources/content/22-0804ifp-arr4digital.pdf. Accessed July 24, 2023.

Kleinschmidt Associates. 2019. Photographs provided by Kleinschmidt Associates staff.

5.0 EXISTING ENVIRONMENT

Per 18 CFR § 5.6(d)(3)(i), this section includes a discussion based on the existing, relevant, and reasonably available information with respect to each resource area as required by paragraphs (d)(3)(ii)-(xiii) of this section, including summaries of existing data or studies regarding the resource; a description of any known or potential adverse impacts and issues associated with the construction, operation or maintenance of the Projects, including continuing and cumulative impacts; and a description of any existing or proposed Project facilities or operations, and management activities undertaken for purpose of protecting, mitigating impacts to, or enhancing resources affected by the Projects, including a statement of whether such measures are required by the Project licenses, or were undertaken for other reasons.

The resource areas, as defined by 18 CFR § 5.6(d)(3)(ii)-(xiii) are discussed in the following pages:

- Geology and Soils
- Water Resources
- Fish and Aquatic Resources
- Wildlife and Botanical Resources
- Floodplains and Wetlands: Wetlands, Riparian, and Littoral Habitat
- Rare, Threatened, and Endangered Species
- Recreation and Land use
- Aesthetic Resources
- Socioeconomic Resources, including Environmental Justice
- Cultural & Tribal Resources

5.1 GEOLOGY AND SOILS

Per 18 CFR §5.6(d)(3)(ii), this section presents descriptions and maps of the existing geology, topography, and soils in the vicinity of the Idaho Falls and Gem State Projects and surrounding areas. The descriptions and maps presented in this section are based on readily available information.

5.1.1 REGIONAL GEOGRAPHY

The Idaho Falls and Gem State Projects are located along the Snake River in eastern Idaho, in the Snake River Plain. The Snake River Plain is divided into eastern and western parts based on geologic features and depositional environments. The Projects lie in the Eastern Snake River Plain (ESRP), directly northwest of the Blackfoot Mountains, and to the east of Hell's Half Acre Lava Field which is the easternmost basaltic lava field of the Snake River Plain (USGS 2022) (Figure 5-1).

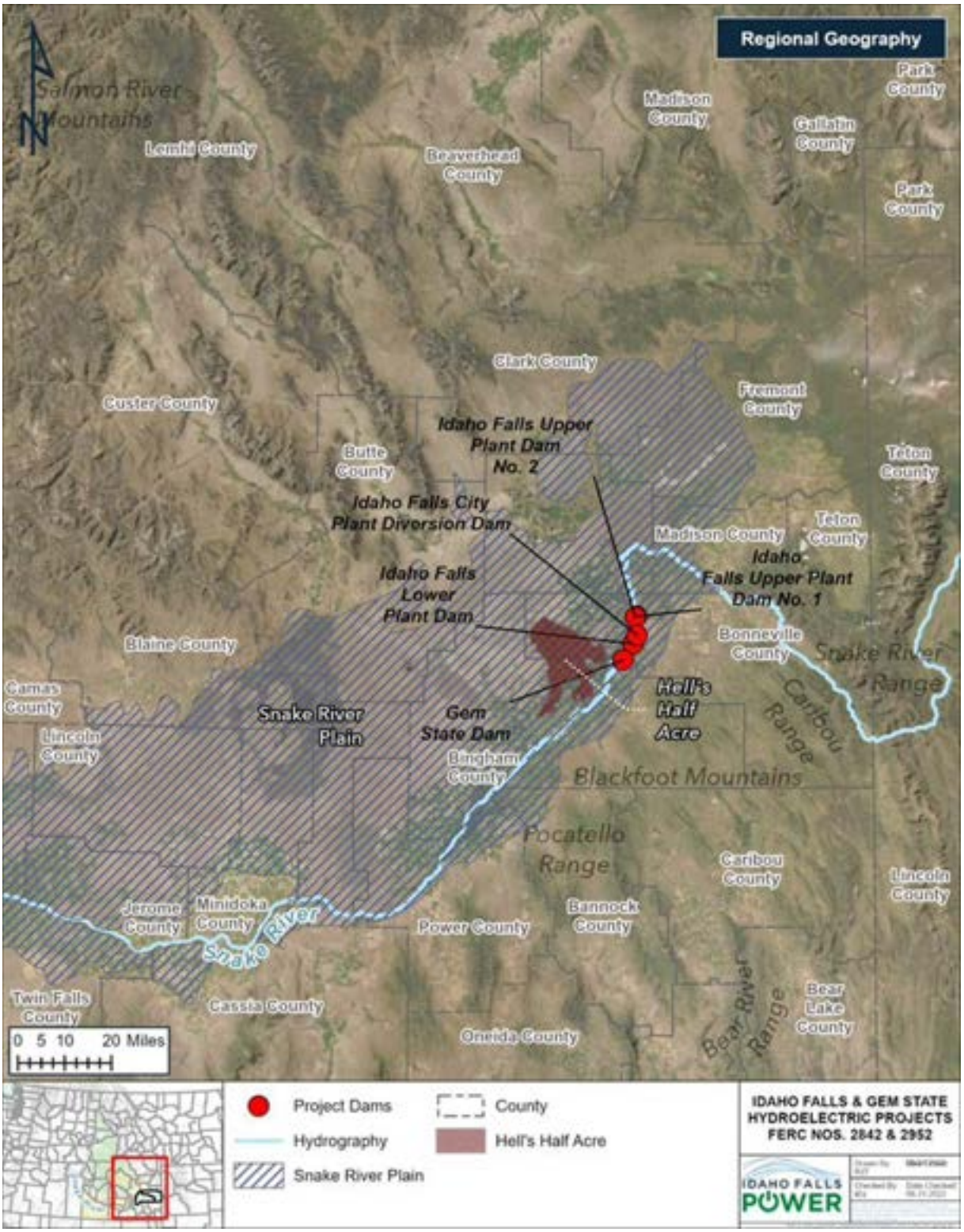

FIGURE 5-1 REGIONAL GEOGRAPHY IN THE PROJECTS' VICINITIES

5.1.2 VOLCANISM AND MOVEMENT OF YELLOWSTONE HOTSPOT

Over the past 16 million years, the crust of the North American tectonic plate has been progressively moving across a mantle plume. This mantle plume is hypothesized to be the cause of the Yellowstone hotspot (Hughes 1999). Interactions between the crust and the mantle plume have resulted in uplift and rhyolitic caldera eruptions, followed by subsidence and basaltic volcanism (Hughes 1999). The Yellowstone hotspot formed the Miocene-Pliocene rhyolitic calderas and Quaternary basaltic lavas and shield volcanoes that are evident in the Snake River Plain and found within the vicinity of the Projects (Figure 5-2).

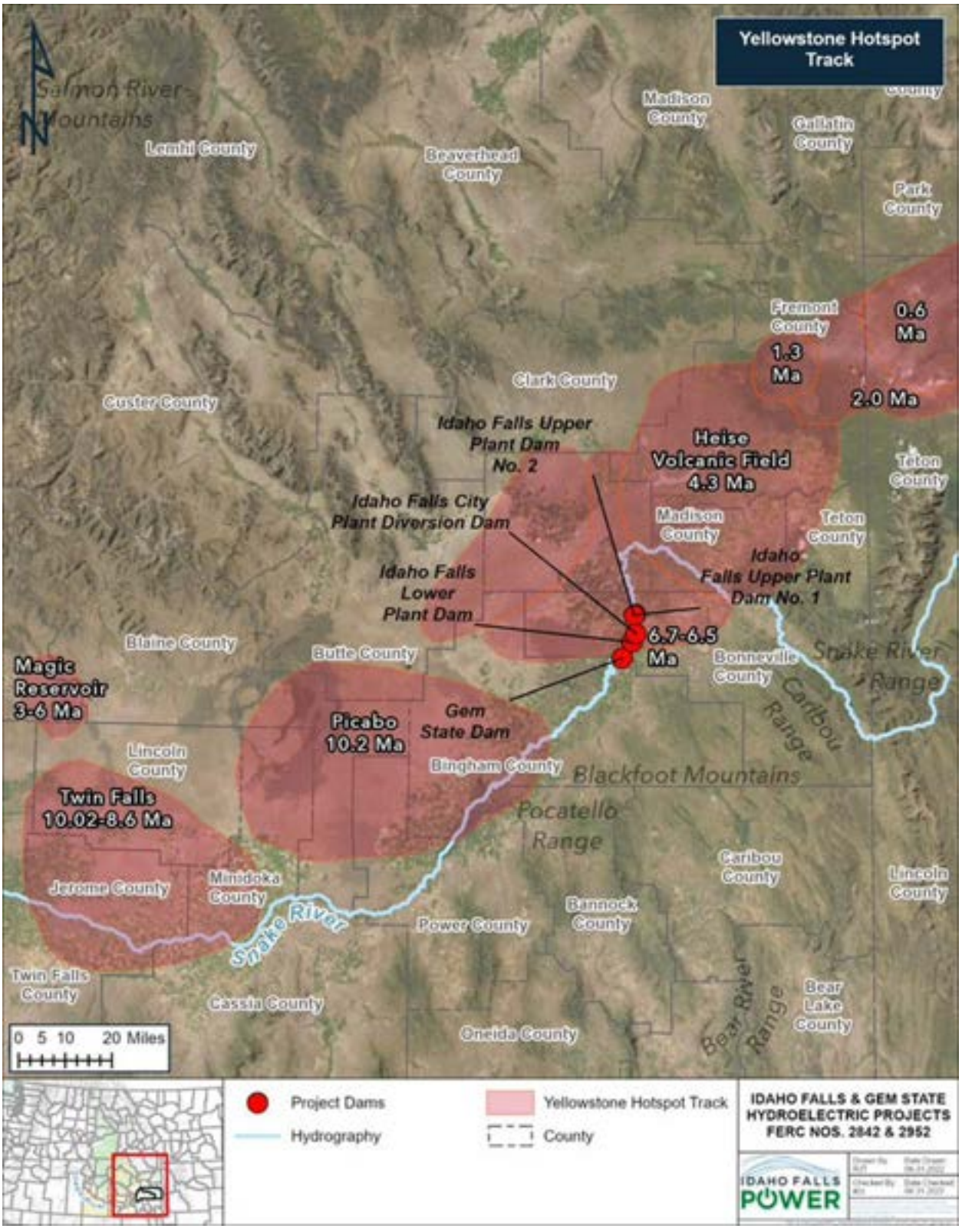

FIGURE 5-2 YELLOWSTONE HOTSPOT TRACK

5.1.3 MIOCENE-PRESENT CRUSTAL EXTENSION OF BASIN AND RANGE

Subduction of the Farallon Plate under the North American continental plate resulted in crust thickening in the western United States. By the middle Miocene, the Farallon Plate and Pacific-Farallon ridge subducted, forming the San Andreas Fault. It is generally accepted that crustal shearing of the San Andreas Fault is the cause of extensional faulting in the Basin and Range region (NPS 2022), which is observed within both the Idaho Falls and Gem State Projects.

The ESRP deformational history can be observed in the local rock formations. Late Quaternary volcanic rift zones present in the ESRP overlie basalt dikes resulting from crustal extensions (Rodgers et al. 2002). The rifting zones run parallel to the Basin and Range faults. Where individual faults can be traced from the Basin and Range into the ESRP, the faulting becomes weaker and obscured by volcanic rift zones (Rodgers et al. 2002).

5.1.4 QUATERNARY CATASTROPHIC FLOODING, GLACIATION AND ASSOCIATED EOLIAN, AND SEDIMENTATION

Catastrophic flooding on the Snake River Plain has occurred three times in geologic history. These megaflood events include the Henry's Fork Flood (approximately 100 to 140 thousand years ago [kya]), the Big Lost River Flood (20.5 kya), and most recently the Bonneville flood (14.5 to 17.4 kya) (Amidon and Clark 2014). The Bonneville flood occurred when the alluvial dam at Red Rock Pass failed, thus draining historic Lake Bonneville. This resulted in an approximate 100-meter-drop in water level and release of approximately 4,750 cubic kilometers (km^3) of water. Floodwaters joined the Snake River, eroding large cataracts and depositing gravel and boulders downstream (Amidon and Clark 2014). Because of the Pleistocene glacial climate, eolian features developed in the ESRP (Phillips 2022). Substantial amounts of silt and sand were deposited along the lower plain by meltwaters from upland glaciers.

The Yellowstone plateau developed a recurrent ice sheet during the Pinedale glaciation (14-25 kya) and Bull Lake Glaciation (140 to 150 kya) (Phillips 2022). During the glacial periods, the meltwater from the Yellowstone ice sheet was the primary source of the Snake River, resulting in a broad braided stream system 10 to 30-kilometers-wide (Phillips 2022). Eolian sediments in the form of gravels, sands, and silts were deposited in the Snake River Plain as a result.

Paleosol dating of loess[9] deposits indicates that the modern Snake River became incised between 14.4 and 12.6 kya as a result of diminishing discharge from the retreating Yellowstone ice sheet (Forman et al. 1993).

5.1.5 BEDROCK LITHOLOGY AND STRATIGRAPHY

Because of the geologic history, the area below the Projects are underlain primarily by Quaternary alluvial deposits. There are Quaternary basalts present in the surface geology of the Idaho Falls Project area. The coverage within two Project areas and descriptions of the lithologic units are provided in Table 5-1 and Table 5-2, and can be seen in Figure 5-3.

[9] Windblown dust and silt that blanket the land; a layer of fine, mineral-rich material is called loess. https://education.nationalgeographic.org/resource/loess. Accessed August 2022.

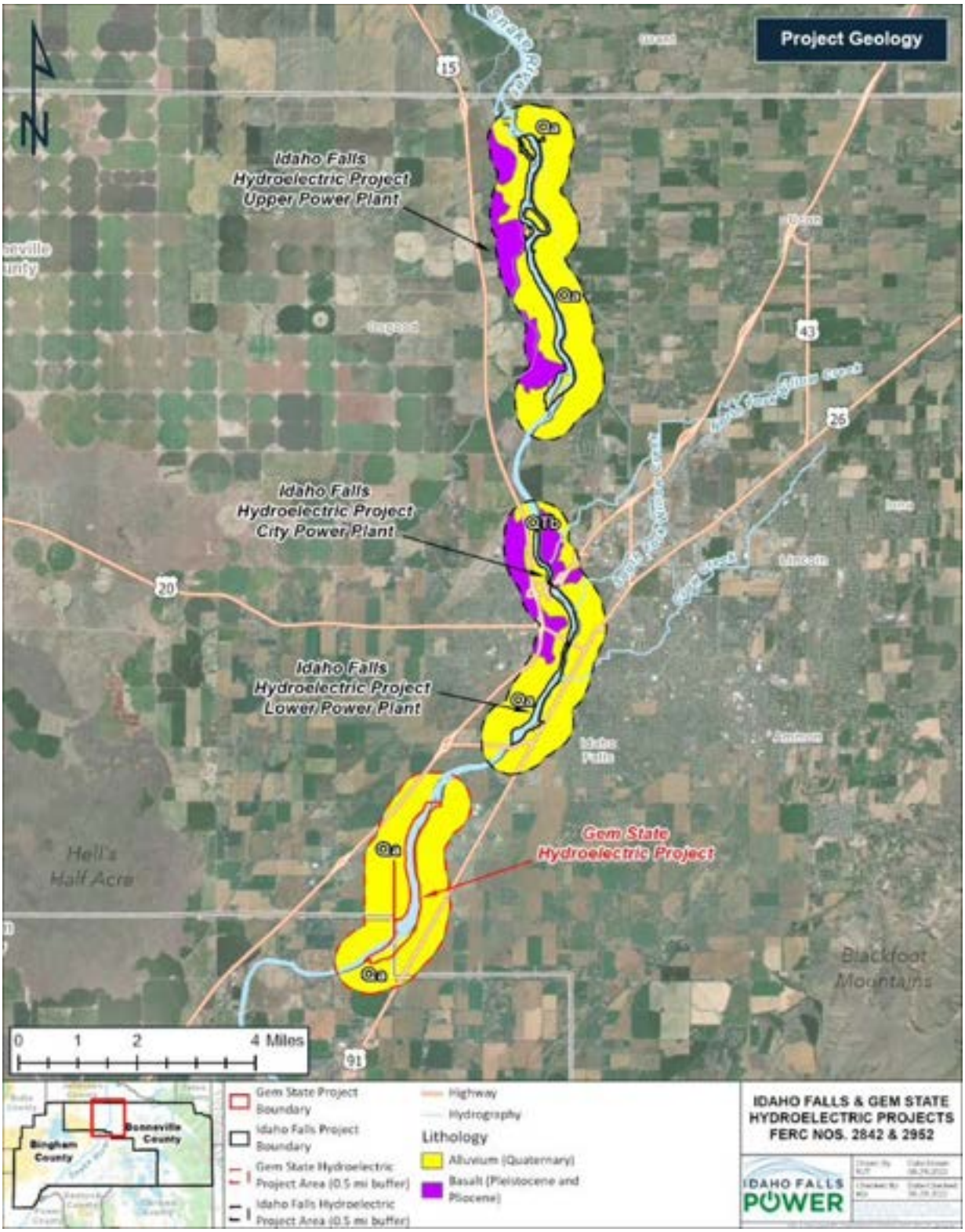

FIGURE 5-3 GEOLOGY WITHIN 0.5 MILES OF THE PROJECT BOUNDARIES

TABLE 5-1 LITHOLOGIES IN THE IDAHO FALLS PROJECT AREA

LITHOLOGIES IN THE IDAHO FALLS PROJECT AREA					
MAP UNIT LABEL	**GEOLOGIC AGE**	**LITHOLOGY DESCRIPTION**	**DESCRIPTION**	**AREA (ACRES)**	**PERCENT OF PROJECT AREA**
Qa	Quaternary	Unconsolidated sediments, alluvial deposits of gravel, sand, and silt.	Gravel and sand of the modern Snake River floodplain. Thickness generally <3 m (10 ft). Consists of gravel-rich point-bar deposits of the main channel and low terraces composed of finer-grain overbank deposits overlain by Harston, Heiseton and Xeric torrifluvent soils.	5702.3	71.2
QTb	Quaternary-Tertiary, Pleistocene-Pliocene	Quaternary to Eocene continental volcanic and intrusive rocks. Seen in basalt flows and cinder cones.	Basalt flows and cinder cones of olivine tholeiite basalt in and near Snake River Plain. Largely Pleistocene but includes flows as old as 2 Ma. Covered with 1 to 3 m (3 to 10 ft) of loess. These basalts include Basalt of Rifle Range (middle to late Pleistocene) and Basalt of Shattuck Butte (middle Pleistocene).	1591.0	19.9
wtr	Present	Water	Bodies of fresh or salt water.	713.7	9.0

Source: Idaho Geological Survey (IGS) 2011. Geologic Map of the Idaho Falls South Quadrangle, Bingham and Bonneville Counties, Idaho

TABLE 5-2 LITHOLOGIES IN THE GEM STATE PROJECT AREA

LITHOLOGIES IN THE GEM STATE PROJECT AREA					
MAP UNIT LABEL	**GEOLOGIC AGE**	**LITHOLOGY** Description	**DESCRIPTION**	**AREA (ACRES)**	**PERCENT OF PROJECT AREA**
Qa	Quaternary	Unconsolidated sediments, alluvial deposits of gravel, sand, and silt.	Gravel and sand of the modern Snake River floodplain. Thickness generally <3 m (10 ft). Consists of gravel-rich point-bar deposits of the main channel and low terraces composed of finer-grain overbank deposits overlain by Harston, Heiseton and Xeric torrifluvent soils.	2939.3	91.5
wtr	Present	Water	Bodies of fresh or salt water.	341.2	8.5

Source: Idaho Geological Survey (IGS) 2011. Geologic Map of the Idaho Falls South Quadrangle, Bingham and Bonneville Counties, Idaho.

5.1.6 SOILS

An analysis of the United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) Web Soil Survey indicates that approximately 35 different soils categorized into 25 individual groups for the Idaho Falls Project area (Table 5-3, Figure 5-4) and approximately 22 different soils categorized into 16 soil groupings for the Gem State Project area (0.5 mile) (Table 5-4).

Primary soils of the Idaho Falls Project area include the Pancheri silt loam, Bannock loam, and the Harston fine sandy loam (27.8 percent, 20.8 percent, and 15.1 percent respectively). Primary soils of the Gem State Project area include the Bannock Loams, Harston Fine Sandy Loam, Bock Loams, and the Heiseton fine sandy loam (33.1 percent, 19.9 percent, 13.5 percent, and 12.5 percent respectively). These soils are described in greater detail in the following text; a full list of soils with brief descriptions are summarized in tables Table 5-3 and Table 5-4 (USDA 2022).

TABLE 5-3 NRCS SOILS WITHIN 0.5-MILE OF THE IDAHO FALLS PROJECT BOUNDARY

SOIL GROUP	DESCRIPTION	TOTAL ACRES	% SOILS
Bannock loam	Well drained soils that formed in medium textured alluvium over gravel and sand. Bannock soils are on stream terraces and alluvial fans and have slopes of 0 to 10 %.	984.5	20.7
Bock loam	Very deep, well drained soils that formed in alluvium from mixed sources. Bock soils are on terraces and alluvial fans and have slopes of 0 to 10 %.	294.8	3.7
Harston fine sandy loam	Deep, well drained soils that formed in moderately coarse textured alluvium. Harston soils are on alluvial fans and low terraces and have slopes of 0 to 4 %.	658.2	8.2
Heiseton fine sandy loam	Deep, moderately-well drained soils that formed in moderately coarse textured alluvium. Heiseton soils are on bottomlands and low stream terraces and have slopes of 0 to 4 %. Soils are mostly cultivated; natural vegetation is rangeland.	1108.5	13.8
Packham gravelly loam	Very deep, well drained soils on stream and fan terraces. They formed in mixed alluvium. Permeability is moderate in the upper part and very rapid in the lower part. Slopes range from 0 to 8 %.	409.1	5.1
Paesl silty clay loam	Very deep, well drained soil found on flood plains along rivers. The soil is formed in alluvium with slopes from 0 to 2 %.	57.0	0.7

SOIL GROUP	DESCRIPTION	TOTAL ACRES	% SOILS
Pancheri silt loam	Deep and very deep, well drained soils that formed in loess covered lava plains. Slopes range from 0 to 50 %. Permeability is moderate.	2158.6	27.0
Pancheri-Rock outcrop complex	This complex is about 70 % Pancheri silt loam with 4 to 25 % slopes, and 25 % rock outcrop. The soils is very deep and well drained, formed mainly in loess. Rock outcrop is bare exposures of basalt through loess. This soil is mainly used for rangeland, wildlife, and recreational use.	101.4	1.3
Paul silty clay loam	Deep, well drained soils that formed in alluvium from mixed sources, but mainly from sandstone and limestone. Paul soils are on alluvial fans and river terraces and have slopes of 0 to 2 %.	169.4	2.1
Pits	Excavations from which the surface layer and underlying material may have been removed, exposing rock or other materials.	97.6	1.2
Polatis-Rock outcrop complex	Loess covered basalt plains in elevations from 4,600 to 5,400 feet. The complex is 65% Polatis silt loam and 25% rock outcrop.	261.8	3.3
Stan sandy loam	Deep, well drained soils on terraces and alluvial fans. They formed in moderately coarse alluvium derived dominantly from quartzite and sedimentary rocks. Slopes are 0 to 4 %.	631.7	7.9
Water	Waterbody.	755.8	9.4
Wolverine sand	Very deep, excessively drained soil found on sand dunes on river terraces. The group formed in aeolian sand.	186.0	2.3
Xeric Torrifluvents	Very deep, well drained, nearly level to sloping soils are found on lower river terraces and islands. Forms in mixed alluvium	132.4	1.7
	Total	***8006.8***	***108.4***

Source: USDA 2022

TABLE 5-4 NRCS SOILS WITHIN 0.5 MILE OF GEM STATE PROJECT BOUNDARY

SOIL GROUP	DESCRIPTION	TOTAL ACRES	PERCENT OF SOILS WITHIN BUFFER
Bannock Loam	Well drained soils that formed in medium textured alluvium over gravel and sand. Bannock soils are on stream terraces and alluvial fans and have slopes of 0 to 10 %.	695.3	21.6
Bock Loam	Very deep, well drained soils that formed in alluvium from mixed sources. Bock soils are on terraces and alluvial fans and have slopes of 0 to 10 %.	409.7	12.8
Harston fine sandy loam	Deep, well drained soils that formed in moderately coarse textured alluvium. Harston soils are on alluvial fans and low terraces and have slopes of 0 to 4 %.	754.6	23.5
Heiseton fine sandy loam	Deep, well drained soils that formed in moderately coarse textured alluvium. Harston soils are on alluvial fans and low terraces and have slopes of 0 to 4 %.	575.0	17.9
Heiseton sandy loam	Deep, moderately well drained soils that formed in moderately coarse textured alluvium. Heiseton soils are on bottomlands and low stream terraces and have slopes of 0 to 4 %. Soils are mostly cultivated; natural vegetation is rangeland.	24.6	0.8
Lava Flows	Miscellaneous land type made up of bare basalt.	3.1	0.1
Packham gravelly loam	Very deep, well drained soils on stream and fan terraces. They formed in mixed alluvium. Permeability is moderate in the upper part and very rapid in the lower part. Slopes range from 0 to 8 %.	56.0	1.7
Pits	Excavations from which the surface layer and underlying material may have been removed, exposing rock or other materials.	41.3	1.3
Presto loamy sand	Moderately deep, somewhat excessively well drained soils are on level to very gently sloping terraces from 0 to 4 %. The soils formed mainly in loamy sand over medium textured lake deposits or alluvium.	140.1	4.4
Sasser fine sandy loam	Moderately deep, well drained soils, with slopes from 0 to 2 %, These soils are found on river terraces.	80.5	2.5
Stan fine sandy loam	Deep, well drained soils on terraces and alluvial fans. They formed in moderately coarse alluvium derived dominantly from quartzite and sedimentary rocks. Slopes are 0 to 4 %.	20.0	0.6
Stan sandy loam	Deep, well drained soils on terraces and alluvial fans. They formed in moderately coarse alluvium derived	26.8	0.8

SOIL GROUP	DESCRIPTION	TOTAL ACRES	PERCENT OF SOILS WITHIN BUFFER
	dominantly from quartzite and sedimentary rocks. Slopes are 0 to 4 %.		
Wapello fine sandy loam	Moderately deep, well drained soil found on stream terraces.	42.5	1.3
Water	Waterbody.	317.1	9.9
Wolverine sand	Very deep, excessively drained soil found on sand dunes on river terraces. The group formed in aeolian sand.	16.4	0.5
Xeric Torrifluvents	Very deep, well drained, nearly level to sloping soils are found on lower river terraces and islands. Forms in mixed alluvium	9.0	0.3
	Total	***3212.0***	***100.0***

Source: USDA 2022

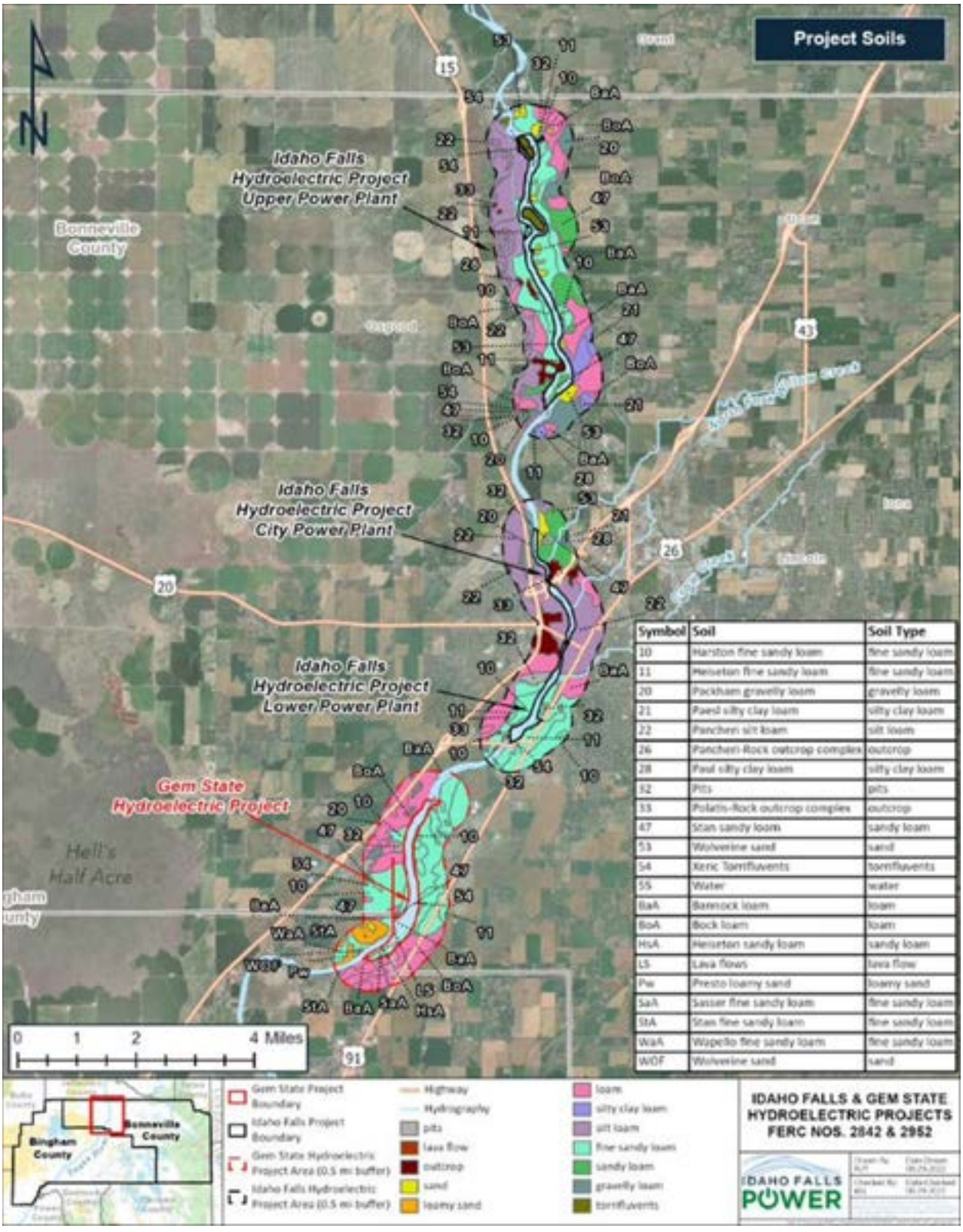

FIGURE 5-4 SOILS WITHIN 0.5 MILE BUFFER OF THE PROJECTS

The Bannock Loam group makes up 20.7 percent of the Idaho Falls Project area and 33.1 percent of the Gem State Project area. The Bannock Loam is characterized as deep and well drained, with nearly level to moderately sloping soils (0 to 10 percent) that are 20 to 40-inches-deep overlaying gravelly sands. These soils formed under sagebrush and bunchgrass in medium textured alluvium on high river terraces. The alluvium is dominantly from quartzite and sedimentary rock sources but contain rhyolitic, basaltic, and granitic materials. In places, the upper part may be eolian sediments. Bannock Loam is typically found on stream terraces and alluvial fans along the high terraces of the Snake River.

The Bock Loam group makes up 4.6 percent of the Idaho Falls Project area and 13.5 percent of the Gem State Project area. The Bock Loam is characterized as deep, well drained, loamy soil, with slopes from 0 to 2 percent. The soils formed in medium textured, mixed alluvium, dominantly from quartzite and sedimentary rock sources. In places, the upper part is eolian deposits. Bock Loam is typically found on long, higher terraces of the Snake River and alluvial fans.

The Harston fine sandy loam makes up 15.1 percent of the Idaho Falls Project area and 19.9 percent of the Gem State Project area. The fine sandy loam is characterized as a very deep, well drained soil, with slopes from 0 to 2 percent. These soils formed in moderately coarse textured alluvium over stream deposited gravel, sand, and lake shore sediments. The alluvium is dominantly derived from quartzite and sedimentary rock sources with lesser influence from rhyolite, basaltic, and granitic materials. The Harston fine sandy loam is typically found on flood plains along the snake river.

The Heiseton fine sandy loam makes up 0.1 percent of the Idaho Falls Project area and 12.5 percent of the Gem State Project area. The Heiseton fine sandy loam is characterized as very deep and well drained, with slopes from 0 to 4 percent. The soils formed mainly in moderately coarse textured alluvium, which may overlie sand and gravel or other stratified sediments. The alluvium is dominantly from quartzite and sedimentary rock sources but contains rhyolitic, basaltic, and granitic material.

The Pancheri Silt Loam makes up of 27.8 percent of the Idaho Falls Project area and is not present in the Gem State Project area. The Pancheri silt loam is characterized as very deep and well drained, with slopes from 8 to 15 percent in the Idaho Falls Development area. Pancheri soils

formed in loess covered lava plains at elevations of 4,200 to 6,000 feet. The parent material is mainly loess. The Pancheri silt loam is found on basalt plains.

5.1.7 GEOLOGIC HAZARDS

An assessment of available Idaho Geological Survey datasets yielded no geological hazards within either of the Project areas (IGS 2011, County Geology and Hazard Maps of Idaho).

5.1.8 MINERAL RESOURCES

Mineral resources located in the Project areas were identified using the USGS (2022) Mineral Resources Data System (MRDS) (Figure 5-5).

There are 14 mineral resource features identified in the Idaho Falls Project area. Of the identified mineral resources in the Idaho Falls Project area, all but one are actively producing sand and gravel for construction, pumice, and stone (MRDS 2022). One mineral resource feature was identified in the Gem State Project area, a gravel pit associated with Quaternary alluvial deposits. These mineral resources are summarized in Table 5-5.

TABLE 5-5 MINERAL RESOURCES IN THE IDAHO FALLS AND GEM STATE PROJECT AREAS

PROJECT	NAME(S)	STATUS	COMMODITY
Idaho Falls	Rock Hollow	Producer	Pumice
	Amcor Crushing Plant	Producer	Pumice
	Gravel Pit	Producer	Sand and Gravel, Construction
	Gravel Pit, Id Hwy Dpt	Producer	Sand and Gravel, Construction
	Gravel Pit	Producer	Sand and Gravel, Construction
	Gravel Pit	Producer	Sand and Gravel, Construction
	Gravel Pit	Producer	Sand and Gravel, Construction
	Gravel Pit	Past Producer	Sand and Gravel, Construction
	Gravel Pit	Producer	Sand and Gravel, Construction
	Gravel Pit	Producer	Sand and Gravel, Construction
	Gravel Pit, Id Hwy Dpt	Producer	Sand and Gravel, Construction
	Gravel Pit	Producer	Sand and Gravel, Construction
	Idaho Falls Pit and Plant	Producer	Sand and Gravel, Construction
	Burns Pit	Producer	Stone
Gem State	Gravel Pit, Id Hwy Dpt	Producer	Sand and Gravel, Construction

Source: USGS. 2022. Mineral Resources Data System (MRDS).

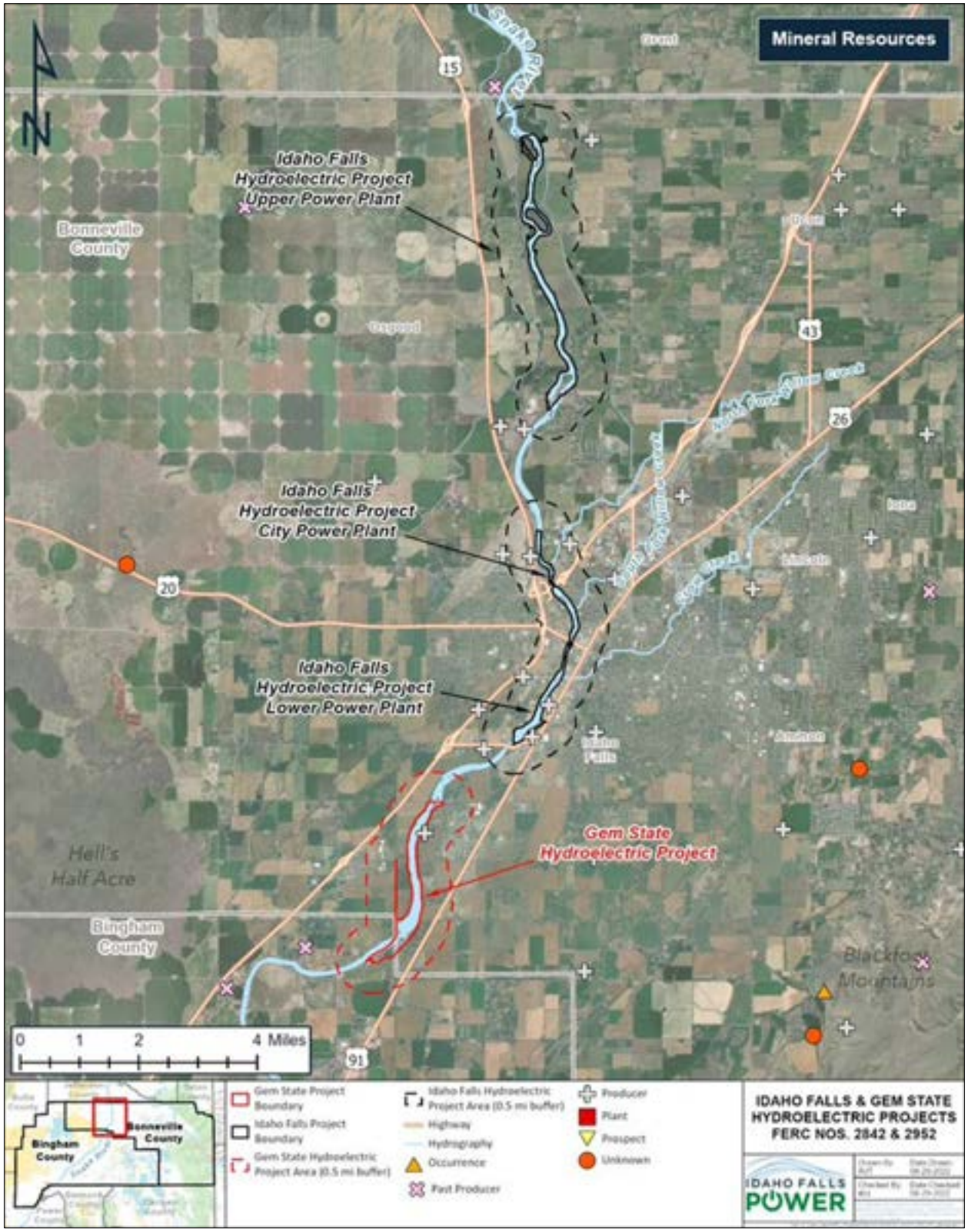

FIGURE 5-5 MINERAL RESOURCES IDENTIFIED WITHIN 0.5 MILES OF THE PROJECTS

5.1.9 RESERVOIR SHORELINES AND STREAMBANKS

Generally, the shorelines for both the Idaho Falls and Gem State Projects are primarily deposits of silts, sands, and gravels approximately 10 feet to 20 feet thick overlying local basalts on both sides of the Snake River.

The southern half of the Gem State Project shoreline consists of engineered water-retaining dike structures, while the northern half is engineered dikes with impervious core.

5.1.10 REFERENCES

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5.2 WATER RESOURCES

As required by 18 CFR §5.6(d)(3)(iii), this section provides descriptions of the water resources of the proposed IFP Projects and surrounding area. This section must address the quantity and quality (chemical/physical parameters) of all waters affected by the Projects, including but not limited to the Project reservoir(s) and tributaries thereto, bypassed reach, and tailrace.

5.2.1 SNAKE RIVER DRAINAGE AREA

The Snake River watershed encompasses 107,904 square miles in six states: Wyoming, Idaho, Oregon, Washington, Nevada, and Utah (Figure 3-1). The hydrologic unit code (HUC) is the USGS numbering system for watersheds. The entire country was mapped with a 2-digit to 12-digit number that uniquely identifies each of the six levels of classification: six-digit HUCs identify basins, 8-digit HUCs identify subbasins (USGS 2022a). The IFP Projects are in the Upper Snake Basin (HUC 170402), which spans Idaho, Wyoming, Utah, and Nevada. The three-development Idaho Falls Project facilities are located on the Snake River between RM 808.7 and 815.4 in the Idaho Falls subbasin (HUC 17040201), which covers 563 square miles (Figure 3-3) (IDEQ 2004). The single-development Gem State Project is on the Snake River at RM 804.2 in the American Falls subbasin (HUC 17040206), which covers 2,869 square miles (IDEQ et. al 2012).

USGS gage 13057160 on the Snake River above Eagle Rock near Idaho Falls, Idaho is approximately 3.7 miles upstream of the Idaho Falls Upper Plant at RM 819.4. The drainage area of the Snake River above Eagle Rock near Idaho Falls is 9,533 square miles (USGS 2022b). Table 5-6 summarizes drainage areas for each development within the Projects. USGS gage 13060000 on the Snake River near Shelley, Idaho is at RM 802.4 and drains an area of approximately 9,790 square miles, excluding indeterminate non-tributary areas on Snake River Plain (Table 5-6) (USGS 2022b).

TABLE 5-6 USGS GAGES AND DRAINAGE AREAS AT THE PROJECTS

FEATURE	RIVER MILE	DRAINAGE AREA (SQUARE MILES)
USGS Gage 13057155: Snake River above Eagle Rock near Idaho Falls, Idaho	819.4	9,533
Idaho Falls Project Upper Plant	815.2	9,231
Idaho Falls Project City Plant	810.4	9,285
Idaho Falls Project Lower Plant	808.7	9,285
Gem State Project Powerhouse	804.2	9,300
USGS Gage 1306000: Snake River near Shelley, Idaho	802.3	9,790

Source: USGS 2022b

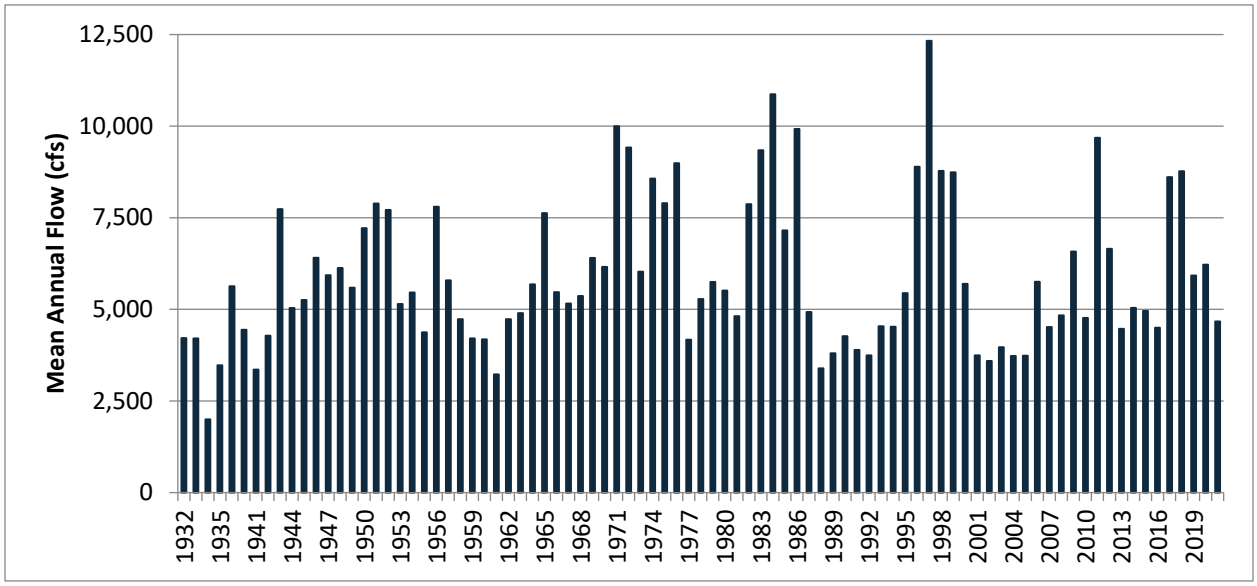
5.2.2 RECORDED FLOWS

The USGS maintains a network of stream gages in the Snake River; two USGS gages currently operate near the Idaho Falls and Gem State Projects (Table 5-7). USGS gage 13060000 on the Snake River at Shelley has been in place since March 1915; although, records for the entire year were not begun until October 1931. Due to its proximity to the projects' areas and its long data record, this gage was used to summarize flows for the IFP Projects. The 2004 Idaho Subbasin Assessment and total maximum daily load (TMDL) identifies a reduction in average annual mean flow of 480 cubic feet per second (cfs) between USGS gage 13057155 on the Snake River above Eagle Rock and USGS gage 1306000 near Shelley despite inflows from Willow Creek due to irrigation withdrawals (IDEQ 2004).

Since the 1932 water year (WY), the average annual flow of the Snake River at Shelley (October 1- to September 31) ranged from 1,998 cfs in 1934 to 12,330 cfs in 1997 (Figure 5-6). (USGS 2022b). Seasonal discharge patterns are primarily dictated by snowmelt, although upstream storage reservoirs and irrigation demands influence the distribution of streamflow in the IFP Projects Areas. Flows at this gage reflect some regulation by active storage in Jackson Lake (847,000 ac-ft), Palisades Reservoir (1,200,000 ac-ft on the Snake River approximately 80 miles-upstream of the Upper Dam), Island Park Reservoir (135,200 ac-ft approximately 90 miles-upstream on the Henry's Fork of the Snake River), Henry's Lake (90,400 ac-ft), and Grassy Lake (15,470 ac-ft) (Figure 3-3). Initial fill of the forebay pool at the Gem Power plant 2 miles upstream occurred

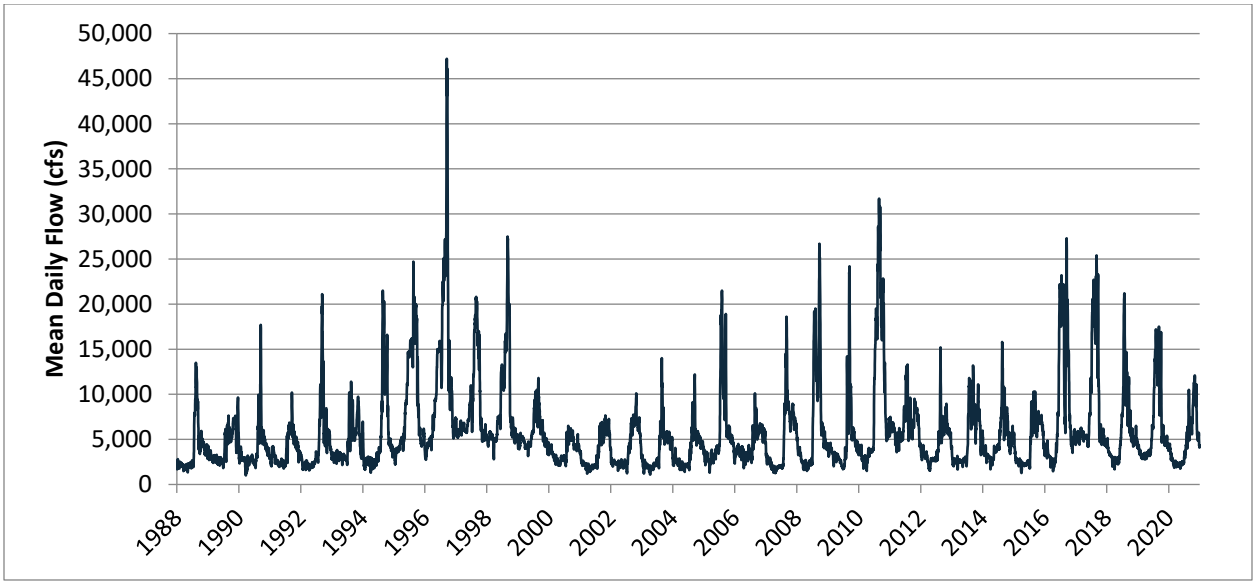
during March and April 1988. This summary includes WYs 1989 through 2021 (October 1–September 31). Mean monthly flows have ranged between 3,077 cfs in January and 11,285 in June. Typical flows were lowest during the winter and spring months (October-March), increased with snowmelt in April, and peaked in May and June. Daily flows were highly variable; during WYs 1997, 1999, 2009, 2011, 2017, and 2018 peak flows exceeded 25,000 cfs (Figure 5-7 and Figure 5-8).

The flood of June 6, 1894 reached an estimated discharge of 75,000 cfs at former USGS gage 13059000 on Snake River at Eagle Rock (now Idaho Falls), 7 miles upstream from the gage near Shelly, ID (USGS 2022b). Excluding the peak flow of 67,300 cfs on June 6, 1976 due to the Teton Dam failure, peak flows of 47,800 cfs were observed on June 17, 1997 (USGS 2022b).



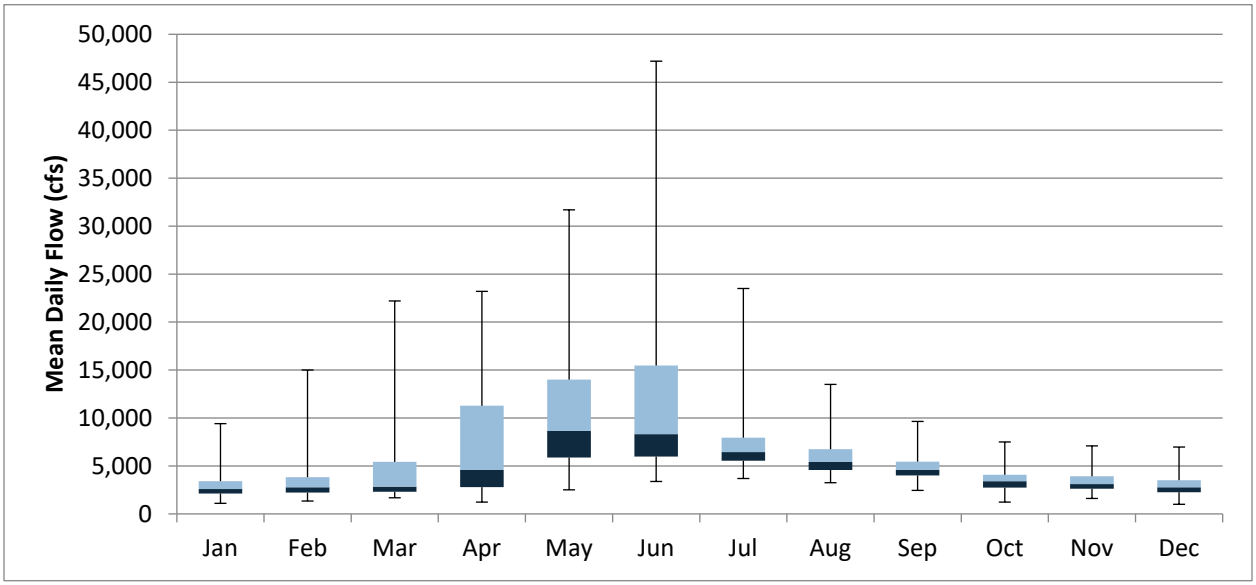
Source: USGS 2022b

FIGURE 5-6 MEAN ANNUAL FLOW FOR THE SNAKE RIVER NEAR SHELLY, ID (1935-2021)



Source: USGS 2022b

FIGURE 5-7 DAILY FLOWS FOR SNAKE RIVER NEAR SHELLY, ID (WYS 1989-2021)



Source: USGS 2022b

FIGURE 5-8 BOX WHISKER PLOT OF MINIMUM, 25TH PERCENTILE, MEDIAN, 75TH PERCENTILE AND MAXIMUM DAILY FLOWS BY MONTH IN SNAKE RIVER NEAR SHELLEY, ID (WYS 1989-2021)

TABLE 5-7 MONTHLY FLOW STATISTICS FOR SNAKE RIVER NEAR SHELLY, ID (WYS 1989-2021)

MONTH	MINIMUM (CFS)	MEDIAN (CFS)	MEAN (CFS)	MAXIMUM (CFS)
January	1,100	2,590	3,077	9,410
February	1,340	2,780	3,512	15,000
March	1,680	2,840	4,663	22,200
April	1,230	4,585	7,472	23,200
May	2,510	8,640	10,584	31,700
June	3,380	8,315	11,285	47,200
July	3,690	6,440	7,464	23,500
August	3,250	5,410	5,858	13,500
September	2,450	4,610	4,787	9,640
October	1,230	3,410	3,529	7,500
November	1,610	3,105	3,443	7,090
December	1,000	2,780	3,116	6,970

Source: USGS 2022b

5.2.3 FLOW DURATION CURVES

Figure 5-9 is the flow duration curve calculated from daily values for the period of analysis including WYs 1989 through 2021 at USGS Shelley gage 1306000. The Snake River had a median flow of approximately 4,400 cfs with flows ranging between approximately 1,975 cfs and 16,200 cfs 90 percent of the time. Monthly flow duration curves are presented in Appendix B.

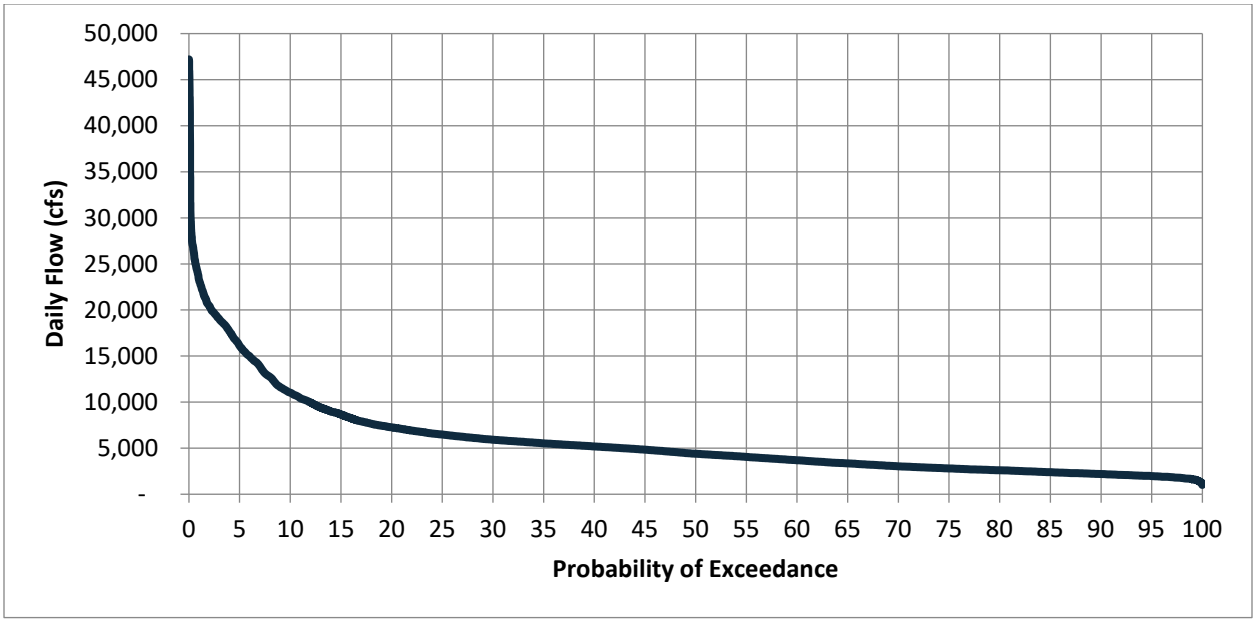


FIGURE 5-9 FLOW DURATION CURVE FOR THE SNAKE RIVER AT SHELLEY, IDAHO (WYS 1989-2021)

5.2.4 EXISTING AND PROPOSED USES OF PROJECT WATER

Water resources of the Upper Snake River Basin were developed extensively for irrigation, power generation, aquaculture, and municipal and industrial supply (IWRB 1998). Irrigation has altered the hydrologic system of the Snake River; the construction of dams, reservoirs, canals, and diversion of large volumes of surface water for irrigation have changed the flow characteristics of the Snake River and many of its tributaries (Goodell 1988). Diversions above the USGS gaging station on the Snake River above Eagle Rock near Idaho Falls provide irrigation for approximately 700,000 acres (USGS 2022b). In 1995, IDWR estimated annual surface water diversions averaged 3.4-million ac-ft in the reach between Palisades and Blackfoot (IWRB 1998). The IFP Projects are located within the state of Idaho Water District No. 1 (District); approximately 345 surface water diversions are administered by the District (IDWR 2020). These diversions account for approximately 1,142 surface water rights within the District authorizing a combined diversion rate in excess of 122,000 cfs (IDWR 2022).

Three irrigation canals divert water to the Projects' vicinities but are not part of either of the Projects. Flows at the three IFP plants are essentially equal most of the year. The irrigation diversion structure for the Porter Canal (Site ID 13057250) is located between the City Plant and the Upper Plant and diverted up to 364 cfs to farmlands southwest of the city of Idaho Falls in 2016 and 2021 (IDWR 2022).

Two water delivery entities (Woodville Canal Company and the Snake River Irrigation District) have water rights that authorize diversion of 1,604 cfs from the Snake River via canals off the Gem State Project reach. This use is primarily restricted to the April through October growing season, with peak diversions occurring in June. Both canals are concrete; the control gates for the Woodville Canal Company are manually operated, while the gates for the Snake River Irrigation District are hand or electrically operated. Operation of the structures is by the water delivery entities (FERC 1990). There are no other diversions from the Snake River between the Gem State Project and the USGS gaging station at Shelley, Idaho (FERC 1983i).

TABLE 5-8 MEAN MONTHLY FLOW (CFS) FOR CANALS DIVERTING FLOWS FROM SNAKE RIVER IN IFP PROJECTS' AREA (WY 2021)

MONTH	PORTER CANAL[1] (13057250)	WOODVILLE CANAL (13059505)	SNAKE RIVER VALLEY CANAL (13059525)
January	0	0	0
February	0	0	0
March	0	0	0
April	32	16	147
May	235	49	404
June	327	53	522
July	253	45	448
August	178	35	313
September	165	32	304
October	57	7.9	85
November	0	0	0
December	0	0	0

Source: IDWR 2022

5.2.5 EXISTING INSTREAM FLOW USES AND WATER RIGHTS

IFP is a department of the City of Idaho Falls, who has a year-round non-consumptive water right for 10 cfs authorized for a wildlife beneficial use associated with the Project (IDWR 2022). The City of Idaho Falls also has water rights authorized for hydropower uses associated with the Projects including 6,000 cfs for the Upper Plant, 6,000 cfs for the City Plant, and 8,440 cfs for the Lower Plant of the Idaho Falls Project and 5,000 cfs for the Gem State Project (Table 5-9). There are no instream flow requirements for the Snake River in the Project areas.

TABLE 5-9 CITY OF IDAHO FALLS SURFACE WATER RIGHTS FOR HYDROPOWER USE SUMMARIZED BY PROJECT FACILITY

FACILITY	WATER RIGHT NUMBER	PRIORITY DATE	DIVERSION RATE (CFS)
Upper Plant	1-2047	10/28/1927	500
	1-2049	2/14/1936	1,080
	1-4003	5/3/1930	580
	1-7013	11/9/1977	2,600
	1-7023	2/15/1979	1,240
		Upper Plant Total	6,000
City Plant	1-40	4/20/1900	140
	1-41	10/22/1904	48
	1-360	7/18/1919	394
	1-361	10/5/1923	485
	1-2014	12/3/1907	485
	1-4002	2/5/1915	388
	1-7015	11/9/1977	2,600
	1-7024	2/15/1979	1,460
		City Plant Total	6,000
Lower Plant	1-281	12/29/1905	1,500
	1-4001	10/5/1940	1,240
	1-7014	11/9/1977	4,800
	1-7025	10/28/1927	500
		Lower Plant Total	8,440
Gem State	1-7018	3/17/1978	5,000

Source: IDWR 2022

5.2.6 ICE CONDITIONS

Ice forms on the Snake River throughout the Project during the winter. The extent of ice cover depends on water temperatures, air temperatures, river flow and the channel configuration among river reaches. Ice is most extensive during extended periods of subzero air temperatures and low river flows under 3,000 cfs (FERC 1994). Ice jams have formed at the Upper Plant Development

reservoir (Zufelt et al. 1990). Frazil ice[10] formed in turbulent open water sections of the Snake River downstream of the Idaho Canal diversion structure 6 miles upstream of the Upper Plant Dam accumulated at the upstream edge of the reservoir's sheet ice cover (Zufelt et al. 1990). Additional ice that can break away from the shoreline areas in the open portion of the river also accumulates at the upstream extent of the reservoir. These ice jams have led to localized flooding of property along the reservoir (winters of 1982-83 and 1984-85) (Zufelt et al. 1990). Interviews with residents describe ice jam flooding on at least two occasions between 1950 and 1958 (Zufelt et al. 1990). An analysis funded by the USACE concluded that dams have neither caused nor aggravated ice jam problems at Bear Island (Zufelt et al. 1990). Ice jams do not occur downstream of the Upper Project because of the insulating ice cover on the IFP Projects reservoirs that keep river waters from supercooling sufficiently thereby preventing frazil ice formation.

5.2.7 WATER QUALITY STANDARDS

Idaho water quality standards consist of three parts: the designated uses of waters, the numeric or narrative criteria to protect those uses, and an anti-degradation policy. Water quality criteria used to protect these beneficial uses include narrative "free from" criteria applicable to all waters (IDAPA 58.01.02.200[11]), and numerical criteria, which vary according to beneficial uses (IDAPA 58.01.02.210[12], 250[13], 251[14], and 252[15]). Idaho water quality standards require that surface waters of the state be protected for beneficial uses, wherever attainable (IDAPA 58.01.02.054[16]). Typical numeric criteria include bacteriological criteria for recreational uses, physical and chemical criteria for aquatic life (e.g., pH, temperature, dissolved oxygen [DO]), ammonia), and toxics and turbidity criteria for water supplies.

[10] Frazil ice is a collection of loose, randomly oriented ice crystals millimeter and sub-millimeter in size and with various shapes.
[11] General Surface Water Quality Criteria
[12] Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use
[13] Surface Water Quality Criteria for Aquatic Life Use Designations
[14] Surface Water Quality Criteria for Recreation Use Designations
[15] Surface Water Quality Criteria for Water Supply Use Designation
[16] Beneficial Use Support Status

The Snake River throughout the Idaho Falls and American Falls subbasins, including the Idaho Falls and Gem State Project areas, is designated for cold-water aquatic life, salmonid spawning, primary contact recreation, agricultural and domestic water supplies. The numerical water quality criteria associated with those beneficial uses are summarized in Table 5-10.

TABLE 5-10 NUMERIC CRITERIA TO SUPPORT BENEFICIAL USES IN THE IFP PROJECT AREAS FOR SELECT WATER QUALITY PARAMETERS

BENEFICIAL USE	PARAMETER	CRITERIA	IDAHO ADMINISTRATIVE CODE 58.01.02 REFERENCE
Aquatic Life (General)	pH	6.5-9.0	250.01a
	TDG	<110% saturation	250.01b
Aquatic Life (Cold Water)	Dissolved Oxygen	Instantaneous >6.0 mg/L During salmonid spawning: inter-gravel Daily min : ≥ 5.0 mg/L 7-day avg: ≥ 6.0 mg/L During salmonid spawning: water column Daily min : ≥ 6.0 mg/L or 90% saturation 7-day avg : ≥ 6.0 mg/L Discharged from dams and hydroelectric facilities (June 15-October 15) Instantaneous ≥ 3.5 mg/L 7-day avg : ≥ 4.7 mg/L 30-day avg : ≥ 6.0 mg/L	250.02a 250.05.f.i 250.02.f.ii 276.02
	Temperature	Instantaneous ≤22°C Daily Average ≤19°C During salmonid spawning: Instantaneous ≤13°C Daily average ≤9°C	250.02.b 250.02.f
	Ammonia	Dependent on temperature and pH. The acute criterion (CMC) is the 1-hour average concentration of total ammonia nitrogen; this is not to be exceeded more than once every 3 years. The chronic criterion (criterion continuous concentration) is the 30-day	250.02b

BENEFICIAL USE	PARAMETER	CRITERIA	IDAHO ADMINISTRATIVE CODE 58.01.02 REFERENCE
		average concentration of total ammonia nitrogen, which is not to be exceeded more than once every 3 years.	
Primary Contact Recreation	*E. coli*	< 126 *E. coli* counts per 100mL (geometric mean) based on a minimum of 5 samples taken every 3 to 11 days over a 45-day period; or < a STV of 410 *E. coli* counts per 100mL in more than 10% of samples collected over a 45-day period.	251.02a
	Enterococci	<35 enterococci counts per 100mL (geometric mean)based on a minimum of 5 samples taken every 3 to 11 days over a 45-day period; or <a STV of 130 enterococci counts per 100mL in more than 10% of samples collected over 45-day period.	251.02.b
Domestic Water Supply	Turbidity	<5 NTU above background when background turbidity is 50 NTU or less; <10% above background when background turbidity is > 50 NTU and < 250 NTU; or <25 NTU above background when background turbidity is 250 NTU or greater	252.02.b

Source: IDEQ 2004

Key:

CMC	criterion continuous concentration
mg/L	milligrams per liter
mL	milliliter
NTU	Nephelometric Turbidity unit
STV	statistical threshold value

5.2.8 EXISTING WATER QUALITY DATA

Limited current water quality data are available in the Project areas. A summary of available water quality assessments, available data sources, and select water quality parameters are summarized below.

Section 303(d) of the Clean Water Act states that waters unable to support their beneficial uses and not meeting water quality standards must be listed as water quality limited waters. Subsequently, these waters are required to have TMDLs developed to bring them into compliance with water quality standards. The IFP Project areas are within a 21.4-mile reach of the Snake River from Dry Bed Creek to RM 804.2. According to the 2022 Integrated Report, this reach is designated as Category 3, not assessed due to insufficient (or no) data and information to determine if beneficial uses are being attained or impaired (IDEQ 2022). The Gem State Project area is within the 58.9-mile reach of the Snake River between RM 804.2 and American Falls Reservoir. The 2022 Integrated Report designates this reach as Category 5, not meeting applicable water quality standards for one or more beneficial uses due to one or more pollutants; therefore, an Environmental Protection Agency (EPA)-approved TMDL is needed. Elevated mercury concentrations are identified as impairing the primary contact recreation, salmonid spawning, and cold-water aquatic life beneficial uses.

The USGS collected limited water quality data at USGS gage 13060000 near Shelley Idaho Irrigation District and New Sweden Irrigation District collected water temperature upstream of the IFP Projects in 2014-2016 to support evaluation of the proposed County Line Hydroelectric Project (IID and NSID 2020). Additional water temperature data were collected by IFP in 1991 to support evaluation of bypass flows (Ralston and Associates 1991). In addition, City monitoring for the water treatment plant permitting includes monthly DO data upstream of the Idaho Falls wastewater treatment plant.

Seasonal exceedances of temperature criteria were documented in the IFP Projects areas. Monitoring just upstream of the IFP Projects from 2014 to 2016 documented several days in late July to early August of both 2015 and 2016 that exceeded the cold-water aquatic life standard (IID and NSID 2020). The salmonid spawning standard was consistently exceeded between early April and late October (IID and NSID 2020). These observations are consistent with temperature

monitoring in the Gem State Project area in 1989 and 1990 that documented temperatures exceeding water quality standards in July and August when air temperatures exceeded 90°F (Ralston and Associates 1991). Notably, these periods of temperature exceedances were not accompanied by DO concentrations below the standard for cold-water aquatic life (Ralston and Associates 1991). More recent monitoring in the Snake River upstream of the Idaho Falls sewage treatment facility under National Pollutant Discharge Elimination System (NPDES) Permit #ID0021261 also documented DO concentrations meeting criteria during all monthly samples (2003-2012; IID and NSID 2020). Under the current NPDES program, IFP monitors temperature, pH, and grease and oil levels. This is done by testing non-contact cooling water discharge from heat exchangers that cool the bearing water, heating ventilation and air conditioning systems at three sampling locations per plant. Since fall 2022, IFP Projects have been tested and reported to the Idaho Department of Environmental Quality (IDEQ) on a monthly basis and have stayed within required levels with no oil or grease detection (IFP Personal Communication).

Generally, the Snake River in the IFP Projects Areas would be described as a slightly basic, hard-water stream, rich in dissolved material and nutrients, with high concentrations of total residue and associated turbidity levels (FERC 1983). Excess mercury in fish is a widespread problem in Idaho (Essig and Kosterman 2008). The IFP Projects Areas are listed as impaired based on the IDEQ assessment of arsenic, mercury, and selenium in fish tissue and water from Idaho's major rivers (Essig and Kosterman 2008). A mercury level of 0.317 milligrams per kilogram (mg/kg), which exceeds the human health criterion of 0.3 mg/kg, was reported in fish tissue from American Falls Reservoir downstream of the IFP Projects Area (Essig and Kosterman 2008).

5.2.9 RESERVOIR DATA

5.2.9.1 UPPER PLANT

The Snake River meanders over a wide floodplain, with the river slope steepening near Idaho Falls. The bed slope increases from 0.0002 upstream of the Idaho Canal Diversion Structure to 0.0011 in the reach between the Idaho Canal Diversion Structure and Upper Dam No. 1 (Zufelt et al. 1990). Just downstream of the Idaho Canal Diversion Structure, the flow regime is dominated by turbulent riffles. South of the County Line Bridge, the river has multiple channels and is characterized by several riffle and pool sections. The river forms a single channel, straightens, and

becomes more tranquil as it enters the backwater of the Upper Power Project reservoir. The Upper Plant impoundment is 100 acres at a normal pool elevation of 4,734.7 feet National Geodetic Vertical Datum (NGVD) and extends approximately 2 miles upstream. The impoundment has a storage capacity of 800 ac-ft at elevation 4,734.7 feet NGVD. The deepest part of the river in the study reach is just upstream of Upper Dam No. 1, where the reservoir is nearly 80 feet deep (Zufelt et al. 1990).

5.2.9.2 CITY PLANT

The City Plant impoundment is 50 acres at a normal pool elevation of 4,700 feet and extends approximately 1 mile upstream. The impoundment has a storage capacity of 400 ac-ft at elevation 4,700 feet.

5.2.9.3 LOWER PLANT

The Lower Plant impoundment is 100 acres at a normal pool elevation of 4,674 feet and extends approximately 2 miles upstream. The impoundment has a storage capacity of 800 ac-ft at elevation 4,674 feet. Operated as run-of-river facilities, the Idaho Falls impoundments experience little fluctuation during normal operations.

5.2.9.4 GEM STATE

The Gem State impoundment is 305 acres at a normal pool elevation of 4,655 feet and extends approximately 20,000 feet upstream. The impoundment has a storage capacity of 5,000 ac-ft at elevation 4,655 feet. Operated as a run-of-river facility, the Gem State impoundment experiences little fluctuation during normal operations. The Snake River in the Gem State Project area is of moderate gradient, falling approximately 1.8 feet per 1,000 feet of stream length (FERC 1983). Substrate through this reach ranges from gravel to boulder-size material on basaltic bedrock. Stream width is approximately 500 feet at the dam site, but rapidly narrows downstream of the dam to a width of approximately 150 feet.

5.2.10 DOWNSTREAM REACHES

The Snake River downstream of the Idaho Falls and Gem State developments is generally a wide, slow, meandering river passing through flat, irrigated cropland (FERC 1983a). The namesake falls

in Idaho Falls were created by the City Plant dam and are not a natural feature. Water surface elevations between the two USGS gages spanning the two projects drop approximately 131 feet over 17.1 miles; channel gradients are gentle and average less than one percent.

5.2.11 REFERENCES

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5.3 FISH AND AQUATIC RESOURCES

Per 18 CFR § 5.6(d)(3)(iv), this section provides a description of the fish and other aquatic resources, including invasive species in the general vicinity of the two Projects. This section discusses the existing fish and macroinvertebrate communities, including the presence or absence of anadromous, catadromous, or migratory fish, and any known or potential upstream or downstream impacts of the Projects on the aquatic community.

5.3.1 EXISTING AQUATIC COMMUNITY

GENERAL OVERVIEW

The reach of the Snake River that encompasses the southeastern region of Idaho supports numerous native and non-native fish species. Native fish species found throughout all or parts of this reach include mountain whitefish (*Prosopium williamsoni*), Yellowstone cutthroat trout (*Oncorhynchus clarkia bouvieri*), Utah chub (*Gila atraria*), longnose dace (*Rhinichthys cataractae*), speckled dace (*Rhinichthys osculus*), redside shiner (*Richardsonius balteatus*), Utah sucker (*Catostomus ardens*), bluehead sucker (*Catostomus discobolus*), mountain sucker (*Catostomus platyrhynchus*), and mountain sculpin (*Cottus sp.*). Non-native species include white sturgeon (*Acipenser transmontanus*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), common carp (*Cyprinus carpio*), brown bullhead (*Ameiurus nebulosus*), channel catfish (*Ictalurus punctatus*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), and yellow perch (*Perca flavescens*) (IDFG 2019).

The Snake River, between Gem State Dam to the confluence of the South Fork is considered a cold-water fishery supporting rainbow trout, brown trout, cutthroat trout, and mountain whitefish (IFG 2019). Additionally, a catch-and-release fishery of white sturgeon is supported between the outfall of the Idaho Falls Upper Plant and the Gem State Dam (IDGH 2019). The 39-mile reach of the Snake River upstream from the Upper Dam to the confluence of the Henry's Fork and South Fork supports a trophy fishery for rainbow trout, brown trout, and cutthroat trout. Catch rates are generally relatively low upstream of the IFP Projects, although trophy-size fish are caught. The 1976 Teton Dam failure and associated silt deposition caused a loss of spawning habitat in this reach (DFG 2007). Some limited natural trout reproduction occurs; The reach downstream of the

Gem State Project is managed for larger trout, with some stocking of adult rainbow trout occurring annually (IDFG 2019). Brown trout stocking historically occurred in this reach but was discontinued in 1999 (IDFG 2007).

HABITAT WITHIN BOTH PROJECT AREAS

The IDFG and City of Idaho Falls stock the Snake River between the Upper Plant of the Idaho Falls Project and the Gem State Project with rainbow trout to support a put-and-take fishery (IDFG 2007). Fingerling and catchable-sized rainbow trout are stocked within both Project areas (IDFG 2022a). Additional species pursued by anglers in the reach between the Idaho Falls and Gem State Projects include yellowstone cutthroat trout, brown trout, and wild rainbow trout (IDFG 2007). The impoundments associated with each Project limit trout migration and spawning habitat within this reach (IDFG 2007). Some natural reproduction is believed to occur between the projects, but annual stocking is necessary to maintain the fishery (IDFG 2019).

Other fish species that have been documented in the vicinity of the Projects include mountain whitefish, Utah sucker, and Utah chub, as well as non-native smallmouth bass and white sturgeon (City of Idaho Falls 1978; IDFG 2019). Smallmouth bass were introduced to the Snake River reach that encompasses the Projects through stocking in 1990 and 1991 (IDFG 1993a). IDFG has stocked white sturgeon between the Upper Plant of the Idaho Falls Project and Gem State Dam since 2007, and in other reaches of the Snake River since 1989. Multiple reaches between the two Projects offer opportunities for anglers to pursue white sturgeon. The fishery is currently designated as catch-and-release only, although future harvest goals are being considered (IDFG 2019).

The Snake River, upstream of the Idaho Falls Upper Plant to the confluence of the Henry's Fork and South Fork, contains a fishery of rainbow trout, cutthroat trout, and brown trout. No fish are stocked upstream of the Idaho Falls Upper Plant (IDFG 2019). Some reproduction does occur, and although catch rates are low, trout that are caught can reach trophy size. Brown trout exceeding 30-inches and rainbow trout exceeding 8 pounds were caught by anglers during recent years (IDFG 2019).

AQUATIC HABITAT

Numerous irrigation diversions exist both upstream and downstream of the Projects. The effect of the diversions on fish entrainment has not been well documented throughout the upstream and downstream reaches but is believed to have substantial effects on fish populations through mortality or removal of fish from the river and into canals (IDFG 2019). Quality and availability of aquatic habitats, and associated habitat suitability upstream of the Idaho Falls Project, is largely influenced by the amount of water diverted from the Snake River for irrigation (IDFG 2019). Effects of irrigation on river flows are especially variable from April to October during the irrigation season (IDFG 2007).

Irrigation releases from the Palisades Reservoir has reduced the maximum summer water temperature of the Snake River upstream of the Idaho Falls Project, maintaining suitable habitat for cold-water species (City of Idaho Falls 1978). Article 40 of the Idaho Falls Project license requires a continuous minimum flow of 100 cfs from the Upper Plant Dam into the east channel and cold water temperatures for select species to discourage reproduction of warm-water species (FERC 1979). Flow into the west channel is maintained through generation (City of Idaho Falls 1978). The Gem State Project is required to maintain a continuous 20 cfs minimum flow for aquatic habitat downstream of the project (FERC 1985).

5.3.2 DISTRIBUTION OF FISH AND AQUATIC COMMUNITY

5.3.2.1 RESIDENT FISH COMMUNITY

The Snake River reach that encompasses the Projects supports a cold-water fishery for multiple trout species, including brown trout, Yellowstone cutthroat trout, hatchery stocked rainbow trout, and wild rainbow trout (IDFG 2019). Mountain whitefish and yellow perch are also pursued by anglers throughout the reach (City of Idaho Falls 1978). Additional gamefish species that occur between the Projects include smallmouth bass and white sturgeon, with white sturgeon stocking efforts ongoing (Table 5-11). Nongame fish species documented in the Idaho Falls Project area include Utah chub and Utah sucker (City of Idaho Falls 1978; IDFG 2019). Electrofishing efforts targeting gamefish species downstream of the Idaho Falls Lower Plant and Gem State Dam have documented relatively high numbers of mountain whitefish relative to the overall fish population (IFP 2018). Hatchery rainbow trout comprise a majority of the salmonid population. Minimal

salmonid spawning activity occurs in the impounded reaches between the Idaho Falls Upper Plant and Gem State Dam (IDFG 2019). Wild trout are present in reaches upstream of the Upper Plant, likely through a combination of some successful spawning activity and emigration (IDFG 1993b, 2019).

TABLE 5-11 GAMEFISH SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

SCIENTIFIC NAME	COMMON NAME	NATIVE/NON-NATIVE TO REACH
Acipenser transmontanus	White sturgeon	Non-native
Micropterus dolomieu	Smallmouth bass	Non-native
Oncorhynchus clarkii bouvieri	Yellowstone cutthroat trout	Native
Oncorhynchus mykiss	Rainbow trout*	Non-native
Prosopium williamsoni	Mountain whitefish	Native
Salmo trutta	Brown trout	Non-native

Source: IDFG 1993b, 2007
*includes hatchery and wild fish

5.3.2.2 FISHERIES MANAGEMENT

The overall management objectives for the reach of the Snake River that includes the Projects include: 1) stocking of white sturgeon in the Project pools and evaluating success, as well as the public's desire to engage in limited sturgeon harvest; 2) offsetting limited spawning habitat by stocking trout, and evaluating effectiveness, as well as maintaining put-and take trout fishing opportunities; 3) evaluating thermal and physical trout habitat characteristics through the reach; 4) maintaining a trophy component to the fishery in some reaches, including assessment of additional regulations, and 5) improving angler access through easements or acquisitions (IDFG 2019).

Goals related to maintenance of a trophy trout fishery are largely applicable to reaches of the Snake River that are outside of the Project areas, while goals within the Project areas emphasize angler success, catch rates, and opportunity. Fisheries management goals specific to the reach of the Snake River that encompasses the Projects include: 1) maintaining a catch rate for trout of 0.5 fish per hour through stocking; 2) monitoring of smallmouth bass populations, and 3) continued stocking of white sturgeon. Species specific management activities are described below (IDFG 2019).

TROUT SPECIES

The IDFG regularly stocks fingerling and catchable-sized rainbow trout throughout several Project pools. Stocking during recent years occurred in the John's Hole Pool (upstream of the City Plant), the Tourist Park Pool (upstream of the Lower Plant), and in Gem Lake (upstream of Gem State Dam) (Figure 5-13 and Figure 5-14). A total of 13,300 rainbow trout were stocked in the John's Hole Pool during 2021 and 2022, and a total of 7,806 rainbow trout were stocked in the Tourist Park Pool between 2018 and 2022. Fish stocked during all of these years were greater than 6-inches in length. A majority of trout stocking in the Project areas occurred in Gem Lake. Stocking records for this reach go back to 1988 with a total of 591,093 trout stocked during the past 10 years (2012-2022) (Table 5-12). Most of the rainbow trout stocked in Gem Lake were greater than 6-inches in length, but rainbow trout less than 6-inches were also stocked (IDFG 2022a). Cutthroat trout stocked during recent years, included 5,002 individuals stocked during 2017 (Table 5-12). The angler daily bag limits in the Gem Lake, John's Hole Pool and Tourist Park Pool are six total trout, only two of which may be cutthroat trout (IDFG 2022b).

Since 2018, IFP has stocked the Gem State Kids Fishing Pond located just downstream of the Gem State Dam with 8-inch and 11-inch trout. From 2018 to 2020, IFP stocked the pond with 1,800 pounds of 8-inch trout and 600 pounds of 11-inch trout. In 2021, Idaho Falls reduced the quantity stocked and supplied 800 pounds of 8-inch trout and 200 pounds of 11-inch trout for only the month of August, 800 pounds of 8 inch trout and 200 pounds of 11 inch trout for only the month of June in 2022, and 800 pounds of 8 inch trout and 200 pounds of 11 inch trout for only the month of August in 2023 (Table 5-13).

TABLE 5-12 IDAHO FISH & GAME TEN-YEAR TROUT STOCKING HISTORY IN THE PROJECT AREA

LOCATION	# STOCKED	GENERAL SIZE	YEAR
John's Hole Pool	9,351	Greater than 6 inches	2022 (through May)
	3,949	Greater than 6 inches	2021
Tourist Park Pool	1,200	Greater than 6 inches	2022 (through May)
	3,600	Greater than 6 inches	2021
	3,006	Greater than 6 inches	2018
Gem Lake	3,003	Greater than 6 inches	2022
	12,000	Greater than 6 inches	2021
	12,000	Greater than 6 inches	2020
	12,000	Greater than 6 inches	2019
	81,498	Less than 6 inches	2018
	12,005	Greater than 6 inches	2018
	5,002[2]	Less than 6 inches[2]	2017[2]
	115	Adult	2017
	12,999	Greater than 6 inches	2017
	19,240	Greater than 6 inches	2016
	38,988	Less than 6 inches	2015
	23,445	Greater than 6 inches	2015
	503	Adult	2015
	11,900	Greater than 6 inches	2014
	79,421[2]	Less than 6 inches[2]	2014[2]
	12,000	Greater than 6 inches	2013
	232,625[2]	Less than 6 inches[2]	2013[2]
	9,000	Greater than 6 inches	2012
	13,349[2]	Less than 6 inches[2]	2012[2]

Source: IDFG 2022a
[1] rainbow trout unless otherwise noted;
[2] cutthroat trout

TABLE 5-13 IDAHO FALLS POWER FIVE-YEAR TROUT STOCKING HISTORY IN THE PROJECT AREA

LOCATION	YEAR	8-INCH TROUT (LBS)	11-INCH TROUT (LBS)
Gem State Fish Pond	2023 (August only)	800	200
	2022 (June only)	800	200
	2021 (August only)	800	200
	2020	1800	600
	2019	1800	600
	2018	1800	600

Source: Idaho Fish Stocking 2018-2023

WHITE STURGEON

White sturgeon is the largest freshwater fish in North America, and one of eight sturgeon species found on the continent. The historical range of the species includes the Snake River from Shoshone Falls downstream to its confluence with the Columbia River. Shoshone Falls presents a natural high migration barrier to the species, preventing further range expansion; therefore, white sturgeon were not historically found in the reach of the Snake River that encompasses the IFP Projects (IDFG 2008).

White sturgeon were stocked in pools between the Upper and Lower Idaho Falls Plants and downstream of Gem State Dam during most years since 2007, with total of 4,571 white sturgeon stocked in the Snake River upstream of American Falls Reservoir and within the Project areas. Initial stocking events occurred upstream of the City Plant, with additional stocking efforts occurring upstream of the Lower Plant and City Plant during recent years (Figure 5-13 and Figure 5-14) (Table 5-14) (IDFG 2008, 2022a). Catchable-sized adult fish were stocked (e.g., approximately 4- to 7-feet), along with fish classified as "greater than 6 inches" are often approximately 16 inches long (Idaho News 2019). The IDFG goal associated with the current white sturgeon stocking regimen is to diversify sport fishing opportunities for anglers by adding an additional species that can be pursued. Longer term goals include evaluation of angler parameters, continued white sturgeon stocking based on biological observations, detection of emigration from the reach, and promoting sturgeon angling opportunities (IDFG 2008, 2019). The species is

currently closed to harvest, with catch-and-release angling allowed. Alternate regulations may be considered that could allow some harvest as a part of future management goals, although harvest of the species is not allowed as of 2022 (IDFG 2019, 2022b). Genetics are not considered as a stocking parameter, as the nearest wild population occurs over 150 RM downstream of the Gem State Project. Fishing regulations for white sturgeon in the Snake River include the use of barbless hooks, and use of a sliding swivel with light line attached to a weight. The purpose of this type of fishing tackle is to allow for minimal tackle to be lost, reducing sturgeon mortality associated with angling activities (IDFG 2022b).

The IDFG conducted surveys during 2021 to document white sturgeon distribution in the reach of the Snake River that includes the Project areas. The surveys documented that some individual white sturgeon remained in the vicinity of their original stocking locations, while others made downstream movements. Most individuals were documented within 5 miles of their original stocking location. One individual that was stocked in the Project areas was found to have migrated past Project dams and was found approximately 80 miles downstream of the Gem State Project. Surveys of white sturgeon anglers suggest that catch rates, and overall sturgeon abundance, are highest immediately downstream of Gem State Dam (IDFG 2021).

TABLE 5-14 WHITE STURGEON STOCKING HISTORY IN THE PROJECT AREAS

LOCATION	# STOCKED	GENERAL SIZE	YEAR
John's Hole Pool	10	Adult	2021
	2	Adult	2019
	84	Greater than 6 inches	2019
	151	Adult	2017
	256	Greater than 6 inches	2017
Tourist Park Pool	154	Adult	2022
	52	Adult	2021
	87	Greater than 6 inches	2018
	200	Adult	2017
Gem Lake	253	Greater than 6 inches	2019
	100	Adult	2016

LOCATION	# STOCKED	GENERAL SIZE	YEAR
	389	Adult	2015
	44	Greater than 6 inches	2015
American Falls Reservoir to Gem Lake Dam*	2	Adult	2019
	250	Adult	2018
	50	Greater than 6 inches	2018
	309	Adult	2017
	215	Adult	2016
	744	Adult	2015
	77	Greater than 6 inches	2015
	381	Adult	2014
	251	Adult	2013
	436	Adult	2010
	74	Adult**	2007

Source: IDFG 2022a
*2007 stocking event is listed as occurring between American Falls Reservoir and Gem Lake Dam in historical stocking records. The white sturgeon Management Plan (IDFG 2008) notes that the stocking event occurred at John's Hole Pool. Additional stocking efforts listed for American Falls Reservoir to Gem Lake Dam may be associated with efforts that occurred upstream of Gem Lake Dam and into the Idaho Falls Project
**Size class for 2007 stocking event is listed as "juvenile" in the white sturgeon Management Plan (IDFG 2008). Other instances of adult size class could include juveniles

5.3.3 AQUATIC INVASIVE SPECIES

Two aquatic invasive species, the Asian clam (*Corbicula fluminea*) and the New Zealand mudsnail (*Potamopyrgus antipodarum*), are abundant in reaches of the Snake River downstream of the IFP Projects. Specifically, the Asian clam is abundant in the reach beginning at the C.J. Strike Reservoir and continuing downstream through the Hells Canyon Complex. The New Zealand mudsnail is abundant in the reach of the Snake River that includes C.J. Strike Reservoir and upstream to American Falls Reservoir (Lysne 2009). Despite their abundance in these downstream reaches, neither species is currently known to occur in the reach of river that includes the IFP Projects (IDFG 2022c, 2022d). An invasive aquatic plant, Eurasian water milfoil (*Myriophyllum spicatum*) was documented in 17 counties in Idaho (IDFG 2019). The nearest documented location of Eurasian water milfoil in the Snake River is approximately 200 RMs downstream of the Gem State Project (ISDA 2020a). Another aquatic invasive plant, hydrilla (*Hydrilla verticillata*) was

documented in approximately the same reach of the Snake River as Eurasian watermilfoil, but is not known to occur further upstream in the basin (ISDA 2020b).

5.3.4 FRESHWATER MUSSELS AND BENTHIC MACROINVERTEBRATES

Mussel species that have been documented in the Snake River system include the western ridged mussel (*Gonidea angulata*) and the western pearlshell (*Margaritifera falcata*). Individual occurrences of western ridged mussel were documented upstream of the IFP Projects in the South Fork (Jefferson County), and downstream of the IFP Projects in the reach of the Snake River below the American Falls Reservoir (Power County) during the early 1990s (IDFG 2022e). The western pearlshell was documented more recently in the Snake River system. Occurrences of the species were noted near the confluence of the South Fork and Henry's Fork, approximately 40 miles upstream of the Upper Plant (Teton County) (IDFG 2022f). No observations of western ridged mussel or western pearlshell have been documented in Bonneville or Bingham counties.

Benthic macroinvertebrates were sampled in the Gem State Project area in November 1980 and in March 1981. A total of 27 taxa were documented, and macroinvertebrate densities ranged from 154 to 1,092 organisms per square foot. Samples collected during March were dominated by midges (Diptera) from the family Chironomidae. Caddisfly (Trichoptera) larvae were the second most abundant taxa collected during March. Caddisfly larvae, from the family Hydropsychidae, were the most abundant taxa collected during November (FERC 1983).

The desert valvata snail (*Valvata utahensis*) was documented immediately upstream of the Lower Plant. This species was listed as endangered under the ESA and was believed to only occur below American Falls Dam until survey work located populations upstream of Blackfoot (IFP 2009). Since then, the desert valvata was removed from the ESA list (USFWS 2010). Desert valvata snail prefers deep pools of the Snake River and flowing waters of less swift Snake River tributaries. The snail inhabits a variety of substrates from silts to small pebbles, gravel and rooted aquatic vegetation. In the IFP 2009 Biological Opinion, the presence of the desert valvata snail was confirmed from a site survey conducted by USFWS of the boat launch located at the lower development of the Idaho Falls Project (IFP 2009).

5.3.5 ESSENTIAL FISH HABITAT

National Marine Fisheries Service (NMFS) identifies essential fish habitat (EFH) for fish species that are commercially managed under the Magnuson-Stevens Fishery Conservation and Management Act. EFH is defined as the habitat needed for managed fish species to spawn, breed, feed, and grow to maturity (NOAA 2007). There are no federally managed commercial fish species near the IFP Projects. The IFP Projects are outside the historic range of all anadromous fish species that occur further downstream in the basin; therefore, there is no EFH in the IFP Project vicinity.

5.3.6 REFERENCES

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5.4 WILDLIFE AND BOTANICAL RESOURCES

Per 18 CFR § 5.6(d)(3)(v), this section describes the wildlife and botanical resources, including invasive species, in the Idaho Falls and Gem State Project vicinities.

5.4.1 WILDLIFE HABITAT

The Idaho Falls and Gem State Projects occur within the Upper Snake River Plain ecoregion. The land within this ecoregion is dominated by grassland/shrubland, which covers approximately two-thirds of the region (Sleeter 2012). The sagebrush steppe ecosystems include species such as big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), basin wildrye (*Leymus cinereus*), rabbitbrush (*Chrysothamnus viscidiflorus*), Thurber needlegrass (*Achnatherum thurberianum*), Idaho fescue (*Festuca idahoensis*), threetip sagebrush (*Artemisia tripartita*), Gardner's saltbush (*Atriplex gardneri*), black greasewood (*Sarcobatus vermiculatus*), Indian ricegrass (*Achnatherum hymenoides*), fourwing saltbush (*Atriplex canescens*), crested wheatgrass (*Agropyron cristatum*), alkali sagebrush (*Artemisia longiloba*), and cheatgrass (*Bromus tectorum*) (Sleeter 2012).

The Idaho Falls and Gem State Projects are located within Bingham and Bonneville counties and are surrounded by urban development and agricultural areas. Although only 0.5 percent of the land cover in the Upper Snake River ecoregion is categorized as developed, this region is home to five of Idaho's largest cities: Boise, Nampa, Pocatello, Twin Falls, and Idaho Falls, the latter of which is where the Project is located (Sleeter 2012). The plains and low hills within the Idaho Falls and Gem State Project Boundaries offer ideal conditions for anthropogenic use, and habitat within the Project vicinities is dominated by cultivated crops (small grain, sugar beet, potato, and alfalfa) and livestock. Heavy irrigation in the Upper Snake River Plain is a major cause of stream degradation in the region, along with channelization, dams, sewage treatment, nonpoint pollution, food processing, and phosphate processing (McGrath et al. 2002).

5.4.2 WILDLIFE RESOURCES

Quality habitat for wildlife species that occur within the Upper Snake River Plain ecoregion is unlikely to be present in the Idaho Falls and Gem State Project Boundaries due to heavy

development and abundance of agricultural lands adjacent to the Snake River. It is likely that many of these wildlife species may occur within the Project vicinities rather than the Project Boundaries.

5.4.2.1 MAMMALS

Land within the Idaho Falls and Gem State Project Boundaries are primarily comprised of aquatic habitat of the Snake River. There is a thin border of terrestrial habitat adjacent to the Project's reservoirs that are included within the Project Boundaries. Mammalian species may use this riparian corridor for movement and occasional foraging. It is unlikely that larger wildlife species common to the Snake River Plain such as elk (*Cervus canadensis)*, American black bear (*Ursus americanus*), and mule deer (*Odocoileus hemionus)* will be present within the Idaho Falls and Gem State Project Boundaries, and more likely that smaller, semi-aquatic mammals such as the American beaver (*Castor canadensis*) and common muskrat (*Ondatra zibethicus*) will utilize the banks of the Snake River for foraging and shelter (Francisco and Griffith 2011). Species such as the raccoon (*Procyon lotor*) are common, especially along the riparian corridors associated with the Project Boundaries. Other mammals present in the vicinity of the Idaho Falls and Gem State Projects include furbearers, small game species, and rodents. Smaller mammals such as various species of mice, shrew, and vole are expected to be abundant in the surrounding grassland and agricultural lands of the Project Boundaries.

The IDFG reports there are 10 species of bat that have the potential to occur within the Projects' vicinities (IDFG 2022) (Table 5-15). Riverine habitat within the Idaho Falls and Gem State project boundaries may serve as a feeding corridor for the identified bat species in Table 5-15, all of which are insectivores. Summer roosting habitat is not likely to be present within the grass-dominated riparian corridor of the portion of the Snake River within the Project Boundaries. Winter hibernaculum for bat species includes mines, caves, forests, and anthropogenic roosts. Although the Snake River Plain has a high density of hibernacula for Townsend's big-eared bat and western small-footed myotis, it is unlikely that natural winter hibernaculum occur within the Project Boundaries (Whiting et al. 2018). Whiting et al. (2018) monitored bat populations in 64 caves over 32 years, which were in part located in Bingham and Bonneville counties on land managed by the National Park Service, BLM, and the U.S. Department of Energy, Idaho Operations Office. There are 33.7 acres of land managed by the BLM within the Project Boundaries. The exact locations of

monitored caves are not stated in Whiting et al. (2018), but due to the proximity of the BLM-managed land to the Snake River, it is unlikely that caves are present on these parcels (Figure 5-10, Figure 5-11, Figure 5-12). Idaho has implemented the North American Bat Monitoring Program since 2015, which is identified as a conservation need in the Idaho State Wildlife Action Plan (IDFG 2017).

FIGURE 5-10 BLM-MANAGED LAND NEAR THE UPPER PLANT BOUNDARY

FIGURE 5-11 BLM-MANAGED LAND NEAR THE CITY AND LOWER PLANTS

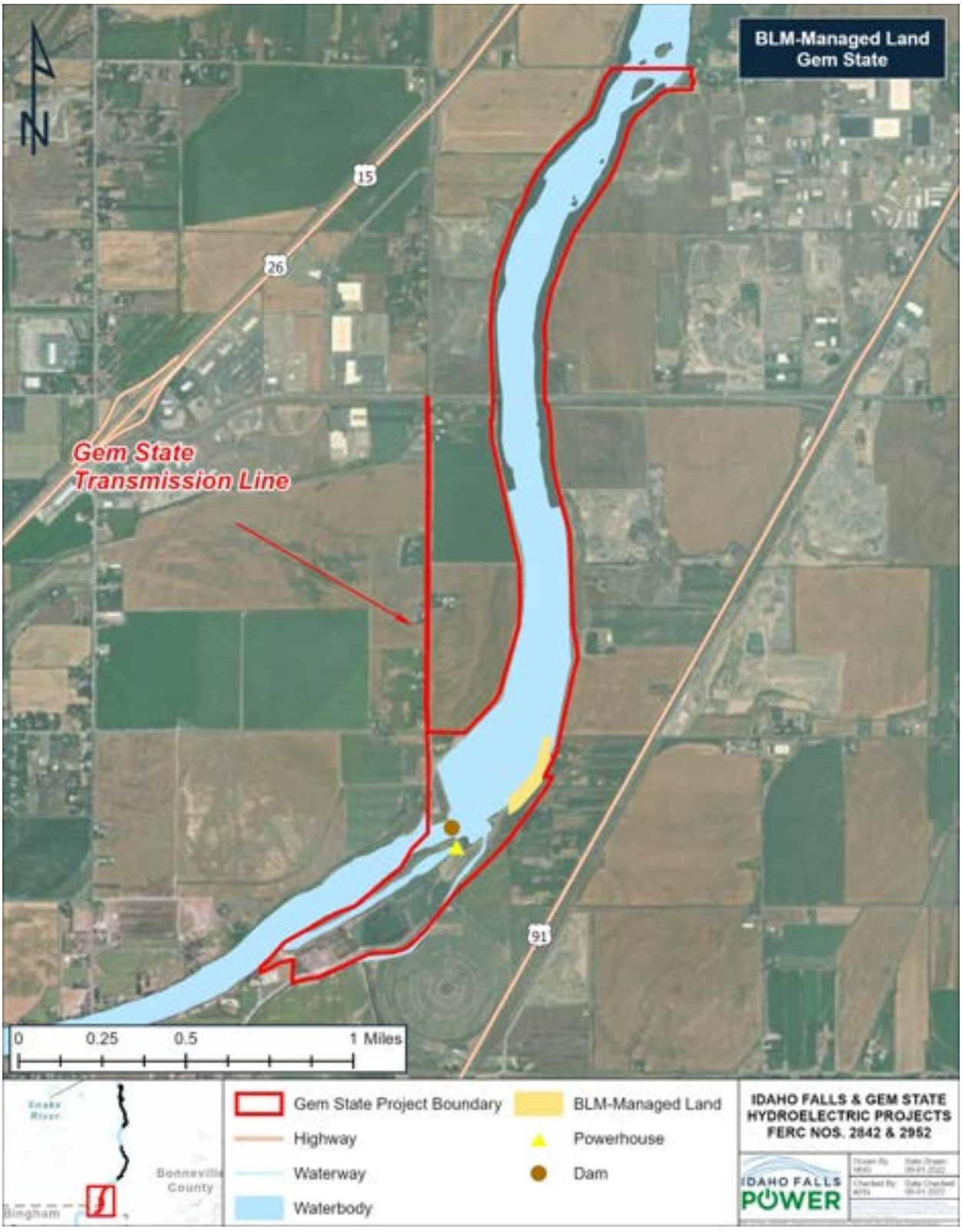

FIGURE 5-12 BLM-MANAGED LAND IN THE GEM STATE PROJECT BOUNDARY

Table 5-15 provides the list of mammal species for Bingham and Bonneville counties that have the potential to occur within the vicinity of the Projects (IDFG 2022).

TABLE 5-15 LIST OF MAMMALS POTENTIALLY OCCURRING IN THE PROJECTS' VICINITIES

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS[1]
MARSUPIALS		
Didelphis virginiana	Virginia opossum	SNA
BATS		
Corynorhinus townsendii	Townsend's big-eared bat	S3
Eptesicus fuscus	Big brown bat	S3
Lasionycteris noctivagans	Silver-haired Bat	S3
Lasiurus cinereus	Hoary bat	S3
Myotis ciliolabrum	Western small-footed myotis	S3
Myotis evotis	Long-eared myotis	S3
Myotis lucifugus	Little brown myotis	S3
Myotis thysanodes	Fringed myotis	S3
Myotis volans	Long-legged myotis	S3
Myotis yumanensis	Yuma myotis	S3
SHREWS AND VOLES		
Lemmiscus curtatus	Sagebrush vole	S5
Microtus longicaudus	Long-tailed vole	S5
Microtus montanus	Montane vole	S4
Microtus pennsylvanicus	Meadow vole	S5
Microtus richardsoni	North American water vole	S4
Myodes gapperi	Southern red-backed vole	S4
Sorex cinereus	Masked shrew	S5
Sorex merriami	Merriam's shrew	S4
Sorex navigator	Western water shrew	S4
Sorex obscurus	Northern montane shrew	S5
Sorex vagrans	Vagrant shrew	S5
RODENTS		
Brachylagus idahoensis	Pygmy rabbit	S3
Callospermophilus lateralis	Golden-mantled ground squirrel	S5
Castor canadensis	American beaver	S4
Dipodomys ordii	Ord's kangaroo rat	S4
Erethizon dorsatum	North American porcupine	S5
Glaucomys sabrinus	Northern flying squirrel	S4
Lepus americanus	Snowshoe hare	S3
Lepus californicus	Black-tailed Jackrabbit	S4
Lepus townsendii	White-tailed Jackrabbit	S4
Marmota flaviventris	Yellow-bellied marmot	S4

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS[1]
Neotamias amoenus	Yellow-pine chipmunk	S5
Neotamias minimus	Least chipmunk	S5
Neotamias umbrinus	Uinta chipmunk	S4
Neotoma cinerea	Bushy-tailed woodrat	S5
Ochotona princeps	American pika	S3
Ondatra zibethicus	Common muskrat	S4
Onychomys leucogaster	Northern grasshopper mouse	S4
Perognathus parvus	Columbia plateau pocket mouse	S5
Peromyscus maniculatus	North American deermouse	S5
Reithrodontomys megalotis	Western harvest mouse	S4
Sylvilagus nuttallii	Mountain cottontail	S4
Tamiasciurus hudsonicus	Red squirrel	S5
Thomomys idahoensis	Idaho pocket gopher	S4
Thomomys talpoides	Northern pocket gopher	S5
Thomomys townsendii	Townsend's pocket gopher	S4
Urocitellus armatus	Uinta ground squirrel	S4
Urocitellus elegans	Wyoming ground squirrel	S3
Urocitellus mollis	Piute ground squirrel	S4
Zapus princeps	Western jumping mouse	S4
UNGULATES		
Alces alces	Moose	S3
Antilocapra americana	Pronghorn	S4
Cervus canadensis	Elk	S5
Odocoileus hemionus	Mule deer	S4
Odocoileus virginianus	White-tailed Deer	S5
Oreamnos americanus	Mountain goat	S3
Ovis canadensis	Bighorn sheep	S3
Ovis canadensis canadensis	Rocky Mountain bighorn sheep	S1
CARNIVORES		
Bassariscus astutus	Ringtail	SNA
Canis latrans	Coyote	S5
Canis lupus	Gray wolf	S4
Gulo gulo	Wolverine	S1
Lontra canadensis	Northern river otter	S4
Lynx canadensis	Canada lynx	SNA
Lynx rufus	Bobcat	S4
Martes caurina	Pacific marten	SNR
Mephitis mephitis	Striped skunk	S4
Mustela erminea	Ermine or short-tailed weasel	S4

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS[1]
Mustela frenata	Long-tailed weasel	S5
Procyon lotor	Northern raccoon	S5
Puma concolor	Mountain lion, cougar, or puma	S5
Taxidea taxus	American badger	S4
Ursus arctos	Grizzly bear or brown bear	S2
Vison vison	American mink	S3
Vulpes vulpes	Red fox	S4
OMNIVORES		
Ursus americanus	American black bear	S4

Source: IDFG 2022, NatureServe 2022
[1]S – State rank indicator; denotes rank based on status within Idaho.
S1 – Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences)
S2 – Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences)
S3 – Rare or uncommon but not imperiled (typically 21 to 100 occurrences)
S4 – Not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences).
S5 – Demonstrably widespread, abundant, and secure.
SNR – Not ranked
SNA – Conservation status rank is not applicable

5.4.2.2 BIRDS

Avian species within the Idaho Falls and Gem State Project Boundaries are expected to utilize the Snake River for foraging, hunting, and as habitat. The Snake River also serves as a migration corridor for avian species. The riparian corridor along the Snake River offers some nesting habitat for small to medium sized songbirds, but the limited canopy habitat within the Project Boundaries is not expected to support an abundance of these birds. Birds of prey occurrences may be more common within the Project Boundaries due to aquatic hunting grounds within the Project's reservoirs, but these species are temporary inhabitants and are not expected to nest within the Project Boundaries. Similarly, nocturnal birds of prey, which include various species of owl, may temporarily occur within the Projects' vicinities where small prey such as mice, shrew, and voles are present. Waterfowl such as teal and duck will utilize the Projects' reservoirs for habitat, breeding, and as a migration route.

Table 5-16 provides the list of bird species for Bingham and Bonneville counties that have the potential to occur within vicinity of the Projects (IDFG 2022), including the NatureServe State Conservation Status Rank for each species describing if a given species is thriving, rare, or

declining (IDFG 2017). No species identified in the Projects' vicinities were listed under the ESA except for the Yellow-billed Cuckoo (YBC; *Coccyzus americanus*), a federally threatened species (Section 5.6.1, *Wildlife Species*).

TABLE 5-16 AVIAN SPECIES WITH THE POTENTIAL TO OCCUR WITHIN THE PROJECTS' VICINITIES

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Acanthis flammea	Common Redpoll	S3N
Accipiter cooperii	Cooper's Hawk	S4
Accipiter gentilis	Northern Goshawk	S3
Accipiter striatus	Sharp-shinned Hawk	S4
Actitis macularius	Spotted Sandpiper	S3B
Aechmophorus clarkii	Clark's Grebe	S2B
Aechmophorus occidentalis	Western Grebe	S2B
Aegolius acadicus	Northern Saw-whet Owl	S4
Aeronautes saxatalis	White-throated Swift	S4B
Agelaius phoeniceus	Red-winged Blackbird	S5
Aix sponsa	Wood Duck	S4B,S4N
Ammodramus savannarum	Grasshopper Sparrow	S3B
Anas - Teal spp.	Unclassified Teal	NL
Anas acuta	Northern Pintail	S4B,S4N
Anas americana	American Wigeon	S4B,S4N
Anas clypeata	Northern Shoveler	S4B,S4N
Anas crecca	Green-winged Teal	S4B,S3N
Anas cyanoptera	Cinnamon Teal	S4B
Anas discors	Blue-winged Teal	S2B
Anas penelope	Eurasian Wigeon	S1N
Anas platyrhynchos	Mallard	S4B,S4N
Anas strepera	Gadwall	S3
Anatidae - Duck spp.	Unclassified Duck	NL
Anthus rubescens	American Pipit	S3B
Aphelocoma californica	Western Scrub-Jay	S3
Aquila chrysaetos	Golden Eagle	S3
Archilochus alexandri	Black-chinned Hummingbird	S5B
Ardea alba	Great Egret	S2B
Ardea herodias	Great Blue Heron	S5B
Artemisiospiza nevadensis	Sagebrush Sparrow	S3B
Asio flammeus	Short-eared Owl	S3
Athene cunicularia	Burrowing Owl	S2B

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Aythya - Scaup spp.	Unclassified Scaup	NL
Aythya affinis	Lesser Scaup	S3B,S3N
Aythya americana	Redhead	S4
Aythya collaris	Ring-necked Duck	S4B,S4N
Aythya marila	Greater Scaup	SNA
Aythya valisineria	Canvasback	S3B,S3N
Baeolophus ridgwayi	Juniper Titmouse	S1
Bombycilla cedrorum	Cedar Waxwing	S5
Bombycilla garrulus	Bohemian Waxwing	S4N
Bonasa umbellus	Ruffed Grouse	S4
Botaurus lentiginosus	American Bittern	S1B
Branta canadensis	Canada Goose	S5B,S5N
Bubo virginianus	Great Horned Owl	S5
Bubulcus ibis	Cattle Egret	S1B
Bucephala - Goldeneye spp.	Unclassified Goldeneye	NL
Bucephala albeola	Bufflehead	S1B,S1N
Bucephala clangula	Common Goldeneye	S5B,S5N
Bucephala islandica	Barrow's Goldeneye	S3B,S3N
Buteo jamaicensis	Red-tailed Hawk	S4
Buteo lagopus	Rough-legged Hawk	S4N
Buteo regalis	Ferruginous Hawk	S3B
Buteo swainsoni	Swainson's Hawk	S5B
Calamospiza melanocorys	Lark Bunting	S1B
Calidris alba	Sanderling	S1M
Calidris bairdii	Baird's Sandpiper	S2M
Calidris canutus	Red Knot	SNA
Calidris himantopus	Stilt Sandpiper	SNA
Calidris mauri	Western Sandpiper	S3M
Calidris melanotos	Pectoral Sandpiper	S2M
Calidris minutilla	Least Sandpiper	S3M
Calidris pusilla	Semipalmated Sandpiper	S1M
Callipepla californica	California Quail	SNA
Cardellina pusilla	Wilson's Warbler	S4B
Cathartes aura	Turkey Vulture	S5B
Catharus ustulatus	Swainson's Thrush	S5B
Catherpes mexicanus	Canyon Wren	S5
Centrocercus urophasianus	Greater Sage-Grouse	S3
Certhia americana	Brown Creeper	S4

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Chaetura vauxi	Vaux's Swift	S3B
Charadrius montanus	Mountain Plover	SNA
Charadrius semipalmatus	Semipalmated Plover	S1M
Charadrius vociferus	Killdeer	S4B,S4N
Chen caerulescens	Snow Goose or Blue Goose	S5M
Chen rossii	Ross's Goose	S3M
Chlidonias niger	Black Tern	S2B
Chondestes grammacus	Lark Sparrow	S4B
Chordeiles minor	Common Nighthawk	S4B
Cinclus mexicanus	American Dipper	S3
Circus cyaneus	Northern Harrier	S4
Cistothorus palustris	Marsh Wren	S5B,S5N
Clangula hyemalis	Long-tailed Duck	S1N
Coccothraustes vespertinus	Evening Grosbeak	S4
Coccyzus americanus	Yellow-billed Cuckoo	ESA Threatened/S1B
Colaptes auratus	Northern Flicker	S5
Columba livia	Rock Pigeon	SNA
Contopus cooperi	Olive-sided Flycatcher	S3B
Contopus sordidulus	Western Wood-Pewee	S5B
Corvus brachyrhynchos	American Crow	S5
Corvus corax	Common Raven	S5
Cyanocitta stelleri	Steller's Jay	S5
Cygnus buccinator	Trumpeter Swan	S1B,S4N
Cygnus columbianus	Tundra Swan	S4M,S4N
Dolichonyx oryzivorus	Bobolink	S2B
Dumetella carolinensis	Gray Catbird	S5B
Egretta thula	Snowy Egret	S1B
Empidonax hammondii	Hammond's Flycatcher	S5B
Empidonax oberholseri	Dusky Flycatcher	S4B
Empidonax occidentalis	Cordilleran Flycatcher	S5B
Empidonax traillii	Willow Flycatcher	S4B
Empidonax wrightii	Gray Flycatcher	S4B
Eremophila alpestris	Horned Lark	S5
Euphagus cyanocephalus	Brewer's Blackbird	S4
Falco columbarius	Merlin	S4
Falco mexicanus	Prairie Falcon	S4
Falco peregrinus	Peregrine Falcon	S3B
Falco sparverius	American Kestrel	S4

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Fulica americana	American Coot	S4B,S4N
Gallinago delicata	Wilson's Snipe	S3N,S4B
Gavia immer	Common Loon	S1B,S2N
Geothlypis tolmiei	MacGillivray's Warbler	S5B
Geothlypis trichas	Common Yellowthroat	S5B
Grus canadensis	Sandhill Crane	S3B
Haemorhous cassinii	Cassin's Finch	S4
Haemorhous mexicanus	House Finch	S4
Haliaeetus leucocephalus	Bald Eagle	ESA Delisted/S5
Himantopus mexicanus	Black-necked Stilt	S4B
Hirundo rustica	Barn Swallow	S5B
Histrionicus histrionicus	Harlequin Duck	S1B
Hydroprogne caspia	Caspian Tern	S1B
Icteria virens	Yellow-breasted Chat	S4B
Icterus bullockii	Bullock's Oriole	S4B
Junco hyemalis	Dark-eyed Junco	S5
Lanius excubitor	Northern Shrike	S3N
Lanius ludovicianus	Loggerhead Shrike	S3
Laridae - Tern spp.	Unclassified Tern	NL
Larus californicus	California Gull	S3B, S2N
Larus delawarensis	Ring-billed Gull	S2B,S2N
Larus fuscus	Lesser Black-backed Gull	SNA
Larus glaucoides	Iceland Gull	SNA
Leucophaeus pipixcan	Franklin's Gull	S3B
Limnodromus scolopaceus	Long-billed Dowitcher	S4M
Limosa fedoa	Marbled Godwit	S2M
Lophodytes cucullatus	Hooded Merganser	S2B,S2N
Loxia leucoptera	White-winged Crossbill	S4
Megaceryle alcyon	Belted Kingfisher	S4
Megascops kennicottii	Western Screech-Owl	S1
Meleagris gallopavo	Wild Turkey	SNA
Melospiza lincolnii	Lincoln's Sparrow	S5B
Melospiza melodia	Song Sparrow	S5
Mergus merganser	Common Merganser	S3
Mergus serrator	Red-breasted Merganser	S1M
Molothrus ater	Brown-headed Cowbird	S5B
Myadestes townsendi	Townsend's Solitaire	S5
Myiarchus cinerascens	Ash-throated Flycatcher	S4B

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Nucifraga columbiana	Clark's Nutcracker	S2
Numenius americanus	Long-billed Curlew	S2B
Nycticorax nycticorax	Black-crowned Night-Heron	S2B,S2N
Oreoscoptes montanus	Sage Thrasher	S3B
Oreothlypis celata	Orange-crowned Warbler	S4B
Oreothlypis virginiae	Virginia's Warbler	S3B
Oxyura jamaicensis	Ruddy Duck	S2
Pandion haliaetus	Osprey	S4B
Passer domesticus	House Sparrow	SNA
Passerculus sandwichensis	Savannah Sparrow	S5B
Passerella iliaca	Fox Sparrow	S4B
Passerina amoena	Lazuli Bunting	S4B
Patagioenas fasciata	Band-tailed Pigeon	SNA
Pelecanus erythrorhynchos	American White Pelican	S3B
Perdix perdix	Gray Partridge	SNA
Petrochelidon pyrrhonota	Cliff Swallow	S5B
Phalacrocorax auritus	Double-crested Cormorant	S4B
Phalaenoptilus nuttallii	Common Poorwill	S4B
Phalaropus lobatus	Red-necked Phalarope	S3M
Phalaropus tricolor	Wilson's Phalarope	S4B
Phasianus colchicus	Ring-necked Pheasant	SNA
Pheucticus melanocephalus	Black-headed Grosbeak	S5B
Pica hudsonia	Black-billed Magpie	S5
Picoides pubescens	Downy Woodpecker	S4
Picoides villosus	Hairy Woodpecker	S4
Pipilo chlorurus	Green-tailed Towhee	S4B
Pipilo maculatus	Spotted Towhee	S4
Piranga ludoviciana	Western Tanager	S5B
Plectrophenax nivalis	Snow Bunting	S4N
Plegadis chihi	White-faced Ibis	S2B
Pluvialis squatarola	Black-bellied Plover	S1M
Podiceps auritus	Horned Grebe	S2N
Podiceps nigricollis	Eared Grebe	S1N,S2B
Podilymbus podiceps	Pied-billed Grebe	S3
Poecile atricapillus	Black-capped Chickadee	S4
Poecile gambeli	Mountain Chickadee	S4
Polioptila caerulea	Blue-gray Gnatcatcher	S5B
Pooecetes gramineus	Vesper Sparrow	S5B

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Porzana carolina	Sora	S1N,S4B
Psiloscops flammeolus	Flammulated Owl	S3B
Quiscalus quiscula	Common Grackle	S1B
Rallus limicola	Virginia Rail	S2N,S3B
Recurvirostra americana	American Avocet	S3B,S3M
Regulus calendula	Ruby-crowned Kinglet	S4
Regulus satrapa	Golden-crowned Kinglet	S5
Rhodostethia rosea	Ross's Gull	SNA
Riparia riparia	Bank Swallow	S4B
Salpinctes obsoletus	Rock Wren	S5B
Sayornis saya	Say's Phoebe	S5B
Scolopacidae - Sandpiper spp.	Unclassified Sandpiper	NL
Selasphorus calliope	Calliope Hummingbird	S4B
Selasphorus platycercus	Broad-tailed Hummingbird	S5B
Selasphorus rufus	Rufous Hummingbird	S4B
Setophaga citrina	Hooded Warbler	SNA
Setophaga coronata	Yellow-rumped Warbler	S5
Setophaga nigrescens	Black-throated Gray Warbler	S4B
Setophaga petechia	Yellow Warbler	S5B
Sialia currucoides	Mountain Bluebird	S5B
Sitta canadensis	Red-breasted Nuthatch	S4
Sitta carolinensis	White-breasted Nuthatch	S4
Sphyrapicus nuchalis	Red-naped Sapsucker	S4B
Spinus pinus	Pine Siskin	S4
Spinus psaltria	Lesser Goldfinch	S5
Spinus tristis	American Goldfinch	S5
Spizella arborea	American Tree Sparrow	S3N
Spizella breweri	Brewer's Sparrow	S4B
Spizella passerina	Chipping Sparrow	S5B
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B
Sterna forsteri	Forster's Tern	S2B
Sterna hirundo	Common Tern	SNA
Sterna paradisaea	Arctic Tern	SNA
Streptopelia decaocto	Eurasian Collared-Dove	SNA
Sturnella neglecta	Western Meadowlark	S5
Sturnus vulgaris	European Starling	SNA
Tachycineta bicolor	Tree Swallow	S5B

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Tachycineta thalassina	Violet-green Swallow	S5B
Tringa flavipes	Lesser Yellowlegs	S2M
Tringa melanoleuca	Greater Yellowlegs	S3M
Tringa semipalmata	Willet	S3B
Tringa solitaria	Solitary Sandpiper	S1M
Troglodytes aedon	House Wren	S4B
Turdus migratorius	American Robin	S5
Tympanuchus phasianellus columbianus	Columbian Sharp-tailed Grouse	SNA
Tyrannus tyrannus	Eastern Kingbird	S5B
Tyrannus verticalis	Western Kingbird	S5B
Tyto alba	Barn Owl	S4
Vireo gilvus	Warbling Vireo	S5B
Vireo plumbeus	Plumbeous Vireo	S2B
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	S4B
Zenaida macroura	Mourning Dove	S5
Zonotrichia leucophrys	White-crowned Sparrow	S5
Zonotrichia querula	Harris's Sparrow	SNA
Alectoris chukar	Chukar	SNA
Anser albifrons	Greater White-fronted Goose	S4M
Asio otus	Long-eared Owl	S5
Branta hutchinsii	Cackling Goose	SNR
Bubo scandiacus	Snowy Owl	SNA
Buteo platypterus	Broad-winged Hawk	SNA
Calcarius lapponicus	Lapland Longspur	S1N
Catharus fuscescens	Veery	S3B
Catharus guttatus	Hermit Thrush	S4B
Chroicocephalus philadelphia	Bonaparte's Gull	S3M
Cyanocitta cristata	Blue Jay	S1N
Dendragapus obscurus	Dusky Grouse	S5
Gavia pacifica	Pacific Loon	SNA
Glaucidium gnoma	Northern Pygmy-Owl	S3
Grus americana	Whooping Crane	SNA
Gymnorhinus cyanocephalus	Pinyon Jay	S3
Larus argentatus	Herring Gull	S2N
Larus thayeri	Thayer's Gull	SNA
Leucosticte tephrocotis	Gray-crowned Rosy-Finch	S4
Loxia curvirostra	Red Crossbill	S4

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Melanerpes lewis	Lewis's Woodpecker	S3B
Melanitta americana	Black Scoter	SNA
Melanitta fusca	White-winged Scoter	SNA
Melanitta perspicillata	Surf Scoter	SNA
Mimus polyglottos	Northern Mockingbird	S1B
Oreothlypis ruficapilla	Nashville Warbler	S4B
Picoides albolarvatus	White-headed Woodpecker	S2
Poecile rufescens	Chestnut-backed Chickadee	S5
Progne subis	Purple Martin	SNA
Psaltriparus minimus	Bushtit	S3
Quiscalus mexicanus	Great-tailed Grackle	S1B
Rhynchophanes mccownii	McCown's Longspur	SNA
Setophaga ruticilla	American Redstart	S2B
Setophaga townsendi	Townsend's Warbler	S5B
Sphyrapicus thyroideus	Williamson's Sapsucker	S4B
Strix nebulosa	Great Gray Owl	S3
Troglodytes pacificus	Pacific Wren	S5
Vireo cassinii	Cassin's Vireo	S5B
Xema sabini	Sabine's Gull	SNA
Zenaida asiatica	White-winged Dove	SNA

Source: IDFG 2022
[1] NL – Not Listed
S – State rank indicator; denotes rank based on status within Idaho.
S1 – Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences)
S2 – Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences)
S3 – Rare or uncommon but not imperiled (typically 21 to 100 occurrences)
S4 – Not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences).
S5 – Demonstrably widespread, abundant, and secure.
SNR – Not ranked
SNA – Conservation status rank is not applicable
A – Accidental (occurring only once or a few times) or casual (occurring more regularly although not every year) in Idaho; a few of these species might have bred on one or more of the occasions when they were recorded
B – Breeding population
M – Only applies when migrant occurs in an irregular, transitory, and dispersed manner. Occurrences cannot be defined from year-to-year
N – Nonbreeding population

5.4.2.3 INVASIVE WILDLIFE

Invasive species are non-native to the ecosystem in which they occur and are likely to cause environmental harm, impacting the economy and human health. There is an abundance of invasive wildlife species within Idaho that have the potential to occur within the Idaho Falls and Gem State Project Boundaries due to urban disturbance adjacent to the Project, which can facilitate the spread of these species. These invasive species include a range of taxa including mammals, insects, fish, and birds (Table 5-17). Aquatic invertebrates pose a particular threat to the Snake River Habitat. Quagga (*Dreissena rostiformis)* and zebra mussels (*Dreissena polymorpha*) are known to inhabit the Snake River, which outcompete native mussel populations and can clog water intake structures such as pipes and screens, increasing maintenance costs for water treatment and power plants (University of California at Riverside 2022).

Table 5-17 provides a list of invasive wildlife species in Idaho, identified by the Invasive Species of Idaho (ISI 2022). Currently there are 71 weed species designated by Idaho law; 2 amphibians, 1 bird, 14 fish, 54 insect, 11 aquatic invertebrate, 1 mammal, and 6 reptile species (Table 5-17).

TABLE 5-17 IDAHO INVASIVE WILDLIFE LIST

SCIENTIFIC NAME	COMMON NAME
Amphibians	
Rana catesbeiana	Bullfrog
Taricha granulosa	Rough skinned newt
Bird	
Myiopsitta monachus	Monk Parakeet
Fish	
Acipenser medirostris	Green sturgeon
Amia calva	Bowfin
Channidae	Snakehead
Clarias batrachus	Walking catfish
Ctenopharyngodon idella var. diploid	Diploid grass carp
Gymnocephalus cernuus	Ruffe
Hypophthalmichthys molitrix	Silver carp
Hypophthalmichthys nobilis	Big headed carp
Lepisosteidae	Gar
Leuciscus idus	Ide
Mylopharyngodon piceus	Black carp
Neogobius melanostomus	Round goby
Piranha	Piranhas

SCIENTIFIC NAME	COMMON NAME
Scardinius erythrophthalmus	Rudd
Aquatic Invertebrates	
Bythotrephes longimanus	Spiny waterflea
Cercopagis bengoi	Fishhook waterflea
Cherax cainii	Marron crayfish
Cherax destructor	Yabby crayfish
Cherax quadricarinatus	Red claw crayfish
Corbicula fluminea	Asian clam
Dreissena polymorpha	Zebra mussel
Dreissena rostriformis	Quaqqa mussel
Orconectes rusticus	Rusty crayfish
Potamopyrgus antipodarum	New Zealand mud snail
Procambarus virginalis	Marbles crayfish/marmorkrebs
Mammal	
Myocastor coypus	Nutria
Reptile	
Chelydra serpentina	Snapping turtle
Hemidactylus turcicus	Mediterranean gecko
Podarcis muralis	Common wall lizard
Podarcis sicula	Italian wall lizard
Ramphotyphlops braminus	Brahminy blindsnake
Trachemys scripta elegans	Red-eared slider

Source: ISI 2022

5.4.2.4 WILDLIFE IN THE OFFSITE MITIGATION AREA

In 1995, IFP submitted their Revised Program to Mitigate Impacts to Wetlands, Riparian Areas, and Wildlife Resources for the Gem State Hydroelectric Project. The offsite mitigation area is a 46.5-acre parcel that was purchased by Idaho Falls along the Snake River near Roberts, Idaho, for offsite mitigation (IFP 1995). This land is located outside the Idaho Falls and Gem State Project Boundaries in Section 12, Township 5 North, Range 37 East, and is approximately six miles downstream of the confluence of the Henry's Fork and South Fork of the Snake River. The parcel purchased by Idaho Falls Power contains a total of approximately 46.5 acres of Snake River floodplain.

The offsite mitigation area provide habitat for songbirds, raptors including rough-legged hawks (*Buteo lagopus*) and red-tailed hawks (*Buteo jamaicensis*), small mammals, and aquatic and

upland furbearers. Mule deer, elk, moose (*Alces alces*), and white-tailed deer (*Odocoileus virginianus*) occur in the area at certain times of the year (IFP 1995).

5.4.3 BOTANICAL HABITAT

Two common natural biotic plant communities within the Idaho Falls and Gem State Project areas are grass-shrub and mixed riparian communities. The dominant community of the area is agricultural crops, which replaced the natural vegetation after land clearing practices, and is maintained by irrigation.

The grass-shrub community is a generally treeless, shrub dominated community with perennial bunch grasses characterizing the understory. This community in the Idaho Falls and Gem State Project areas is bordered on one side by the riparian community and constrained on the other side by agricultural crops. Dominant woody species include big sagebrush, rabbitbrush, and horsebrush (*Tetradymia glabrata*). The dominant grass species are cheatgrass, Sandberg's bluegrass (*Poa sandbergii*), and Indian ricegrass. Disturbed areas within the community are dominated by cheatgrass and herbaceous species such as milkweed (*Asclepias speciosa*), cocklebur (*Xanthium strumarium*), and mullein (*Verbascum thapsus*). The grass-shrub community stops abruptly at the edges of roads, canal banks and agricultural fields; however, there is a transition zone between the riparian community and the grass-shrub community. The dominant species in the transition zone are big sagebrush and cheatgrass (Francisco and Griffith 2011).

The riparian community occurs as a band of vegetation approximately 6 to 90 feet wide on either side of the Snake River and is composed of herbaceous and woody riparian types. The dominant components of the woody overstory includes several willow species (*Salix* spp.), two cottonwood species (*Populus* spp.), and Russian Olive (*Eleagnus angustifolia*). The dominant components of the woody understory includes squawbush (*Rhus trilobata*), golden current (*Ribes aureum*), and Wood's rose (*Rosa woodsii*). Common herbaceous species include clematis (*Clematis lingusticifolia*), Solomon seal (*Smilacina stellata*), spiney sowthistle (*Sonchus asper*), and reed canarygrass (*Phalaris arundinacea*).

5.4.4 BOTANICAL RESOURCES

Table 5-18 provides IDFG County list of plant species for Bingham and Bonneville counties that have the potential to occur within the vicinity of the Projects (IDFG 2022) (Table 5-18).

TABLE 5-18 PLANT SPECIES THAT MAY OCCUR IN BINGHAM AND/OR BONNEVILLE COUNTIES

SCIENTIFIC NAME	COMMON NAME	LISTING & CONSERVATION STATUS[1]
Asclepias incarnata	swamp milkweed	S2?
Asclepias speciosa	showy milkweed	SNR
Eriogonum hookeri	Hooker's buckwheat	S1
Eschscholzia minutiflora ssp. covillei	pygmy poppy	Not Listed
Asclepias fascicularis	narrowleaf milkweed	SNR
Physaria carinata ssp. paysonii	Payson's bladderpod	S2
Pinus albicaulis	whitebark pine	ESA Candidate/S3
Poa paucispicula	Alaska bluegrass	S1
Spiranthes diluvialis	Ute ladies'-tresses	ESA Threatened/S1

Source: IDFG 2022
[1] S – State rank indicator; denotes rank based on status within Idaho.
S1 – Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences)
S2 – Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences)
SNR – Not ranked
? – Uncertainty exists about the stated rank

5.4.4.1 BOTANICAL RESOURCES ON THE OFFSITE MITIGATION AREA

The floodplain in the 46.5-acre offsite mitigation area is a mosaic of dense shrubs, weedy openings, and a small forest stand. Shrubs such as Wood's rose, red-osier dogwood (*Cornus sericea*), Pacific willow (*Salix lucida*), sandbar willow (*Salix exigua*), and narrowleaf cottonwood (*Populus angustifolia*) are present. Major vegetative communities in this area are weedy clearings and scrub/shrub riparian communities. Clearings have a few scattered Wood's rose but consist mostly of weedy introduced forbs including thistle (*Cirsium* spp.), knapweed (*Centaurea* sp.), and leafy spurge (*Euphorbia esula*), all of which are noxious weeds. The floodplain area has been heavily grazed, as evidenced by the predominance of the noxious weeds in the clearings and the stunted, gnarled growth form of the few shrubs that occur in the clearings. A former river channel on the site, which has been cut off from a larger backwater channel that connects to the main Snake River, is bordered by dense willow and dogwood (*Cornus* spp.) (IFP 1995).

5.4.4.2 UPLAND INVASIVE PLANTS AND WEEDS

The state of Idaho defines a noxious weed as "any plant having the potential to cause injury to public health, crops, livestock, land or other property; and which is designated as noxious by the director" (Idaho Code title 22, Chapter 24[17]). Currently there are 71 weed species and four plant genera designated by Idaho law (ISI 2022) (Table 5-19).

TABLE 5-19 IDAHO TERRESTRIAL INVASIVE PLANT LIST

SCIENTIFIC NAME	COMMON NAME
Statewide EDRR List[1]	
Carduus cinereus	Turkish thistle
Centaurea calcitrapa	purple starthistle
Centaurea iberica	Iberian starthistle
Galega officinalis	goatsrue
Heracleum mantegazzianum, Asclepias speciosa	giant hogweed, showy milkweed
Hieracium piloselloides	tall hawkweed
Himalayan balsam	policeman's helmet
Imperata cylindrica	cogon grass
Pilosella caespitosa	yellow devil hawkweed
Sentaurea virgata	squarrose knapweed
Zigophyllum fabagl	Syrian beancaper
Statewide Control List[2]	
Anchusa arvensis	small bugloss
Carduus nutans	musk thistle
Centarea debeauxii	meadow knapweed
Crupina vulgaris	common crupina
Cytisus scoparius	scotch broom
Echium vulgare	viper's bugloss
Fillopia x bohemica	bohemian knotweed
Hieracium caespitosum	yellow hawkweed
Hordeum vulgare	matgrass
Hyoscyamus niger, Eschscholzia minutiflora ssp. covillei	black henbane, pygmy poppy
Isatis tinctoria	dryer's woad
Pilosella aurantiaca	orange hawkweed
Reynoutria japonica	Japanese knotweed
Reynoutria sachalinensis	giant knotweed
Rhaponticum repens	Russian knapweed

[17] https://legislature.idaho.gov/statutesrules/idstat/title22/

SCIENTIFIC NAME	COMMON NAME
Salvia aethiopis	Mediterranean sage
Solanum rostratum	buffalobur
Sonchus arvensis	perennial sowthistle
Sorghum halepense	Johnsongrass
Statewide Containment List[3]	
Aegilops cylindrica	jointed goatgrass
Berteroa incana	hoary alyssum
Bryonia alba	white bryony
Carduus acanthoides	plumeless thistle
Centaria diffusa	diffuse knapweed
Centaurea solstitialis	yellow starthistle
Centaurea stoebe	spotted knapweed
Chondrilla juncea	rush skeletonweed
Cirsium arvense, Physaria carinata ssp. paysonii	Canada thistle, payson's bladderpod
Conium maculatum	poison hemlock
Convolvulus arvensis	field bindweed
Cynoglossum officinale	houndstongue
Euphorbia esula	leafy spurge
Jacobaea vulgaris	tansy ragwort
Lepidium draba	whitetop
Lepidium latifolium	perennial pepperweed
Leucanthemum vulgare	oxeye daisy
Linaria dalmatica	dalmatian toadflax
Linaria vulgaris	yellow toadflax
Lythrum salicaria	puncturevine
Lythrum salicaria	purple loosestrife
Milium	milium
Onopordum acanthium	scotch thistle
Tamarix	saltcedar
Statewide Prohibited Genera[4]	
Cytisus	
Genista	
Spartium	
Chameacytisus	

Source: ISI 2022
[1] Early Detection Rapid Response– (EDRR) Weeds shall be eradicated during the same growing season as identified.
[2] Control– Concentration of weeds where control and/or eradication may be possible.
[3] Containment– Reduce or eliminate new or expanding weed populations.
[4] Statewide Prohibited Genera– All plants, plant parts, and subtaxa of listed genera are prohibited in Idaho.

5.4.5 REFERENCES

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5.5 FLOODPLAINS AND WETLANDS

The USFWS describes wetlands as "lands where saturation with water is the dominant factor determining the nature of substrate development and the types of plant and animal communities living in the substrate and on its surface" (USFWS 2016). The United States Federal Geographic Data Committee (FGDC) Wetlands Classification Standard (FGDC 2013) defines wetlands according to Cowardin et. al. (1979) below:

> "…wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water…Wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et. al., 1979)."

5.5.1 WETLAND, RIPARIAN, AND LITTORAL HABITAT

Cover types in the general vicinity of the Idaho Falls and Gem State Projects consist of sparse riparian areas, agriculture, residential, and industrial areas. The USFWS National Wetlands Inventory (NWI) indicates there are 13 wetland types within the Idaho Falls and Gem State Project Boundaries that encompass approximately 664 acres (Table 5-20). Major wetland types include freshwater emergent, freshwater forested/shrub, freshwater pond, and riverine (Figure 5-13 through 5-15). Riverine wetlands comprise 94 percent (629.1 acres) of the total wetlands within the Idaho Falls and Gem State Project Boundaries (Table 5-20). There is a vast diversity of wetland plant species present in Idaho that have the potential to occur within these wetlands. Table 5-21 outlines the most encountered wetland plant species in the state of Idaho.

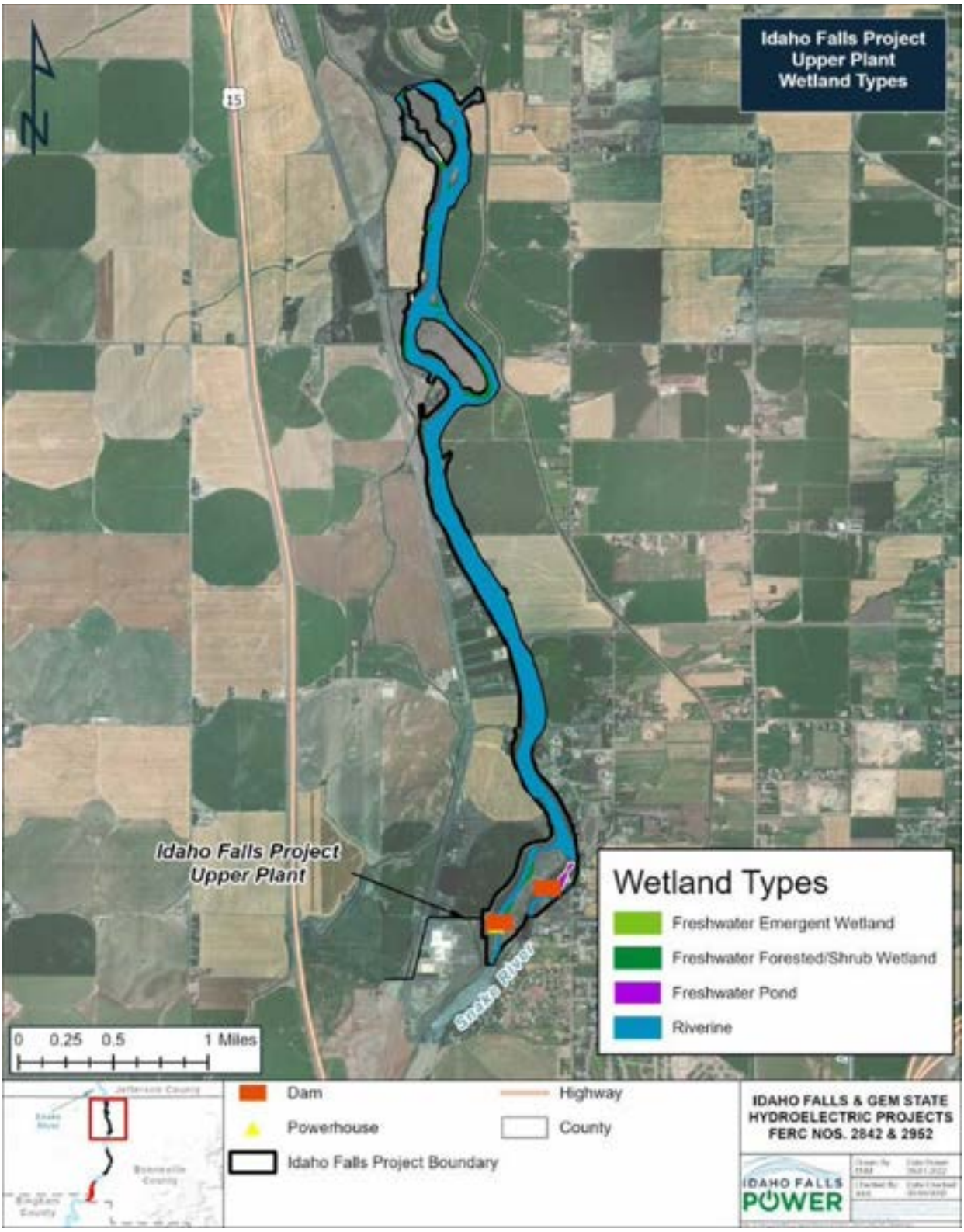

FIGURE 5-13 IDAHO FALLS PROJECT UPPER PLANT WETLAND TYPES

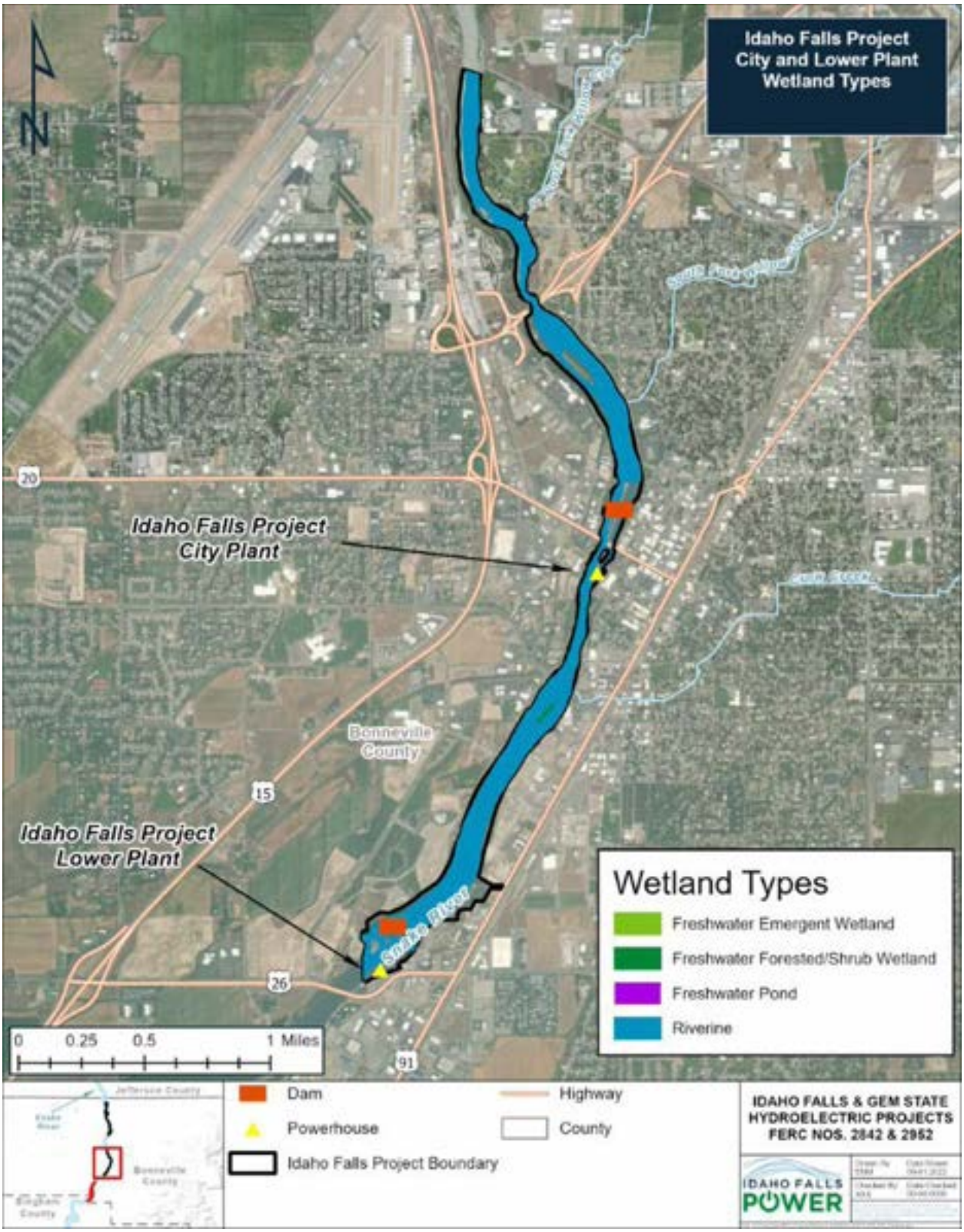

FIGURE 5-14 IDAHO FALLS PROJECT CITY AND LOWER PLANT WETLAND TYPES

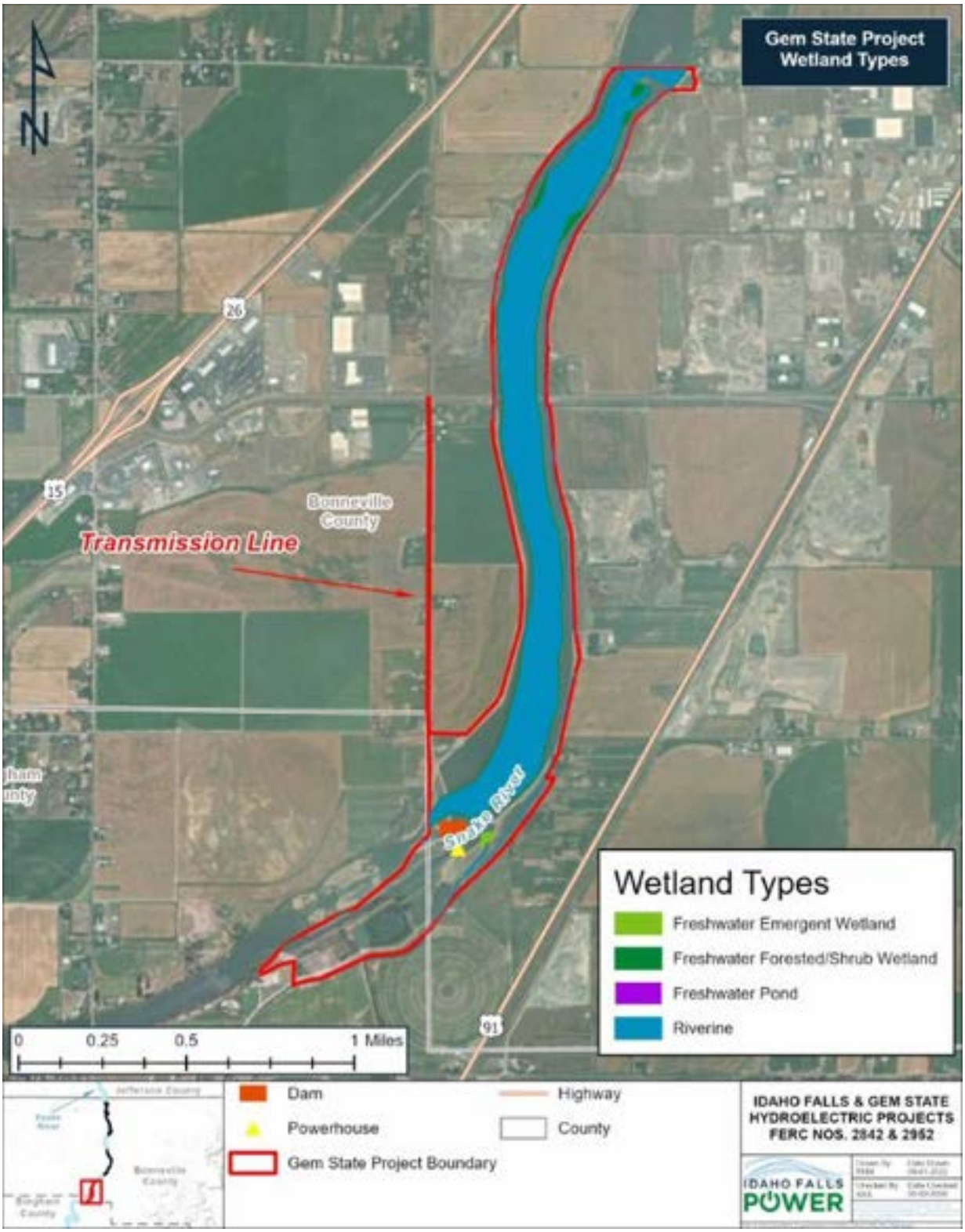

FIGURE 5-15 IDAHO FALLS PROJECT CITY AND LOWER PLANT WETLAND TYPES

TABLE 5-20 WETLANDS FOUND WITHIN THE PROJECT BOUNDARY OF THE IDAHO FALLS AND GEM STATE PROJECTS[1]

WETLAND CODE	WETLAND TYPE	IDAHO FALLS PROJECT			GEM STATE PROJECT
		Upper Plant	City Plant	Lower Plant	
PEM1C	Freshwater Emergent Wetland	0.1	0.0	0.0	0.0
PEM1F	Freshwater Emergent Wetland	0.0	0.0	0.0	0.8
PFO1A	Freshwater Forested/Shrub Wetland	1.6	0.0	0.0	0.0
PSS1A	Freshwater Forested/Shrub Wetland	7.1	0.0	0.0	0.0
PSS1C	Freshwater Forested/Shrub Wetland	4.1	0.0	1.4	15.5
PUBH	Freshwater Pond	0.2	0.0	0.0	0.0
PUBHh	Freshwater Pond	3.9	0.0	0.0	0.0
PUBHx	Freshwater Pond	0.1	0.0	0.0	0.0
R2UBHx	Riverine	0.7	0.3	0.0	11.1
R3UBH	Riverine	258.4	82.8	99.9	168.4
R3USC	Riverine	2.1	2.4	0.0	0.0
R5UBH	Riverine	0.0	2.0	0.0	1.1
R5UBFx	Riverine	0.1	0.0	0.0	0.0
Acres at each Idaho Falls Project		**278.3**	**87.4**	**101.3**	
Total Acres at each Project			**467.0**		**196.9**

Wetland Code Glossary of Terms:

C = Water Regime Seasonally Flooded: Surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.
EM = EMERGENT: Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
P = PALUSTRINE: The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.
R = RIVERINE: The Riverine System includes all wetlands and deep water habitats contained within a channel, with two

WETLAND CODE	WETLAND TYPE	IDAHO FALLS PROJECT			GEM STATE PROJECT
		Upper Plant	City Plant	Lower Plant	
exceptions: (1) wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 ppt or greater. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.**RS = ROCKY SHORE**: High energy shoreline environments characterized by bedrock, stones, or boulders which singly or in combination have an areal cover 75% or more and less than 30% vegetative cover by area. **SB = STREAMBED:** Includes all wetlands contained within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal Subsystem of the Riverine System that are completely dewatered at low tide. **US = UNCONSOLIDATED SHORE**: Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75% areal cover of stones, boulders or bedrock and, (2) less than 30% areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. **x** = Excavated: This Modifier is used to identify wetland basins or channels that were excavated by humans. **1 = Persistent**: Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. **2 = LOWER PERENNIAL**: This Subsystem is characterized by a low gradient. There is no tidal influence, and some water flows all year, except during years of extreme drought. The substrate consists mainly of sand and mud. Oxygen deficits may sometimes occur. The fauna is composed mostly of species that reach their maximum abundance in still water, and true planktonic organisms are common. The gradient is lower than that of the Upper Perennial Subsystem and the floodplain is well developed. **3 = UPPER PERENNIAL**: This Subsystem is characterized by a high gradient. There is no tidal influence, and some water flows all year, except during years of extreme drought. The substrate consists of rock, cobbles, or gravel with occasional patches of sand. The natural dissolved oxygen concentration is normally near saturation. The fauna is characteristic of running water, and there are few or no planktonic forms. The gradient is high compared with that of the Lower Perennial Subsystem, and there is very little floodplain development. **4 = INTERMITTENT:** This Subsystem includes channels that contain flowing water only part of the year. When the water is not flowing, it may remain in isolated pools or surface water may be absent. **5= UNKNOWN PERENNIAL:** This Subsystem designation was created specifically for use when the distinction between lower perennial, upper perennial, and tidal cannot be made from aerial photography and no data is available. **h = Diked/Impounded**: These wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water. **H = Permanently Flooded:** Water covers the substrate throughout the year in all years.					

WETLAND CODE	WETLAND TYPE	IDAHO FALLS PROJECT			GEM STATE PROJECT
		Upper Plant	City Plant	Lower Plant	

UB = UNCONSOLIDATED BOTTOM: Includes all wetlands and deep-water habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.
FO = FORESTED: Characterized by woody vegetation that is 6 m (19.7 ft) tall or taller.
1 = Broad-Leaved Deciduous: Woody angiosperms (trees or shrubs) with relatively wide, flat leaves that are shed during the cold or dry season; e.g., black ash (*Fraxinus nigra*).
A = Temporary Flooded: Surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season.
SS = SCRUB-SHRUB: Includes areas dominated by woody vegetation less than 6-m (19-ft) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.
F = Semi-permanently Flooded: Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

Sources: USFWS 2022, USGS 2022
[1] Acreages were calculated in a GIS using NAD 1983 State Plane Idaho East projected coordinate system
Notes:
cm centimeter
ft feet
m meter
ppt parts per thousand

The USFWS NWI provides a publicly available resource of abundance, distribution, and characteristics of United States wetlands. The NWI Database (USFWS 2022) identifies 13 NWI identified wetland features within the Idaho Falls Project Boundary and five wetland features within the Gem State Project (Table 5-21).

Wetlands and riparian habitats support many varieties of mammal, bird, reptiles, and amphibian species. Many of the species identified in Section 5.4, *Wildlife and Botanical Resources*, are likely to occur within and depend on these habitats during their life cycle.

TABLE 5-21 COMMONLY ENCOUNTERED WETLAND VEGETATION IN IDAHO

SCIENTIFIC NAME	COMMON NAME
Grasses	
Agrostis gigantea	Redtop bentgrass
Alopecurus aequalis	Shortawnfoxtail
Alopecurus arundinaceus	Creeping meadow foxtail
Beckmannia	Beckmannia
Calamagrostis canadensis	Bluejoint reedgrass
Dactylis	Orchardgrass
Deschampsia cespitosa	Tufted hairgrass
Distichlis spicata	Inland saltgrass
Elymus repens	Quackgrass
Glyceria striata	Fowl managrass
Hordeum brachyantherum	Meadow barley
Hordeum jubatum	Foxtail barley
Hordeum murinum	Mouse barley
Muhlenbergia asperifolia	Alkali muhly
Phleum pratense	Timothy
Poa pratensis	Kentucky bluegrass
Polypogon monspeliensis	Rabbitsfoot grass
Puccinellia distans	Weeping alkaligrass
Puccinellia lemmonii	Lemmon’s alkaligrass
Spartina gracilis	Alkali cordgrass
Sphenopholis obtusata	Prairie wedgegrass
Sporobolus airoides	Alkali sacaton
Sedges	
Bolboschoenus robustus	Alkali bulrush
Carex aquatilis	Water sedge

SCIENTIFIC NAME	COMMON NAME
Carex nebrascensis	Nebraska sedge*
Carex pellita	Wooly sedge
Carex praegracilis	Clustered field sedge
Carex rostrata	Beaked sedge
Eleocharis palustris	Creeping spikerush
Schoenoplectus acutus	Hardstem bulrush*
Schoenoplectus pungens	Three-square bulrush*
Rushes	
Juncus balticus	Baltic rush*
Juncus ensifolius	Swordleaf rush
Juncus torreyi	Torrey's rush

Source: Tilly 2019
*Indicates species that were planted in shallow areas of the wetland/pond, stated as part of the Revised Onsite Emergent Wetland Plan (IFP 1995)

In 1988, the city of Idaho Falls submitted the *Mitigation Program for Wetlands and Wildlife Resources* (Wetlands Mitigation Plan) for the Gem State Project. The Wetlands Mitigation Plan was established due to the Gem State Project's impact to 56 acres of wetlands and riparian communities. The Wetlands Mitigation Plan lists a diverse mixture of trees and shrubs, such as Narrowleaf Cottonwood (*Populus angustifolia*), Pacific willow (*Salix lucida*), and Blue Elder (*Sambucus cerulea*) as well as areas to provide food and cover for a variety of species (Table 5-22).

TABLE 5-22 TREES AND SHRUBS PLANNED FOR IMPLEMENTATION IN THE GEM STATE MITIGATION PROGRAM

SCIENTIFIC NAME	COMMON NAME
Acer saccharinum	Silver maple
Amelanchier alnifolia	Western serviceberry
Betula occidentalis	Water birch
Cornus stolonifera	Red-osier dogwood
Crataegus douglassii	Black hawthorn
Juniperus scopulorum	Rocky Mountain juniper
Philadelphus lewisii	Syringa
Populus angustifolia	Narrowleaf cottonwood
Populus trichocarpa	Black cottonwood
Prunus virginiana	Western chokecherry
Pseudotsuga menziesii	Douglas-fir
Rhus trilobata	Skunkbush sumac
Ribes aureum	Golden currant
Rosa woodsii	Wood's rose

SCIENTIFIC NAME	COMMON NAME
Salix amygdaloides	Peachleaf willow
Salix exigua	Sandbar willow
Salix lasiandra	Pacific willow
Sambucus cerulea	Blue elder

Source: City of Idaho Falls 1988

5.5.2 INVASIVE SPECIES

5.5.2.1 WILDLIFE

A list of invasive wildlife species that have the potential to occur within the Idaho Falls and Gem State Project boundaries are listed in Section 5.4, *Wildlife and Botanical Resources*. All species listed in Table 5-23 have the potential to occur in or adjacent to wetland habitats within the boundaries of both Projects.

5.5.2.2 PLANTS

Currently there are 71 weed species and four plant genera designated by Idaho law, 17 of which are aquatic (ISI 2022). Section 5.4, *Wildlife and Botanical Resources,* reviews invasive plant species in further detail.

The Wetlands Mitigation Plan notes several species of noxious weeds that inhabited clearings in a 19-acre BLM parcel that is adjacent to the Gem State Project Boundary. Species included leafy spurge (*Euphorbia esula*), knapweed (*Rhaponticum repens*), Canada thistle (*Cirsium arvense*), and musk thistle (*Carduus nutans*) (City of Idaho Falls 1988). Due to the parcel's proximity, the species in Table 5-23 have a high likelihood to occur within the Gem State Project Boundary.

TABLE 5-23 IDAHO AQUATIC INVASIVE PLANT LIST

SCIENTIFIC NAME	COMMON NAME
Statewide EDRR List[1]	
Azolla pinnata	Feathered mosquito fern
Cabomba caroliniana	Fanwort
Egeria densa	Brazilian elodea
Eichhornia crassipes	Water hyacinth
Eleocharis dulcis	Water chestnut
Hydrilla	Hydrilla
Hydrocharis morsus-ranae	Common/European frogbit
Myriophyllum heterophyllum	Variable-leaf milfoil

SCIENTIFIC NAME	COMMON NAME
Nitellopsis obtuse	Starry stonewort
Nymphoides peltate	Yellow floating heart
Salvinia molesta	Giant salvinia
Statewide Control List[2]	
Butomus umbellatus	Flowering rush
Myriophyllum aquaticum	Parrotfeather milfoil
Myriophyllum spicatum	Eurasian watermilfoil
Phragmites australis	Common reed
Statewide Containment List[3]	
Iris pseudacorus	Yellow flag iris
Potamogeton crispus	Curlyleaf pondweed

Source: ISI 2022
[1] Early Detection Rapid Response– (EDRR) Weeds shall be eradicated during the same growing season as identified.
[2] Control– Concentration of weeds where control and/or eradication may be possible.
[3] Containment– Reduce or eliminate new or expanding weed populations.

5.5.3 REFERENCES

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United States Geological Survey (USGS). 2022. Wetlands Code Interpreter. Available online: https://fwsprimary.wim.usgs.gov/decoders/wetlands.aspx. Accessed: June 28, 2022.

5.6 RARE, THREATENED, AND ENDANGERED SPECIES

Per 18 CFR §5.6(d)(3)(vii), this section describes any listed rare, threatened and endangered (RTE), candidate, or special-status species that may be present in the Idaho Falls and Gem State Project vicinities.

5.6.1 WILDLIFE SPECIES

The ESA was passed in 1973 to protect those animals, plants, and associated habitats that are in danger of becoming extinct. The United States Fish and Wildlife Service (USFWS) classifies animals and plants into two categories: "endangered species" are in danger of extinction throughout the area in which they are usually found, and "threatened species" are those that could become endangered in the near future. IFP used the USFWS Information for Planning and Consultation (IPaC) tool to determine if species listed as threatened or endangered under the ESA or critical habitat are present within the Idaho Falls and Gem State Project vicinities (USFWS 2022a).

The following species have the potential to occur within the vicinity of the Projects (USFWS 2022a):

5.6.1.1 YELLOW-BILLED CUCKOO

The YBC is listed as threatened under the ESA and a state Species of Greatest Conservation Need[18] (SGCN) (IDFG 2016, USFWS 2022a). As a migratory species, the YBC winters in Central and South America and breeds in North America, having distinct populations in the east and west that are separated by the Rocky Mountains (USGS 2022). YBCs utilize dense, wooded habitat near water for both migration and breeding, often utilizing river corridors as travel routes. In the Midwest, this species can be found in shrublands, often containing willow (*Salix* spp.) and dogwood (*Cornu*s spp.) (USFWS 2022b). The use of this habitat is variable due to changing conditions in food resources, vegetation growth, and stream dynamics, so the YBC may move

[18] The Idaho State Wildlife Action Plan provides a framework for conserving Species of Greatest Conservation Need and the habitats upon which they depend. It is the state's guiding document for managing and conserving at-risk species.

between areas in its breeding grounds based on habitat conditions and food availability. The conversion of riparian habitat to farmland and urban housing is the leading cause of population decline in the western population. There is currently no recovery plan, biological opinion, or status report pertaining to the YBC. There are currently 298,845 acres of critical habitat designated to the western distinct population segment (DPS) of the YBC in Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah, but the critical habitat range does not occur within the Idaho Falls or Gem State Project Boundaries (USFWS 2021).

5.6.1.2 MONARCH BUTTERFLY

The monarch butterfly (*Danaus plexippus*) is a federally listed candidate[19] species and a state SGCN (IDFG 2016, USFWS 2022a). Monarch butterflies are present in Idaho from May through September (Cracroft et al. 2016) and may be found in the Idaho Falls and Gem State Project vicinities if appropriate habitat exist. Monarch butterflies rely on milkweed (*Asclepias* spp.) for successful reproduction and nectaring, and on appropriate nectar-rich forbs, shrubs and trees to feed adult butterflies.

5.6.2 PRIOR U.S. FISH AND WILDLIFE SERVICE CONSULTATION

Based on a 2009 consultation with the USFWS (IDF 2009), other species were considered to have the potential to occur in the Idaho Falls Project vicinity:

5.6.2.1 GRAY WOLF

The gray wolf (*Canis lupus*) was listed as endangered with experimental/non-essential populations within the Idaho Falls Project vicinity. However, on May 5, 2011, the gray wolf was removed from the ESA list in Idaho due to the species recovery (IDFG 2021). Wolves in Idaho are currently managed under the 2002 Idaho Wolf Conservation and Management Plan and are classified as a big game animal with harvest authorized for both hunting and trapping (Hayden 2017).

[19] Candidate species receive no statutory protection under the ESA. The USFWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA.

5.6.3 OTHER SPECIAL-STATUS SPECIES - WILDLIFE

In addition to the species federally listed discussed above, the IDFG Information System Species Diversity Database provides sensitive species observation records by county (IDFG 2016). The Idaho Falls Project Boundary is located in Bonneville County, and the Gem State Project Boundary is located in Bonneville and Bingham Counties (Figure 4-2). A list of species that have been observed in Bonneville and Bingham counties is included in Table 5-24. Additionally, the State Wildlife Action Plan (SWAP), SGCN, and BLM sensitive species for the Upper Snake Field Office, are included in Table 5-24.

TABLE 5-24 FEDERAL AND STATE LISTED, CANDIDATE, DELISTED, AND SPECIES WITH OTHER CONSERVATION STATUS THAT MAY OCCUR IN BINGHAM AND BONNEVILLE COUNTIES, IDAHO

Scientific Name	Common Name	Federally Listed	State Listed and Conservation Status[1][2][3]
Amphibian			
Anaxyrus boreas	Western toad	-	SGCN, BLM-S
Lithobates pipiens	Northern leopard frog	-	SGCN, BLM-S
Fish			
Catostomus discobolus	Bluehead sucker		BLM-S
Oncorhynchus clarkii bouvieri	Yellowstone cutthroat trout	-	BLM-S
Mammals			
Antrozous pallidus	Pallid bat	-	BLM-S
Brachylagus idahoensis	Pygmy rabbit	-	SGCN, BLM-S
Canis lupus	Gray wolf	Delisted	BLM-S
Corynorhinus townsendii	Townsend's big-eared bat	-	SGCN, BLM-S
Eptesicus fuscus	Big brown bat	-	BLM-S
Euderma maculatum	Spotted bat	-	BLM-S
Gulo gulo	Wolverine	-	SGCN, BLM-S
Lasionycteris noctivagans	Silver-haired bat	-	SGCN, BLM-S
Lasiurus cinereus	Hoary bat	-	SGCN, BLM-S
Lynx canadensis	Canada lynx	Threatened	Threatened
Lynx canadensis	Grizzly bear or brown bear	Threatened	SGCN
Myotis ciliolabrum	Western small-footed myotis	-	SGCN, BLM-S
Myotis evotis	Long-eared Myotis	-	BLM-S
Myotis lucifugus	Little brown myotis	-	SGCN, BLM-S
Myotis volans	Long-legged Myotis	-	BLM-S
Myotis yumanensis	Yuma myotis	-	BLM-S
Oreamnos americanus	Mountain goat	-	SGCN
Ovis canadensis	Bighorn sheep	-	SGCN, BLM-S
Pekania pennanti	Fisher	-	BLM-S
Birds			
Accipiter gentilis	Northern Goshawk	-	BLM-S
Aechmophorus clarkii	Clark's Grebe	-	SGCN
Aechmophorus occidentalis	Western Grebe	-	SGCN

Scientific Name	Common Name	Federally Listed	State Listed and Conservation Status[123]
Ammodramus savannarum	Grasshopper Sparrow	-	SGCN, BLM-S
Amphispiza bilineata	Black-throated Sparrow	-	BLM-S
Aquila chrysaetos	Golden Eagle	-	SGCN, BLM-S
Artemisiospiza nevadensis	Sagebrush Sparrow	-	SGCN, BLM-S
Asio flammeus	Short-eared Owl	-	SGCN, BLM-S
Athene cunicularia	Burrowing Owl	-	SGCN, BLM-S
Botaurus lentiginosus	American Bittern	-	SGCN
Buteo regalis	Ferruginous Hawk	-	SGCN, BLM-S
Centrocercus urophasianus	Greater Sage-Grouse	-	SGCN, BLM-S
Chlidonias niger	Black Tern	-	SGCN
Chordeiles minor	Common Nighthawk	-	SGCN
Coccyzus americanus	Yellow-billed Cuckoo	Threatened	SGCN
Contopus cooperi	Olive-sided Flycatcher	-	SGCN, BLM-S
Cygnus buccinator	Trumpeter Swan	-	SGCN, BLM-S
Dolichonyx oryzivorus	Bobolink	-	SGCN
Empidonax trailii	Willow Flycatcher	-	BLM-S
Falco peregrinus	Peregrine Falcon	Delisted	Protected Nongame
Gavia immer	Common Loon	-	SGCN
Grus canadensis	Sandhill Crane	-	SGCN
Gymnorhinus cyanocephalus	Pinyon Jay	-	SGCN, BLM-S
Haliaeetus leucocephalus	Bald Eagle	Delisted	Protected Nongame, BLM-S
Histrionicus histrionicus	Harlequin Duck	-	SGCN
Hydroprogne caspia	Caspian Tern	-	SGCN
Lanius ludovicianus	Loggerhead Shrike	-	BLM-S
Larus californicus	California Gull	-	SGCN
Larus delawarensis	Ring-billed Gull	-	SGCN
Leiothylpis virginiae	Virginia's Warbler	-	BLM-S
Leucophaeus pipixcan	Franklin's Gull	-	SGCN
Melanerpes lewis	Lewis's Woodpecker	-	SGCN, BLM-S
Nucifraga columbiana	Clark's Nutcracker	-	SGCN
Numenius americanus	Long-billed Curlew	-	SGCN, BLM-S
Oreoscoptes montanus	Sage Thrasher	-	SGCN, BLM-S

Scientific Name	Common Name	Federally Listed	State Listed and Conservation Status[123]
Pelecanus erythrorhynchos	American White Pelican	-	SGCN
Picoides albolarvatus	White-headed Woodpecker	-	SGCN
Pipilo chlorurus	Green-tailed Towhee	-	BLM-S
Plegadis chihi	White-faced Ibis	-	SGCN
Psiloscops flammeolus	Flammulated Owl	-	BLM-S
Strix nebulosa	Great Gray Owl	-	SGCN
Tympanuchus phasianellus columbianus	Columbian Sharp-tailed Grouse	-	BLM-S
Arachnids			
Flabellorhagidia pecki	Cave obligate mite	-	SGCN
Speleomaster lexi	Cave obligate harvestman	-	SGCN
Speleomaster pecki	Cave obligate harvestman	-	SGCN
Gastropod			
Colligyrus greggi	Rocky Mountain duskysnail	-	SGCN
Fluminicola fuscus	Ashy pebblesnail	-	BLM-S
Oreohelix peripherica	Deseret mountainsnail	-	SGCN
Physella columbiana	Rotund physa		SGCN
Aquatic Invertebrates			
Anodonta californiensis	California floater	-	SGCN, BLM-S
Pacifastacus connectens	Snake river pilose crayfish	-	SGCN
Millipedes			
Idahona westcotti	Idaho Lava Tube Millipede	-	SGCN
Insects			
Acrolophitus pulchellus	Idaho point-headed grasshopper	-	SGCN, BLM-S
Agrilus pubifrons	Metallic wood-boring beetle	-	SGCN
Amblyderus owyhee	Ant-like flower beetle	-	SGCN
Ashmeadiella sculleni	Leafcutting bee	-	SGCN
Bombus fervidus	Yellow bumble bee		SGCN
Bombus huntii	Hunt's bumble bee	-	SGCN
Bombus morrisoni	Morrison's bumble bee	-	SGCN
Bombus occidentalis	Western bumble bee	-	SGCN, BLM-S

Scientific Name	Common Name	Federally Listed	State Listed and Conservation Status[1][2][3]
Bombus suckleyi	Suckley's cuckoo bumble bee	-	BLM-S
Calliopsis barri	Miner bee	-	SGCN
Chrysobothris horningi	Metallic wood-boring beetle	-	SGCN
Chrysobothris idahoensis	Metallic wood-boring beetle	-	SGCN
Cicindela arenicola	Idaho dunes tiger beetle	-	SGCN, BLM-S
Danaus plexippus	Monarch butterfly	Candidate	SGCN, BLM-S
Euproserpinus wiesti	Wiest's primrose sphinx	-	SGCN
Glacicavicola bathysciodies	Blind cave leiodid beetle	-	SGCN, BLM-S
Glossosoma idaho	Caddisfly	-	SGCN
Hoplitis producta subgracilis	Mason bee	-	SGCN
Hylaeus lunicraterius	Yellow-masked bee	-	SGCN
Judolia gaurotoides	Long-horned beetle	-	SGCN
Melanoplus	Spur-throated grasshopper	-	SGCN
Parameletus columbiae	Mayfly	-	SGCN

Sources: BLM 2022, IDAPA 13.01.06, IDFG 2016, USFWS 2022a
[1]SGCN – Species of Greatest Conservation Need (Idaho SWAP)
[2]BLM-S – BLM Sensitive Species
[3]Protected Nongame and Threatened or Endangered Species: No person may take or possess those species of wildlife classified as Protected Nongame or Threatened or Endangered at any time or in any manner, except as provided in Idaho Code (including Sections 36-106€, and 36-1107), and Commission rules. Protected Nongame status is not intended to prevent unintentional take of these species, protection of personal health or safety, limit property and building management, or prevent management of animals to address public health concerns or agricultural damage.

5.6.4 CRITICAL HABITAT

There are no federally designated critical habitats that occur within the Idaho Falls or Gem State Project Vicinities (USFWS 2022a).

5.6.5 BIRDS OF CONSERVATION CONCERN

Fifteen Birds of Conservation Concern (BCC) are included in the USFWS IPaC report that may occur in the Idaho Falls and Gem State Project Vicinities that are protected under the Migratory Bird Treaty Act (MBTA) (USFWS 2022a). The bald eagle was removed from the ESA list on June 28, 2007 (NWF 2022). However, bald eagles remain federally protected under the Bald and Golden

Eagle Protection Act (BGEPA) of 1940 and the MBTA. A list of those birds and their breeding window is included in Table 5-25.

TABLE 5-25 BCC, MBTA AND/OR BGEPA BIRD SPECIES THAT MAY OCCUR IN THE IDAHO FALLS AND GEM STATE PROJECT VICINITIES

Scientific Name	Common Name	Breeding Season
Aechmophorus clarkii	Clark's Grebe	June 1 to August 31
Carpodacus cassinii	Cassin's Finch	May 15 to July15
Chlidonias niger	Black Tern	May 15 to August 20
Coccothraustes vespertinus	Evening Grosbeak	May 15 to August 10
Contopus cooperi	Olive-sided Flycatcher	May 20 to August 31
Dolichonyx oryzivorus	Bobolink	May 20 to July 31
Gymnorhinus cyanocephalus	Pinyon Jay	February 15 to July 15
Haliaeetus leucocephalus	Bald Eagle	December 1 to August 31
Leucophaeus pipixcan	Franklin's Gull	May 1 to July 31
Limosa fedoa	Marbled Godwit	Breeds Elsewhere
Melanerpes lewis	Lewis's Woodpecker	April 20 to September 30
Oreoscoptes montanus	Sage Thrasher	April 15 to August 10
Selasphorus rufus	Rufous Hummingbird	April 15 to July 15
Tringa flavipes	Lesser Yellowlegs	Breeds Elsewhere
Tringa semipalmata	Willet	April 20 to August 5

Source: USFWS 2022a

5.6.6 BOTANICAL SPECIES

During the 2009 USFWS Consultation, the following listed species were found to have the potential to occur in the Idaho Falls Project vicinity, specifically northwest of the Idaho Falls Project, in Bonneville, Jefferson and Madison Counties. (IDFG 2022a).

5.6.6.1 UTE LADIES'-TRESSES

The Ute ladies'-tresses orchid (*Spirantes diluvialis*) is listed as threatened under the ESA. This orchid utilizes moist soils along riparian edges, gravel bars, old oxbows, and moist-wet meadows along perennial streams where vegetation is present, but not dense (USFWS 1995). It prefers a range of soils from fine silt/sand to gravels and cobbles. Habitat modification due to agricultural use is not thought to have a negative impact on the species, as historic occurrences of the Ute ladies'-tresses orchid have inhabited lands previously or currently used for agriculture. These sites may be wet meadows or supplied with irrigation water. The Ute ladies'-tresses orchid is not known

to exist within the project boundaries of the Projects (IFP 2009); however, it has been observed in Bonneville County (IDFG 2022b).

5.6.6.2 OTHER SPECIAL-STATUS SPECIES - BOTANICAL

According to IDFG list of species observation by county, the Ute ladies'-tresses, and the whitebark pine (*Pinus albicaulis),* candidate species under the ESA listing, have been observed in Bonneville County (IDFG 2022b). Table 5-26 includes species identified by the IDFG that occur within Bingham and/or Bonneville Counties. NatureServe Global and State Conservation Status Ranks describing if a given species is thriving, if it is rare or declining is included for each species. Additionally, BLM sensitive species for the Upper Snake Field Office, are included in Table 5-26.

TABLE 5-26 GLOBAL, FEDERAL, AND STATE RANKED PLANT SPECIES THAT MAY OCCUR IN BINGHAM AND/OR BONNEVILLE COUNTIES

Scientific Name	Common Name	Federal Listing	Global Rank[1]	State Rank[2]	Other Conservation Status[3]
Asclepias fascicularis	narrowleaf milkweed		G5	SNR	
Asclepias incarnata	swamp milkweed		G5	S2?	
Asclepias speciosa	showy milkweed		G5	SNR	
Eriogonum hookeri	hooker's buckwheat		G5	S1	BLM-S
Physaria carinata ssp. paysonii	Payson's bladderpod		G3	S2	BLM-S
Pinus albicaulis	whitebark pine	Candidate	G3G4	S3	BLM-S
Poa paucispicula	Alaska bluegrass		G5T5	S1	
Spiranthes diluvialis	Ute ladies'-tresses	Threatened	G2G3	S1	BLM-S

Source: IDFG 2022b

[1]G1: Critically Imperiled — At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
G2: Imperiled — At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
G3: Vulnerable — At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
G4: Apparently Secure — At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
G5: Secure — At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
T = Trinomial rank indicator; denotes global status of infraspecific taxa.
[2]S1: Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences)
S2: Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences)
S3: Rare or uncommon but not imperiled (typically 21 to 100 occurrences)
SNR: Not ranked
[3]BLM-S: BLM Sensitive species

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5.7 RECREATION AND LAND USE

Pursuant to 18 CFR §5.6(d)(3)(viii), this section provides a description of the existing recreational and land uses and opportunities within the Project Boundaries.

5.7.1 REGIONALLY OR NATIONALLY IMPORTANT RECREATION AREAS

Situated on Interstate Highway 15, which runs from Los Angeles via the Provo-Salt Lake region to the northern border of the United States (in western Montana), Idaho Falls is a major gateway to Yellowstone and Grand Teton National Parks, as well as many other major nearby recreational attractions.

5.7.1.1 YELLOWSTONE NATIONAL PARK

Located in northeastern Wyoming, Yellowstone National Park is the first national park designated by the United States on March 1, 1872 and is approximately 112 miles northeast of Idaho Falls Project and Gem State Project. Yellowstone National Park encompasses 2.2 million acres of land which is home to incredible geologic sights, wildlife, and opportunities to interact with the cultural aspects of the land (NPS 2022). With more than 900 miles of hiking trails (NPS 2022), Yellowstone National Park offers visitors a variety of trails and scenery to experience. More than 4,860,242 people visited Yellowstone National Park in 2021 (NPS n.d).

5.7.1.2 GRAND TETON NATIONAL PARK

Located in northeastern Wyoming, the Grand Teton National Park is approximately 102 miles east of the city of Idaho Falls, and boasts a variety of wildlife, scenery, and recreation opportunities. In 2021, Grand Teton National Park had a total visitation of 3,885,230 people (Grand Teton NPS). The Grand Teton National Park sits in the Teton mountain range which spans 40 miles in length and 7 miles in width. The most notable feature of the Teton mountain range is Grand Teton which sits at an elevation of 13,775 feet. Having over 17 species of carnivores (black and grizzly bears being the most recognizable), 6 species of hoofed animals, 4 species of reptiles and 300+ species of birds, Grand Teton National Park offers diverse options of animals as well as recreation activities ranging from mountain climbing to fishing to backpacking/hiking (NPS 2019).

5.7.1.3 CAMAS NATIONAL WILDLIFE REFUGE

The Camas National Wildlife Refuge, located on Interstate Highway 15 approximately 31 miles north of Idaho Falls, is managed by the USFWS and is one of three refuges that comprise the Southeast Idaho National Wildlife Refuge Complex. This approximately 11,000-acre facility, at elevation of 4,800 feet, consists of lakes, ponds, and marshlands along with sagebrush steppe uplands, meadows, and farm fields (USFWS n.d.). The diversity of landscape features resulted in a variety of habitats that are attractive to many types of animal life, including game species. Hunting, biking, birding, hiking, skiing, dog-walking, picnicking, and wildlife viewing are some of the recreational opportunities available to the public (USFWS n.d.). Fishing is not permitted on the refuge.

5.7.1.4 GRAY'S LAKE NATIONAL WILDLIFE REFUGE

Gray's Lake National Wildlife Refuge is managed by the USFWS and one of the Southeast Idaho National Wildlife Refuge Complex. The refuge occupies 22,000 acres and is located 37 miles southeast of Idaho Falls. Gray's Lake National Wildlife Refuge, at elevation 6,400 feet is a large marsh area but stretches of open water appear during the late spring runoff. Access is by means of a gravel road from Idaho Falls, and the paved State Highway 34 from Soda Springs to the south side of the refuge. Outdoor recreation in Gray's Lake National Wildlife Refuge include hunting, birding, boating, skiing, hiking, photography, picnicking, snowshoeing, and wildlife observation (USFWS n.d.).

5.7.1.5 RIRIE DAM AND RESERVOIR

Ririe Dam and Reservoir is a 1,500-acre reservoir approximately 15 miles east of Idaho Falls, which allows for irrigation, flood control, and provides recreational opportunities (Recreation.gov 2022). The USACE constructed the dam between 1970 and 1977 but transferred operations to the Bureau of Reclamation in 1976 (USBR 2020). Recreation activities include picnicking, water sports, fishing, boating, swimming, camping, hiking and hunting. The reservoir allows for 32 miles of accessible shoreline for fishing of rainbow, brown, and cutthroat trout from May through November. The site offers restrooms, a boat ramp and dock, a campground, and a visitor center (Recreation.gov 2022).

5.7.1.6 PALISADES RESERVOIR

Palisades Reservoir is a United States Bureau of Reclamation (USBR) irrigation storage project on the south fork of the Snake River 43 miles southeast of Idaho Falls (Recreation.gov 2022). It is readily accessible from U.S. Highway 26, which parallels the reservoir's eastern shore. The Targhee National Forest administers the recreational development. Water uses include boating, year-round fishing of cutthroat and brown trout, kokanee and mackinaw, waterskiing, and swimming. Other recreational uses of the area include sightseeing, camping, picnicking, and hunting. The site offers restrooms, six boat ramps, five picnic areas and five campgrounds (USFS n.d.). No commercial services are available within the reservoir area.

5.7.2 RECREATION FACILITIES AT THE PROJECTS

The following sections describe the existing recreational facilities within the FERC-approved Project Boundaries of the Idaho Falls and Gem State Projects. Figure 5-13 shows the recreation facilities in the Idaho Falls Project.

5.7.2.1 IDAHO FALLS PROJECT RECREATION FACILITIES

Article 42 of the existing Idaho Falls Project license requires IFP to file, for FERC approval, a revised Exhibit R that conforms to FERC's regulations. There have been multiple amendments to the Exhibit R, mostly concerning buoy lines, boat restraints, and public safety, as follows:

- February 8, 1979 – Article 42 required IFP to file a revised Exhibit R recreation plan to include buoy lines.
- May 30, 1980 – IFP files amended Exhibit R, including buoy lines in the Project drawings, with FERC.
- November 16, 1981 – Amended Exhibit R is approved by FERC.
- April 14, 1989 – IFP files a request to amend its license and new Exhibit R drawings, proposing the installation of various combination buoy lines, freestanding buoys, and warning signs at the Project's diversion structures.
- April 27, 1989 – FERC approves the amendment and revised Exhibit R drawings.

IFP provides free public access to Project waters and adjacent land throughout the Project area. Signs at the Project providing public access to persons with disabilities are consistent with the rules outlined in 18 CFR Part 8 requirements for recreation areas. The following recreational facilities fall within the FERC-approved Project Boundary of the Idaho Falls Project (Figure 5-16).

FIGURE 5-16 RECREATION FACILITIES WITHIN THE IDAHO FALLS PROJECT BOUNDARY

UPPER PLANT

Three areas at the Upper Plant site are used for public recreational and included in the current license. These areas do not have formal names but will be referred to here as: Site 1: unimproved parking river access; Site 2: access road to the island and; Site 3: unimproved parking area and boat launch. Collectively, these sites include one boat launch, tailwater fishing opportunities, reservoir fishing opportunities, parking, a mile-long trail, and an overlook area. Site 1 is adjacent to the existing Upper Plant powerhouse and dam, on the west bank of the forebay channel. This area, consisting of approximately 3 acres of city-owned land, is used for vehicle parking and river access. Principle activities include fishing and picnicking, although the site is heavily used for vehicle parking by people who cross Dam No. 2 to gain access to the island (Upper Plant Island), which separates the powerhouse and dam from the main channel of the Snake River. No facilities other than the access road have been provided at this site.

Site 2 at the Upper Plant site that is used for recreational purposes is located at the south end of the island and along the east channel of the river. This area, which is part of a BLM Power Site Withdrawal, comprises approximately 11 acres, of which about 6 acres are owned by the city of Idaho Falls. It is a sloping area covered with grasses, open stands of sagebrush and scatterings of trees.

Site 3 is approximately 8 acres at the east abutment located 0.47 miles northeast of the Upper Plant Powerhouse of the diversion dam (Dam No. 1) in the east channel of the Snake River. A portion of this area is within the power site withdrawal leased by the city of Idaho Falls from the BLM. An unimproved parking area and boat launching ramp have been provided at the upper end of the area, and a narrow road leads through a stand of willows and cottonwood trees to the east abutment of Dam No. 1.

CITY PLANT

City Plant Fishing Access Area

There is a fishing platform in the tailrace area near the City Plant and dispatch center. This is a restricted area and any fishermen that are interested in fishing here must sign in with IFP before accessing the area. A parking area is available for recreational use as well.

Eagle Rock Crossing

Located just north of Pedersen's Sportsman's Park on the east riverbank is Eagle Rock Crossing. The historical landmark provides a picnic area with benches and a drinking fountain, overlook structures, a parking area, restroom facilities and trail access to the Greenbelt.

John's Hole Forebay Park

John's Hole is a boat launching facility on the west side of the Snake River, just below the bridge carrying U.S. Highway 20 over the river. Constructed in 1975, it marks the northernmost part of the continuous greenbelt. It is situated on a narrow strip of land between the Porter Canal and the Snake River and contains approximately 4.13 acres and is 2.58 miles north of the Lower Plant Powerhouse (IFPR 2020). Public floating docks which line the edge of a 6-foot-high retaining wall are used by boaters, swimmers, and sunbathers. A swimming area was designated at the northern end of the park. Recreation at John's Hole consists of boat ramp and dock, picnic facilities, parking areas, restroom facilities, fishing access, and a section of the Greenbelt, a trail along the river including picnic facilities, restrooms, and scenic viewpoints. This area is picnic/swim and boat launch day-use area.

Keefer's Island

Located south of John's Hole lies a historic landmark known as Keefer's Island. The island is only accessible by boat and provides a looping trail system with picnic tables.

Pederson's Sportsman's Park

Pederson's Sportsman's Park is located between the City Plant and Broadway Bridge. The 4-acre park (IFPR 2020), on an island in the Snake River, is a heavily used recreational area and is located .07 miles north of the City Powerhouse. A low diversion dam that channels water into the City Plant forebay extends from the island to the downstream face of a pier of Broadway Bridge. Access to the island is provided by a footbridge over the forebay near the northern end of the island and by a walkway along a railroad trestle near the southern end. Recreation at Sportsman Park includes walking paths and bridges that span the river, an amphitheater sitting area, and fishing access to the river. There is also a water fill-up facility and sewage dumping facility for campers and motor

homes. The Friendship Garden is located on the island with Pederson's Sportsman's Park and was implemented to the park in 2011. The garden was developed to celebrate 30 years of associating with the Japanese sister city, Tokai-Mura and to encourage friendship with peoples throughout the world. The Friendship Garden contains a traditional Japanese garden gate, many water features, a viewing platform, a deck, a "Dragon's Path" across a pond, and a large Japanese lantern given to the city by Tokia-Mura. One abutment of a historic bridge across the Snake River, erected in 1865, is located on the west side of the island, and its companion is visible across the river from this park.

Russell Freeman Park

Russell Freeman Park and the Intermountain Science Experience Center occupy approximately 60.83 acres on the north edge of Idaho Falls on a site that was fonnerly a sanitary landfill. This area is hilly and has local relief of more than 50 feet. Established in 1968, the park has been seeded to grasses, and ornamental trees and shrubs have been planted throughout. Four baseball diamonds, complete with bleachers, dugouts, and parking areas, have been established. One diamond is lighted. A road system connects all areas of the park. Four picnic shelters have been built, and picnic tables and fireplaces have been established at regular intervals throughout the park. The park has two restrooms available on site as well as shelters, band shelter, disc golf course, and a war memorial. Several pieces of playground equipment have been installed, and some boat launching already occurs in the park. A large parking area has been constructed, and a nature trail, designed for use by older and persons with disabilities as well as others, has been established. Local plants, animals, geology, early Indian history, and aspects of the June 1976 flood, which inundated most of the trail area are identified along the trail.

South Capital Park

South of IFP on the east riverbank is the South Capital Park and Shelter, also called Memorial Park and War Mother's Park (Parks & Rec, n.d.). Visitors have access to a parking area, picnic shelter with tables, a fishing pier, playground, restroom facilities, a river overlook and trail access to the Greenbelt.

LOWER PLANT

South Tourist Park

South Tourist Park is located near the south city limit of Idaho Falls on the east bank of the Snake River, approximately 0.4-mile northeast of the Lower Plant site. It is accessible from the South Yellowstone Highway (U.S. 26/91). The 13.90-acre recreational area is owned by the city of Idaho Falls and operated by the City Parks and Recreation Department (IFPR 2020). It is a combination overnight and day-use area and receives heavy picnic, boat launch, and overnight transient use. This is the only public area in the Project vicinity that provides overnight camping facilities. Facilities available for public use at South Tourist Park include a boat launching ramp and docking facilities with adjacent parking, informal swimming and fishing access, a restroom building connected to city water and sewer systems, 16 designated camping areas, movable picnic tables, garbage cans, area lighting, playground equipment, extensive grassed areas and access to the Greenbelt trail. As of October 1st, 2021, the price per camper, recreational vehicle, or tent per night is $18. Camping is open from April-October, weather permitting. No hook ups (no water or power); however, the park does have a dump station (IFPR 2020).

Pursuant to Order Approving Revised Exhibit R, the licensee is required to maintain South Tourist Park, which provides a boat launch and other recreation facilities. In 2008, the licensee noticed that the park's concrete boat ramp had deteriorated to the point of causing damage to boat trailers that used the launch. In order to prevent further trailer damage, the licensee temporarily closed the boat ramp in order to replace it. FERC approved the boat launch replacement in 2009.

5.7.2.2 GEM STATE PROJECT RECREATION FACILITIES

Article 50 of the current Gem State Project license required IFP, after consultation with BLM, NPS, and the IDPR, to prepare a revised Report on Recreation Resources for the Gem State Project. This Recreation Resources Report includes:

1. The location of appropriate facilities to be developed for Recreational Sites A, G, and H, as designated in the application;
2. A plan for removal of rock outcroppings and submerged features that could pose a boating hazard;

3. The location and type of markers to warn boaters of hazardous areas that would remain within the project reservoir;
4. Compatible treatment of the shoreline greenbelt and BLM river trail;
5. A schedule for the development, operation, and maintenance of the proposed recreational facilities; and
6. Copies of any letters received from consulted agencies and any agreement entered into for the development and operation of the project recreation facilities.

A revised Report on Recreation Resources was approved by FERC on January 11, 1985. Since approval, the plan has been amended multiple times for minor changes to implementation requirements. IFP has completed substantial implementation required by Article 50 and continues to maintain all FERC-approved recreation sites.

Article 50 also required IFP to coordinate with IDPR in the preparation of a reservoir zoning plan to designate areas for specific recreational use, and to file a zoning plan with FERC within one year of license issuance (FERC 1983).

The following recreational facilities fall within the FERC-approved Project Boundary of the Gem State Project.

UPPER MARINA (GEM LAKE RECREATION AREA)

Owned by the city of Idaho Falls, Upper Marina (Gem Lake Recreation Area) is located 2.38 miles north of the Gem State Powerhouse and consists of a boat ramp, docks, floats, parking, picnic tables, fire pits, toilets meeting Americans with Disabilities Act (ADA) standards, garbage cans and a parking area that was extended in 2004. Here, members of the public have boating access for fishing, water skiing, and general enjoyment on the north side of Highway 26 bridge. A boat restraining barrier upstream of the Gem State Dam as well as warning signs, buoys, sirens, and lights are maintained by IFP to notify boaters and the public of facilities and to alert tailrace anglers to the potential for rapidly rising water levels.

LOWER MARINA

The Lower Marina recreation site is located approximately 0.30 miles west of the Gem State Powerhouse and provides car-top boat access to the Snake River between the Gem State dam and

the Highway 26 bridge through a footpath over the dike embankment. Parking is available within 800 feet from the access road. A boat ramp, docks, restrooms and picnic shelters are also available at the marina. For safety purposes, IFP maintains a buoyed rope across the channel to prevent smaller boats from approaching the hydroelectric facilities and dam (Idaho Falls 1984).

FISHING ACCESS

Primarily used to maintain fishing stream access, public access is largely be restricted to the west bank, even during minimum release from the dam. The facility is located 0.12 miles from the Gem State Powerhouse and includes of parking, ADA restroom facilities, garbage cans, and informational signage. These facilities are also accessible to sportsmen using the reservoir access at the Lower Marina site. This area allows access to the tailrace for fishing.

GEM STATE FISHING POND

The 5-acre Gem State Fishing Pond provides public fishing access for children under 14 years of age and is located 0.33 miles south of the Gem State Powerhouse, near the powerhouse tailrace on the east bank. A parking area is provided about 1,000 feet north of Canyon Road. Access to the pond, from the parking area, is about 1,000 feet, restricting access to foot traffic only. The pond is stocked three times throughout the year with a variety of fish by IFP (FERC 2016). This area is equipped with picnic tables, benches, and trash receptacles. The Pond is closed March 1st through June 15th to allow nesting of waterfowl in the area.

5.7.3 RECREATIONAL OPPORTUNITIES IN THE VICINITY OF THE PROJECTS

This section describes recreational opportunities in the Projects' vicinities, but not associated with the current license, for each the Idaho Falls Project and the Gem State Project. As both the Idaho Falls and Gem State Projects are located in close succession from each other, a 5-mile buffer around each Project was used to identify recreational facilities and opportunities within each Project vicinity. Table 5-27 includes a list of recreation amenities located within the Projects' vicinitiesProject vicinity.

TABLE 5-27 LIST OF PARKS AND AMENITIES (NON-PROJECT FACILITIES) LOCATED WITHIN THE PROJECTS' VICINITIES

Park Name	Address	Shelter	Rest Rooms	Play Ground	Picnic Area	Ball Fields	Soccer Fields	Tennis/ Skate
Antares Park	1436 Anteres Drive	-	-	X	-	-	-	-
Civitan Plaza	510 Park Avenue and B	-	-	-	X	-	-	-
Freeman Park	1290 Science Center	X	X	X	X	X	-	-
Greenbelt Eastside	Broadway & Memorial	X	X	-	X	-	-	-
Greenbelt Westside	Broadway & Riverside	-	X	-	X	-	-	-
Highland Park/Melaleuca	568 E. Elva	X	X	X	X	X	-	-
Idaho Falls Greenbelt Trail	N/A	-	-	-	-	-	-	-
Poitevin Park	300 W. 13th Street	-	-	X	X	-	-	-
Reinhart Park	1055 Washburn	X	X	X	X	X	-	-
Rollandet Park	2280 Rollandet Avenue	N/A	X	X	-	X	-	-
Ryder Park	2001 W. Sunnyside Road	X	-	-	X	-	-	-
Sage Lakes Golf Course	100 E. 65th N.	-	X	-	-	-	-	-
Snake River Animal Park	2930 Lindsay Boulevard	-	-	-	X	-	-	-
Tautphaus Park	2800 S. Boulevard	X	X	X	X	X	X	X
Taylors Crossing	River Walk Drive	-	-	-	X	-	-	-
Tennis Court SHHS	1855 Skyline Drive	-	-	-	-	-	-	X
West River Boat Ramp	9404 N. River Road	-	-	-	-	-	-	-

Source: IFPR, n.d.

Plans by the Idaho Falls Parks and Recreation Department to expand existing recreational areas in the Project Vicinity are consistent with expectations that current trends in the local demand for recreation would continue. The increasing demand for day-use recreational facilities along the Snake River is being met in accordance with a comprehensive recreational plan, as funding becomes available.

Along with the recreational opportunities listed above, the following Figure 5-17 shows recreational opportunities in the vicinity of the Projects.

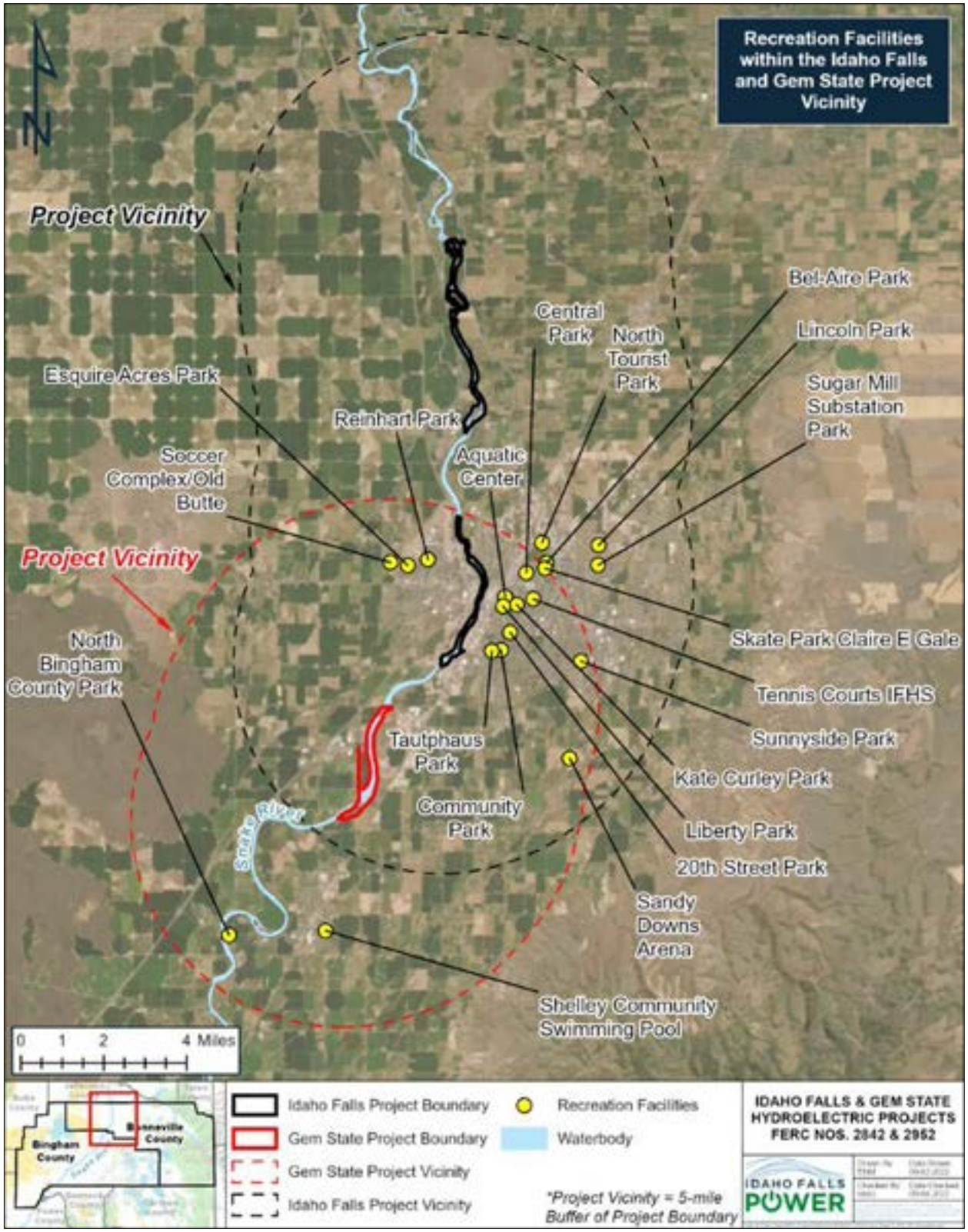

FIGURE 5-17 RECREATION FACILITIES WITHIN THE IDAHO FALLS AND GEM STATE PROJECT VICINITIES

GREENBELT

Several segments of a planned, continuous Snake River greenbelt have been completed in Idaho Falls. One completed portion extends nearly a mile northward from the City Plant along the east bank of the river. The other developed section occupies more than a mile of the west river bank from the Broadway Bridge to Johns Hole Park, where U.S. Highway 20 crosses the Snake River. Because of its proximity to downtown Idaho Falls on the east and a major hotel area on the west, the greenbelt receives heavy daytime use by both residents and visitors. Benches and portable picnic tables are located at varying intervals throughout the greenbelt, and pedestrian/bicycle paths wind along the river, separated from the adjacent city streets. Naturally occurring trees have been preserved. Landscaping and extensive lawns have been planted. The contrast presented by the relatively quiet waters of the forebay adjacent to the cascading waters of the Idaho Falls of the Snake River provide a unique scenic attraction in the greenbelt.

CIVITAN PARK

At the northern end of the greenbelt, east of Riverside Drive, is the 2.63-acre, triangular Civitan Park. This park is a grassed area with plantings of ornamental trees and shrubs. Its primary function is to provide a regulation baseball diamond complete with backstop, outfield fence, and spectator bleachers. Restroom facilities have been built. Four picnic shelters equipped with tables provide a view across the Snake River and of Keefer's Island (a small island about 1300 feet downstream from the U.S. Highway 20 Bridge).

5.7.4 CURRENT AND FUTURE RECREATION NEEDS AND MANAGEMENT FOR THE PROJECTS

5.7.4.1 FERC FORM 80

The most recent recreational use information for the Idaho Falls Project and Gem State Project is provided in the Licensed Hydropower Development Recreation Report, FERC Form No. 80 (Form 80) filed in 2014 for both projects. Until recently (FERC Order 852, effective March 28, 2019), licensees were required to file Form 80 reports for each project development every 6 years, unless the licensee obtained an exemption from FERC (Table 5-28). The information provided by the licensee was used to document overall recreational use of project lands and waters at each Project

Development. below illustrate the available amenities of the Idaho Falls Project and Gem State Project along with their capacities as indicated on the most recent FERC Form 80 in 2014.

TABLE 5-28 2014 IDAHO FALLS UPPER PLANT FORM 80 RESULTS

Facility	Capacity Utilization (percent)
Idaho Falls Project Upper Plant	0-10
Idaho Falls Project Lower Plant	0-40
Idaho Falls Project City Plant	0-50
Gem State Project	0-50

Source: FERC 2014

5.7.4.2 IDAHO FALLS COMPREHENSIVE AND STRATEGIC MASTER PLAN

Idaho Falls Comprehensive and Strategic Master Plan gives detailed insight to what is needed and what recommendations will be needed for the future pertaining to recreation within the city limits Goals for this plan include:

- Engage the community, leadership and stakeholders through innovative public input means to build a shared vision for parks, open space, trails, and recreation in the city of Idaho Falls for the next 10 to 20 years
- Utilize a wide variety of data sources and best practices, including a statistically valid survey to predict trends and patterns of use and how to address unmet needs in the city of Idaho Falls
- Determine unique Level of Service Standards to develop appropriate actions regarding parks, open space, trails, and recreation that reflects the city of Idaho Fall's strong commitment in providing high quality recreational activities for the community
- Shape financial and operational preparedness through innovative and "next" practices to achieve the strategic objectives and recommended actions with achievable strategies
- Develop a dynamic and realistic strategic plan that creates a road map to ensure long-term success and financial sustainability for the city of Idaho Fall's parks, open space, trails and recreation, as well as action steps to support the family-oriented community and businesses that call Idaho Falls home

When analyzing the facilities offered by the Idaho Falls Department of Parks and Recreation, residents identified the need for multiuse paved trails, picnic areas and shelters, small neighborhood parks, and large community parks. The facilities that were the most important to households were multiuse paved trails, outdoor swimming pools/water parks, and multiuse

unpaved trails. The plan identified that focusing on multiuse paved trails would provide the greatest benefit for the largest number of residents within the city of Idaho Falls (IFPR 2020).

5.7.4.3 IDAHO STATE COMPREHENSIVE OUTDOOR RECREATION PLAN AND RELATED REPORTS

Idaho Statewide Comprehensive Outdoor Recreation Plan (SCORP) is created by the IDPR to provide an all-encompassing document for Idaho's outdoor recreation for the next 5 years. The Idaho SCORP provides current assessment of the outdoor recreation system in Idaho which includes detailing providers and supply, understanding the demands and needs, and identifying issues impacting outdoor recreation throughout the state (IDPR 2018). While SCORP helps identify statewide and regional trends and issues, IDPR strongly encourages local and regional planning, research, and interagency cooperation in order to meet and understand local demands and needs (IDPR 2018). Throughout the development of this plan, the following themes emerged as current and potential areas of concern over the next 5 years:

- Loss of public lands, including federal land transfers
- Loss of motorized trail access due to administrative closures, and non-motorized trail access due to lack of funding for maintenance
- Balancing population growth, increased participation and natural resource protection
- Engaging youth in outdoor recreation
- Maintaining existing facilities and infrastructure
- Improving communication between providers and the public
- Funding for programming and interpretation
- Improving education and stewardship/respect for natural resources
- Building new and unique partnerships
- Adapting to changes in activities and emerging activities; staying relevant
- Blending technology with outdoor recreation
- Connecting with new users, including minority and underserved populations
- Improving access for people with disabilities

5.7.5 PROTECTED RIVER SEGMENTS

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the

enjoyment of present and future generations (NWSRS n.d). Though certain portions of the upstream headwaters of the Snake River fall within the Wild and Scenic River System, no segments of the river within either of the Project Boundaries are designated as wild and scenic.

The National Trails System is composed of more than 55,000 miles of scenic, historic and recreation trails that traverse wilderness, rural, suburban and urban areas in 49 states (USFS 2016). The National Trails System Act of 1968 calls for establishing trails in both urban and rural settings for people of all ages, interests, skills, and physical abilities (NPS 2021). No trails are designated as part of the National Trail System within both the Idaho Falls Project and Gem State Project Boundaries. The nearest national scenic trail to both Projects is the Continental Divide Trail (CDT n.d), which traverses along the southeastern side of the Beaverhead and Deerlodge National Forests, approximately 150 miles northeast of the Idaho Falls Project.

There are no wilderness areas within the Idaho Falls Project or Gem State Project.

5.7.6 LAND USE AND MANAGEMENT

5.7.6.1 AGRICULTURE AND INDUSTRY IN THE VICINITY OF THE PROJECTS

Agriculture, Idaho's leading industry, is the largest water user in the state (University of Idaho 2010). The Snake River discharge in the Idaho Falls area is used extensively for irrigation purposes (FERC 1983a). Agricultural crops dominate this region of Idaho, including alfalfa, potatoes, and small grains (FERC 1983a) (Photo 5-1).

Source: Brownell & Sons, n.d.

PHOTO 5-1 HISTORIC PHOTO OF RUSSET POTATO HARVEST IN IDAHO FALLS

Many food-processing industries are concentrated around the cities of Idaho Falls, Burley, Twin Falls, Boise, and Payette.

Idaho Falls is the 4th largest city in the state of Idaho. The city provides a myriad of residential and commercial developments. As shown in Figure 5-18, the majority of land within the Project areas is developed to medium intensity or is used for cultivated crops. The main crops grown in Idaho include potatoes, various grain and seed, sugarbeets, onions, legumes, fruit and mint (Idaho State Department of Agriculture, n.d.).

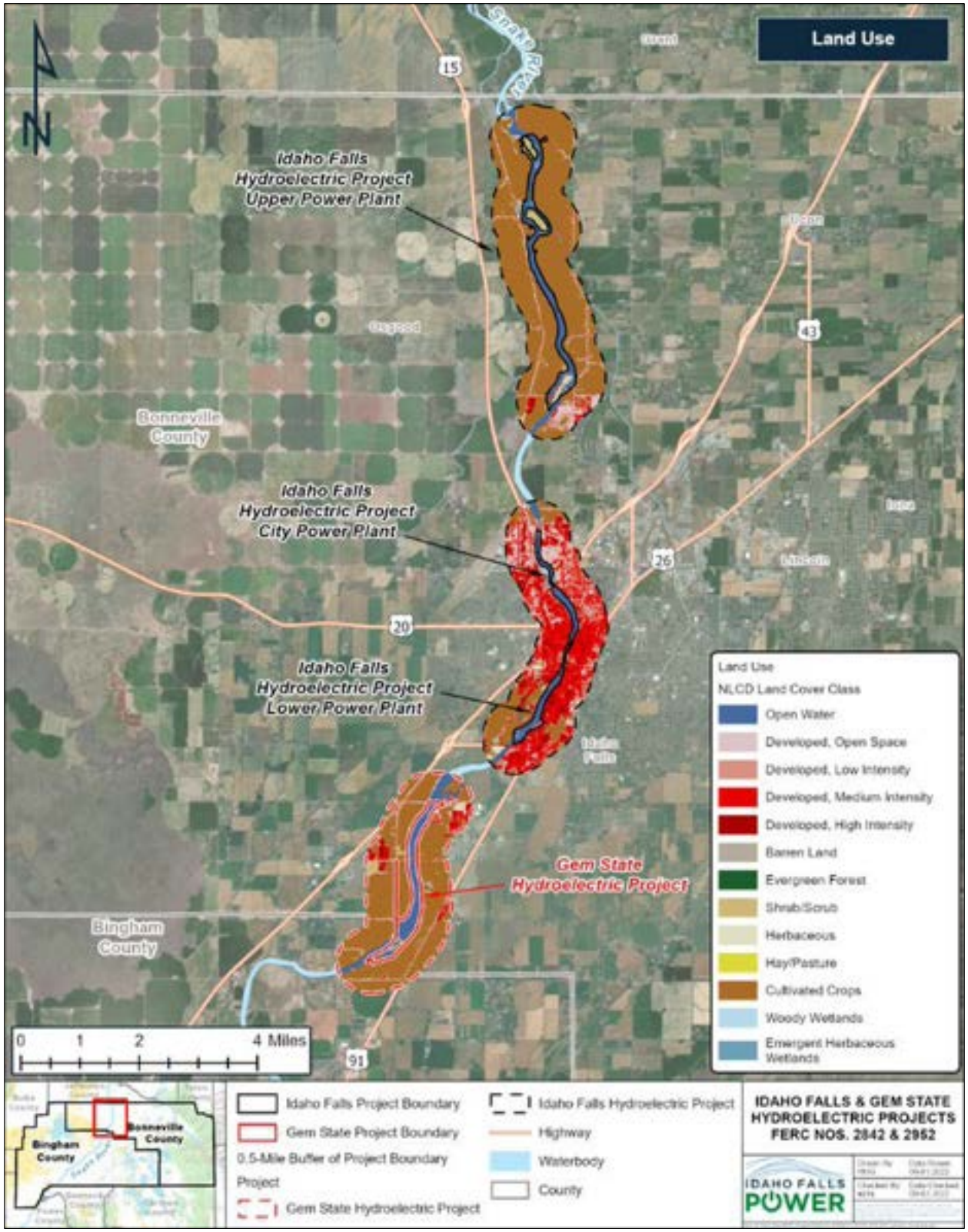

FIGURE 5-18 PROJECT LAND USE

5.7.6.2 IDAHO FALLS HYDROELECTRIC PROJECT

UPPER PLANT

The Upper Plant, which was constructed in 1930, is located approximately 4 miles upstream from the Idaho Falls city center at RM 805. Approximately 31.89 acres of privately owned land are contained within the Project Boundary. Nearly 304 acres of public lands owned by the State of Idaho within the Project Boundary are occupied by the Snake River channel. Agricultural and rural residential land uses are dominant near the plant site, but gravel pits, junk yards, and other industrial uses occur along the westside highway adjacent to the railroad. Upstream lies level agricultural land of the Snake River plain.

CITY PLANT

The City Plant, built in 1913, is located in downtown Idaho Falls at the falls of the Snake River at RM 800, adjacent to the central business section of the city of Idaho Falls. The City Plant impoundment is 50 acres at a normal pool elevation of 4,700 feet NGVD and extends approximately 1 mile upstream. Approximately 0.2 acres are within the existing railroad right-of-way for the Union Pacific Railroad spur line, which crosses the property. Approximately 0.6 acres are owned by the city of Idaho Falls.

LOWER PLANT

The Lower Plant, erected in 1940, is located 2 miles downstream from the city center at RM 798. A commercial and industrial strip facing the Yellowstone Highway and the Union Pacific Railroad parallels the east side of the Snake River south of Idaho Falls. A small area of irrigated cropland, evolving toward industrial and commercial uses, lies just east of the plant. The Lower Plant impoundment is 100 acres at a normal pool elevation of 4,674 feet NGVD and extends approximately 2 miles upstream. Approximately 4.0 acres of private property are included within a right-of-way for a dike on the east bank of the river upstream from the power plant to the 17th Street Bridge. Approximately 5.6 acres are owned by the city of Idaho Falls.

TABLE 5-29 LAND USE IN THE IDAHO FALLS PROJECT AREA

	Area (Acres)			
	Idaho Falls Hydroelectric Project			Gem State Hydroelectric Project
Land Cover Class	Upper Plant	City Plant	Lower Plant	
Open Water	313.8	93.9	102.3	274.0
Developed, Open Space	2.3	5.3	2.0	2.0
Developed, Low Intensity	4.6	7.5	8.9	1.8
Developed, Medium Intensity	2.7	6.4	8.6	1.2
Developed, High Intensity	0.2	4.8	3.5	0.7
Barren Land	2.9	0.0	0.2	4.6
Evergreen Forest	0.0	0.0	0.0	0.5
Shrub/Scrub	29.3	0.8	0.5	21.0
Herbaceous	15.6	0.0	0.0	2.2
Cultivated Crops	57.2	0.0	1.3	62.5
Woody Wetlands	8.0	0.1	1.3	4.0
Emergent Herbaceous Wetlands	11.3	1.1	0.0	2.2

Source: USGS 2021

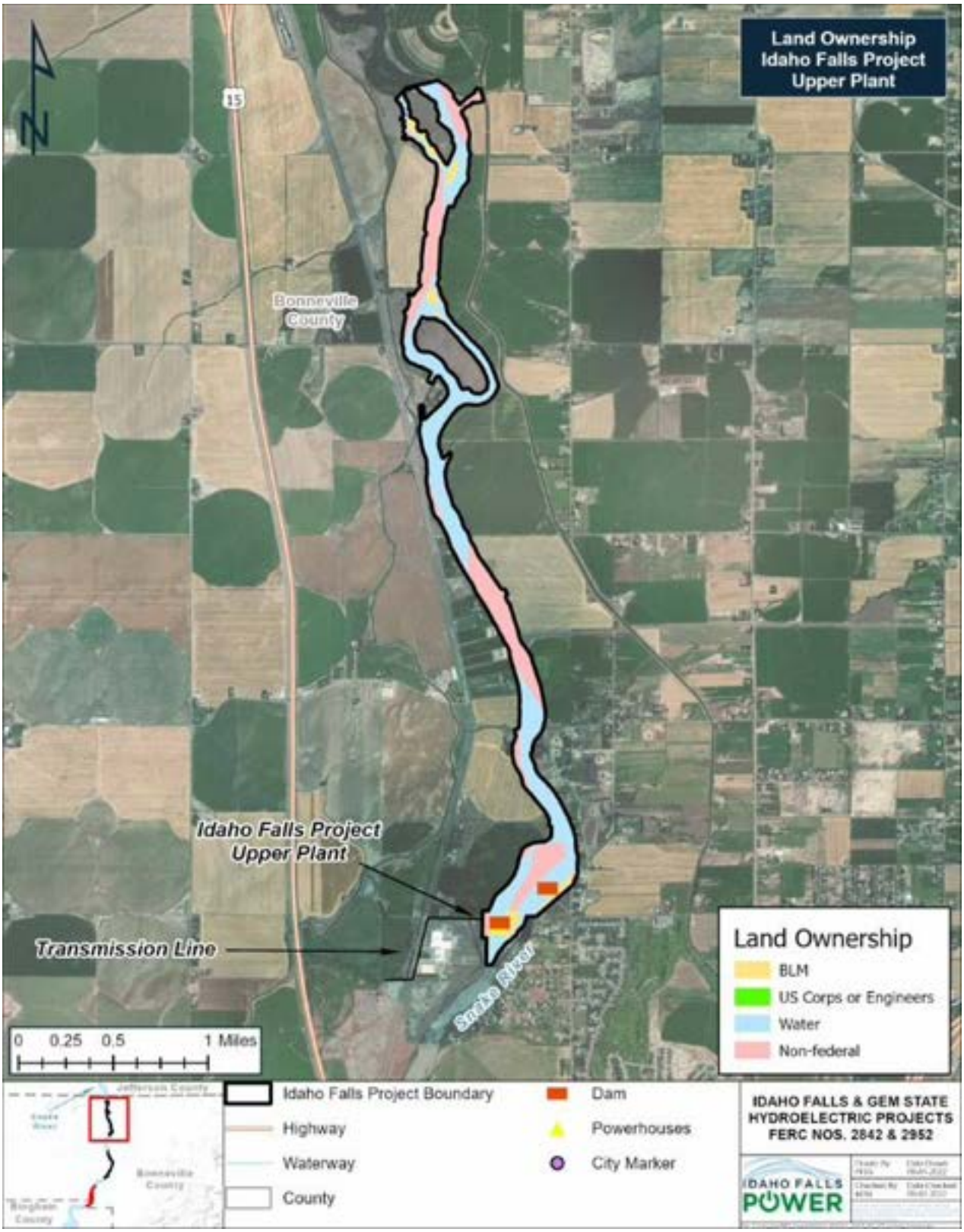

FIGURE 5-19 LAND OWNERSHIP IN THE IDAHO FALLS PROJECT—UPPER PLANT

FIGURE 5-20 LAND OWNERSHIP IN THE IDAHO FALLS PROJECT AREA—CITY AND LOWER PLANTS

5.7.6.3 GEM STATE HYDROELECTRIC PROJECT

The Gem State Hydroelectric Project is located on the Snake River, near the southern edge of the Snake River Plain at RM 789.76, approximately 5.5 miles southwest of the city of Idaho Falls. The Project is located entirely on municipally owned lands and consists of one development. The Project is located in Bonneville and Bingham counties in the State of Idaho. The Project occupies a total of 197.7 acres of land, including 189.4 acres of non-federal lands and 5.8 acres of United States lands administered by the BLM. The average elevation in the Project area is about 4,700 feet mean sea level (msl), with slightly to moderately sloping terrain.

There is one 3.13 acre lot belonging to the United States located on the left bank of the Snake River within the Project Boundary (Figure 5-21), Lot 7 in Section 15, Township 1 North, Range 37 East of the Boise Meridian, Bonneville County, Idaho, The United States has retained easements under provisions of the Omitted Lands Act of 1962 to 50- and 100-foot strips parallel to the ordinary high-water line. These easements are for recreational facilities and general recreational use. These easements are along the right bank throughout Section 10, Township 1 North, Range 37 East of the Boise Meridian, Bonneville County, Idaho, and along the left bank in the tailrace area.

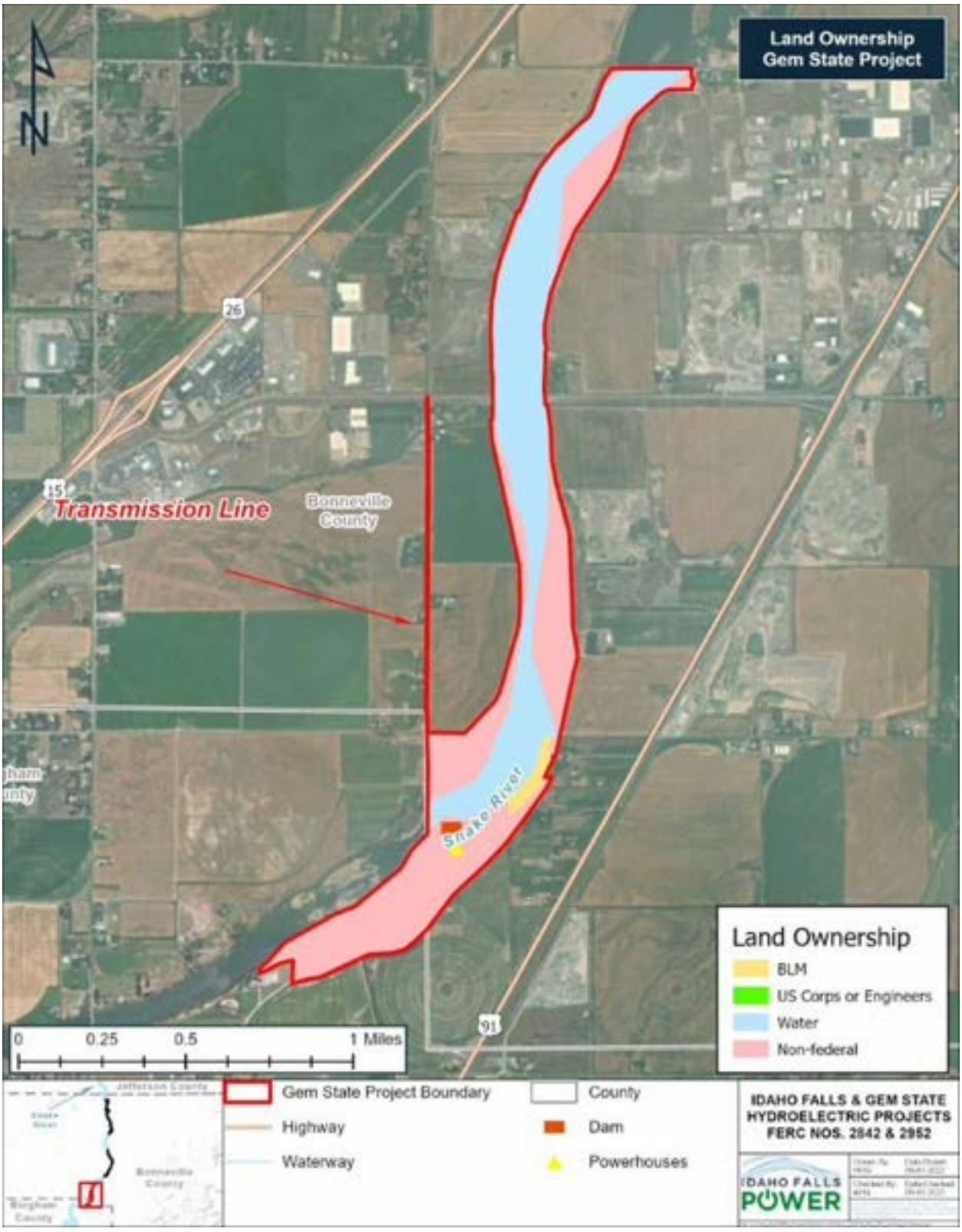

FIGURE 5-21 LAND OWNERSHIP IN THE GEM STATE PROJECT AREA

5.7.6.4 COMPREHENSIVE PLANS

IDAHO FALLS COMPREHENSIVE PLAN

According to the City Core Plan for Idaho Falls, the downtown area is comprised of commercial business while south of downtown is considered an "urban neighborhood" that permits a range of building types and commercial uses complimentary to residencies.

The River Edge subdistrict contains valuable public and cultural services and amenities on the Riverwalk. IFP is contiguous to these uses. The city of Idaho Falls aims to improve South Capital Avenue and its connectivity to the rest of South Downtown while preserving its valuable natural amenities. Idaho Falls plans to integrate form-based codes, which offer an alternative zoning type that relies less on land use designations and focuses instead on the built characteristic of individual sites

BONNEVILLE COUNTY COMPREHENSIVE PLAN

Agriculture dominates Bonneville County's land use. Just under 96 percent of all private lands in the county are used for farmsteads, primary processing of agricultural commodities, cropland or rangeland. Agriculture and agribusiness enterprises are also the second largest source of employment and personal income in the county, falling just behind the Idaho National Engineering Laboratory and its associated firms. According to the 2013 Bonneville County Comprehensive Plan, the maintenance of agricultural land and water resources, and of viable farm units, is essential to the county's continued prosperity. Agriculture is also an integral part of Bonneville County history and the principal contributor of the pastoral open spaces that compose much of its scenic landscape.

BINGHAM COUNTY COMPREHENSIVE PLAN

Agriculture is Bingham County's dominant land use. Agriculture and agribusiness enterprises are an important source of personal income in the county. The maintenance of agricultural land and water resources and of viable farm units is essential to the county's continued prosperity. The 2018 Bingham County Comprehensive plan encourages agricultural land uses in Bingham County to provide an economic base.

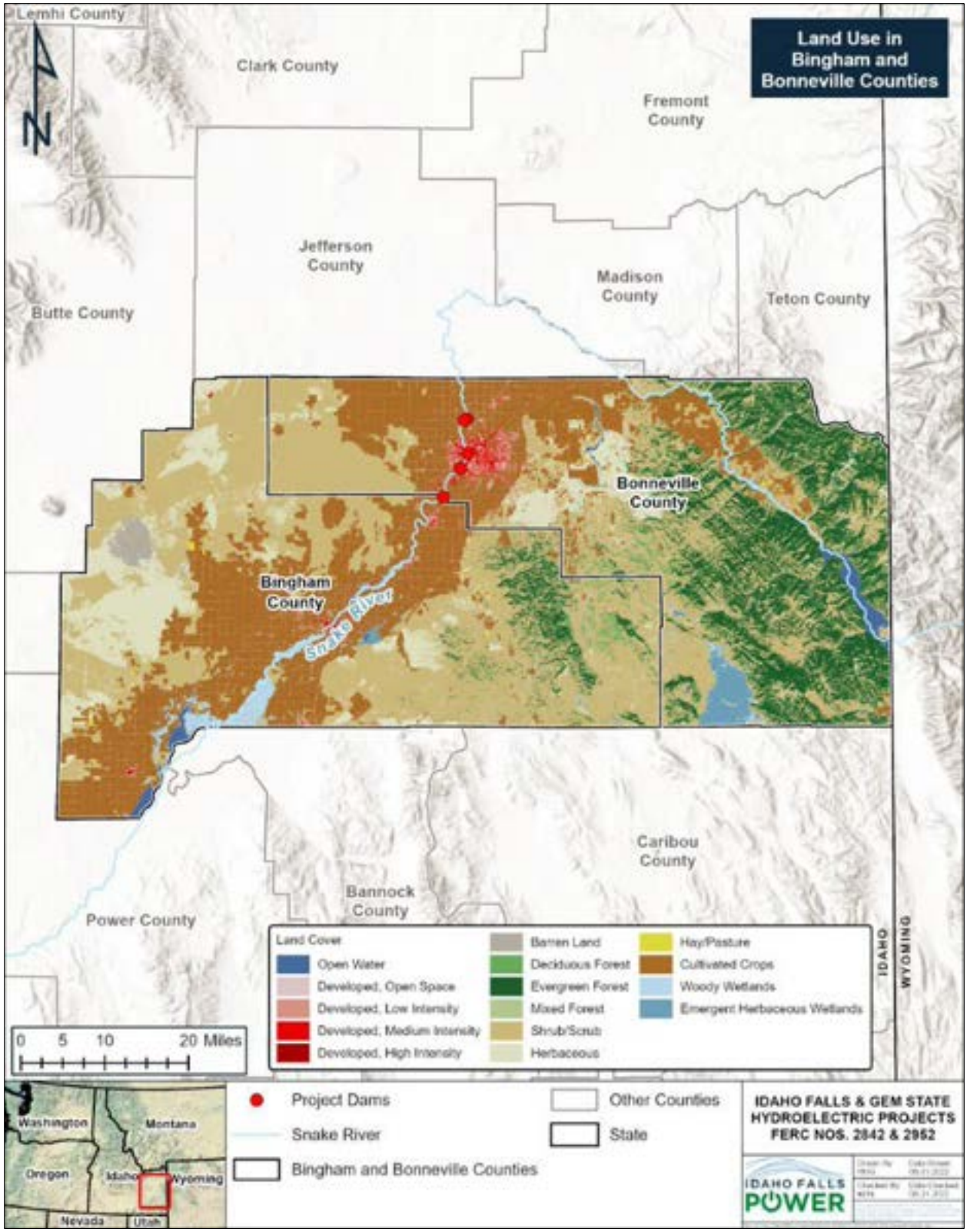

FIGURE 5-22 LAND USE IN BINGHAM AND BONNEVILLE COUNTIES

BIG DESERT MANAGEMENT FRAMEWORK PLAN

The Big Desert Management Framework Plan (MFP) guides management of public lands managed by the Upper Snake BLM Field Office. Covering 1.8 million acres of public lands (BLM, 2022), this MFP guides the decisions and actions taken by the BLM in managing resources on public lands. This land use plan is currently under revision to be a part of a comprehensive land use management direction. Direction is needed to designate public lands for retention or disposal as well as to allow for the development of alternative energy sources.

5.7.6.5 SHORELINE MANAGEMENT AND BUFFER ZONES

There are no existing shoreline buffer zones within the boundaries of the Projects.

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5.8 AESTHETIC RESOURCES

Pursuant to 18 CFR § 5.6(d)(3)(ix), the text in this section includes a description of the aesthetic, or visual, characteristics of the lands and waters potentially affected by the Idaho Falls and Gem State Projects.

5.8.1 EXISTING REGIONAL VISUAL CHARACTER

The Snake River is the major natural water feature present in the vicinity of the Projects, with smaller tributaries emptying into the Snake River (Figure 3-2). Both Projects are located within the Upper Snake River Floodplain EPA Level IV ecoregion (EPA 2002) which is characterized by nearly level river terraces and floodplains containing canals and other water diversions.

Lands north of the city of Idaho Falls, and near the Upper Plant, are characterized by agricultural fields, industrial uses, and scattered residential development. The southern portion of the Idaho Falls Project is located in a moderately-to-heavily developed urban area within the heart of the city of Idaho Falls (MRLC 2019). The west bank of the Snake River includes a mixture of industrial, retail, and parkland or other open space. Lands on the east bank of the Snake River consist of industrial, retail, residential, and parkland or other open space. As the distance from the Snake River increases, urban development becomes less dominant and land use transitions to agricultural uses (see Figure 5-18 in the Land Use Section of this PAD). The Gem State Project is surrounded by a mixture of industrial, retail, and agricultural lands, with some residential areas (see Figure 5-18 in the Land Use Section of this PAD).

Other nearby reservoirs include the Ririe Reservoir, Palisades Reservoir, and American Falls Reservoir. Ririe Reservoir is located on Willow Creek, approximately 15 miles east of the Idaho Falls Project. Palisades Reservoir is located on the South Fork Snake River, approximately 43 miles southeast of the Idaho Falls Project. The American Falls Reservoir is located approximately 40 miles downstream of the Gem State Project on the Snake River. These reservoirs are popular

for day-use activities, camping, boating, fishing, waterskiing, and swimming, and other uses (City of Idaho Falls 1978).

The Snake River watershed above the Projects extend into the Teton Range of the Rocky Mountains. The upper portion of the watershed lies in the high, rugged area of northwestern Wyoming, including Yellowstone and Grand Teton National Parks. These areas are forested and protected under the management plans of the NPS and the surrounding national forests. The lower portion of the watershed, in which the Projects are located, is characterized by grazing and agricultural use (City of Idaho Falls 1978).

5.8.2 VISUAL CHARACTER OF PROJECT LANDS AND WATERS

The visual character of the Snake River in the vicinity of the Projects is that of a wide, slow, meandering river passing through flat, irrigated cropland (FERC 1983), except for its passage through the urban area of the city of Idaho Falls (Photo 5-2 through Photo 5-8) and the small falls at and near the Project facilities. Residential areas are present adjacent to both Idaho Falls and Gem State Projects, including dense residential neighborhoods along the east bank of the river in the city of Idaho Falls. Dispersed residences occur in proximity to the Snake River, including several residences with frontage on the Snake River north and south of Idaho Falls.

5.8.2.1 IDAHO FALLS PROJECT

The Idaho Falls Project is a run-of-river facility consisting of three developments; the Upper, City, and Lower Plants. All dams and associated facilities are located along the Snake River within Bonneville County, with the southern two plants also located within the city limits of Idaho Falls, Idaho. The three dams vary in height from 23 feet- to 33 feet tall and are comprised of concrete and earth fill structures stretching across the Snake River. The powerhouses contain generators, transmission lines, and other infrastructure associated with these three plants as well as a reservoir upstream from each dam. No new facilities are planned to be constructed at these three dam sites.

5.8.2.2 GEM STATE PROJECT

The Gem State Project is a run-of-river facility consisting of one development, completed in 1987 and is located on the Snake River, within Bonneville and Bingham counties, approximately 5 miles downstream of the Idaho Falls Project. This dam is a 40-foot-high earth fill, concrete, and rock fill

structure stretching across the Snake River. The hydroelectric plant consists of a powerhouse, transmission line, and other infrastructure as well as a reservoir upstream from the dam. No new facilities are planned to be constructed at this dam site.

5.8.3 VISUALLY SENSITIVE AREAS AND OTHER SCENIC ATTRACTIONS

Two scenic byways are located near the Idaho Falls Project; the Sacajawea Historic Byway and the For Henry Historic Byway. The Fort Henry Historic Byway begins about 26 miles north of the city of Idaho Falls, near Rexburg, ID. Fort Henry was the earliest European settlement in Idaho Territory, the 81-mile route runs through high-altitude desert into deep forest near Island Park, Idaho. The 135-mile Sacajawea Historic Byway begins about 26 miles northwest from the city of Idaho Falls where Highways 33 and 15 meet and parallels the Continental Divide for most of the drive.

The city of Idaho Falls is a major gateway to the Yellowstone and Grand Teton National Parks, as well as many other major nearby recreational attractions (Section 5.7; City of Idaho Falls 1978). Many of the recreational attractions described in Section 5.7, *Recreation and Land Use*, provide scenic and aesthetic value and contribute to the overall rural character of the region around the city of Idaho Falls. No segments of the Snake River within the Idaho Falls and Gem State Project Boundaries are designated as wild and scenic under the National Wild and Scenic Rivers system (Refer to Section 5.7, *Recreation and Land Use*, for additional information).

5.8.4 FEDERAL AND LOCAL VISUAL RESOURCE PLANNING OBJECTIVES

5.8.4.1 BUREAU OF LAND MANAGEMENT

As inventoried by the BLM, through the development of the Upper Snake Field Office Visual Resource Inventory (VRI), both Projects are located on lands classified as VRI Class III, and specifically including Class B scenery (Main Snake near Ferry Butte scenic quality rating unit [SQRU]) with moderate visual sensitivity associated with the lands adjacent to the Snake River) and located within the foreground/middle ground distance zone (BLM 2010).

These values are based on BLM Manual 8410-1, VRI, using the following factors: (1) diversity of landscape features that define and characterize landscapes in a given planning area (scenic quality), (2) public concern for the landscapes that make up a planning area (sensitivity levels), and

(3) landscape visibility from public viewing locations (distance zones). These factors are combined to determine VRI Classes, which identify the overall scenic value of different portions of the landscape. Although the BLM only has jurisdiction over the specific land it manages, VRI data are often collected for most, if not all land jurisdictions within a given BLM field office, district office, or planning area. The VRI classes and individual factors provide baseline visual resources data that are used in combination with other resource needs, to determine Visual Resource Management (VRM) classes on BLM lands. VRM classes are established to provide management objectives in terms of allowable levels of disturbance and noticeability (i.e., visual contrast) and are established through the BLM's land use planning process, as described in BLM Manual 8410-1 (BLM 1986a).

The BLM Upper Snake Field Office, through their land use planning process, manages the isolated BLM-administered parcels along the Snake River as VRM Class II. BLM Manual 8431-1, Visual Contrast Rating, outlines the objectives for VRM Class II are to:

> Retain the existing character of the landscape. The level of change [contrast] to the characteristic landscape should be low. Management activities may be seen but should not attract attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape (BLM 1986b).

BLM parcels included within the Idaho Falls Project 27.2 acres and 5.8 acres within the Gem State Project.

5.8.4.2 REGIONAL MANAGEMENT PLANS VISUAL PLANNING OBJECTIVES

Through review of city and county comprehensive plans and other planning documents within the vicinity of the Projects, Bingham County is the only area with specific visual planning objectives. The 2018 Bingham County Comprehensive Plan goals state that community design should relate to the visual appearance and physical relationship of both the natural and man-made environments within the county, and that all rural communities, neighborhoods and cities within Bingham County should be encouraged to develop with sensitivity and appreciation for the aesthetic qualities of the surrounding physical environment (Bingham County 2018). The Bingham County

Comprehensive Plan provides following policies: encourage visually attractive and aesthetically pleasing development in the community and improve the visual characteristics of the county by establishing and enforcing location standards and setback requirements and preserving locations of visual corridors. These county goals and policies provide the intentions and interests of Bingham County, rather than providing specific compliance requirements for the Idaho Falls and Gem State Projects. No other federal, state, or local visual management requirements were identified for the Projects.

5.8.5 PROJECT PHOTOS

Source: Kleinschmidt 2019

PHOTO 5-2 THE SNAKE RIVER NEAR THE CITY PLANT IN IDAHO FALLS

Source: Kleinschmidt 2019

PHOTO 5-3 THE SNAKE RIVER NEAR THE CITY PLANT

Source: Kleinschmidt 2019

PHOTO 5-4 THE SNAKE RIVER NEAR THE CITY PLANT

Source: Kleinschmidt 2019

PHOTO 5-5 LOWER PLANT AND POWERHOUSE

Source: Kleinschmidt 2019

PHOTO 5-6 THE SNAKE RIVER AT CITY PLANT

Source: Kleinschmidt 2019

PHOTO 5-7 VEGETATED AREA IN A BEND OF THE SNAKE RIVER NEAR THE GEM STATE PROJECT

Source: Kleinschmidt 2019

PHOTO 5-8 IRRIGATED FIELDS NEAR THE GEM STATE PROJECT

5.8.6 REFERENCES

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5.9 SOCIOECONOMIC RESOURCES

Per 18 CFR § 5.6(d)(3)(xi), this section includes a general description of socioeconomic conditions in the vicinity of the Idaho Falls and Gem State Projects.

5.9.1 BONNEVILLE COUNTY

Bonneville County, Idaho covers 1,866.0 square miles of land and is the 15th largest county in Idaho by total area (U.S. Census 2020b). Agriculture is Bonneville County's dominant land use; according to the 1995 Bonneville County Comprehensive Plan (Amended 2013) just under 96 percent of all private lands in the county are used for farmsteads, primary processing of agricultural commodities, cropland, or rangeland. Agriculture and agribusiness enterprises are the second largest source of employment and personal income in the county (behind the Idaho National Engineering Laboratory and its associated firms) (Bonneville County 1995).

Approximately 71 percent of Bonneville County's residents live within the incorporated cities of Ammon, Idaho Falls, Iona, Irwin, Ririe, Swan Valley, and Ucon (Bonneville County 1995).

5.9.2 BINGHAM COUNTY

Bingham County, Idaho covers 2,093 square miles of land area and is the 12th largest county in Idaho by total area (U.S. Census 2020c). Lying entirely within the Snake River Plain, Bingham County is situated on a high plateau forming a wide intermountain belt in southern Idaho. Both the Blackfoot River and the Snake River flow through Bingham County. Bingham County is known as the potato capital of the world (Photo 5-9) however, other major crops grown in the county include alfalfa hay, sugar beets, oats, barley, wheat (spring and winter), mixed grains, rye, clover, and corn silage (Bingham County 2018).

Source: VisitIdaho 2017

PHOTO 5-9 IDAHO POTATO MUSEUM IN BLACKFOOT, IDAHO, BINGHAM COUNTY

The 2018 Bingham County Comprehensive Plan indicates that there is significant rural population growth in the county, with a major part of rural growth occurring close to, but outside of the city limits of the larger towns in the county, such as Blackfoot, Shelley, and Aberdeen. Some of this growth at the northern end of the county can be attributed to spillover from the increase in population of the Idaho Falls area (Bingham County 2018).

5.9.3 POPULATION PATTERNS

This section describes population patterns at the state, county, and city level, with respect to the location of the Idaho Falls and Gem State Projects.

5.9.3.1 STATE OF IDAHO

According to the 2020 Census, Idaho was the second-fastest growing state during the last decade, with a total change of 17.3 percent in population between 2010 and 2020 (U.S. Census 2021). The state of Idaho's population was 1,754,367 with a median age of 36.6 years (U.S. Census 2020a) with an average of 22.3 people per square mile (U.S. Census 2021). The five largest population centers in Idaho are the cities of Boise, Meridian, Nampa, Idaho Falls, and Caldwell (U.S. Census

2019). There are 649,299 households in the state (Table 5-30) (U.S. Census 2020a) with homeownership at 70.8 percent (U.S. Census 2020a) and the median sale price for homes at $512,600 in April 2022 (Redfin 2022).

TABLE 5-30 STATE OF IDAHO CENSUS PROFILE AT-A-GLANCE

MEASURED CHARACTERISTIC	STATISTIC
Total Population	1,839,106
Median Household Income	$58,915
Bachelor's Degree or Higher	28.7%
Employment Rate	60.2%
Total Housing Units	751,859
Percentage without Health Care Coverage	10.4%
Total Employer Establishments	51,957
Total Households	649,299
Hispanic or Latino (of any race)	239,407

Source: U.S. Census 2020a

5.9.3.2 BONNEVILLE COUNTY

Bonneville County's total population was 123,964 residents with a median age of 33 years old based on the 2020 census (U.S. Census 2020b). The population density of Bonneville County is 66.4 people per square mile (U.S. Census 2021). Bonneville County experienced growth of 18.9 percent between 2010 and 2020 (U.S. Census 2021). Approximately 115,000 residents identified as white (U.S. Census 2020d), even though the 2020 census results confirmed an increase in the number of residents who identify as two or more races (U.S. Census 2021) (Table 5-33). In Bonneville County, 17,094 residents identified as Hispanic or Latino (of any race) (U.S. Census 2020b) with English as the dominant language spoken in the home (U.S. Census 2020b). The median price of homes listed for sale was $425,500 in Bonneville County as of April 2022 (Realtor 2022a) with an ownership rate of 69.8 percent (U.S. Census 2020b).

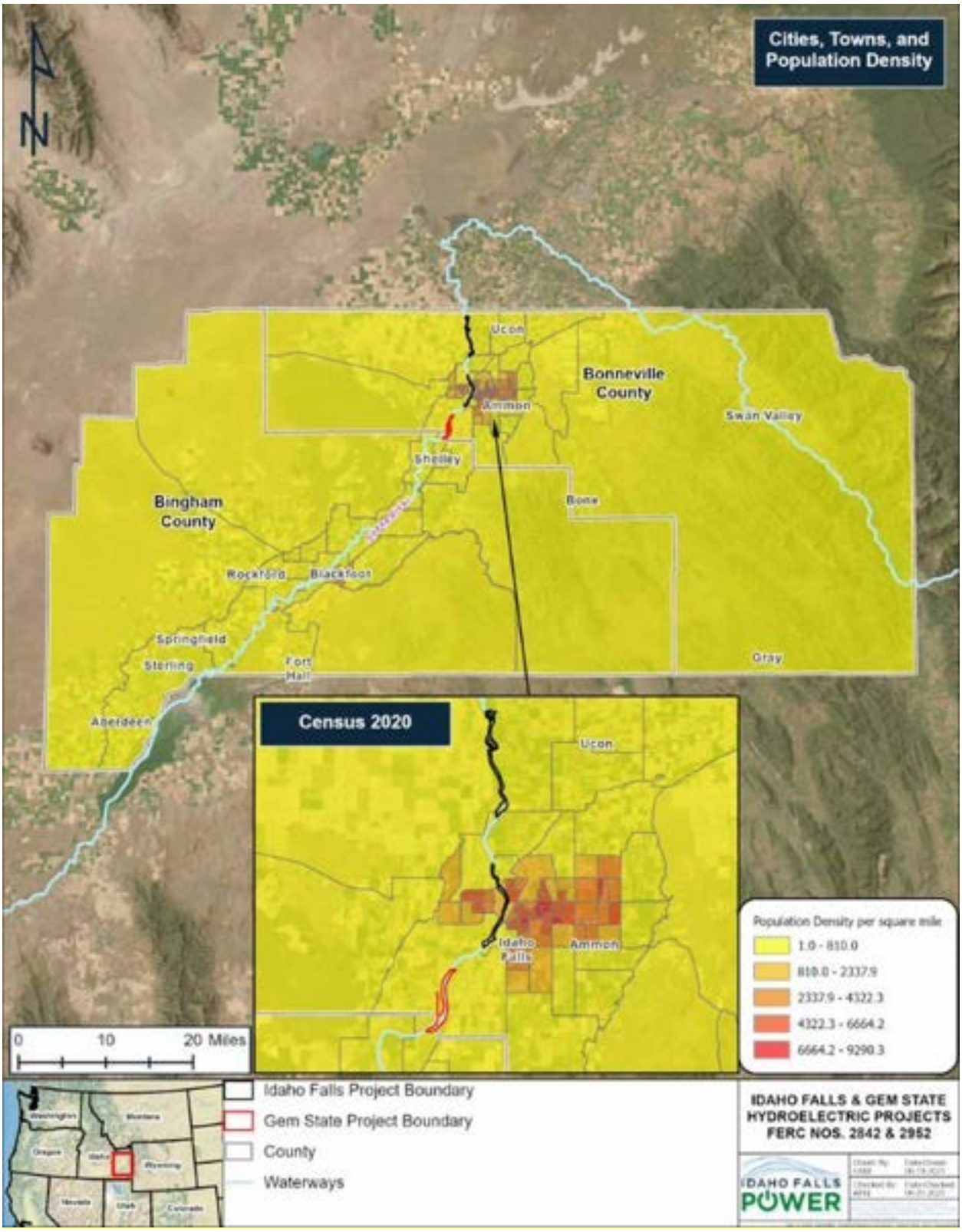

FIGURE 5-23 POPULATION DENSITY OF BONNEVILLE AND BINGHAM COUNTIES

5.9.3.3 BINGHAM COUNTY

The total population of Bingham County, Idaho was 47,992 based on the 2020 census (U.S. Census 2022c), with a population density of 22.9 persons per square mile (U.S. Census 2021). Between 2010 and 2020, the population in Bingham County increased 5.2 percent (U.S. Census 2021). The median age of Bingham County residents was 34.1 years old with English as the dominant language spoken in the home (U.S. Census 2020c). The number of residents who identify as white is 36,630 (U.S. Census 2020e). As with Bonneville County, based on the 2020 census there was an increase in the percentage of residents who identified as two or more races (Table 5-31). The number of Bingham County residents who identified as Hispanic or Latino (of any race) was 8,831 (U.S. Census 2020c). The Bingham County homeownership rate was 78.2 percent (U.S. Census 2020c) while the median listed home price was $375,000 as of April 2022 (Realtor 2022b).

TABLE 5-31 CHANGE IN RESIDENTS IDENTIFYING AS TWO OR MORE RACES, 2010-2020

LOCATION	PERCENT OF RESIDENTS 2010 POPULATION	PERCENT OF RESIDENTS 2020 POPULATION
State of Idaho	2.5	8.3
Bonneville County	2.1	7.2
Bingham County	2.1	7.3

Source: U.S. Census 2021

5.9.3.4 CITY OF IDAHO FALLS

As of the 2020 census, the city of Idaho Falls' population was 64,818 with a median age of 33.4 (U.S. Census 2020f). Most residents identify as white with English as the dominant language spoken in the home (U.S. Census 2020g, 2020f) (Table 5-32). The races of the city of Idaho Falls are provided in Table 5-32 and Table 5-33. The number of residents who identify as Hispanic or Latino (of any race) in the city of Idaho Falls is 10,041 (U.S. Census 2020f).

TABLE 5-32 2020 POPULATION OF IDAHO FALLS BY RACE

RACE	TOTAL POPULATION
White	52,860
Black or African American	437
American Indian and Alaska Native	833
Asian	870
Native Hawaiian and Other Pacific Islander	93
Some Other Race	4,671
Total Population of One Race	59,764

Source: U.S. Census Bureau 2020g

TABLE 5-33 2020 POPULATION OF IDAHO FALLS BY RACE, TWO RACES

TWO RACES	TOTAL POPULATION
White; Black or African American	331
White; American Indian and Alaska Native	869
White; Asian	482
White; Native Hawaiian and Other Pacific Islander	73
White; Some other Race	2,868
Black or African American; American Indian and Alaska Native	16
Black or African American; Native Hawaiian and other Pacific Islander	2
Black or African American; Some other Race	28
A6merican Indian and Alaska Native; Asian	6
American Indian and Alaska Native; Some Other Race	77
Asian; Native Hawaiian and Other Pacific Islander	13
Asian; Some Other Race	8
Native Hawaiian and Other Pacific Islander; Some Other Race	7
Total Population of Two or More Races[1]:	5,054

Source: U.S. Census Bureau 2020g

[1]TheU.S.Census provides additional data on residents who identify as more than two races; the total number of Idaho Falls residents who identify as three, four, five, or six races was 256, 17, 1, and 0, respectively.

5.9.4 SOURCES OF EMPLOYMENT

5.9.4.1 BONNEVILLE COUNTY

The employment rate in Bonneville County was 62.4 percent with a median household income of $61,435 (U.S. Census 2020b). The largest percentage of workers are employed in educational services, health care, and social assistance, followed by professional, scientific, and management, and administrative and waste management services (Table 5-34) (U.S. Census 2020b). The top occupations are in management, business, science, and arts, followed by sales and office work (U.S. Census 2020b). Most workers are employees of private companies, and on average, employed Bonneville County residents work 37.6 hours per week (U.S. Census 2020b).

TABLE 5-34 BONNEVILLE COUNTY EMPLOYMENT PERCENTAGES BY INDUSTRY

INDUSTRY	PERCENTAGE OF CIVILIAN EMPLOYED POPULATION 16 YEARS AND OVER
Agriculture, Forestry, Fishing and Hunting, Mining	2.8
Construction	8.8
Manufacturing	8.0
Wholesale Trade	3.3
Retail Trade	11.9
Transportation and Warehousing, and Utilities	4.1
Information	1.4
Finance and Insurance, and Real Estate and Rental and Leasing	4.2
Professional, Scientific, and Management, and Administrative and Waste Management Services	14.2
Educational Services, and Health Care and Social Assistance	23.8
Arts, Entertainment, and Recreation, and Accommodation and Food Services	10.5
Other services, except Public Administration	3.7
Public Administration	3.4

Source: U.S. Census 2020b

5.9.4.2 BINGHAM COUNTY

The 2020 employment rate in Bingham County was 59.4 percent with a median household income of $58,260 (U.S. Census 2020c). The industry that employs the highest percentage of Bingham County's population is educational services, health care, and social assistance (Table 5-35) (U.S. Census 2020c). The top occupations are in management, business, science, and arts, followed by sales and office (U.S. Census 2020c). Most workers are employees of private companies, and on average, work 39.1 hours per week (U.S. Census 2020c).

TABLE 5-35 BINGHAM COUNTY EMPLOYMENT PERCENTAGES BY INDUSTRY

INDUSTRY	PERCENTAGE OF CIVILIAN EMPLOYED POPULATION 16 YEARS AND OVER
Agriculture, Forestry, Fishing and Hunting, Mining	9.2
Construction	7.7
Manufacturing	9.6
Wholesale Trade	2.6
Retail Trade	9.7
Transportation and Warehousing, and Utilities	6.9
Information	1.1
Finance and Insurance, and real estate and rental and leasing	4.3
Professional, scientific, and management, and administrative and waste management services	10.5
Educational services, and health care and social assistance	23.7
Arts, entertainment, and recreation, and accommodation and food services	6.5
Other services, except public administration	3.6
Public administration	4.7

Source: U.S. Census 2020c

Blackfoot is Bingham County's largest city and is a major farm service, potato processing, and potato-shipping center (Bingham County 2018).

Bingham County is heavily dependent on agriculture and agriculture-related industries. The county supports large agriculture-related manufacturers like Basic American Foods and Idaho Supreme Potatoes, along with Sputnik and Milestone, fabricators of farm machinery. High-tech fabricators such as Premier Technology are diversifying the county's workforce. The city of Blackfoot is home to the Bingham Memorial Hospital and State Hospital South. The county is located between two trade centers: Pocatello to the south, and Idaho Falls to the north, which assure diverse work options for citizens of the county (Bingham County 2018).

Other employment centers in the county and surrounding areas include the Idaho Nuclear Engineering and Environmental Laboratory (Idaho National Laboratory), the Fort Hall Indian Reservation, the National Grain Repository, and the University of Idaho Research and Extension Center (Bingham County 2018).

5.9.4.3 CITY OF IDAHO FALLS

Major industries in the city of Idaho Falls, in the Project areas of both the Idaho Falls Project and Gem State Project include education and health care, scientific and professional, retail trade, and construction (City of Idaho Falls n.d.(a)) (Table 5-36) The largest employer in Idaho Falls is the Idaho National Laboratory, opened in 1949 by the Atomic Energy Commission; the Idaho National Laboratory leads research on energy production challenges, with contributions in energy transmission, energy security, renewable energy integration, transportation transformation, water utilization, energy critical materials, biomass feedstock assembly, and advanced manufacturing (City of Idaho Falls n.d.(b)). The Idaho National Laboratory has over 5,000 employees, and the average base salary for an employee was $104,1547 in 2020, with a total economic impact from Idaho National Laboratory on the region of over $339 million (IFP 2020).

The Idaho Falls area ranks high in the labor market engagement index (LMEI), a measure of how engaged residents are in the local labor market. The LMEI is calculated using a formula provided by the U.S. Department of Housing and Urban Development and is based on the level of employment, labor force participation, and educational attainment in a geography. The value calculated is a national percentile ranking, where higher scores are representative of better LMEI than lower scores. The Idaho Falls area has an LMEI ranking of 84 (City of Idaho Falls n.d.(a)).

The city of Idaho Falls itself employs 675 full time employees and 946 temporary employees (IFP 2020). The city serves as a regional center for retail, wholesale, medical, educational, and governmental services, with an underlying strong base of agriculture production and processing (IFP 2020).

TABLE 5-36 EMPLOYMENT BY INDUSTRY IN THE IDAHO FALLS AREA

INDUSTRY	NUMBER OF PEOPLE EMPLOYED
Agriculture, Fishing, and Mining	2,869
Construction	6,004
Manufacturing	5,308
Wholesale Trade	2,097
Retail Trade	8,188
Transportation	3,029
Information	922
Finance & Insurance	3,004
Scientific & Professional	8,777

INDUSTRY	NUMBER OF PEOPLE EMPLOYED
Education & Healthcare	15,473
Arts, Food, and Entertainment	6,477
Public Administration	2,748
Other Services	2,668

Source: City of Idaho Falls n.d.(a).

5.9.5 ENVIRONMENTAL JUSTICE

Pursuant to Executive Orders 12898[20] and 14008[21] FERC is required to complete an analysis of potential impacts from project operations on the local community in the vicinity of the Projects to understand the impacts to human health and the environment as they relate to environmental justice communities, or communities that stand to be disproportionately impacted by construction of a new facility or the continued operation of an existing facility, including socioeconomic and/or sociocultural impacts.

Additionally, FERC understands that it plays an integral role in regulating large parts of the United States energy industry, having far-reaching impacts to the nation, especially regarding the move toward cleaner energy (FERC 2022). Although FERC is not required to comply with Executive Order 13985[22], it has voluntarily elected to participate in the process, in an effort to ensure that everyone benefits from the clean energy transition (FERC 2022). Pursuant to Executive Order 13985, FERC developed an Equity Action Plan (EAP) based on five focus areas, which discusses barriers traditionally experienced by underserved and environmental justice communities regarding FERC practices, and outlines actions to remove those barriers and foster a commitment to equity (FERC 2022).

FERC recognizes that many of the licensed hydropower projects were constructed prior to implementation of the National Environmental Policy Act (NEPA), or the issuance of executive

[20] Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 16, 1994). Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.
[21] Exec. Order No. 14008, 86 Fed. Reg. 7619-7633 (Jan. 27, 2021) Tackling the Climate Change Crisis at Home and Abroad.
[22] Exec. Order No. 13985 (June 2021). Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.

orders related to equity or environmental justice (FERC 2022). The steps taken by FERC related to the three executive orders will include equity considerations when making decisions regarding hydropower relicensing and consider environmental justice communities as they relate to the relicensing process.

5.9.5.1 IDENTIFICATION OF ENVIRONMENTAL JUSTICE COMMUNITIES

The thresholds used for populations meeting environmental justice status are as follows:

- For minority populations, the meaningfully greater analysis method was used, where the minority population in a block group is at least 10 percent greater than that of the same population for the county:

  (County population) x (1.10) = threshold above which a minority population must be for inclusion as an environmental justice community

- The low-income threshold criteria was used to identify environmental justice communities based on income level, where the block group must have a higher percentage of low-income households than the county.

5.9.5.2 ENVIRONMENTAL JUSTICE COMMUNITIES

The Idaho Falls and Gem State Projects are located on the Snake River in the city of Idaho Falls, Bonneville County, Idaho. Small portion of the Idaho Falls and Gem State Projects flow through Jefferson County and Bingham County. Those census block groups were included in this analysis. Within 1 mile of the Idaho Falls and Gem State Projects are 35 census block groups that could potentially be impacted by relicensing. Of the 35 census block groups within the Idaho Falls and Gem State Projects Areas, 32 include environmental justice communities. As of the 2020 United States Census, the environmental justice communities based on race within the Idaho Falls and Gem State Project areas include:

- African American
- American Indian/Alaska Native
- Asian
- Pacific Islander/Native Hawaiian
- Individuals identifying as a race other than one of the surveyed choices
- Individuals identifying as two or more races
- Hispanic

The most commonly occurring environmental justice community based on race is Hispanic, with 18 individual groups, followed by Asian and individuals identifying as two or more races, each with 11 groups (Table 5-37). American Indian/Alaska Native represents seven groups, and African American represents three groups, while Pacific Islander/Native Hawaiian, and individuals identifying as a race other than one of the surveyed choices each represent one group Table 5-37.

In addition to race, environmental justice communities include groups of individuals with income levels below poverty level, measured by household. Within the Idaho Falls and Gem State Project areas there are 20 communities meeting environmental justice status related to household income level (Table 5-37 and Figure 5-24 and Figure 5-25).

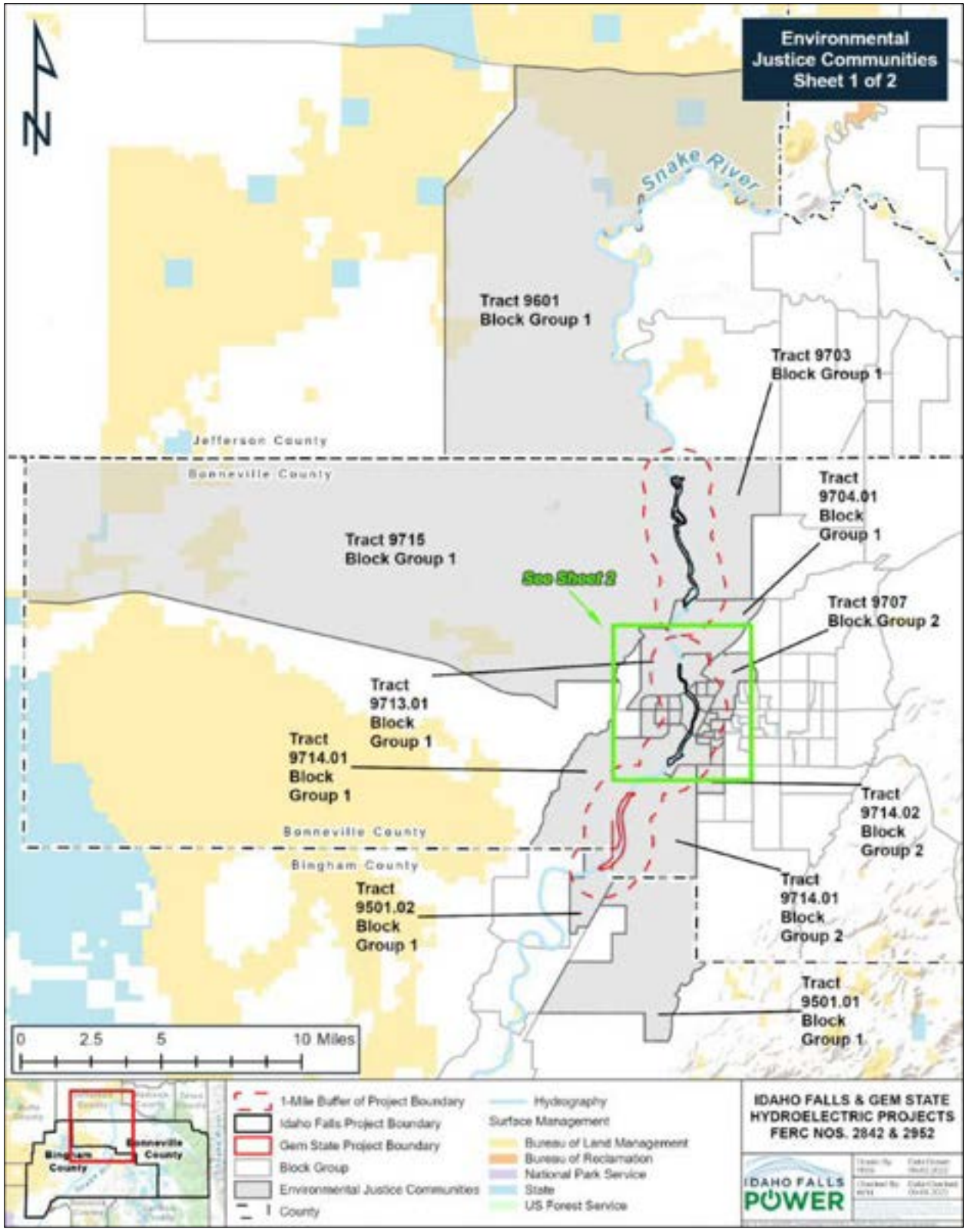

FIGURE 5-24 ENVIRONMENTAL JUSTICE COMMUNITIES (SHEET 1 OF 2)

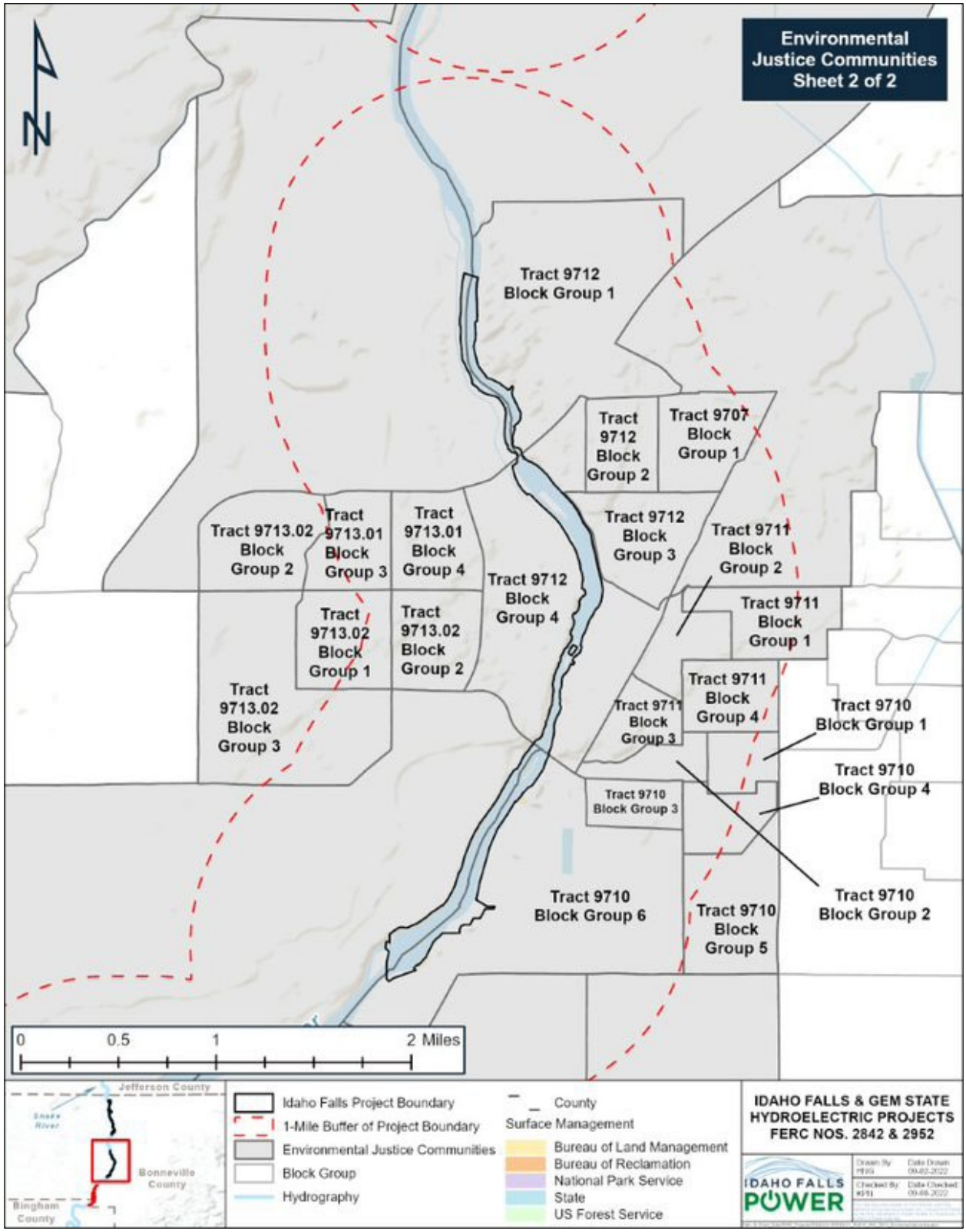

FIGURE 5-25 ENVIRONMENTAL JUSTICE COMMUNITIES (SHEET 2 OF 2)

TABLE 5-37 CURRENT COMMUNITY DATA FOR THE 1-MILE ZONE AROUND THE IDAHO FALLS HYDROELECTRIC PROJECT

Geographic Area			Total Population (Count)	White Alone, not Hispanic (%)[a]	African American/ Black (%)[a]	American Indian/ Alaska Native (%)[a]	Asian (%)[a]	Native HI & Other Pacific Islander (%)[a]	Some Other Race (%)[a]	Two or More Races (%)[a]	Hispanic Origin (any race) (%)[a]	Total Minority Population (%)	Households in Poverty (%)[b]
Census Tract	Block Group	Associated Project											
Idaho			1687809	82.22%	0.64%	1.11%	1.35%	0.14%	0.06%	2.10%	12.39%	17.78%	13.55%
Bonneville County			112397	83.23%	0.51%	0.39%	0.86%	0.14%	0.05%	1.94%	12.88%	16.77%	11.63%
9714.02	Block Group 2	Idaho Falls City and Lower Plant	2731	82.86%	0.00%	0.00%	**2.12%**	0.00%	0.00%	**2.45%**	12.56%	17.14%	3.78%
9711	Block Group 3	Idaho Falls City and Lower Plant	545	86.97%	0.00%	0.00%	0.00%	0.00%	**2.20%**	0.00%	10.83%	13.03%	10.84%
9713.01	Block Group 4	Idaho Falls City and Lower Plant	668	80.39%	0.00%	0.00%	0.00%	0.00%	0.00%	**5.54%**	14.07%	19.61%	**30.00%**
9711	Block Group 1	Idaho Falls City and Lower Plant	743	83.58%	0.00%	0.00%	**1.62%**	**3.23%**	0.00%	**2.56%**	83.58%	90.98%	**15.02%**
9707	Block Group 1	Idaho Falls City and Lower Plant	825	68.85%	0.00%	**1.70%**	0.00%	0.00%	0.00%	0.00%	**29.45%**	31.15%	**14.71%**
9710	Block Group 3	Idaho Falls City and Lower Plant	430	95.81%	0.00%	0.00%	**1.63%**	0.00%	0.00%	0.70%	1.86%	4.19%	**14.11%**
9708	Block Group 4	Idaho Falls City and Lower Plant	807	97.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.11%	2.11%	5.13%
9707	Block Group 2	Idaho Falls City and Lower Plant	3108	64.51%	**5.15%**	**2.96%**	0.90%	0.00%	0.00%	**3.12%**	**23.36%**	35.49%	**29.57%**
9710	Block Group 1	Idaho Falls City and Lower Plant	701	79.03%	0.00%	0.00%	0.00%	0.00%	0.00%	**4.85%**	**16.12%**	20.97%	**33.57%**
9710	Block Group 2	Idaho Falls City and Lower Plant	634	89.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.88%	10.88%	**19.01%**
9710	Block Group 4	Idaho Falls City and Lower Plant	914	69.69%	0.00%	0.00%	0.00%	0.00%	0.00%	**4.60%**	**25.71%**	30.31%	2.99%
9710	Block Group 5	Idaho Falls City and Lower Plant	1192	97.15%	0.00%	0.00%	**1.34%**	0.00%	0.00%	0.00%	1.51%	2.85%	3.58%
9710	Block Group 6	Idaho Falls City and Lower Plant	845	97.63%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	2.13%	2.37%	**30.52%**
9711	Block Group 2	Idaho Falls City and Lower Plant	1030	73.11%	0.00%	0.00%	**2.33%**	0.00%	0.00%	**2.23%**	**22.33%**	26.89%	**18.11%**

Geographic Area			Total Population (Count)	White Alone, not Hispanic (%)[a]	African American/ Black (%)[a]	American Indian/ Alaska Native (%)[a]	Asian (%)[a]	Native HI & Other Pacific Islander (%)[a]	Some Other Race (%)[a]	Two or More Races (%)[a]	Hispanic Origin (any race) (%)[a]	Total Minority Population (%)	Households in Poverty (%)[b]
Census Tract	Block Group	Associated Project											
9711	Block Group 4	Idaho Falls City and Lower Plant	426	80.52%	0.00%	0.00%	0.00%	0.00%	0.00%	1.41%	**18.08%**	19.48%	9.52%
9713.02	Block Group 1	Idaho Falls City and Lower Plant	1148	61.67%	0.00%	**1.39%**	**1.48%**	0.00%	0.00%	**10.02%**	**25.44%**	38.33%	2.72%
9712	Block Group 1	Idaho Falls City and Lower Plant	1127	83.14%	0.00%	0.00%	0.80%	0.00%	0.00%	1.60%	**14.46%**	16.86%	**24.69%**
9712	Block Group 2	Idaho Falls City and Lower Plant	1536	78.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	**20.31%**	21.22%	**25.21%**
9712	Block Group 3	Idaho Falls City and Lower Plant	1447	72.08%	0.00%	**0.90%**	0.00%	0.00%	0.00%	0.00%	**27.02%**	27.92%	**18.64%**
9712	Block Group 4	Idaho Falls City and Lower Plant	342	64.91%	**5.26%**	0.00%	**3.22%**	0.00%	0.00%	0.00%	**26.61%**	35.09%	**19.80%**
9713.01	Block Group 2	Idaho Falls City and Lower Plant	1637	66.22%	**4.52%**	0.00%	0.00%	0.00%	0.00%	**2.57%**	**26.70%**	33.78%	**14.51%**
9713.01	Block Group 3	Idaho Falls City and Lower Plant	743	57.20%	0.00%	0.00%	**2.56%**	0.00%	0.00%	0.00%	**40.24%**	42.80%	**39.85%**
9713.02	Block Group 2	Idaho Falls City and Lower Plant	787	41.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**58.07%**	58.07%	**21.21%**
9713.02	Block Group 3	Idaho Falls City and Lower Plant	1602	90.95%	0.00%	**0.75%**	**3.56%**	0.00%	0.00%	**3.18%**	1.56%	9.05%	4.78%
9713.01	Block Group 1	Idaho Falls City and Lower Plant, Upper Plant	1603	85.96%	0.00%	**2.31%**	0.87%	0.00%	0.00%	0.00%	10.85%	14.04%	8.48%
9704.01	Block Group 1	Idaho Falls City and Lower Plant, Upper Plant	1992	96.23%	0.00%	0.00%	**1.15%**	0.00%	0.00%	0.00%	2.61%	3.77%	1.16%
9703	Block Group 1	Idaho Falls Upper Plant	2194	99.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	0.91%	**12.41%**
9715	Block Group 1	Idaho Falls Upper Plant	704	64.63%	0.00%	0.00%	0.00%	0.00%	0.00%	1.28%	**34.09%**	35.37%	19.34%

Geographic Area			Total Population (Count)	White Alone, not Hispanic (%)[a]	African American/ Black (%)[a]	American Indian/ Alaska Native (%)[a]	Asian (%)[a]	Native HI & Other Pacific Islander (%)[a]	Some Other Race (%)[a]	Two or More Races (%)[a]	Hispanic Origin (any race) (%)[a]	Total Minority Population (%)	Households in Poverty (%)[b]
Census Tract	Block Group	Associated Project											
9714.01	Block Group 2	Idaho Falls City and Lower Plant, Gem State	2183	88.23%	0.00%	**0.73%**	0.55%	0.00%	0.00%	1.24%	9.25%	11.77%	11.17%
9714.01	Block Group 1	Idaho Falls City and Lower Plant, Gem State	1497	73.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	**26.05%**	26.39%	5.88%
Jefferson County			27969	86.82%	0.09%	0.55%	0.51%	0.05%	0.00%	1.47%	10.52%	13.18%	7.34%
9601	Block Group 1	Idaho Falls Upper Plant	1362	75.33%	0.00%	0.00%	**3.82%**	0.00%	0.00%	0.00%	**20.85%**	24.67%	**19.25%**
9602	Block Group 3	Idaho Falls Upper Plant	1534	94.39%	0.00%	0.00%	0.00%	0.00%	0.00%	5.61%	0.00%	5.61%	0.00%
Bingham County			45551	73.78%	0.25%	5.24%	0.76%	0.00%	0.10%	1.90%	17.97%	26.22%	12.65%
9501.02	Block Group 1	Gem State	1310	89.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**10.53%**	10.53%	**23.08%**
9501.02	Block Group 2	Gem State	1249	80.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	19.30%	19.30%	0.00%
9501.01	Block Group 1	Gem State	2128	89.38%	0.00%	0.00%	0.00%	0.00%	0.00%	**4.18%**	6.44%	10.62%	6.68%

a Percent of total population Table B03002 - Hispanic or Latino Origin by Race American Community Survey. 2020 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau retrieved from https://data.census.gov/cedsci/table?q=United%20States&t=Race%20and%20Ethnicity&g=0100000US_0400000US16_0500000US16019,16073,16075_1500000US160199703001,160199704011,160199707001,160199707002,160199708004,160199710001,160199710002,160199710003,160199710004,160199710005,160199710006,160199711001,160199711002,160199711003,160199711004,160199712001,160199712002,160199712003,160199712004,160199713011,160199713012,160199713013,160199713014,160199713021,160199713022,160199713023,160199714011,160199714012,160199714022,160199715001,160739501011,160739501021,160739501022,160759601001,160759602003&tid=ACSDT5Y2018.B03002&moe=falsee on August 30, 2022.

b Percent of Households Table B17017 - Poverty Status in the Past 12 Months by Household Type by Age of Householder. 2020 ACS 5-Year Estimated Detailed Tables. U.S. Census Bureau retrieved fromhttps://data.census.gov/cedsci/table?q=United%20States&t=Income%20and%20Poverty&g=0100000US_0400000US16_0500000US16019_1500000US160199703001,160199704011,160199707001,160199707002,160199708004,160199710001,160199710002,160199710003,160199710004,160199710005,160199710006,160199711001,160199711002,160199711003,160199711004,160199712001,160199712002,160199712003,160199712004,160199713011,160199713012,160199713013,160199713014,160199713021,160199713022,160199713023,160199714011,160199714012,160199714022,160199715001&tid=ACSDT5Y2018.B17017&moe=false on August 30, 2022.

* Grey-shaded cells indicate Environmental Justice community

5.9.6 REFERENCES

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5.10 CULTURAL AND TRIBAL RESOURCES

Pursuant to Title 18 CFR § 5.6(d)(3)(x) and (xii), this section includes a description of the known cultural or historical resources of the proposed Idaho Falls and Gem State Projects and surrounding area and a description of Indian tribes, tribal lands, and interests that may be affected by the Projects.

Cultural resources include historic architectural resources such as buildings and structures and archaeological sites of past human occupation or activities that are non-renewable and important to our history. Previously recorded archaeological sites, historic architectural resources, linear sites, historic districts, and previous projects located within 1 mile of the Idaho Falls and Gem State Project Boundaries are listed in Table 5-38 and Table 5-40 and Appendix C. These lists were compiled from records requests submitted to the Idaho State Historic Preservation Office (SHPO) on May 10, 2022, supplemented by a review of the National Register of Historic Places (NRHP) database, USGS historical topographic maps, General Land Office (GLO) historical topographic maps, and aerial imagery from Google Earth.

5.10.1 AREA OF POTENTIAL EFFECT

The Area of Potential Effects (APE) as defined under Section 106 of the NHPA, 36 CFR § 800.16(d) entails "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." IFP proposes that the APE for the relicensing proceedings associated with the Idaho Falls Project and the Gem State Project include the lands within the existing Project Boundaries for each Project, respectively. While the APE will be limited to the areas within the Project Boundaries; a background search was conducted to include an area of the APE plus 1 mile per Idaho SHPO guidance.

5.10.2 IDAHO FALLS

The Idaho SHPO records request and NRHP database review for the Idaho Falls Project indicated that three previously recorded archaeological sites (Table 5-38), 1,224 previously recorded historic architectural resources (Table 5-39 and Appendix C), 20 previously recorded linear resources (Table 5-40), and six historic districts (Table 5-41) are within the Project Boundary or within 1

mile of the Project Boundary. All three of the archaeological sites fall within the Project Boundary, likely fall within it, or are adjacent to (i.e., within 200 feet of) it, while four of the historic architectural resources, six linear resources, and one historic district fall within or are adjacent to the Project Boundary.

TABLE 5-38 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES LOCATED WITHIN ONE MILE OF THE IDAHO FALLS PROJECT BOUNDARY

SITE NUMBER	SITE NAME	SITE CLASS	SITE TYPE	NRHP ELIGIBILITY
10BV52*	–	Prehistoric	Artifact scatter	Undetermined
10BV161*	Keefer Bridge	Historic	Bridge	Undetermined
10BV280*	–	Historic	Concrete box	Ineligible

Source: Idaho SHPO 2022
*Within or adjacent to (i.e., within 200 feet of) the Project Boundary

TABLE 5-39 PREVIOUSLY RECORDED HISTORIC ARCHITECTURAL RESOURCES WITHIN OR ADJACENT TO THE IDAHO FALLS PROJECT BOUNDARY

IHSI #	PROPERTY NAME/	STREET	CITY	ELIGIBILITY
19-18149*	Lower Power Plant	W. Sunnyside Road at the Snake River	Idaho Falls	Eligible
19-18272*	John's Hole bridge	U.S. 20 over the Snake River	Idaho Falls	Ineligible
19-18397*	Sky-Vu Drive-In	3000 S. Yellowstone Highway	Idaho Falls	Unevaluated
19-482*	Eagle Rock Ferry	Snake River	Idaho Falls	NRHP listed

Source: Idaho SHPO 2022
Note: IHSI = Idaho Historic Sites Inventory
*Within or adjacent to (i.e., within 200 feet of) the Project Boundary

Refer to Appendix C for previously recorded historic architectural resources located within 1 mile of the Idaho Falls Project Boundary.

TABLE 5-40 PREVIOUSLY RECORDED LINEAR SITES WITHIN ONE MILE OF THE IDAHO FALLS PROJECT BOUNDARY

SITE NUMBER	IHSI #	SITE NAME	TYPE	ELIGIBILITY
10BV197	19-18170	Idaho Canal	Canal	Eligible
10BV203	–	Harrison Canal	Canal	Eligible
10JF331	51-17930	Idaho Canal	Canal	Eligible
–	19-18142	Gustafson Lateral Canal	Canal	Eligible
–	19-18147	Sidehill Canal	Canal	Eligible
–	19-18175	Butte Arm Canal	Canal	Eligible
–	19-18227*	Burgess Canal	Canal	Eligible
–	51-17950	Burgess Canal	Canal	Eligible
–	19-18241*	Sage Canal	Canal	Ineligible
–	19-18268	East Lateral Canal	Canal	Eligible
–	19-18315	Great Western Canal	Canal	Eligible
–	51-18002	Great Western Canal	Canal	Eligible
–	19-18316*	Wilkins Canal	Canal	Eligible
–	19-18317	Owners Mutual Canal (also known as Kennedy Canal)	Canal	Eligible
–	19-18169	Yellowstone Highway	Highway	Eligible
–	19-18251*	US Highway 20	Highway	Eligible
–	19-18299*	Idaho Falls Canal; Old City Canal	Canal	Ineligible
10JF258	51-17931	Utah Northern Railroad, UPRR	Railroad	Eligible
–	19-18172*	Union Pacific Railroad	Railroad	Eligible
–	19-18174	Union Pacific Railroad - Yellowstone Branch	Railroad	Eligible

Note: IHSI = Idaho Historic Sites Inventory; UPRR = Union Pacific Railroad

*Within or adjacent (i.e., within 200 feet) of the Project Boundary
Source: Idaho SHPO 2022

TABLE 5-41 NATIONAL REGISTER DISTRICTS WITHIN ONE MILE OF THE IDAHO FALLS PROJECT BOUNDARY

DISTRICT NAME	NATIONAL REGISTER REFERENCE NUMBER	DATE LISTED
Proposed Keefer's Addition Historic District	Not listed	–
Art Troutner Houses Historic District	08000868	9/10/2008
Eagle Rock Ferry*	74000734	6/7/1974
Ridge Avenue Historic District	93000388	5/20/1993
Eleventh Street Historic District	97000863	8/8/1997
Idaho Falls Airport Historic District	97001126	9/10/1997

*Within or adjacent to (i.e., within 200 feet of) the Project Boundary
Source: Idaho SHPO 2022

None of the three archaeological sites identified from the SHPO records request, all of which are within or adjacent to the Project Boundary, were listed in or determined eligible for the NRHP; however, based on the SHPO record information, one of the sites, 10BV52, may be subject to the Native American Graves Protection and Repatriation Act. One of the previously recorded architectural resources located within the Project Boundary, the Eagle Rock Ferry (19-482), is listed on the NRHP, and another, Lower Power Plant (19-18149), was determined eligible for the NRHP. Four previously recorded linear sites located in the Project Boundary were determined eligible for the NRHP: the Burgess Canal (19-18227) and the Wilkins Canal (19-18316); the Union Pacific Railroad (19-18172); and U.S. Highway 20 (19-18251). In 1974, Eagle Rock Ferry was listed in the NRHP historic district.

One previously recorded architectural resource located within or adjacent to the Project Boundary, the currently abandoned Sky-Vu Drive-In (movie theater), has not been evaluated for the NRHP. The remaining previously recorded archaeological resources, historic architectural resources, and linear sites located within or adjacent to the Project Boundary have either been determined not eligible for the NRHP or demolished.

Consistent with SHPO guidelines, historical GLO maps and topographic maps were also examined to identify archaeological resources, historic architectural resources, and linear sites that may be present in or near the Project Boundary but have not been previously recorded. The area covered by the Project Boundary is included on several historical GLO and topographic maps, several of which show historic features in or within 1 mile of the Project Boundary, as listed in Table 5-46. Previously unrecorded historic features shown on these maps consist of multiple roads (unnamed), dams, bridges, and a power plant.

TABLE 5-42 HISTORIC FEATURES SHOWN ON GLO AND HISTORICAL TOPOGRAPHIC MAPS WITHIN ONE MILE OF THE IDAHO FALLS PROJECT BOUNDARY

MAP TYPE	YEAR	AUTHOR	MAP LOCATION/ QUADRANGLE NAME	HISTORIC FEATURES
GLO	1877	David	3N 37E	Two roads
GLO	1908	Mosley	3N 37E	None
GLO	1916	Bardsley	3N 37E	None
GLO	1933	Bardsley	3N 37E	Two dams
GLO	1943	Harris	3N 37E	One dam
GLO	1969	Good	3N 37E	Possibly a road
GLO	1878	Chandler	3N 37E	None
GLO	1878	David	3N 38E	None
GLO	1878	David	2N 37E	None
GLO	1933	Bardsley	2N 37E	None
GLO	1943	Harris	2N 37E	None
GLO	1965	Good	2N 37E	None
GLO	1878	Carter	2N 37E	None
GLO	1878	David	2N 38E	None
GLO	1878	Carter	2N 38E	None
Historic topo	1948	USGS	Idaho Falls North	One dam, Idaho Falls Municipal Power Plant
Historic topo	1949	USGS	Idaho Falls North	One dam, Idaho Falls Municipal Power Plant
Historic topo	1955	USGS	Idaho Falls	Road, dam, power plant, bridge, power plant
Historic topo	1958	USGS	Idaho Falls	Three bridges, one road, two power plants

Source: BLM GLO (undated)

5.10.3 GEM STATE

The Idaho SHPO records request and NRHP database review for the Gem State Project indicate that one previously recorded archaeological site (10BV329), 14 previously recorded historic architectural resources (Table 5-43), and 11 previously recorded linear sites (Table 5-44) fall in the Project Boundary or within 1 mile of it. The archaeological site does not fall within the Project Boundary, one of the historic architectural resources falls within or is adjacent to (i.e., within 200 feet of) the Project Boundary, and two of the linear sites fall within or are adjacent to the Project Boundary.

TABLE 5-43 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES LOCATED WITHIN ONE MILE OF THE GEM STATE PROJECT BOUNDARY

SITE NUMBER	SITE NAME	SITE CLASS	SITE TYPE	NRHP ELIGIBILITY
10BV329	–	Historic	Building foundation	Ineligible

Source: Idaho SHPO 2022

TABLE 5-44 PREVIOUSLY RECORDED HISTORIC ARCHITECTURAL RESOURCES LOCATED WITHIN ONE MILE OF THE GEM STATE PROJECT BOUNDARY

IHSI #	PROPERTY NAME	STREET	CITY	NRHP ELIGIBILITY
11-17815	Snake River Valley Canal Bridge	US 91, approx. 2.0 miles northeast of Shelley at milepost 120.4	Shelley	Eligible
11-17825	N. Hwy 91 Private Residence - 1472	1472 N. Hwy 91	Shelley	Ineligible
11-17876	N. Hwy 91 House - 1468	1468 N. Hwy 91	Shelley vicinity	Ineligible
19-18118	H-K Contractor House and Barn	York Rd. just east of US 91	Idaho Falls	Ineligible
19-18144	Rotenberger/Pointner Property	2364 W. 8100 S.	Idaho Falls	Ineligible
19-18145	George Property	2506/2508 W. 8100 S.	Idaho Falls	Ineligible
19-18146	Eastern Idaho Potato Warehouse	Just northeast of the intersection of US 91 and 8100 S. (Cotton Rd.)	Idaho Falls	Ineligible

IHSI #	PROPERTY NAME	STREET	CITY	NRHP ELIGIBILITY
19-18148	S. Bellin Rd. Farmstead	S. Bellin Rd., adjacent to Sidehill Canal	Idaho Falls	Eligible
19-18168	Belia Mora Home	7397 S. 4500 W. (New Sweden Rd.)	Idaho Falls	Ineligible
19-18208	S. Yellowstone Hwy. Private Residence - 9648	9648 S. Yellowstone Hwy	Idaho Falls	Ineligible
19-18210	S. Yellowstone Hwy. Private Residence - 7320	7320 S. Yellowstone Hwy	Idaho Falls	Ineligible
19-18211	S. Yellowstone Hwy. Private Residence - 6624	6624 S. Yellowstone Hwy	Idaho Falls	Ineligible
19-18270	New Sweden Road Bridge	New Sweden Rd. at I-15	Idaho Falls vicinity	Ineligible
19-18296*	Gem State Dam	Southwest of Idaho Falls at Snake River	Idaho Falls vicinity	**

Source: Idaho SHPO 2022
Note: IHSI = Idaho Historic Sites Inventory
*Within or adjacent to (i.e., within 200 feet of) the Project Boundary
**No information provided in SHPO records

TABLE 5-45 PREVIOUSLY RECORDED LINEAR SITES LOCATED WITHIN ONE MILE OF THE GEM STATE PROJECT

SITE NUMBER	IHSI #	SITE NAME	TYPE	ELIGIBILITY
10BM694	11-7851	Cedar Point Canal	Canal	Eligible
–	19-18147	Sidehill Canal	Canal	Eligible
–	19-18041*	Woodville Canal	Canal	Eligible
–	19-18042*	Snake River Valley Canal	Canal	Eligible
–	11-7851	Snake River Valley Canal, Cedar Point Canal	Canal	Eligible
–	11-17826	Quigg Lateral and Siphon	Ditch	Ineligible
–	19-18209	Quigg Lateral and Siphon	Ditch	Ineligible
–	11-17818	Yellowstone Highway	Highway	Eligible
–	19-18169	Yellowstone Highway	Highway	Eligible
–	11-17822	Union Pacific Railroad	Railroad	Eligible
–	19-18172	Union Pacific Railroad	Railroad	Eligible

Source: Idaho SHPO 2022
Note: IHSI = Idaho Historic Sites Inventory
*Within or adjacent to (i.e., within 200 feet of) the Project Boundary

None of the previously recorded archaeological sites or the previously recorded historic architectural resources located in or adjacent to the Project Boundary were listed in or determined to be eligible for the NRHP. The two previously recorded linear sites located in or adjacent to the Project Boundary were both determined eligible for the NRHP. These resources are the Woodville Canal (19-18041) and the Snake River Valley Canal (19-18042), each of which parallels the Snake River within the Project Boundary. Both canals extend beyond the Project Boundary.

Historical GLO maps and topographic maps were also examined to identify archaeological resources, historic architectural resources, and linear sites that may be present in or near the Project Boundary but have not been previously recorded. The area covered by the Project Boundary is included on several historical GLO and topographic maps (Table 5-46). The Snake River Valley

Canal (19-18042) is the only resource within 1 mile of the Project Boundary that was identified from the review of these maps.

TABLE 5-46 HISTORIC FEATURES SHOWN ON GLO AND HISTORICAL TOPOGRAPHIC MAPS WITHIN ONE MILE OF THE GEM STATE PROJECT BOUNDARY

MAP TYPE	YEAR	AUTHOR	MAP LOCATION/ QUADRANGLE NAME	HISTORIC FEATURES
GLO	1878	David	2N 37E	None
GLO	1878	Carter	2N 37E	None
GLO	1877	David	1N 37E	None
GLO	1968	Good	1N 37E	Snake River Valley Canal
GLO	1877	Carter	1N 37E	None
Historic topo	1955	USGS	Idaho Falls	None
Historic topo	1958	USGS	Idaho Falls	None

Note: GLO = General Land Office; topo = topographic
Source: BLM GLO (undated)

5.10.4 DISCOVERY MEASURES

5.10.4.1 IDAHO FALLS

Based on the Idaho SHPO records searched, 95 cultural resources projects were conducted within 1 mile of the Project Boundary (Table 5-47). It is unknown which of these projects intersect or are adjacent to the Project Boundary because SHPO did not provide project spatial data. No projects appear to be related to the Gem State Project.

TABLE 5-47 PREVIOUS CULTURAL RESOURCES PROJECTS WITHIN ONE MILE OF THE IDAHO FALLS PROJECT BOUNDARY

TITLE	AUTHOR	YEAR	AGENCY
Snake River Greenbelt Riverside Trail Extension (Union Pacific Bridge to Private Lands North of Proposed BLM Administrative Site)	Hill, Dick	1991	BLM, Idaho Falls District
City of Idaho Falls Upper Plant No. 1 ROW	Hill, Richard D.	1992	BLM, Idaho Falls District
Sage Junction State/BLM Land Exchange	Hill, Richard D.	1996	BLM, Idaho Falls District
Greenbelt Expansion and ROW, City of Idaho Falls. North Wind, Inc., Idaho Falls, ID	Harding, William M.	2007	BLM, Idaho Falls District
Idaho Falls Power New Substation. North Wind, Inc., Idaho Falls, ID	Shelton, J.	2009	BLM, Idaho Falls District
Annual Report of Archaeological Investigations 1982	Gaston, Jenna	1983	ITD
Annual Report of Archaeological Investigations, 1984	Gaston, Jenna	1984	ITD
Annual Report of Archaeological Investigations, 1985	Gaston, Jenna	1985	ITD
ARR, Pancheri Drive Corridor Study	Gaston, Jenna	1986	ITD
Idaho Bridge Inventory: Volume 1 History	Herbst, Rebecca	1983	ITD
Taylor Toll Bridge Replica	Petersen, Nick	1994	ITD
Cranny Pit	Myler, Terrie	1997	ITD
Britton Pit, Contractor's Future	Lohse, E.S.	1998	ITD
South Boulevard Grade Separation	Petersen, N.	1998	ITD
Riviera Intersection, Idaho Falls	Gaston, J.	1999	ITD

TITLE	AUTHOR	YEAR	AGENCY
Holmes Avenue/Anderson Street to Iona Road, US20B	Gaston, J.	2000	ITD
I-15, Sunnyside Interchange to I-15B, Idaho Falls	Science Applications International Corporation	2001	ITD
Fremont Avenue Pathway/Interchange Landscape, Idaho Falls	Crockett, Stephanie	2001	ITD
Sunnyside Road Corridor Improvement Project; Idaho Falls, ID	Miller, S.	2000	ITD
Virgin Contractors Aggregate Source. Faunal Analysis and CRM Services, Idaho Falls, ID	Miller, S.	2001	ITD
US 20 St. Leon Grade Interchange. Bionomics Environmental, Inc., Boise, ID	Mauser, L.	2001	ITD
University Place Pathway Project, Idaho Falls. SERG, Inc., Idaho Falls	Crockett, Stephanie	2002	ITD
H-K Towers Material Source. Prepared for ITD by Northwind Environmental, Idaho Falls.	Harding, William M.	2002	ITD
Sunnyside Ic to I-15b, Idaho Falls. North Wind, Inc., Idaho Falls, ID	Harding, William M.	2004	ITD
Sunnyside Interchange to I-15b, Idaho Falls, Key No. 7771. North Wind, Inc., Idaho Falls, ID	Harding, William M.	2004	ITD
U.S. 91 North Corrido Plan: Shelley to York Road	Cooper, J.	2005	ITD
District 6 RWIS Sites	Munch, Marc	2006	ITD
HK Sunnyside Staging Area, Idaho Falls. North Wind, Inc., Idaho Falls, ID.	Harding, William M.	2007	ITD

TITLE	AUTHOR	YEAR	AGENCY
Miskin Waste Area, Idaho Falls. North Wind, Inc., Idaho Falls, ID.	Harding, William M.	2007	ITD
John Adams Parkway Bridge, Idaho Falls. North Wind, Inc., Idaho Falls, ID.	Harding, William M.	2009	ITD
Garfield Street Idaho Canal Bridge, Idaho Falls. North Wind, Inc., Idaho Falls, ID.	Harding, William M.	2009	ITD
Rhodehouse Gravel Source. North Wind, Inc., Idaho Falls, ID.	Harding, William M.	2009	ITD
State, FY2010 Highway Advisory Radio Installation	Munch, M.	2009	ITD
I-15, Pancheri Dr. Overpass, NR Idaho Falls, ITD, Boise, Idaho	Everhart, D.	2011	ITD
Pancheri Dr., Bellin Rd to Skyline Dr	Nickoloff, N	2011	ITD
Pancheri Br Over E Lateral Canal, Idaho Falls	Nickoloff, Niki	2012	ITD
Pancheri Underpass/Hyde Waste Area	Harding, William M.	2012	ITD
Idaho Falls Area Bridge Preservation	Hartmans, Donna	2013	ITD
Grandview Drive; Skyline Drive to Saturn Avenue	Richards, Martha, et al.	2015	ITD
FY17b (FY18) D6 Bridge Repair, Bonneville and Jefferson Counties. Arrow Rock Architects, PLLC.	Hartmans, Donna	2016	ITD
Lomax and F Streets, Flashing Stop Signs, Idaho Falls, Bonneville County. Arrow Rock Architects, PLLC.	Hartmans, Donna	2016	ITD
South Boulevard Corridor RRFB Light, Idaho Falls, Bonneville County. Arrow Rock Architects, PLLC.	Hartmans, Donna	2016	ITD

TITLE	AUTHOR	YEAR	AGENCY
Elva to Holmes and North Tourist Park, Idaho Falls. North Wind Resource Consulting	Ruter, Helena, and Greta Rayle	2017	ITD
12th Street/Idaho Canal Culvert, Idaho Falls	Bauer, Barbara P.	2017	ITD
Intersection of E. 17th Street and S. Woodruff Avenue, Idaho Falls: Bonneville County, Idaho. Bionomics Environmental, Inc.	Martin, Jillian C.	2018	ITD
East River Road (N 5th W) Curve Improvement, Bonneville County. Horrocks Engineers	Calkins, Nancy, Ben Pearson, and Peter Steele	2019	ITD
Idaho Canal Trail, Phase 1 & Phase 2, Idaho Falls. North Wind Resource Consulting	Mooney, Courtney, Kasey Fulwood, and Greta Rayle	2019	ITD
Cultural Resources Review: Higbee Bridge, Idaho Falls	Kriegl, Matthew	2020	ITD
Historic Survey of Roads in Idaho's State Highway System Volume 1: Historic Context and Volume 2: *Application of the National Register of Historic Places Criteria for Evaluation*	Mead & Hunt	2019	ITD
Historic Survey of Roads in Idaho's State Highway System Volume 1: Historic Context and Volume 2: *Application of the National Register of Historic Places Criteria for Evaluation*	Mead & Hunt	2019	ITD
US-91 Shelley to York Rd Phase II (Anheuser Busch Material Source and Staging Area): (Anheuser Busch Material Source and Staging Area). Commonwealth Heritage Group, Inc.	Johnson, Wendy Simmons	2020	ITD

TITLE	AUTHOR	YEAR	AGENCY
Archaeological Investigations: Gem State Hydroelectric Project, Idaho Falls. Basin and Range Research, Pocatello	Druss, Claudia, Steven Wright, and Mark Druss	1981	Basin and Range Research
Agricultural Landscapes Survey. Prepared by Idaho State Historical Society. IHSI Survey #104	Eastman, Jennifer Attebery	1987	Idaho State Historical Society
Archaeological Investigations: Gem State Hydroelectric Project, Idaho Falls. Basin & Range Research	Druss, Claudia, Steven Wright, and Mark Druss	1981	Basin & Range Research
Cultural Resource Survey of Idaho Innovation Center Technological Park, Idaho Falls. EG&G Idaho, Inc.	Ringe, Brenda L.	1993	Idaho National Laboratory
Gary Dixon Irrigation Mainline. Frank Fink, SCS Boise	Robertson M.	1995	Frank Fink, SCS Boise
Cultural Resources Investigations for the Idaho Falls Environmental Engineering and Science Center. INEEL, Idaho Falls, Idaho	Pace, B.	1998	Idaho National Laboratory
Archaeological Clearance Surveys and Cultural Resource Inventories on the Idaho National Engineering Laboratory, April 1967-March 1985	Miller, S.	1985	Idaho National Laboratory
S.M. Stoller Corporation Phase 1 Cell Towers #3519, Seven (1-acre) Parcel Survey. Report prepared by Office of Anthropological Research, ISU, Pocatello, Idaho	Williamson, A.	2001	Other
50 Clear Talk Wireless Cell Phone Tower Locations in Southeast and South-Central Idaho. Prepared for Clear Talk Wireless by Northwind Environmental, Inc., Idaho Falls, Idaho	Harding, W., J. Shelton, and C. Green	2001	Other

TITLE	AUTHOR	YEAR	AGENCY
Ammon/Shelley Regional Wastewater Project. Prepared for East Central Idaho Planning & Development Association, Rexburg, Idaho. SERG, Inc.	Crockett, Stephanie	2004	Other
Edge Wireless Idaho Falls Sunnyside Cell Tower. North Wind, Idaho Falls, ID.	Wester, S.	2005	Other
Edge Wireless, Post Register Cell Tower. North Wind, Inc., Idaho Falls, ID.	Shelton, J.	2005	Other
ID-06-Union Pacific Cell Tower, Idaho Falls	Gray, D.	2006	Other
ID-4073 Post Cellular Collocation. SWCA, Salt Lake City, UT.	Smith, Ellen W.	2010	Other
Idaho Falls Airport Fence and Irrigation Improvements. FAA, Renton, WA.	Harding, William M.	2010	C. Morgan, FAA, Renton, Washington
T-Mobile West New Conduit; SL01443D, Idaho Falls KIDK TV	Bonner, Wayne	2012	Other
Verizon Wireless ID6 Union Pacific Communications Facility, 1112 Centre Avenue, Idaho Falls, Bonneville County	Valentine, Melissa	2013	Other
Museum of Idaho Expansion Project, Idaho Falls, Bonneville County Historical Society, NEH	Smith, Claire	2014	Other
Cultural Resource Evaluation and Visual Effect Analysis for the Proposed 'ID6 Taylorview' Telecommunications Project, Bonneville County, Idaho Falls, Idaho (South Holmes Avenue)	Buckard, Jason	2014	FCC
'ID6 West Broadway' Cellular Telecommunications Project 1770 West Broadway, Idaho Falls, Bonneville County	Retter, Michael	2014	FCC
Idaho Falls Airport Improvements	Shelton, Jeff A.	2014	Other

TITLE	AUTHOR	YEAR	AGENCY
A Cultural Resource Inventory and Visual Effects Analysis for the Proposed 'ID6 Auditorium' Cellular Telecommunications Facility, Idaho Falls, Bonneville County, Idaho. SWCA Environmental Consultants	Moon, Jennifer	2016	FCC
A Cultural Resource Inventory and Visual Effects Analysis for the Proposed 'ID6 Compass' Cellular Telecommunications Facility, Idaho Falls, Bonneville County, Idaho. SWCA Environmental Consultants	Moon, Jennifer, and Nicole Kromarek	2016	FCC
A Cultural Resource Inventory and Visual Effects Analysis for the Proposed 'ID6 Sage Lakes' Self-Support Cellular Telecommunications Facility, Idaho Falls, Bonneville County, Idaho. SWCA Environmental Consultants	Kromarek, Nicole	2016	FCC
A Cultural Resource Inventory and Visual Effects Analysis for the Proposed 'ID6 Cotton' Cellular Telecommunications Facility, Idaho Falls, Bonneville County, Idaho. SWCA Environmental Consultants	Moon, Jennifer	2016	FCC
Keefer's Addition Reconnaissance Survey. Idaho Falls HPC	Williams, Julie Braun, Christina Olson, and Renee Magee	2016	Idaho Falls HPC
Idaho Military Division Survey and Inventory of Army National Guard Armories. Arrow Rock Architects PLLC	Hartmans, Donna	2004	Army National Guard
Class III Cultural Resource Inventory and Visual Impact Assessment for the Compass-B Communication Facility, Bonneville County, Idaho. Cannon Heritage Consultants, Inc.	Peart, Jonathan M., Maureen P. Boyle, Kenneth P. Cannon, and Ron Sladek	2017	FCC

TITLE	AUTHOR	YEAR	AGENCY
CLR Hydroelectric Project Cultural Survey, Jefferson and Bonneville Counties, Idaho. Frontier Historical Consultants	Gray, Dale M.	2017	FERC
Idaho Falls Commercial Survey. Prepared by Idaho SHPO	Attebery, Jennifer Eastman	1983	Idaho State Historical Society
Idaho Falls Reconnaissance Survey Year End Report, August 1988	Idaho Falls CLG	1988	Idaho Falls HPC
Idaho Falls Reconnaissance Survey Year End Report, August 1989	Idaho Falls CLG	1989	Idaho Falls HPC
City of Idaho Falls Intensive Level Survey Report: Stone Residences. Prepared for Idaho Falls HPC	Magee, Renee R., Mark Platt, and June Howard	1990	Idaho Falls HPC
City of Idaho Falls Reconnaissance Level Survey Report of Numbered Streets (9th, 10th, 11th, 12th, and 13th). Prepared for Idaho Falls Historic Preservation Commission	Vaughn, William, et. al.	1991	Idaho State University
City of Idaho Falls Reconnaissance Level Survey Report - Sixth and Seventh Streets. Prepared for Idaho Falls HPC	Magee, Renee	1993	Idaho Falls HPC
Downtown Idaho Falls Reconnaissance Survey - 1996. Prepared for Idaho Falls HPC	Magee, Renee, and Mark Platt	1996	Idaho Falls HPC
New Sweden-Riverview Study Interim Report. Prepared by Idaho SHPO	Attebery, Jennifer Eastman	1990	Idaho State Historical Society
Section 110 Documentation for Excess of Federal Property: Idaho National Laboratory IORC	Olson, Christina L.	2020	US DOE
Idaho Falls Regional Airport Historic Resource Documentation. Preservation Solutions LLC. T-O Engineers.	Davis, Kerry, and Joe Guenther	2019	FAA

TITLE	AUTHOR	YEAR	AGENCY
Multiple Project in Jerome, Idaho Falls, and Boise.	Fruhlinger, Jake	2020	Department of Defense
Submission Packet, FCC Form 621, for proposed Collocation Project 333 Northgate Mile, Idaho Falls, Bonneville County, 83402, IDL04073 / THE POST / 10129915. EBI Consulting.	Bowman, Maureen A.	2020	FCC
Idaho Falls Stockyard Phase II Environmental Site Assessment: 701 Northgate Mile, Idaho Falls, Bonneville County, ID 83401. Stantec Consulting Services, Inc.	Herrick, Daniel	2020	US EPA
Site-Specific Sampling and Analysis Plan: Teton Vista Property, 260 Olive Plaza, Idaho Falls, Idaho 83401.	Stantec Consulting Services Inc.	2020	US EPA
A Cultural Resource Assessment of the Modification of an Existing Wireless Telecommunications Service Facility "Idaho Falls KIDK TV/ SL01443D" for T-Mobile West LLC, in Idaho Falls, Bonneville County, Idaho. Environmental Assessment Specialists, Inc.	Billat, Scott	2020	FCC

Note: Project titles and agency/contractor names appear as listed by the Idaho SHPO and have been only lightly edited.
BLM = Bureau of Land Management; ROW = right-of-way; FAA = Federal Aviation Association; FCC = Federal Communications Commission; HPC = Historic Preservation Commission; ITD = Idaho Transportation Department; DOE = U.S. Department of Energy; IORC = Information Operations and Research Center;U.S.EPA = U.S. Environmental Protection Agency; IHSI = Idaho Historic Sites Inventory
Source: Idaho SHPO 2022

5.10.4.2 GEM STATE

Based on the Idaho SHPO records search, 35 cultural resources projects were conducted within 1 mile of the Project Boundary (Table 5-48). It is unknown which of these projects intersect or are adjacent to the Project Boundary because Idaho SHPO did not provide project spatial data. Of the projects provided in the records search, one appears to be associated with the Gem State Project. In 1981, the Archaeological Investigations: Gem State Hydroelectric Project was conducted by Basin and Range Research.

TABLE 5-48 PREVIOUS CULTURAL RESOURCES PROJECTS WITHIN ONE MILE OF THE GEM STATE PROJECT BOUNDARY

TITLE	AUTHOR	YEAR	AGENCY
Woodville Community Well and Pipeline ROW	Hill, Richard D.	1997	BLM, Idaho Falls District
Couillard ROW IDI-35763. North Wind, Inc., Idaho Falls, ID	Harding, William M.	2008	BLM, Idaho Falls District
Robert Hay Jr. Road ROW IDI-35763	Hill, Richard D.	2007	BLM, Idaho Falls District
Karl and Aleeta David Road ROW IDI-35783	Hill, Richard D.	2007	BLM, Idaho Falls District
Annual Report of Archaeological Investigations 1979, 1980	Gaston, Jenna	1981	ITD
Annual Report of Archaeological Investigations, 1984	Gaston, Jenna	1984	ITD
Idaho Falls South Interchange	Petersen, Nick	1992	ITD
York Road Source	Myler, Terrie	1997	ITD
Riviera Intersection, Idaho Falls	Gaston, J.	1999	ITD
Amcor Precast Source	Horting, C.	2000	ITD
Valley Redi-Mix Gravel Aggregate Source Expansion (Pit No. BN-140C). Idaho State University, Pocatello, ID	Horting, C.	2000	ITD
I-15, Sunnyside Interchange to I-15B, Idaho Falls	SAIC	2001	ITD
Burns Aggregate Source: Bn-152c	Miller, S.	2001	ITD
I-15 Traveler's Radio Advisory Project-B, Key No. 7818. North Wind, Inc., Idaho Falls, ID	Harding, William M.	2004	ITD
Sunnyside Interchange to I-15b, Idaho Falls, Key No. 7771. North Wind, Inc., Idaho Falls, ID	Harding, William M.	2004	ITD
U.S. 91 North Corrido Plan: Shelley to York Road	Cooper, J.	2005	ITD

TITLE	AUTHOR	YEAR	AGENCY
State, Dynamic Message Signs	Munch, M.	2009	ITD
State, FY2010 Highway Advisory Radio Installation	Munch, M.	2009	ITD
Idaho Falls Area Bridge Preservation	Hartmans, Donna	2013	ITD
FY 16 District 5 Bridge Repair	Davis, Kerry	2014	ITD
US-91 Shelley to York Road Expansion, Addendum 1. Versar	Noll, Christopher D.	2015	ITD
Historic Survey of Roads in Idaho's State Highway System Volume 1: Historic Context and Volume 2: *Application of the National Register of Historic Places Criteria for Evaluation*	Mead & Hunt	2019	ITD
US-91 Shelley to York Rd Phase II (Anheuser Busch Material Source and Staging Area): (Anheuser Busch Material Source and Staging Area). Commonwealth Heritage Group, Inc.	Johnson, Wendy Simmons	2020	ITD
Archaeological Investigations: Gem State Hydroelectric Project, Idaho Falls. Basin and Range Research, Pocatello.	Druss, Claudia, Steven Wright, and Mark Druss	1981	Basin and Range Research
Report on Cultural Resources in the Shelley Hydroelectric Project Area. FERC Preliminary Permit No. 5090-00 CH2M Hill.	Simmons, Alexy	1985	FERC/CH2M-Hill
Agricultural Landscapes Survey. Prepared by Idaho State Historical Society. IHSI Survey #104.	Eastman, Jennifer Attebery	1987	Idaho State Historical Society
Archaeological Investigations: Gem State Hydroelectric Project, Idaho Falls. Basin & Range Research.	Druss, Claudia, Steven Wright, and Mark Druss	1981	Basin and Range Research
50 Clear Talk Wireless Cell Phone Tower Locations in Southeast and South-Central Idaho. Prepared for Clear Talk Wireless by Northwind Environmental, Inc., Idaho Falls, Idaho	Harding, W., J. Shelton, and C. Green	2001	Other

TITLE	AUTHOR	YEAR	AGENCY
Ammon/Shelley Regional Wastewater Project. Prepared for East Central Idaho Planning & Development Association, Rexburg, Idaho. SERG, Inc.	Crockett, Stephanie	2004	Other
Depatco Gravel Source	Crockett, Stephanie	2010	Misc
Cultural Resource Evaluation and Visual Effect Analysis for the ID6 Wapiti Cellular Telecommunications Project, 6775 South Overland Drive, Idaho Falls, Bonneville County, Idaho	Kromarek, Nicole, Susan Leary, Jim Steely, and Michael Ritter	2014	FCC
Archaeological Records Check and Phase IA (Class III) Archaeological Reconnaissance of Approximately 0.3 Acres for the SL80XCR80 Idaho Falls Tower Site, Bonneville County. RESCOM Environmental Corp.	Smith, Andrew	2017	FCC
Idaho's Historic Bridges: A Context Study	Gray, Dale	2004	ITD
Copper Meadows Subdivision: Cultural Resources Survey. Sundance Consulting, Inc.	Larsen, David N.	2019	US EPA
New Sweden-Riverview Study Interim Report. Prepared by Idaho State Historic Preservation Office	Attebery, Jennifer Eastman	1990	Idaho State Historical Society

Note: Project titles and agency/contractor names appear as listed by the Idaho SHPO and have been only lightly edited.
Note: ITD = Idaho Transportation Department; U.S.EPA = U.S. Environmental Protection Agency; FCC = Federal Communications Commission; ROW = right-of-way; IHSI = Idaho Historic Sites Inventory; FERC = Federal Energy Regulatory Commission
Source: Idaho SHPO 2022

5.10.5 TRIBAL RESOURCES

Under Section 106 of the NHPA, FERC is obligated to seek out any federally recognized Indian Tribe that can demonstrate a traditional cultural or religious connection to land under its jurisdiction and involve them in the relicensing process.

Although the Project Boundary encompasses no federally recognized Tribal lands, there are tribes that may have an interest in the Idaho Falls and Gem State Project relicensing processes. The

following tribes are included on FERC's mailing list and/or are identified on the U.S. Department of the Interior's Bureau of Indian Affairs website, as well as other Tribes that may have a traditional cultural or religious connection to the lands in or around the Projects (BIA 2022).

- Shoshone Tribe of the Wind River Reservation
- Shoshone-Bannock Tribes of the Fort Hall Reservation
- Northwestern Band of Shoshone Nation
- Kootenai Tribe
- Nez Perce Tribe
- Coeur d'Alene Tribe
- Confederated Tribes of the Warm Springs Reservation
- Fort Belknap Indian Community of the Fort Belknap Reservation

Concurrent with the NOI and PAD filings, IFP requested to be FERC's non-federal representative for Section 106 Consultation with the Tribes. The following sections identify Tribes that may have an interest in the Projects and a brief history. Pending Tribal consultation, no Indian traditional or religious cultural properties are known in or near the Gem State or Idaho Falls Project Boundaries.

5.10.5.1 SHOSHONE TRIBES

Historically, Shoshoni-speaking bands lived in the part of the northern Great Basin that includes the upper Snake and Salmon Rivers in Idaho and the Green and Bear Rivers in Utah and Wyoming. In the early 1700s, horses were introduced to North American tribes and these groups began traveling over large areas, covering portions of what is now Montana, southern Alberta in Canada, and across Wyoming. However, by the mid-1700s, the Plains tribes that acquired both horses and guns from European settlers resisted this expansion. The Shoshone returned to their earlier territories within the western river valleys: the Lemhi Shoshones and Flathead Salish along the Salmon River, the Northern Shoshones and Bannocks along the Snake River, and the Eastern Shoshones along the Green and Bear Rivers. Throughout the nineteenth century these groups continued to participate in annual bison hunts to the east (Jackson Hole Historical Society 2022; Murphy and Murphy 1986; Steward 1937). Most bands later organized into federally recognized tribes, including the Shoshone-Bannock Tribes, the Northwest Band of Shoshone Nation, and the Shoshone Tribes of the Wind River Reservation.

Steward (1937) reported that a band known as the Bohogue' generally wintered near Fort Hall, although they traveled seasonally from Camas Prairie in the west to Wyoming in the northeast. This band was comprised of two integrated but culturally and linguistically distinct groups: the Bannocks, a Northern Paiute group that moved into the area in the seventeenth century, and the Northern Shoshones (Murphy and Murphy 1986; Shoshone-Bannock Tribes 2021; Steward 1937). While the Bannocks were a minority, the chief who led the band may have come from either group (Murphy and Murphy 1986).

Once horses arrived in the area in the 1700s, the Northern Shoshones and Bannocks gathered for fall bison hunts in Wyoming, after which they would typically return to winter camps in the Snake River bottoms, near the Gem State Project area (Murphy and Murphy 1986; Shoshone-Bannock Tribes 2021). In the spring, groups would fish for salmon below Shoshone Falls and then travel west to Camas Prairie to gather during the summer months.

British and American fur trappers began moving into the Snake River Valley in the early nineteenth century. By the 1840s the fur trade had collapsed and the bison herds west of the Continental Divide had been exterminated (Murphy and Murphy 1986). Emigration along the Oregon Trail brought more Euro-American settlers through the region. The members of the Church of Jesus Christ of Latter-day Saints began settling in the 1860s (Murphy and Murphy 1986). The last great bison hunt by the Northern Shoshones and Bannocks was in 1864 (Shoshone-Bannock Tribes 2021). The two groups entered peace treaties with the United States government in 1863 and 1868, which led to the establishment of the Fort Hall Reservation in 1869. Other Shoshone groups were relocated to the Fort Hall Reservation as well, including the Northwestern Band of Shoshone Nation, a group comprised of Bannocks and the former Lemhi and Sheepeater Shoshones who were forced off their original reservation in both 1905 and 1907 (American Indian Relief Council 2022; Murphy and Murphy 1986). The Northwestern Band of Shoshone Nation received federal recognition in 1980 (American Indian Relief Council 2022).

The ancestors of the Shoshone Tribe of the Wind River Reservation were Eastern Shoshone peoples who lived in what is now western Wyoming. They were accomplished bison hunters prior to the introduction of the horse (Shimkin 1986). In the 1800s, the Eastern Shoshone Tribe inhabited

an area along the eastern slope of the Rocky Mountains that extended from what is now southwestern Wyoming to southwestern Montana (Eastern Shoshone 2022).

In 1805, Lewis and Clark's famous expedition met with the Lemhi Shoshones (Jackson Hole Historical Society 2022) and was accompanied by a Shoshone woman, Sacajawea, on their expedition through the Northwest (Eastern Shoshone 2022).

By the 1860s, the Eastern Shoshone lived primarily in the Wind River Valley in Wyoming, spending the summer months in the Fort Bridger area. Chief Washakie became a prominent leader in the 1850s, and in 1852, he was the sole Shoshone representative to negotiate the Latter-day Saint settlement with Brigham Young in Salt Lake City (Jackson Hole Historical Society 2022; Shimkin 1986). In 1863, Chief Washakie negotiated the first treaty of Fort Bridger, which set rough boundaries for a Shoshone Reservation that included parts of Utah, Idaho, Montana, Wyoming, and Colorado. However, the second treaty of Fort Bridger in 1868 limited the boundaries to an area in west-central Wyoming (Eastern Shoshone 2022). The boundaries of the Wind River Reservation were further reduced in 1874 when gold was discovered near South Pass, and the southern portion of the reservation was purchased (Eastern Shoshone 2022). In 1877, Chief Washakie and other Shoshone leaders agreed to allow the Arapaho to move onto the Wind River Reservation (Jackson Hole Historical Society 2022). The Arapaho were given fertile, irrigable lands on the east side of the reservation by the United States government (Shimkin 1986). In 1939, lands north of the Big Wind River were restored to the Shoshone, along with a monetary settlement from the federal government after the Tribe won a legal suit, which the Shoshone Tribal Council put towards economic development of the Tribe (Shimkin 1986). While both Tribes still live on the Wind River Reservation, they operate as two separate Tribal governments. The Shoshone Tribe of the Wind River Reservation is federally recognized.

Given the Tribes' history in the area, the Shoshone-Bannock Tribes, the Northwest Band of Shoshone Nation, and the Shoshone Tribes of the Wind River Reservation may attach cultural or religious significance to land and/or resources in the Gem State Project Boundary.

5.10.5.2 KOOTENAI TRIBE OF IDAHO

Historically, the Kootenai people lived along the Kootenay River in the Rocky Mountains, covering a territory that encompassed what is now northern Montana and Idaho and portions of British Columbia in Canada. Winters were spent in upriver villages, hunting, fishing, and pursuing bison herds by snowshoe to the east of the Rocky Mountains. In the summer, as wetlands flooded, people would move downriver to temporary camps to participate in communal deer hunts, hunt waterfowl, and gather fish and plant foods. Euro-American twentieth-century ethnographers described a linguistic division between the Upper Kootenai, who lived upriver and to the east, and the Lower Kootenai, who lived downriver to the west (Brunton 1998). When horses were introduced to the Tribe, the Kootenai people joined other Plateau groups and organized joint bison hunts on the plains to the east (Brunton 1998).

Euro-Americans moved into the territory of the Kootenai at the beginning of the 1800s, drawn by the fur trade. Catholic missionaries attempted to influence the Tribes, both the Kootenai and their neighbors, the Flathead (Brunton 1998). The Kootenai people, as well as bands and tribes at several locations in British Columbia and Montana, were divided into geographic communities following the designation of the U.S.-Canada border (UCUT 2022). Epidemics of smallpox and other diseases heavily impacted the Tribe. A signed treaty in 1855 established the Flathead Reservation, to the southeast of the Kootenay River where the Kootenai people settled (Brunton 1998). However, the Lower Kootenai did not sign the 1855 Treaty, and in 1974 the remaining 67 Kootenais declared a peaceful war on the United States to reclaim their traditional lands. As a result, the federal government and the State of Idaho transferred 12.5 acres of land to the Kootenai Tribe of Idaho for a reservation (Brunton 1998; UCUT 2022). In 1982 the Kootenai Tribe of Indians joined the Upper Columbia United Tribes (UCUT) alongside the Coeur d'Alene Tribe of Indians, Confederated Tribes of the Colville Reservation, Kalispel Tribe of Indians, and Spokane Tribe of Indians and are actively managing 2 million acres (UCUT 2022). The Kootenai Tribe of Idaho is federally recognized.

Given the Tribe's history in the area, the Kootenai Tribe of Idaho may attach cultural or religious significance to land and/or resources in the Gem State Project Boundary.

5.10.5.3 NEZ PERCE TRIBE

The Nez Perce Tribe are Sahaptin speakers who traditionally occupied parts of what is now Idaho, Oregon, and Washington (Nez Perce Tribe 2018). French fur traders gave this group the name Nez Percé, which means "pierced nose" in French, but they call themselves the Nimiipuu, which means "we the people" (Hillstrom and Hanes 2022; Nez Perce Tribe 2018).

The Nez Perce Tribe fished during the spring and fall salmon runs, gathered camas roots in the late summer, and hunted large game and birds. Once horses were introduced to the area after 1700, like many other groups, the Nez Perce would organize short bison hunting trips in Montana and Wyoming to augment their winter stores of meat (Nez Perce Tribe 2018; Walker 1998). The Nez Perce maintained large herds and became skilled horse breeders and trainers, developing the breed known as Appaloosas (Hillstrom and Hanes 2022).

In 1800, the Nez Perce Tribe had more than 70 permanent villages and hundreds of temporary camps centering on three rivers: the Middle Snake, Clearwater, and Salmon Rivers (Walker 1998). They soon began trading with Euro-American and European fur trappers, including the North West Company. However, the demand for furs in Europe quickly decimated the beaver and other fur-bearing animals on the plateau (Walker 1998).

A treaty was negotiated with the United States government in 1855, which ensured both Nez Perce reservation lands and the right to continued use of traditional off-reservation lands for fishing, hunting, gathering, and grazing livestock in their usual and accustomed places. The original reservation boundaries were significantly reduced in 1863, after gold was discovered, and even more land was lost due to the Allotment Act, which resulted in a "checkerboard" of Indian allotments and non-Indian-owned parcels within the reservation boundaries by the end of the 1800s. However, the Tribe's off-reservation rights were repeatedly upheld in the state courts (Nez Perce Tribe 2018). The Nez Perce is a federally recognized Tribe.

Given the Tribe's history in the area, the Nez Perce Tribe may attach cultural or religious significance to land and/or resources in the Gem State Project Boundary.

5.10.5.4 CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION OF OREGON

The Confederated Tribes of the Warm Springs Reservation of Oregon consist of members of three different Indian tribes: Wascoes, Warm Springs, and the Paiutes. In 1937, the three tribes were organized into a single governing body, the Confederated Tribes of Warm Springs Reservation of Oregon (CTWS 2021).

The Wascoes are Chinookan-speaking Indians who historically lived along the south shores of the Columbia River in what is now Oregon (CTWS 2021; French and French 1998). They were primarily salmon fishermen, but the Wascoes engaged in extensive trade with neighboring groups. For example, they traded root bread, salmon, and bear grass to the Nez Perce in return for game, clothing, and horses (CTWS 2021).

The Warm Springs people are Sahaptin speakers who traditionally lived along the tributaries of the Columbia River to the east of the Wascoes (CTWS 2021; Hunn and French 1998). They fished for salmon but had a tendency to move between winter and summer villages. Game, roots, and berries were important staples in their diet. The Warm Springs people sometimes joined intertribal group hunts for bison to the east of the Rocky Mountains in the 1700s after the introduction of horses (Hunn and French 1998). While the Warm Springs and Wasco people did not share linguistic or cultural roots, the two groups traded heavily with one another prior to Euro-American contact (CTWS 2021).

Beginning in the early 1800s, Euro-American fur trappers began entering the Columbia River valley to trade (Hunn and French 1998). During the 1840s, thousands of Euro-American immigrants began traveling through the Wasco and Warm Spring territories as they traveled west into Oregon and California. In 1855, the Wasco and Warm Springs people negotiated a treaty with the superintendent of the Oregon Territory that designated the Warm Springs Reservation on the Warm Springs River for the Tribes' sole use and maintained rights to harvest fish, game, and other foods in their usual and accustomed places on off-reservation lands. However, salmon was less plentiful than it had been on the Columbia River (CTWS 2021).

In 1879, a group of 38 Paiutes moved to Warm Springs from the Yakima Reservation in Washington. The Paiutes are Shoshonean speakers whose traditional territory included portions of what is now Oregon, Nevada, Idaho, and western Utah. Prior to contact, they were hunter-gatherers who were highly nomadic and traveled long distances in the Great Basin. The Paiute bands that settled at Warm Springs originated from southeast Oregon. At the end of the 1878 Bannock War against the United States government, many Northern Paiute bands were forcibly relocated to the Yakama Reservation and Fort Vancouver. Despite the differences in their traditional lifeways, the Paiutes became a permanent part of the Warm Spring Reservation (CTWS 2021). The Confederated Tribes of the Warm Springs Reservation of Oregon is a federally recognized Tribe.

Given the Tribe's history in the area, members of the Confederated Tribes of the Warm Springs Reservation of Oregon may attach cultural or religious significance to land and/or resources in the Gem State Project Boundary.

5.10.5.5 FORT BELKNAP INDIAN COMMUNITY OF THE FORT BELKNAP RESERVATION

The Fort Belknap Indian Community of the Fort Belknap Reservation consists of two tribes: the Nakoda (also known as the Assiniboine, the Ojibwa name for the Tribe) and the Aaniih (called Gros Ventre by French fur trappers). The Gros Ventre were members of the Blackfeet Confederacy. Both groups were nomadic bison hunters from the northern Great Plains (Fort Belknap Indian Community 2022).

The Assiniboine are Siouxan-speaking people who traditionally lived in what is now Canada, but in the 1740s, some bands moved south into an area that extended from Minnesota west to Montana (Fort Belknap Indian Community 2022). They followed and hunted the bison herds, and their clothing, tools, and homes were primarily made from bison products (Fort Belknap Indian Community 2022). However, they hunted other large and small game and gathered plant foods (Miller 2011).

The Gros Ventre are Algonquin-speaking people who lived along the Saskatchewan River and were once affiliated with the Arapaho and Cheyenne. By the 1830s, the Gros Ventre were found in north central Montana, west of Assiniboine territory and east of the Blackfeet (Fleming 2011;

Fort Belknap Indian Community 2022). They relied on bison for their primary source of food and clothing (Fleming 2011). The Gros Ventre joined the Blackfeet and their territory stretched north into Canada (Fort Belknap Indian Community 2022).

In 1855, the governor of the Washington Territory negotiated a peace treaty with the Blackfeet, Flathead, and Nez Perce Tribes that created a large joint territory. The Gros Ventre, included as members of the Blackfeet Confederation, and the Assiniboine were signatories to the treaty (Fort Belknap Indian Community 2022). However, the discovery of gold in Montana in 1862 and the completion of the Union Pacific and Northern Pacific railroads increased settling of the area by Euro-Americans (Fleming 2011).

Fort Belknap was established along the Milk River in the 1870s as a substation post and trading post. The Gros Ventre and Assiniboine both received their allotted rations and annuity goods from the fort until it was closed in 1876. The Tribes were then directed to relocate to Fort Peck and Wolf Point, but the Gros Ventre would not go because of long-standing enmity with the Sioux who lived there. In 1888, the Fort Belknap Reservation was established for the Gros Ventre and Assiniboine people who had remained in the area, one of three smaller reservations that were created from the earlier joint reservation. However, after gold was discovered in the Little Rocky Mountains in 1884, the Fort Belknap reservation was reduced in size. In 1935, the Assiniboine and Gros Ventre members of Fort Belknap adopted a constitution and created a community council (Fort Belknap Indian Community 2022). The Fort Belknap Reservation is a federally recognized reservation.

Given the Tribe's history in the area, members of the Fort Belknap Indian Community of the Fort Belknap Reservation may attach cultural or religious significance to land and/or resources in the Gem State Project Boundary.

5.10.6 REFERENCES

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5.11 PURPA BENEFITS

IFP is a domestic, municipal utility and is not claiming preference under Section 7(a) of the FPA, nor seeking benefits under Section 210 of the Public Utility Regulatory Policies Act of 1978.

6.0 PRELIMINARY LIST OF POTENTIAL ISSUES

This section presents potential resource issues and lists proposed studies and analyses needed to support evaluation of potential effects from continued Project Operations and Maintenance (O&M). This section also describes existing and proposed environmental measures and relevant comprehensive plans. FERC content requirements for this section are specified in 18 CFR § 5.6(d)(4). Potential resource issues associated with the Project that are listed in subsections herein were identified from the following:

- Review and evaluation of relevant readily available information (see Section 5.0, *Description of Existing Environment*).
- Discussions with IFP personnel familiar with Project O&M and resources in the Idaho Falls and Gem State Project vicinities.
- Early engagement meetings held with stakeholders (including resource agencies, tribes, and interested members of the public).
- IFP has identified a suite of issues that could result from potential Project-induced effects and have a clear nexus to ongoing O&M activities relating to both the Idaho Falls and Gem State Projects.
- Section 6.1, *Preliminary Issues and Studies*, presents issues for which additional data gathering or studies are needed to assess potential Project effects. Note that no potential resource issues or data gaps related to Project effects have been identified for socioeconomic or aesthetic resources.

6.1 PRELIMINARY ISSUES AND STUDIES

This section identifies preliminary issues identified for which data gathering, potential studies, and/or analyses may be needed to address Project effects or complete the license application. IFP has identified preliminary topics related to water resources, aquatic resources, wildlife resources, botanical resources, recreation use, and cultural/tribal resources in Table 6-1.

Items identified in Table 6-1 should be considered preliminary and are subject to modification pending consultation with Stakeholders, and submission of study requests by interested parties, as described in Section 2.0, *Process Plan and Schedule*.

TABLE 6-1 SUMMARY OF POTENTIAL ISSUES AND STUDIES

STUDY PLAN TOPIC	POTENTIAL RESOURCE ISSUE	PROPOSED STUDY AND APPROACH
Water Quality	Project operations have the potential to alter water quality in Project reservoirs and affected stream reaches, which may affect fish or other aquatic species, or exceed Regional Quality Control objectives for Project waters. Limited current water quality data are available in the Project areas.	Water Quality Study (WQ-1) • Profiles of water temperature, DO, pH, specific conductivity, and turbidity could be measured at the reservoirs. Profiles may be measured during spring, summer, and fall at each site, at 1-meter intervals at each reservoir's location of maximum depth. A multi-parameter water quality meter (HydroLab, YSI, or similar) may be used to measure profiles, and a GPS unit will be used to record the location of each profile. • Stream samples could be collected from just below the water surface as a composite sample from a well-mixed area of each stream site. Parameters may be measured in spring, summer, and fall.
Fish Assemblage	Project operations have the potential to impact local fish assemblage within Project-affected reaches. There is limited current information regarding the distribution of fish species of management interest in the Project area.	Fish Assemblage Study (AQ-1) • Sampling could be conducted using gillnetting and boat electrofishing, dependent on access. • Species composition, relative abundance, age-distribution, and condition could be characterized within Project Boundaries. • Study could focus on white sturgeon and salmonids.
Fish Mortality	Project operations have the potential to affect fish mortality due to entrainment. The effect of the diversions on fish entrainment has not been well documented throughout the Project reaches.	Fish Entrainment Study (desktop review) (AQ-2) • A literature review of fish entrainment data for facilities with similar operation specifications could be conducted to assess potential entrainment rates at the Project.

STUDY PLAN TOPIC	POTENTIAL RESOURCE ISSUE	PROPOSED STUDY AND APPROACH
		• Could conduct a desktop analysis of the fish species present and Project operations in order to estimate entrainment and assign injury and mortality estimates based on Project O&M.
Aquatic Habitat and Sediment Characterization	Operations from the Projects have the potential to affect quantity and quality of aquatic habitat for fish populations within Project-affected reaches. There is limited information available to characterize habitat types, identify spawning patches, or to determine potential habitat-related limiting factors for the fish populations.	Aquatic Habitat Assessment (AQ-3) • Pedestrian surveys to delineate aquatic habitat could be conducted in Project-affected reaches during late summer/fall base flows. • Concurrent with habitat mapping, the location, size, quality, and particle distribution of spawnable gravel patches (i.e., coarse sediment) could be recorded.
Botanical	Special-status botanical resources or USFS SCC that are either known or have the potential to occur in the Project areas and could be affected by Project O&M, including Ute ladies'-tresses. Introduction and/or spread of invasive plant populations have the potential to occur due to Project maintenance activities. There is limited current information available on the Project for special status botanical, USFS SCC, or invasive plant populations.	Botanical Survey (TERR-1) • A literature review could be conducted to determine if any special-status botanical resources or invasive species have been identified as having the potential to occur within the Project areas. • Could conduct mapping of potentially suitable habitat for special status plants. • May conduct pedestrian surveys focused around areas of Project features and those likely to be impacted by project O&M activities
Wildlife and RTE	Potential effects from Project O&M on special-status wildlife species that are either known or have the potential to occur in the Project areas, including the	General Wildlife Study (TERR-2) • Could perform pedestrian surveys at appropriate times of the year (e.g., nesting season) to maximize the opportunity to

STUDY PLAN TOPIC	POTENTIAL RESOURCE ISSUE	PROPOSED STUDY AND APPROACH
	Yellow-billed Cuckoo. There is limited current information available on the Project for special status wildlife species or USFS SCC.	observe special-status wildlife species as determined by the literature review.
Recreation	Characterize existing recreation use and access, assess future recreation needs associated with the Projects. Use data is minimal for determining how recreation users are utilizing the Project areas.	Recreation Use and Needs Study (REC-1) • Could audit existing Exhibit R (as applicable) and update drawings with as-builts and any facilities proposed under a new license. • Visitor surveys could be conducted in the second study season using a survey form to collect recreation user characteristics and demographics (e.g., origin, gender, age and group size); satisfaction; type of activities; length of stay; and perception of crowdedness, site conditions, fees and site needs. • Spot counts and/or traffic/trail counters could also be implemented at certain locations but may not be necessary. • Creel surveys could potentially be conducted but may not be necessary.
Facilities Condition assessment	It is necessary to evaluate the condition of and public accessibility to existing recreation facilities directly related to the Projects. Limited information regarding existing conditions and accessibility is available.	Existing Recreation Facilities Condition Assessment (REC-2) • A facility inventory and condition assessment could be performed on Project recreation sites. • Generally, the study could include an inventory and cursory condition assessment of the following within the study area: general assessment of the condition of facilities; universal accessibility of facilities; public safety measures; signage and

STUDY PLAN TOPIC	POTENTIAL RESOURCE ISSUE	PROPOSED STUDY AND APPROACH
		wayfinding; and site-specific circulation roads, campsite spurs, and parking areas
Project Lands and Roads	It may be necessity to modify the current existing FERC Project Boundaries, lands, and roads to address current use and future needs. A comprehensive catalogue of how existing roads are used to access the Project is limited.	Project Lands and Roads Study (LAND-1) • May build on recent analysis of the existing FERC Project Boundaries • Could ensure no mapping errors or omissions are present in the representation of Project lands needed for operation under the current license. • May consult with IFP O&M staff to determine whether the existing FERC Project Boundaries adequately encompasses all lands needed for current operations or any proposed changes to facilities or operations. • Could assess the condition of roads or access trails identified for Project purposes.
Cultural	O&M for the Projects could affect cultural resources that are listed in or eligible for listing in the NRHP.	Cultural Resource (CUL-1) • May complete a records search and compile additional information from available repositories. • Could conduct a pedestrian survey within the APE for each Project in areas that have not been surveyed or should be resurveyed and identify any new sites. • Could record and document all sites and built environment resources.

STUDY PLAN TOPIC	POTENTIAL RESOURCE ISSUE	PROPOSED STUDY AND APPROACH
Tribal	O&M for the Projects may be currently or potentially impacting NRHP-eligible cultural resources.	Tribal Resource Study (TRI-1) • May conduct background archival research of the study area. • Could identify and document tribal resources identified within or immediately adjacent to the APE. • Could conduct a thorough Native American ethnographic/ethnohistoric survey of the APE. • Could conduct interviews with knowledgeable informants.

The Project will continue run-of-river operations without changes to facilities. No change to aesthetic resources is anticipated due to the proposed relicensing, and no studies or PME measures are proposed for the Projects. Additionally, continued run-of-river operation is not anticipated to disproportionately adversely affect the identified Environmental Justice communities. No studies or mitigation measures related to socioeconomic resources or Environmental Justice are proposed.

6.1.1 STUDY REQUESTS

During the scoping phase of this process (see Section 2.0), IFP will work with interested parties and relicensing participants to identify areas where there is little or no information relevant to issues of potential concern for project effects to the human and natural environments. Stakeholders may identify additional studies for consideration. As specified by 18 CFR 18 §5.9(b), any study request must:

- Describe the goals and objectives of each study proposal and the information to be obtained;
- If applicable, explain the relevant resource management goals of the agencies or Native American tribes with jurisdiction over the resource to be studied;
- If the requestor is not a resource agency, explain any relevant public interest considerations regarding the proposed study;
- Describe existing information concerning the subject of the study proposal, and the need for additional information;
- Explain any nexus between project operations and effects (direct, indirect and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;
- Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge;
- Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs; and
- Describe any available cost-share funds or in-kind services that the sponsor of the request may contribute towards the study effort.

Study requests must be in MS Word or PDF format and be uploaded to the FERC eLibrary with a copy to: Richard Malloy (see Section 1.3 of this PAD for contact information).

6.2 REFERENCES

Federal Energy Regulatory Commission (FERC). 2020. Integrated Licensing Process (ILP). Available online: https://www.ferc.gov/industries-data/hydropower/licensing/licensing-processes/integrated-licensing-process-ilp. Accessed May 4, 2022.

7.0 COMPREHENSIVE MANAGEMENT PLANS

7.1 RELEVANT COMPREHENSIVE MANAGEMENT PLANS

Section 10(a)(2) of the FPA requires FERC to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, and conserving waterways affected by a project. In accordance with Section 10(a)(1) of the FPA, the list of FERC-approved federal and state comprehensive plans for Idaho was reviewed to determine applicability to the Projects (FERC 2022). The federal and state resource agencies have prepared a number of comprehensive plans, which provide a general assessment of a variety of environmental conditions in Idaho. These plans address wildlife resources and their habitats, fisheries management, recreational access, and scenic river management issues. The Projects' consistency with pertinent state and federal comprehensive plans is discussed below. FERC currently lists 55 comprehensive plans for the state of Idaho, of which 20 are potentially relevant to the vicinity of the Projects (Table 7-1).

TABLE 7-1 LIST OF RESOURCE MANAGEMENT PLANS POTENTIALLY RELEVANT TO THE PROJECTS

FEDERAL, STATE, REGIONAL, LOCAL	RESOURCE MANAGEMENT PLANS/POLICIES
Federal	Bureau of Land Management. Forest Service. 1991. Snake River final activity/operations plan. Department of the Interior, Idaho Falls, Idaho. Department of Agriculture, Idaho Falls, Idaho. February 1991.
Federal	National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
Federal	U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.
State	Idaho Department of Water Quality. 2018. Water Quality Standards. Boise, Idaho.
State	Idaho Department of Fish and Game. 2005. Idaho comprehensive wildlife conservation strategy. Boise, Idaho. September 2005.
State	Idaho Department of Fish and Game. 2007. Management plan for the conservation of Yellowstone cutthroat trout in Idaho. Boise, Idaho. April 2007.
State	Idaho Department of Fish and Game. 2008. Idaho mule deer management plan: 2008-2017. Boise, Idaho. March 2008.

FEDERAL, STATE, REGIONAL, LOCAL	RESOURCE MANAGEMENT PLANS/POLICIES
State	Idaho Department of Fish and Game. 2008. Management plan for the conservation of Snake River white sturgeon in Idaho. Boise, Idaho. September 2008.
State	Idaho Department of Fish and Game. 2010. Mule deer initiative action plan. Boise, Idaho. 2010.
State	Idaho Department of Fish and Game. 2019. Fisheries Management Plan, 2019-2024. Boise, Idaho. 2019.
State	Idaho Department of Fish and Game. 2013. Management plan for the conservation of Westslope cutthroat trout in Idaho. Boise, Idaho. November 2013.
State	Idaho Department of Fish and Game. 2014. Idaho Elk management plan: 2014-2024. Boise, Idaho. June 2014.
State	Idaho Department of Fish and Game. 2015. Idaho State Wildlife Action Plan (SWAP). Boise, Idaho. 2015.
State	Idaho Department of Fish and Game. Bonneville Power Administration. 1986. Pacific Northwest Rivers Study. Final report. Boise, Idaho.
State	Idaho Department of Parks and Recreation. 2018. Idaho Statewide Comprehensive Outdoor Recreation Plan 2018-2022. Boise, Idaho.
State	Idaho Water Resource Board. 2012. Idaho State water plan. Boise, Idaho. November 2012.
State	State of Idaho. State of Oregon. State of Washington. Confederated Tribes of the Warm Springs Reservation of Oregon. Confederated Tribes of the Umatilla Indian Reservation. Nez Perce Tribe. Confederated Tribes and Bands of the Yakima Indian Nation. 1987. Settlement Agreement pursuant to the September 1, 1983, Order of the U.S. District Court for the District of Oregon in Case No. 68-5113. Columbia River fish management plan. Portland, Oregon. November 1987.
Local	Idaho Water Resource Board. 2009. Eastern Snake Plain aquifer comprehensive aquifer management plan. Boise, Idaho. January 2009.
Regional	Northwest Power and Conservation Council. 2014. Columbia River Basin Fish and Wildlife Program. Portland, Oregon. Council Document 2014-12. October 2014.

FEDERAL, STATE, REGIONAL, LOCAL	RESOURCE MANAGEMENT PLANS/POLICIES
Regional	Northwest Power and Conservation Council. 2016. The Seventh Northwest Conservation and Electric Power Plan. Portland, Oregon. Council Document 2016-02. February 2016.
Regional	Northwest Power and Conservation Council. 1988, 1991. Protected areas amendments and response to comments. Portland, Oregon.

Source: FERC 2022

7.2 REFERENCES

Federal Energy Regulatory Commission (FERC). 2022. *List of Comprehensive Plans*. Federal Energy Regulatory Commission Office of Energy Projects, Washington, D.C., March 2022.