NorthWestern Energy
Delivering a Bright Future

NWE-THF-4263

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

June 8, 2023

Re: NorthWestern Energy filing Thompson Falls Hydroelectric Project P-1869-060
Updated Study Report Meeting Summary

Dear Secretary Bose:

NorthWestern Energy (NorthWestern) is currently engaged in the relicensing of the Thompson Falls Hydroelectric Project (P-1869) (Project) using the Federal Energy Regulatory Commission's (FERC or Commission) Integrated Licensing Process (ILP). In accordance with 18 C.F.R. § 5.15(c)(3), NorthWestern hereby files its summary of the Updated Study Report (USR) meetings, which were held on May 24 and 25, 2023.

NorthWestern filed its USR for the relicensing of the Project on May 5, 2023, per FERC's ILP regulations (18 C.F.R. § 5.15(f).[1] The USR provided an Executive Summary, described the six studies approved in the Commission staff's September 1, 2022 Determination on Requests for Study Modifications (Study Plan Determination),[2] and presented results of the second season of studies.[3]

Relicensing Participants were notified of the filing. That notification provided both a link to NorthWestern's Project relicensing website where the USR is posted and instructions for accessing the reports through FERC's eLibrary. NorthWestern sent additional, separate notifications to Relicensing Participants inviting them to participate in a project tour on the afternoon of May 25, 2023. In addition to NorthWestern staff, approximately 20 people attended the tour including local residents, resource agency representatives and Commission staff.

As required under FERC's ILP regulations (18 C.F.R. §§ 5.15(c)(2), 5.15(f)), NorthWestern hosted an USR meeting on Wednesday, May 24, 2023. The meeting was held at NorthWestern's Missoula, Montana office, 1801 South Russell Street, from 9:00 AM until 2:00 PM. A virtual option (Zoom) was also available. NorthWestern hosted a second USR meeting in Thompson Falls, Montana on May 25, 2023 from 6:00 to 8:00 PM so that interested stakeholders in the vicinity of the Project could attend. That meeting was held at the Sanders County Courthouse, 1111 W Main Street, Thompson Falls,

[1] NorthWestern Corporation d/b/a NorthWestern Energy submits Updated Study Report for the Thompson Falls Hydroelectric Project under P-1869, Accession No. 20230508-5019.

[2] *See* Letter from John Wood, FERC, to Mary Gail Sullivan, NorthWestern, Project No. 1869-060, Accession No. 20220901-3052 (issued Sept. 1, 2022).

[3] USR, Accession No. 2023-0508-5019.

Montana 59873, and a virtual (Zoom) option was also made available. Local residents, FERC staff, resource agencies, tribes, local government authorities, and other relicensing participants attended one or both meetings, either in person or virtually.

A summary of the USR meetings is included as Attachment 1. It includes the meeting agendas, attendees, and the presentations given at the meetings. A copy of the summary is posted on NorthWestern's Project relicensing website, https://northwesternenergy.com/TFallsRelicensing. Notification that the summary is available has also been provided to Relicensing Participants, and the distribution list is attached as Attachment 2.

Comments on the USR are due by July 9, 2023 (18 C.F.R. §§ 5.15(c)(4), 5.15(f)). Following an opportunity for NorthWestern to respond to any comments (18 C.F.R. §§ 5.15(c)(5), 5.15(f)), FERC is expected to issue a Determination on Disagreements/Amendments for the second season of studies, for which the deadline is September 7, 2023 (18 C.F.R. §§ 5.15(c)(6), 5.15(f)).

Should you have any questions, please contact me at (406) 497-3382, or via email at marygail.sullivan@northwestern.com.

Sincerely,

Mary Gail Sullivan
Director, Environmental and Lands

CC: Andy Welch, NorthWestern Energy
John Tabaracci, NorthWestern Energy

Enclosure

ATTACHMENT 1

Thompson Falls Hydroelectric Project #1869-060
NorthWestern Energy
Updated Study Report Meeting
Meeting Summary

On May 24 and 25, 2023, NorthWestern Energy (NorthWestern) hosted the Thompson Falls Hydroelectric Project (Project) Updated Study Report (USR) meeting as required by the Federal Energy Regulatory Commission's (FERC's) Integrated Licensing Process regulations (18 C.F.R. §§ 5.15(c)(2), 5.15(f)). On May 24, 2023, an in-person daytime meeting was held at NorthWestern's offices in Missoula, MT. On May 25, 2023, an in-person tour of the project was offered. That evening, a meeting was held at the Sanders County Courthouse in Thompson Falls, MT. Both meetings included a virtual option on Zoom. The meeting agendas and attendee lists are attached. PowerPoint slides presented at the meetings by NorthWestern representatives are also attached. The presentations included discussion of the second year of studies' findings and results, variances to those studies (as applicable), and updates on the relicensing schedule. During the meetings, a comment and question period followed each presentation. Attendees were also advised that written comments would be accepted by FERC through July 9, 2023.

Thompson Falls Hydropower Project Relicensing
Updated Study Report Meeting
Daytime Meeting
May 24, 2023, 9:00 AM to 2:00 PM (Mountain Time)

Location: NorthWestern Energy Offices
1801 S. Russell Street
Missoula, Montana 59801

AGENDA

Start Time	Topic
9:00:00 AM	**Introductions, Zoom Tips, Overview of the FERC Process**
9:30:00 AM	**Hydraulic Conditions Study**
10:00:00 AM	**Fish Behavior Study**
10:30:00 AM	**Break**
11:00:00 AM	**TDG Study**
11:30:00 AM	**Cultural Resource Study**
12:00:00 PM	**Environmental Justice Study**
12:30:00 PM	**Lunch (NorthWestern Provides)**
1:00:00 PM	**Operations Study**
2:00:00 PM	**Adjourn**

Remote connection option:
https://us06web.zoom.us/j/88577088020

Meeting ID: 885 7708 8020

One tap mobile
+16694449171,,88577088020# US
+12532050468,,88577088020# US

Dial by your location
+1 669 444 9171 US
+1 253 205 0468 US
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 301 715 8592 US (Washington DC)

Meeting ID: 885 7708 8020
Find your local number: https://us06web.zoom.us/u/kj0zBTRgy

Name	**Affiliation**
Mary Gail Sullivan	NorthWestern Energy
Bruce Bugbee	American Public Land Exchange, Inc
Mark Sommer	American Public Land Exchange, Inc
Roscoe Kronfuss	self
Bruce Paulsen	United States Forest Service
Pat Saffel	Montana Fish, Wildlife and Parks
Josh Schulze	United States Forest Service Lolo National Forest
David Schmetterling	Montana Fish, Wildlife and Parks
Jodie Rasmussen	Homeowner
Laura Marsh	State Office of Historic Preservation
Adam Strainer	Montana Fish, Wildlife and Parks
David Wrobleski	United States Forest Service Lolo National Forest
Kim McMahon	Pinnacle
Jeremy Clotfelter	NorthWestern Energy
John Tabaracci	NorthWestern Energy
Jordan Tolleffson	NorthWestern Energy
Justin Jimenez	United States Forest Service
Jason Blakney	Montana Fish, Wildlife and Parks
Ginger Gillin	GEI Consultants, Inc
Chuck Sensiba	Troutman Pepper
Andrea Wortzel	Troutman Pepper
Michael Tust	Federal Energy Regulatory Commission
Abigail Maddigan	Montana Fish, Wildlife and Parks
Kristi Webb	New Wave
Kevin Aceituno	United States Fish and Wildlife Service
Keenan Storrar	Montana Department of Environmental Quality
Ken Dickerson	Mitzi Rossillon Consulting
Mitzi Rossillon	Mitzi Rossillon Consulting
Mark Ashenfelter	GEI Consultants, Inc.
Andy Welch	NorthWestern Energy
Jon Hanson	NorthWestern Energy

Thompson Falls Updated Study Report Meeting May 24, 2023 9:00 AM- 2:00 PM
NorthWestern Energy Attendance recorded by Lauren Gordon, GEI Consultants, Inc.
Zoom Participants

Northwestern Energy Meeting – Participants:

Northwestern Energy Missoula

Carolyn Gleason, Environmental Protection Agency

Craig Barfoot, Confederated Salish and Kootenai Tribes

Eric Holmstead, GEI Consultants, Inc.

Ingrid Brofman, Federal Energy Regulatory Commission

James Strait, Montana Department of Environmental Quality

Kristen Cook, Montana Fish, Wildlife, and Parks

Kristen Sinclair, Federal Energy Regulatory Commission

Lauren Townson, Federal Energy Regulatory Commission

Leanna Gebhardt, GEI Consultants, Inc.

Miranda Millerick, Federal Energy Regulatory Commission

Pete Gomben, United States Forest Service, Hydropower Program

Stephen Begley, Montana Fish, Wildlife, and Parks

Steve Lewis, Bureau of Indian Affairs

Kevin Walton, United States Forest Service, Hydropower Program

David Froehlich, Federal Energy Regulatory Commission

Traci Sylte, United States Forest Service, Lolo Watershed Program Manager

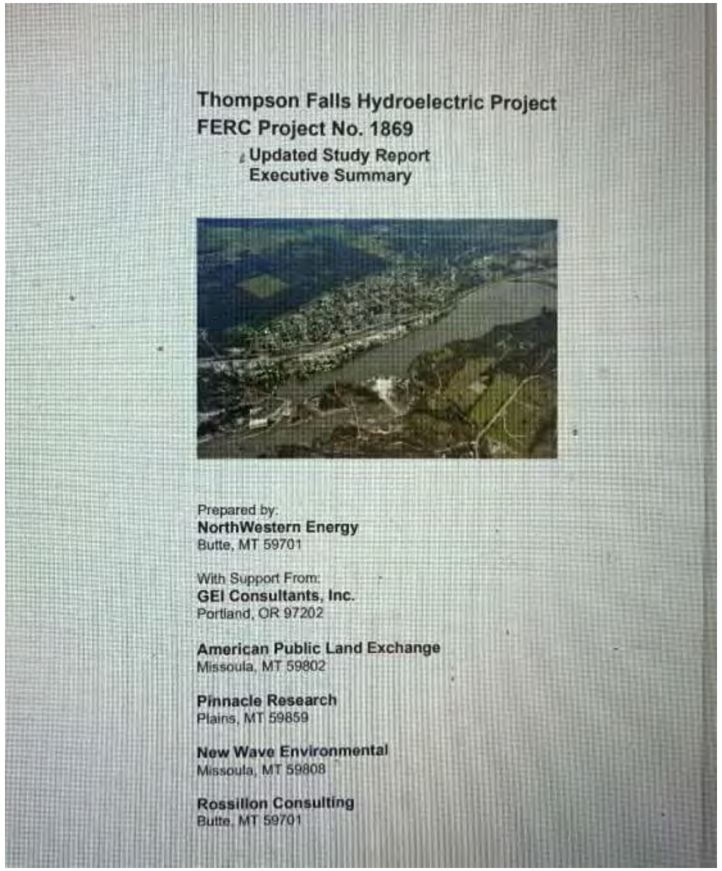
Delivering a Bright Future

Thompson Falls Hydroelectric Project Relicensing

Updated Study Report Meeting May 24, 2023

Welcome

- Introductions
- Safety Moment
- Purpose of the Meeting
- Review Relicensing Schedule
- Detailed Agenda
- Zoom Etiquette



Thompson Falls Hydroelectric Project
FERC Project No. 1869
Updated Study Report
Executive Summary

Prepared by:
NorthWestern Energy
Butte, MT 59701

With Support From:
GEI Consultants, Inc.
Portland, OR 97202

American Public Land Exchange
Missoula, MT 59802

Pinnacle Research
Plains, MT 59859

New Wave Environmental
Missoula, MT 59808

Rossillon Consulting
Butte, MT 59701

NorthWestern Energy
Delivering a Bright Future

Planting Trees

Planning Your Plant
Pick the right tree and the right place.

1. **Get measurements**. Get height and width for once the tree is fully grown.
2. **Call 811**. Before digging, call 811 or visit Call811.com to have underground utility lines marked for free.
3. **Look up**. If power lines are over the area where you want to plant, plan to plant roughly 20 feet away based on the mature size of your tree.
4. **Look down**. To be safe, plant at least 25 feet away from the flags that indicate underground natural gas lines.
5. **Look around**. If there are any ground-level transformers nearby, plant at least 10 feet away from the front

NorthWestern Energy
Delivering a Bright Future

Purpose of the Meeting

Discuss the second year study results

1. Hydraulic Conditions Study
2. Fish Behavior
3. Total Dissolved Gas
4. Cultural Resources
5. Environmental Justice
6. Operations Study

Submit written comments directly to FERC by July 9, 2023

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

NorthWestern Energy
Delivering a Bright Future

2023 ILP Schedule

	Pre-Filing Activity	Due Date
NorthWestern	File Updated Study Report	5/10/2023
Relicensing Participants	Hold Updated Study Report Meeting	5/25/2023
NorthWestern	File Updated Study Report Meeting Summary	6/9/2023
Relicensing Participants	File Comments on USR Summary /Study Requests	7/9/2023
NorthWestern	File Response to Comments/Study Requests	8/8/2023
FERC	Resolve USR Summary Disagreements and Study Plan Determination	9/7/2023
NorthWestern	File Draft License Application	8/3/2023
Relicensing Participants	File Comments Draft License Application	11/1/2023
NorthWestern	File License Application with DEQ for Major Facility Siting	12/31/2023
NorthWestern	File Final License Application	12/31/2023

NorthWestern Energy
Delivering a Bright Future

Today's Schedule

- 9:00-9:30 Introductions, Housekeeping
- 9:30-10:00 Hydraulic Conditions Study
- 10:00-10:30 Fish Behavior Study
  - Break
- 11:00-11.30 TDG Study
- 11:30-12:00 Cultural Resource Study
- 12:00-12:30 Environmental Justice Study
  - Lunch
- 1:00-2:00 Operations Study

Guidelines for Today's Meeting

- **In-person Participation**
  - **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Virtual Participation via Zoom**
  - **Video and Audio:** Keep OFF, unless you are speaking as a presenter or called on to ask a question. Phone controls for participants –*6 –to toggle mute/unmute.
  - **Technical Difficulties:** If you are having technical issues, please contact Lauren Gordon at 925.266.0419, lgordon@geiconsultants.com, or use the "Chat" function.
- **Accurate Attendance**
  - **In-person:** Be sure to sign-in.
  - **Zoom:** If you are shown by a phone number or abbreviated name, please send Lauren Gordon a message via "Chat" to capture your attendance.
- **Asking a Question**
  - **In-person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.
  - **Zoom:** During the Q&A–click on the "Chat" icon and type your question or click on the "Raise Your Hand" icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question. Phone controls for participants –*9 –to raise hand.
- **Agenda**
  - The time for each segment of the schedule will be maintained.

NorthWestern Energy
Delivering a Bright Future

NorthWestern® Energy

Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Hydraulic Conditions Study

Updated Study Plan Meeting

May 24th, 2023

- Background
- Computational Fluid Dynamics (CFD) Modeling
- Phase 1 CFD Modeling
- Phase 2 CFD Modeling

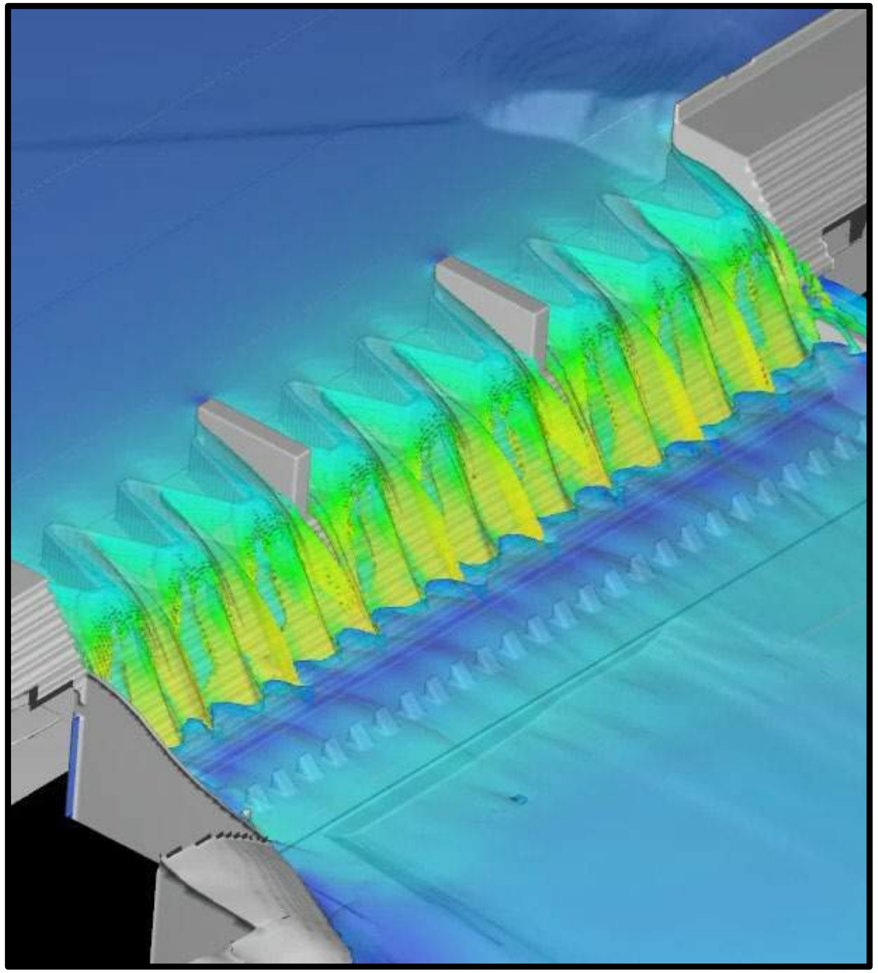
- 2008 Biological Opinion required a scientific review of the fish passage facility.
- Recommended a hydraulic study in the area downstream of the fish passage facility
- Hydraulic Modeling results to be combined with fish tracking data to evaluate the effectiveness of the fish passage facility.

NorthWestern Energy
Delivering a Bright Future

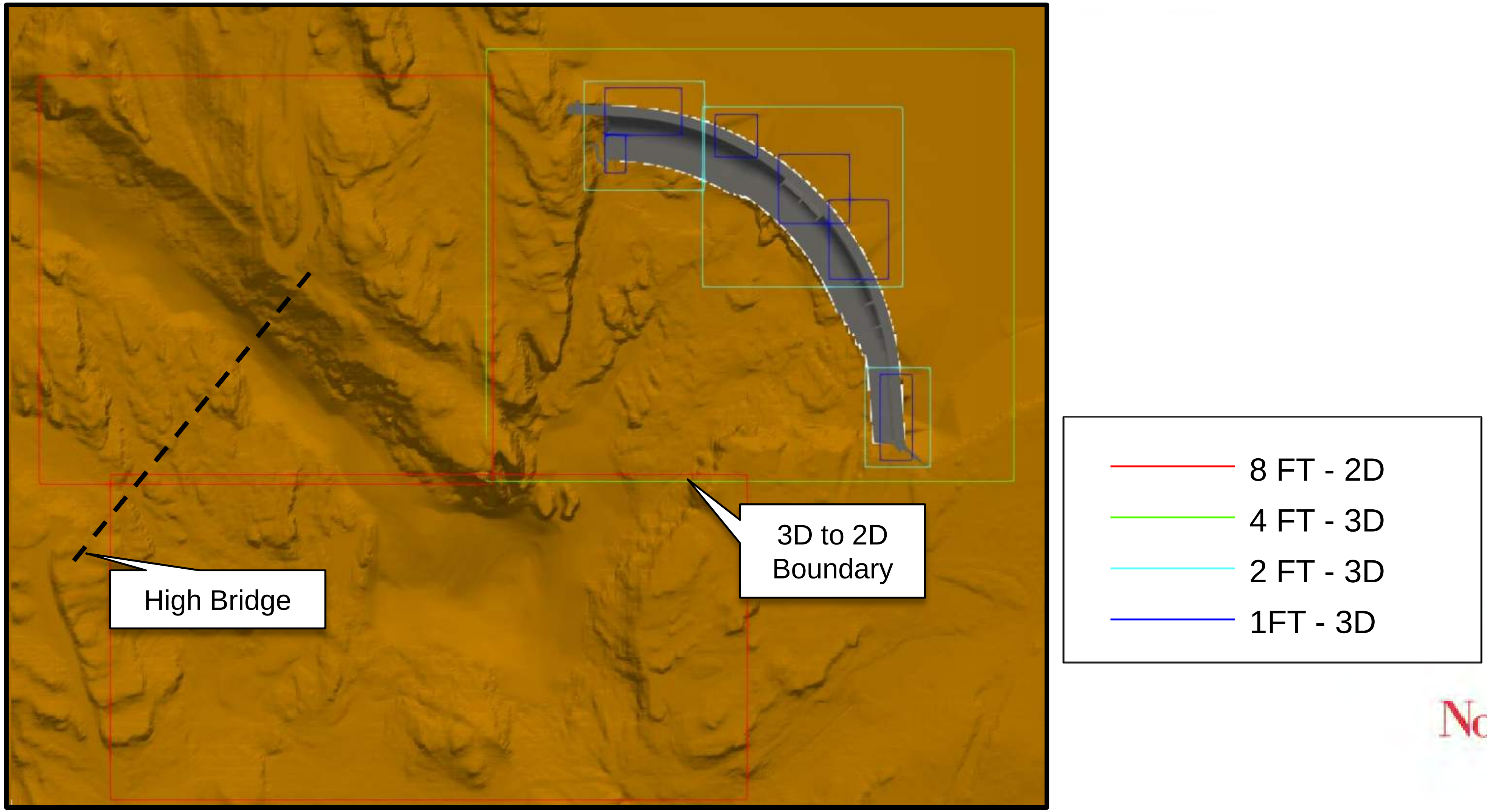
Study Area in the FERC-approved Study Plan

NorthWestern Energy
Delivering a Bright Future

- Computational fluid dynamics (CFD) is a numerical modeling technique.
- The technique involves dividing a fluid domain into a mesh of small computational cells.
- Governing equations for fluid motion such as conservation of mass, momentum, and energy are solved inside each cell at each time step.

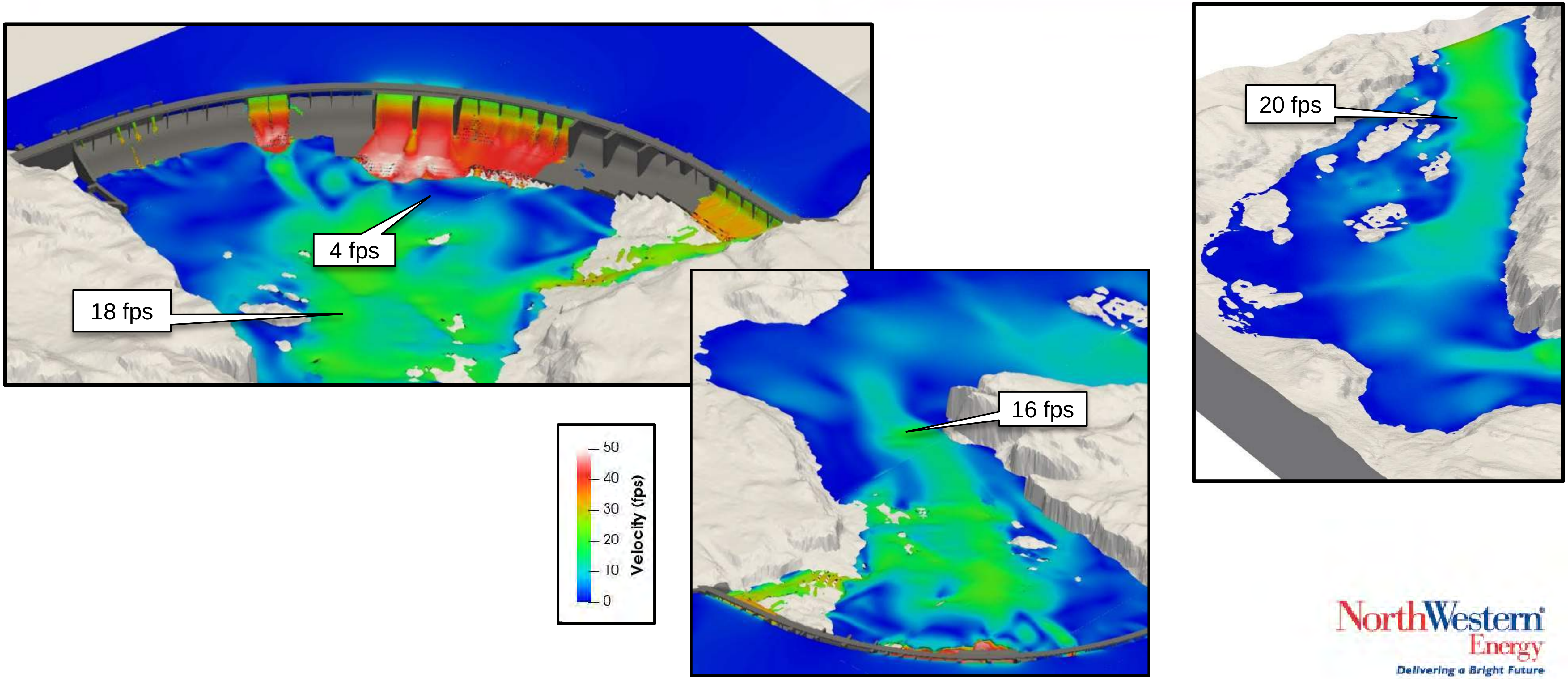


- Mesh block configuration

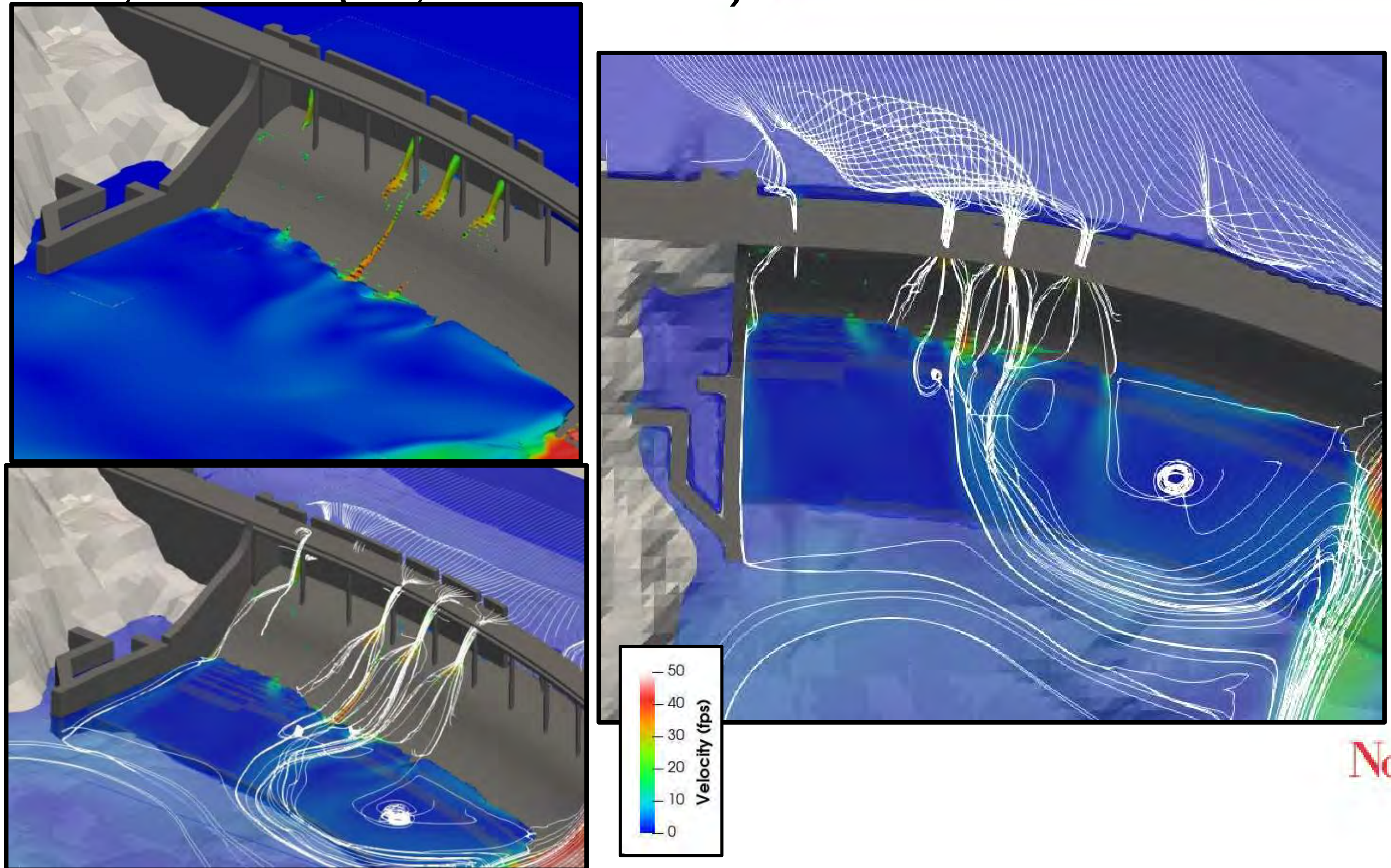


Phase 1 CFD Modeling

- 37,000 cfs (60,000 cfs total)

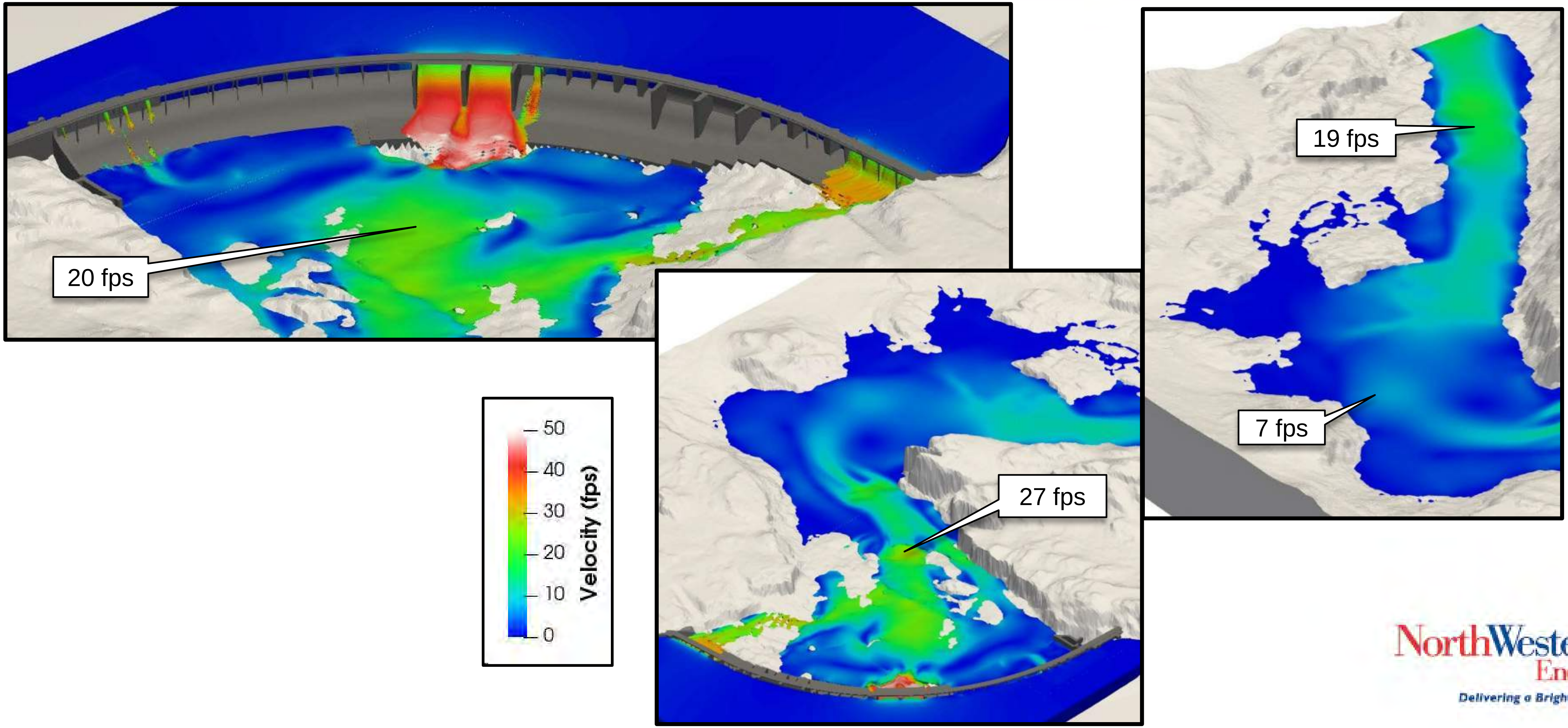


- 37,000 cfs (60,000 cfs total)



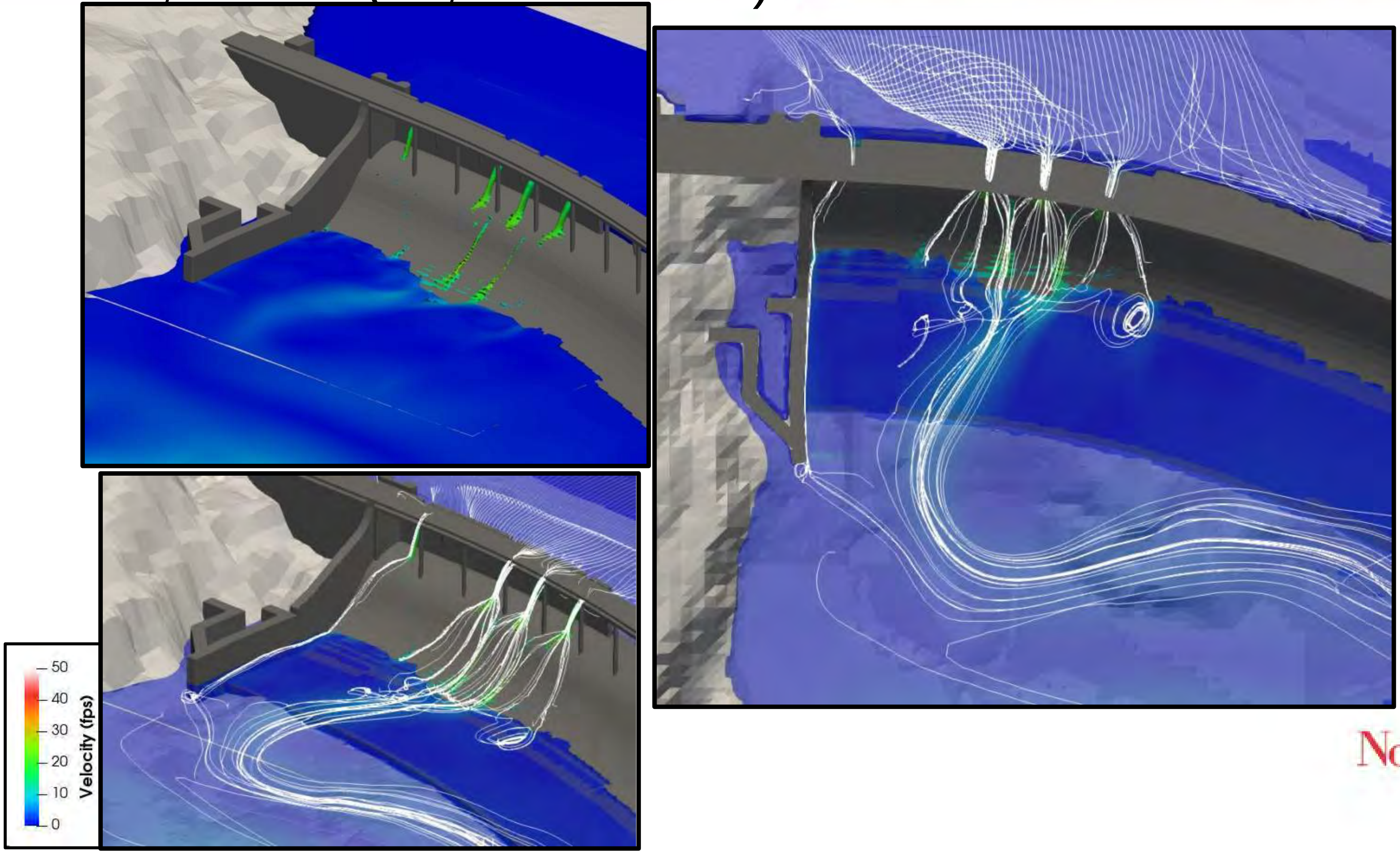
NorthWestern Energy
Delivering a Bright Future

- 25,000 cfs (48,000 cfs total)

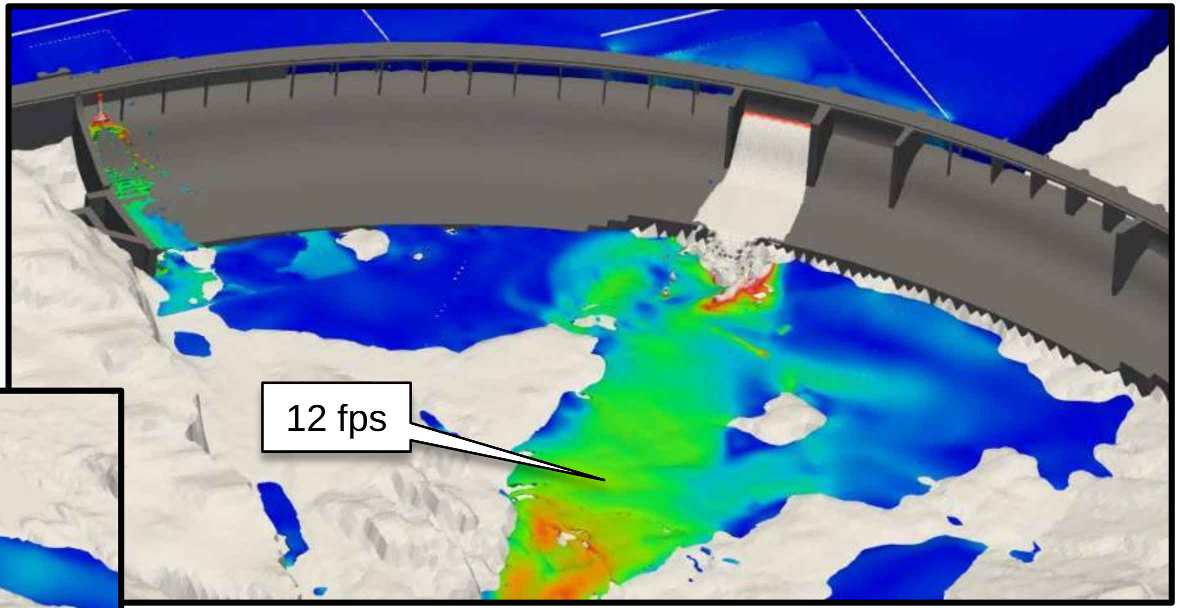


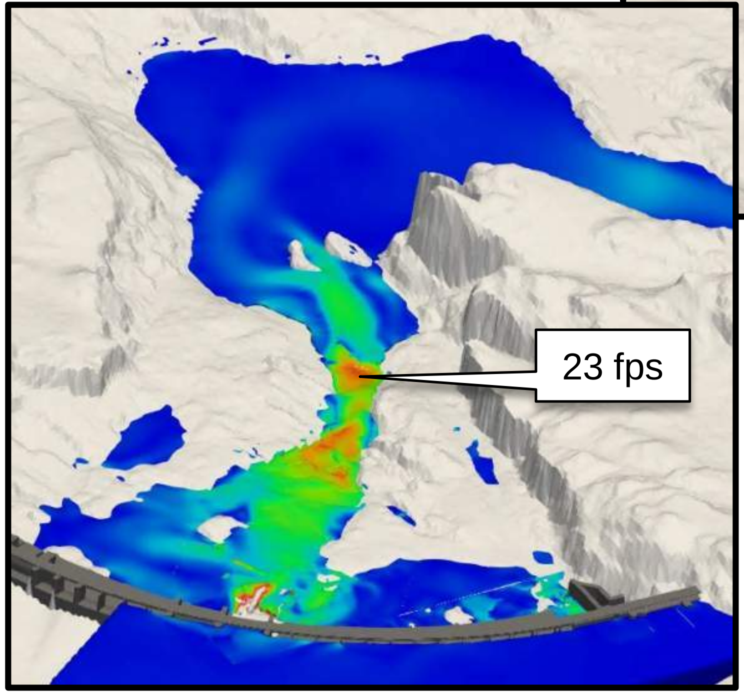
NorthWestern Energy
Delivering a Bright Future

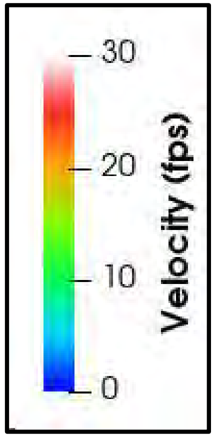
- 25,000 cfs (48,000 cfs total)

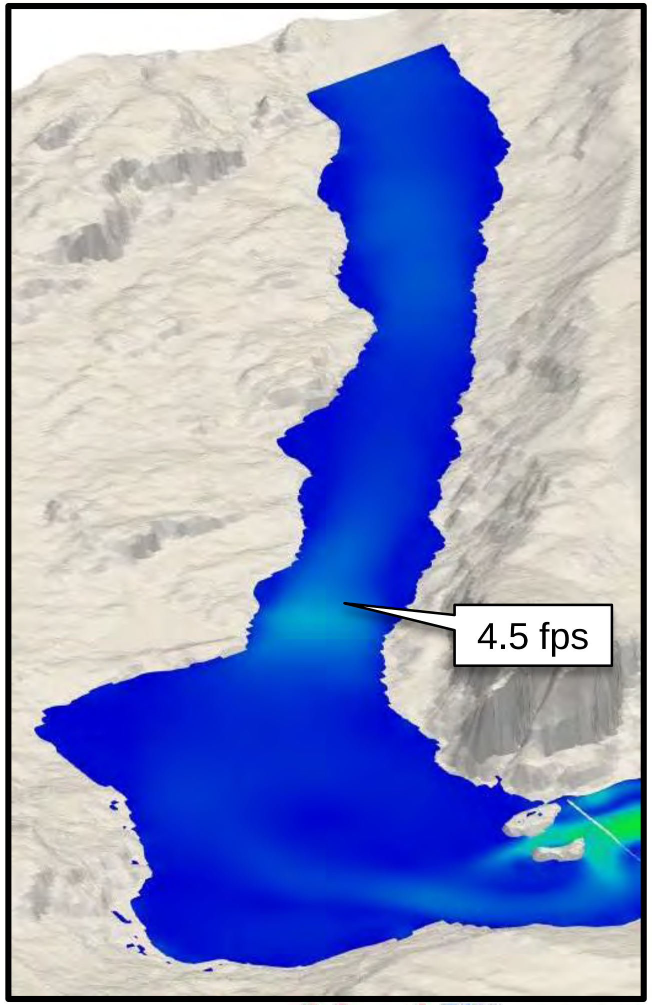


- 2,000 cfs (25,000 cfs total)

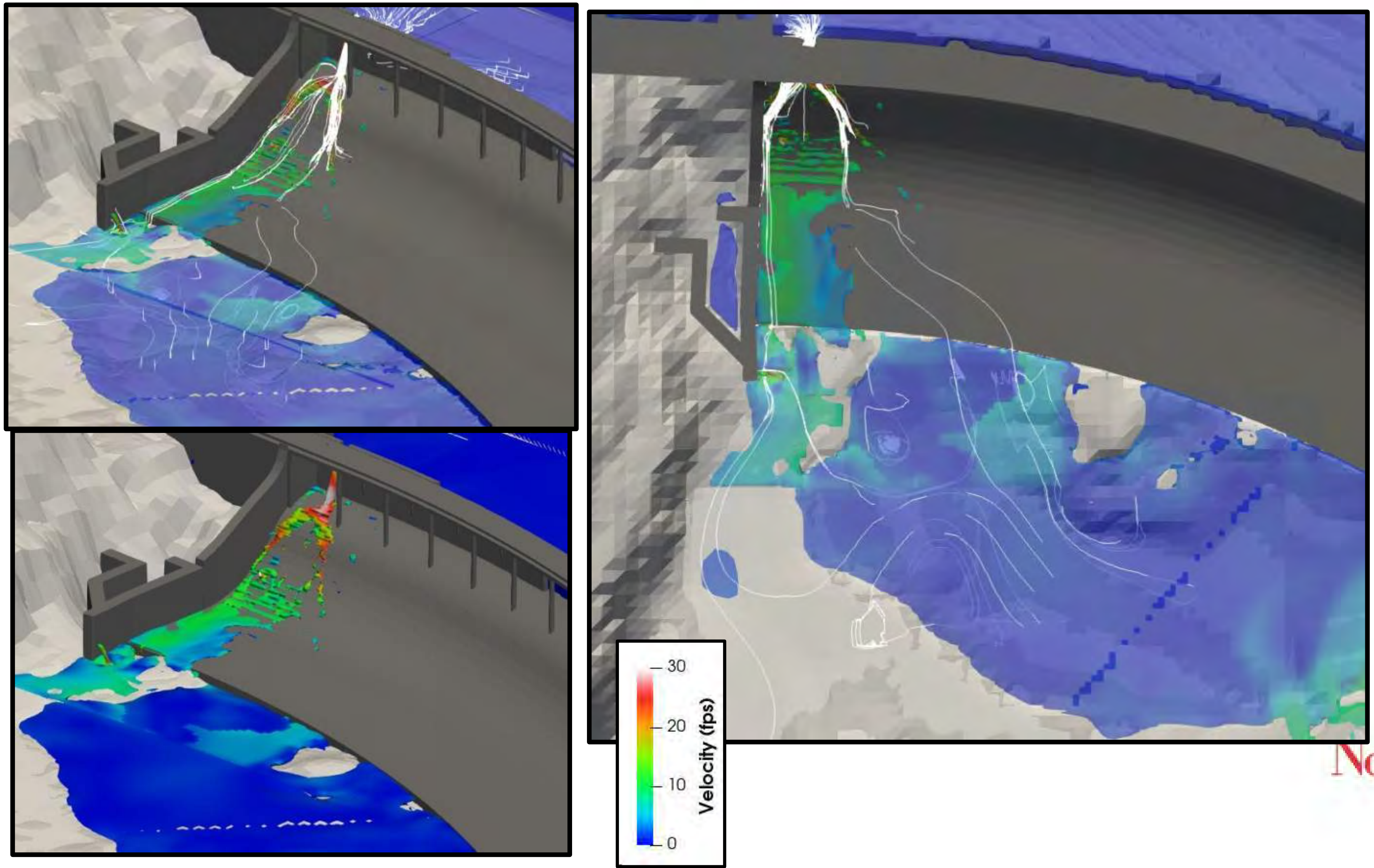








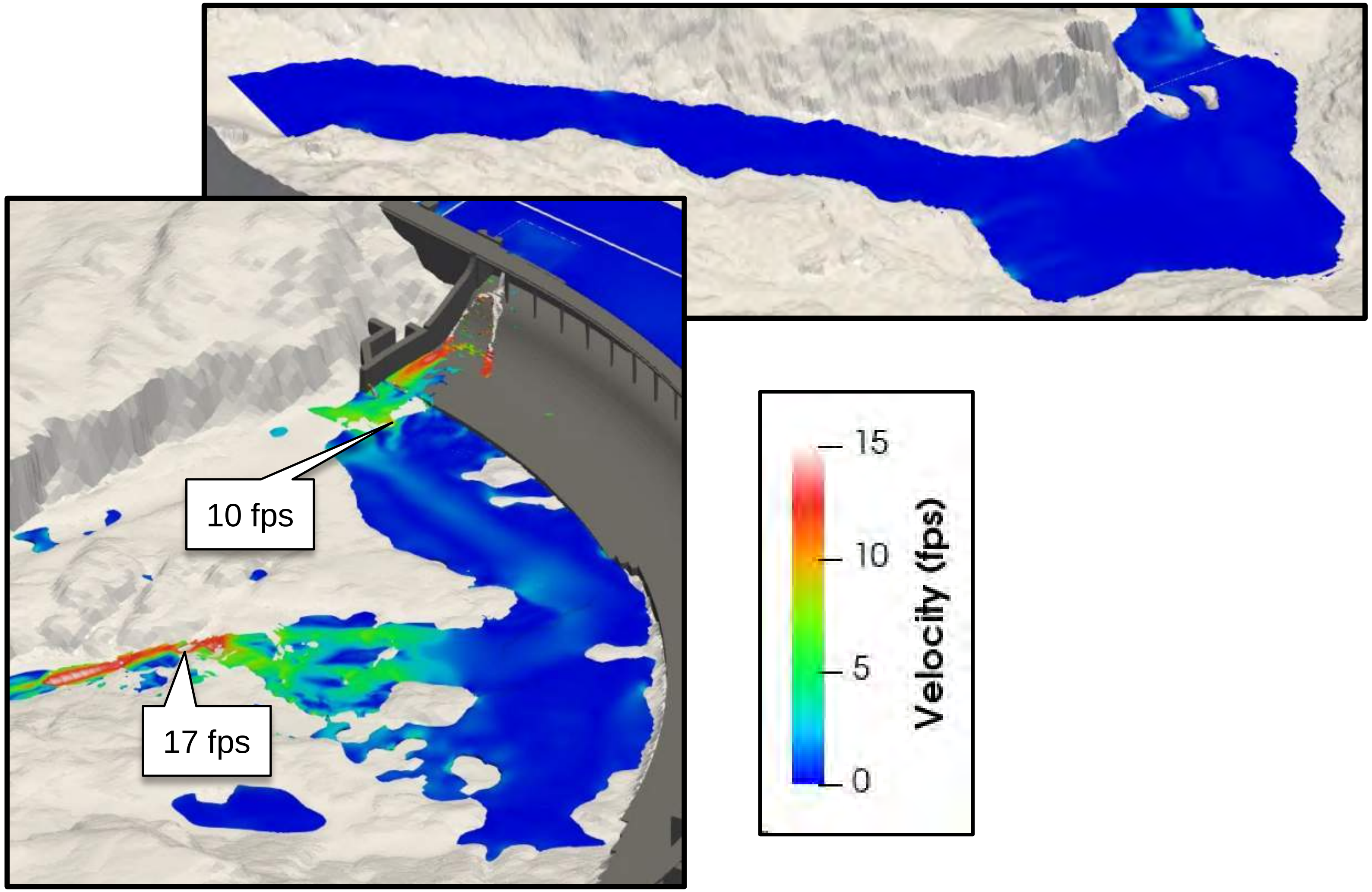
- 2,000 cfs (25,000 cfs total)

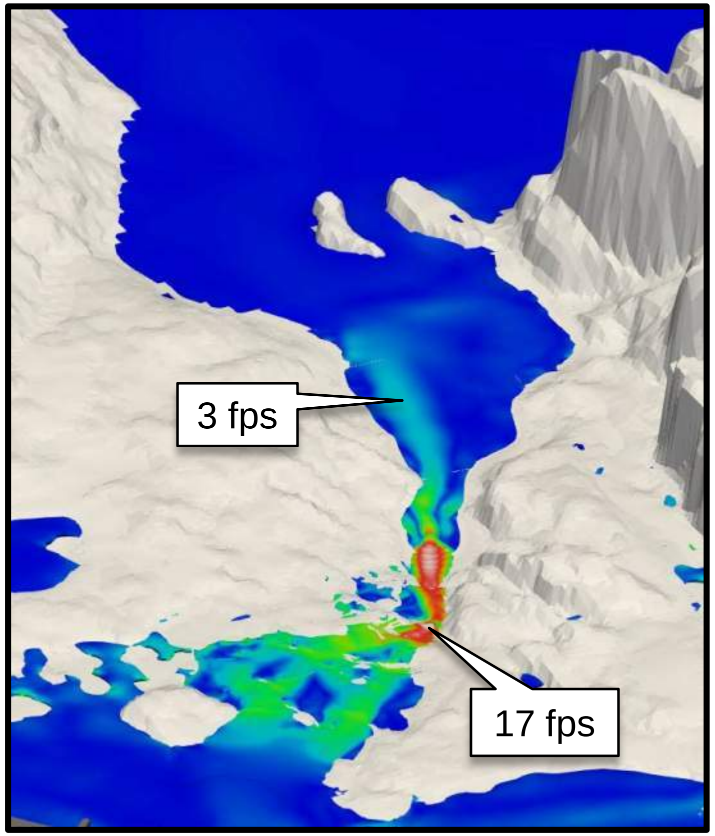


NorthWestern Energy
Delivering a Bright Future

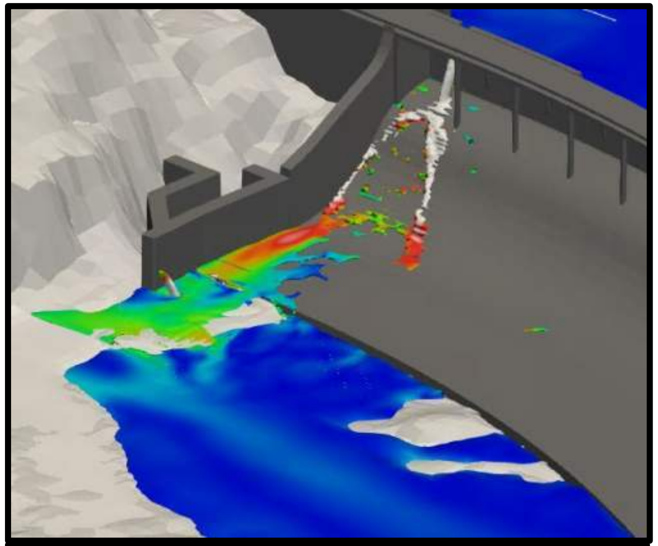
Phase 1 CFD Modeling

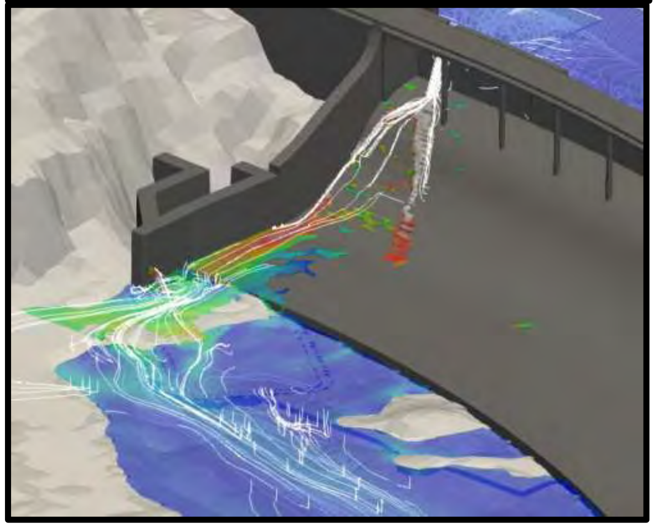
- 200 cfs (<23,000 cfs total)

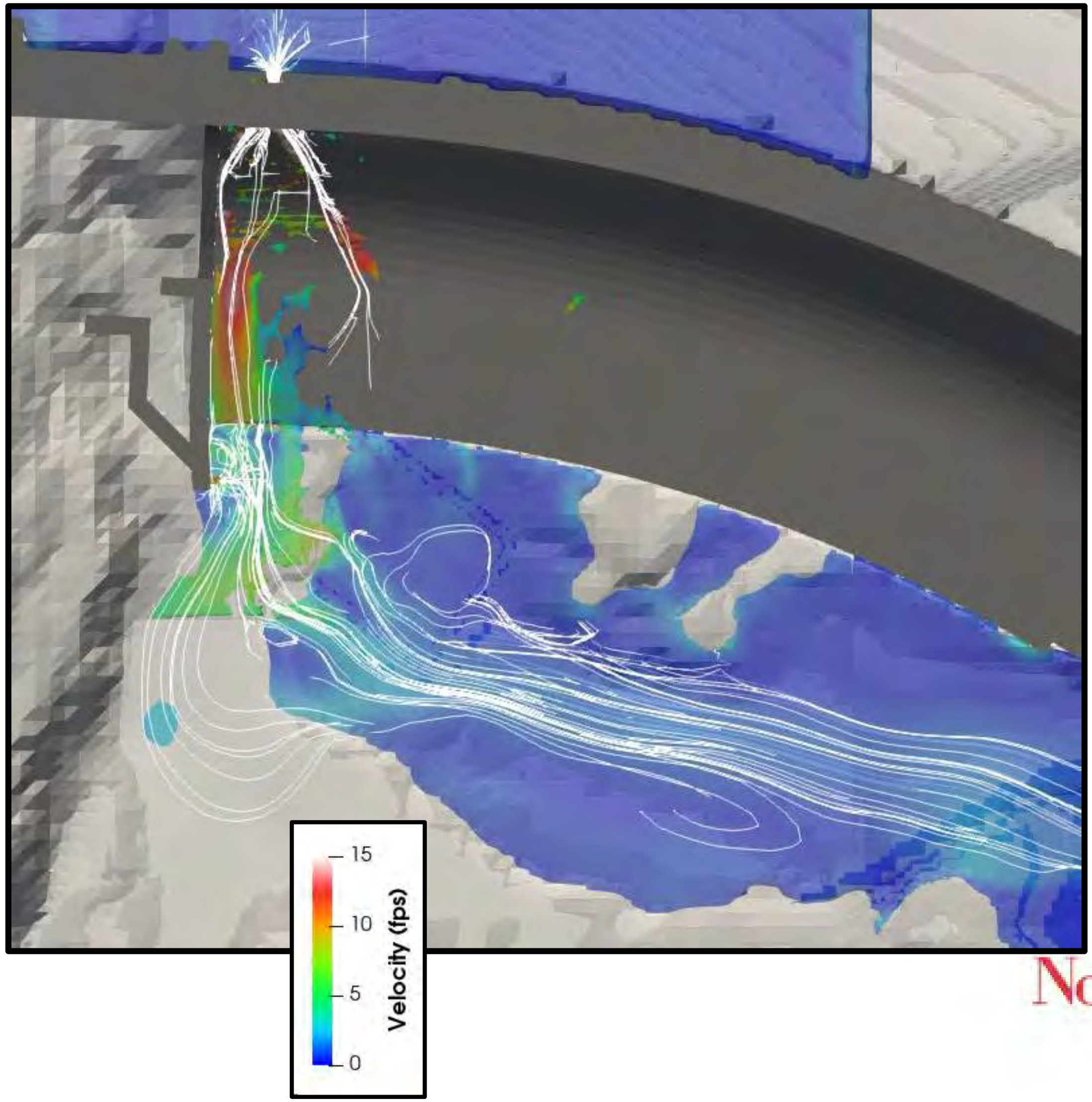




- 200 cfs (<23,000 cfs total)







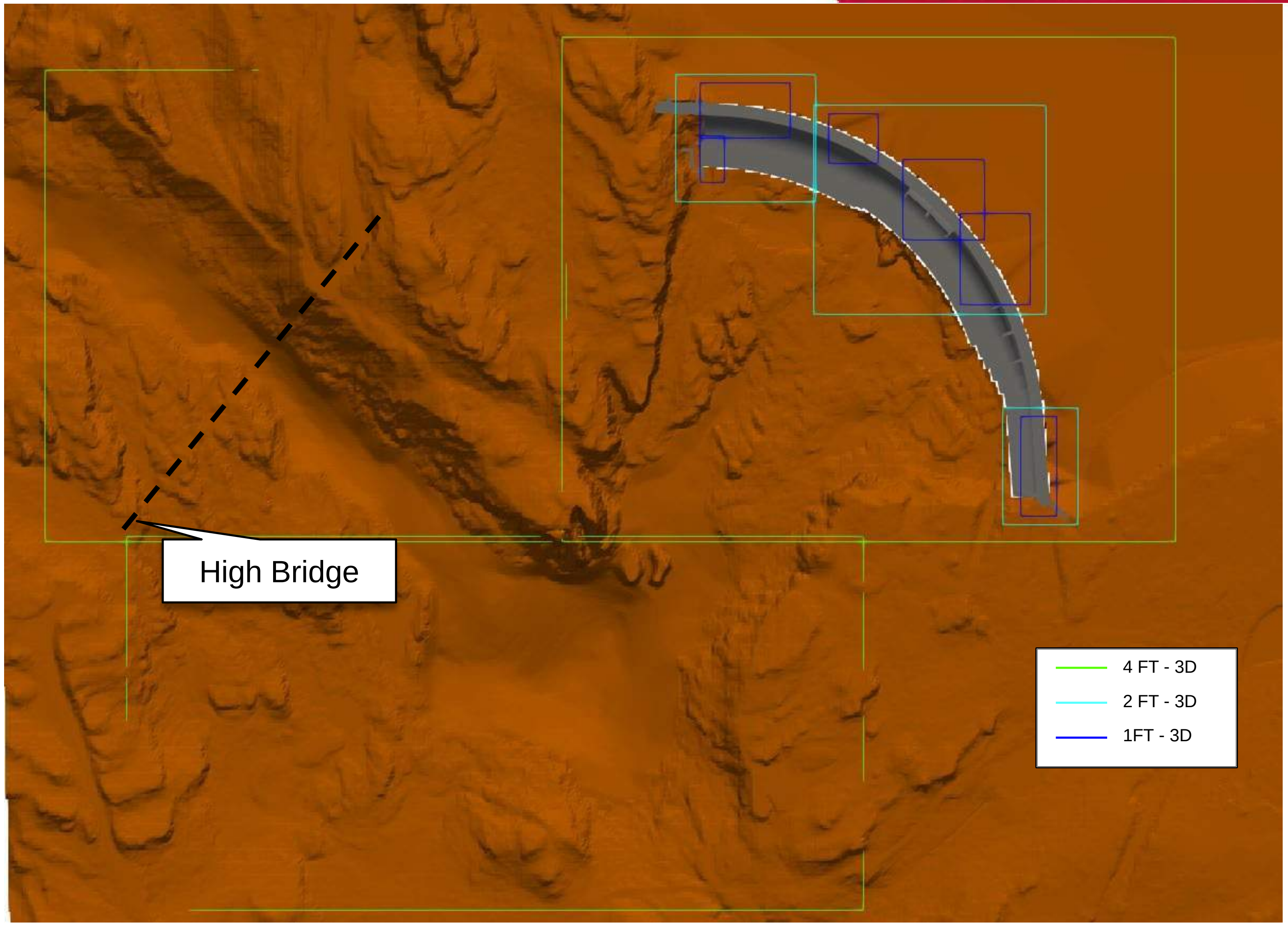
NorthWestern Energy
Delivering a Bright Future

Phase 2 CFD Modeling

- Phase 2 analyzed full model domain with 3D modeling in order to analyze vertical velocity distribution in critical areas
- Evaluated flows of 37,000 and 2,000 cfs.
- Identified 3 critical areas: ladder entrance, falls, and High Bridge.
- Results evaluated based on 3 categories of fish swimming ability.

NorthWestern Energy
Delivering a Bright Future

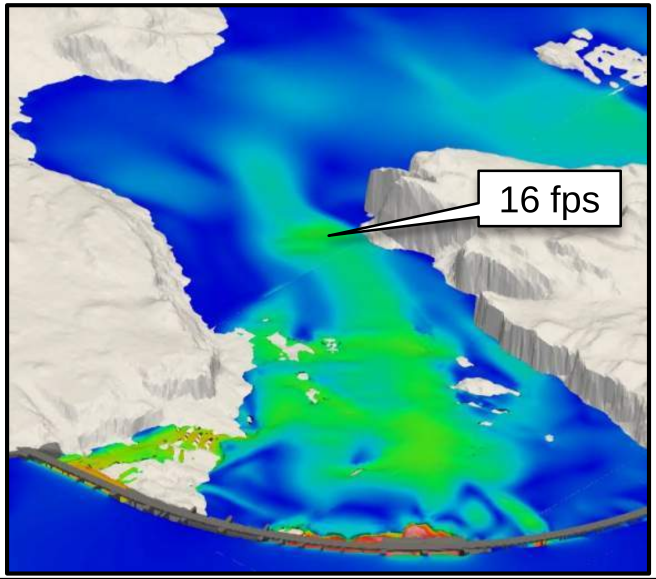
Phase 2 CFD Modeling

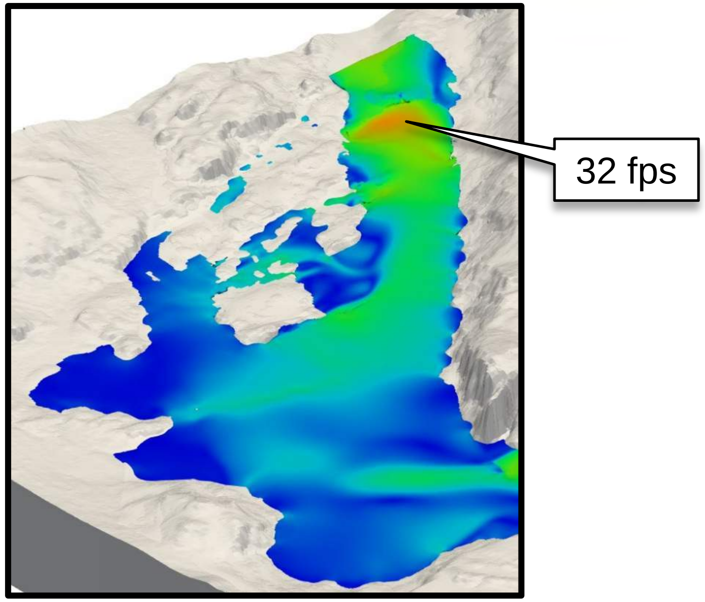


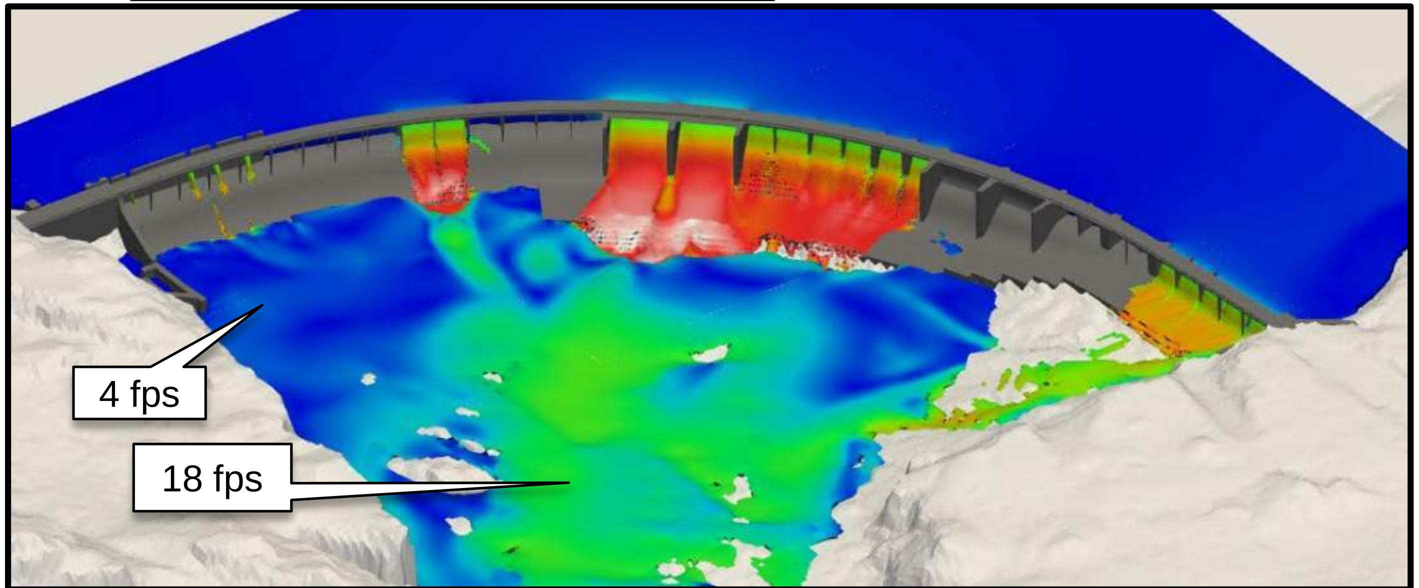
NorthWestern Energy
Delivering a Bright Future

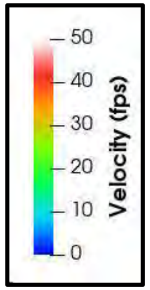
Phase 2 CFD Modeling

- 37,000 cfs (60,000 cfs total)

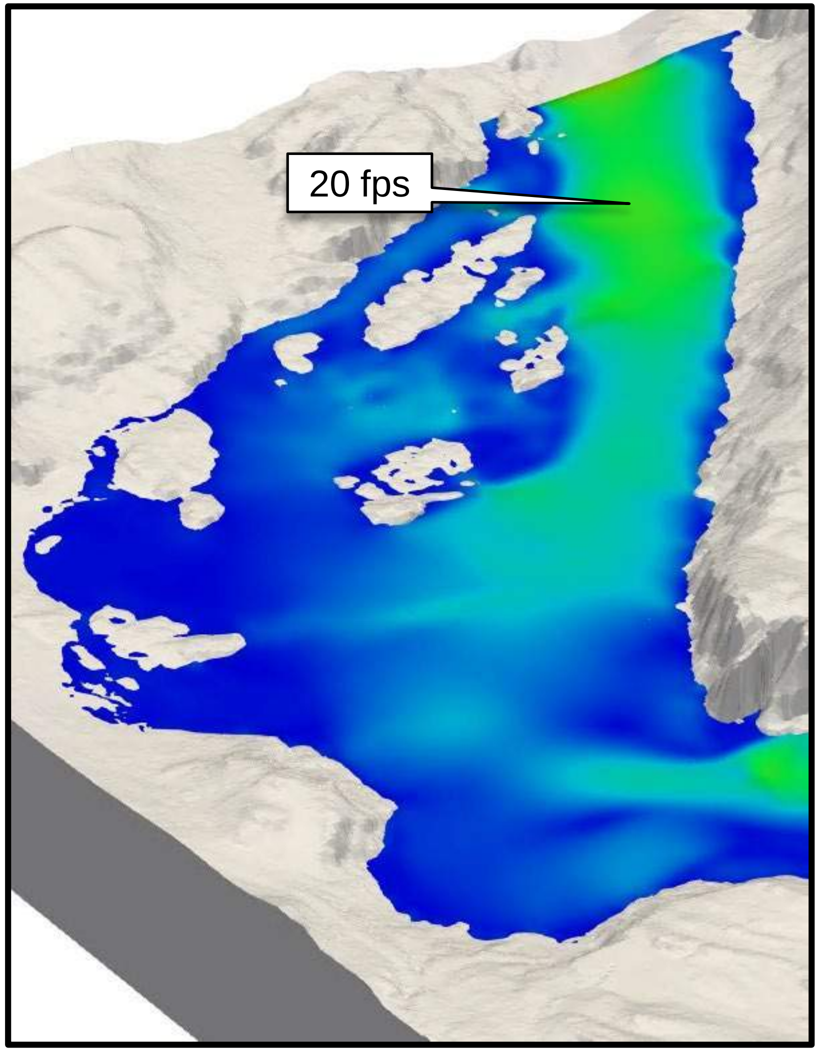




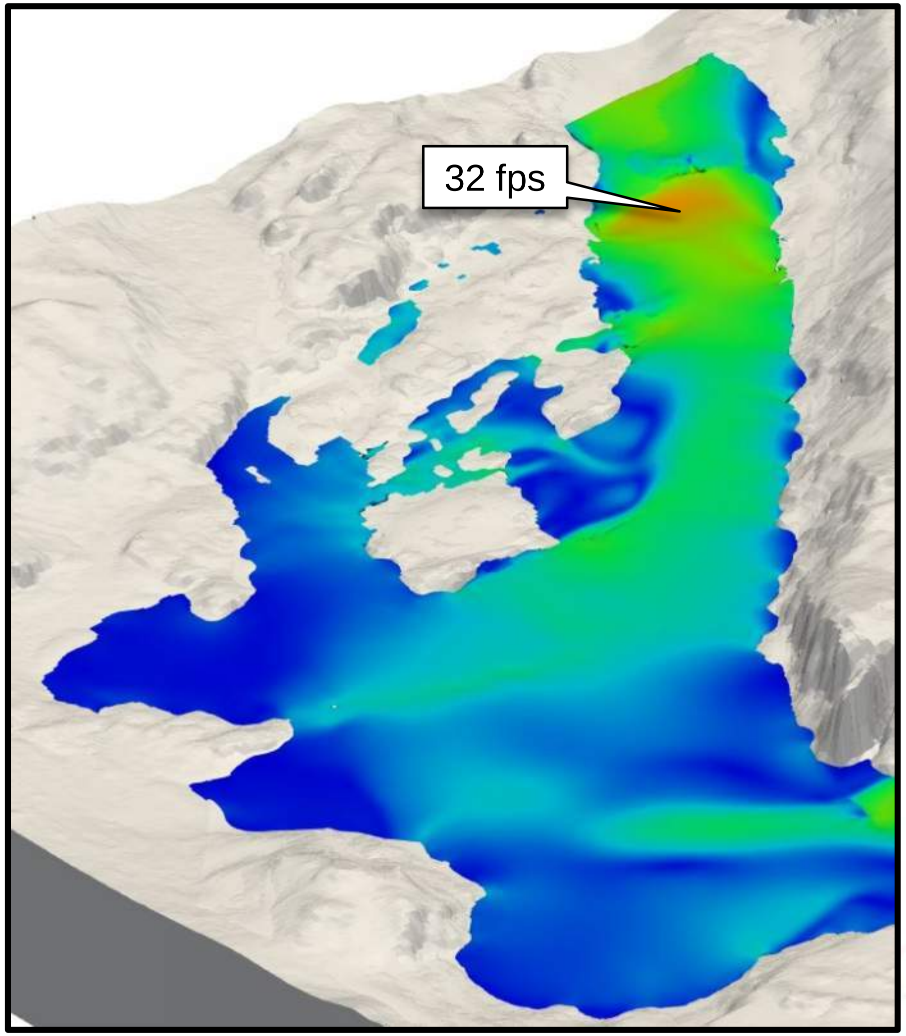




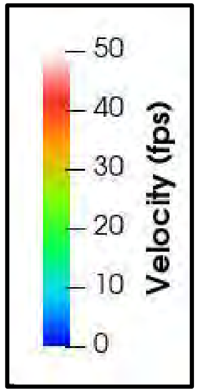
- 37,000 cfs (60,000 cfs total)



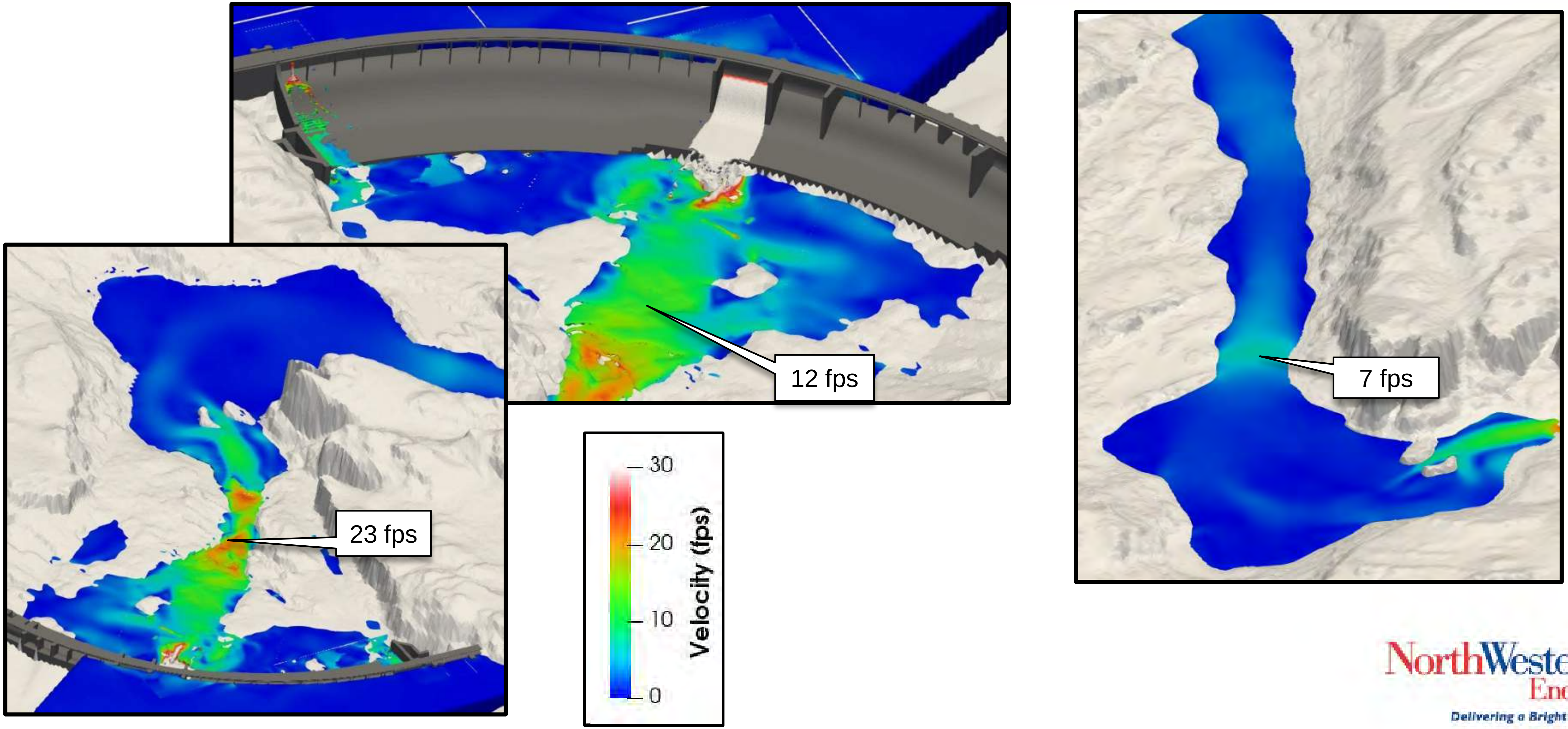
Phase 1 – 2D Mesh



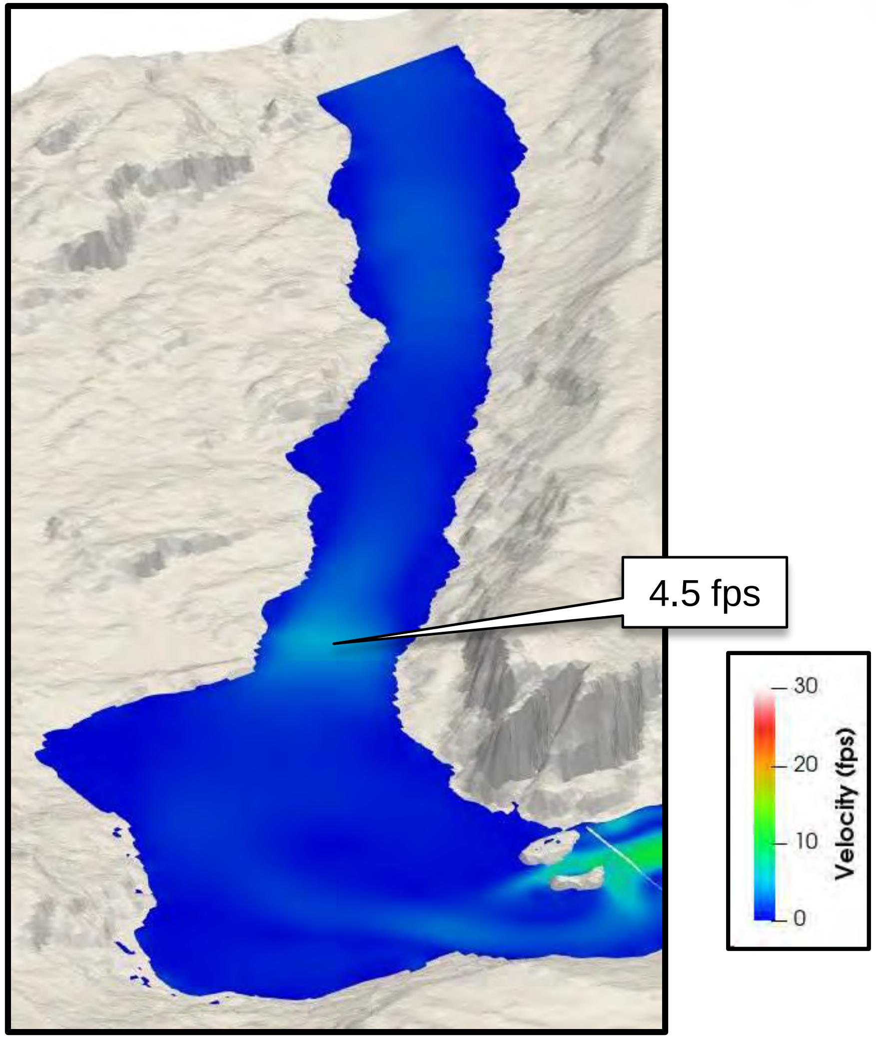
Phase 2 – 3D Mesh



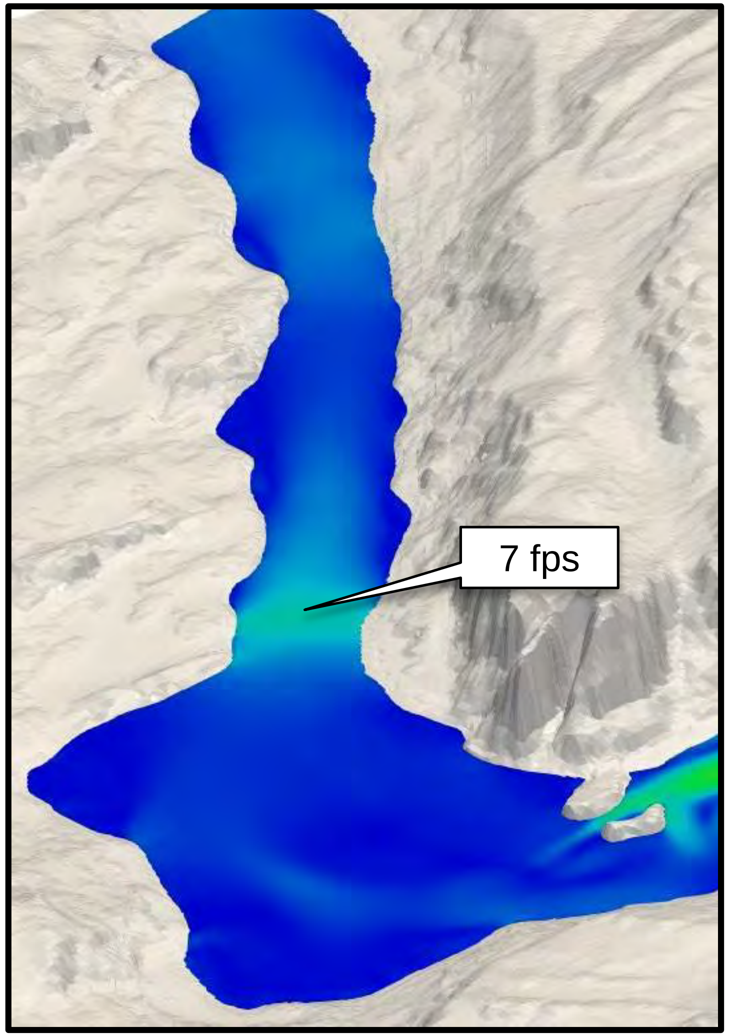
• 2,000 cfs (25,000 cfs total)



- 2,000 cfs (25,000 cfs total)



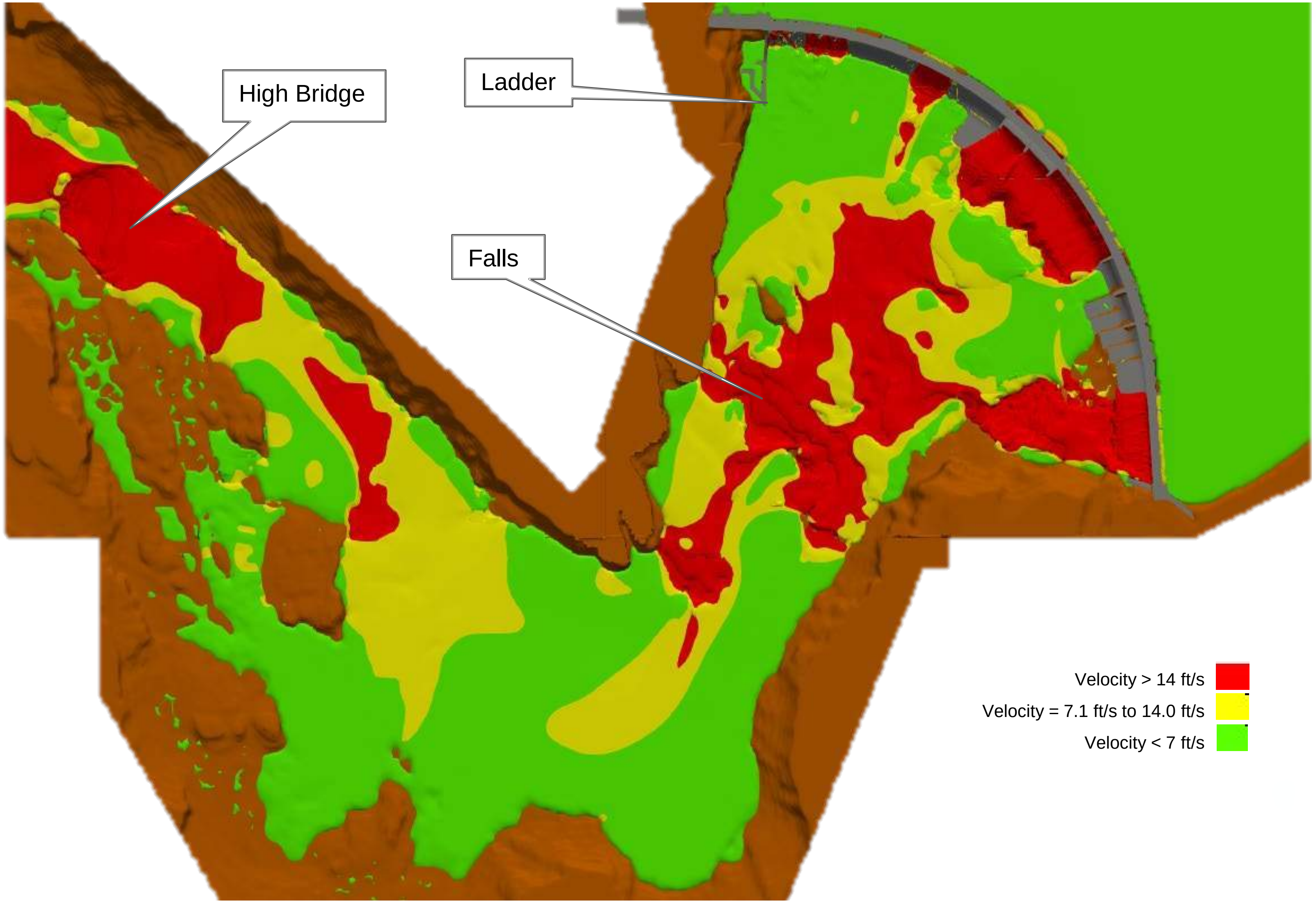
Phase 1 – 2D Mesh



Phase 2 – 3D Mesh

NorthWestern Energy
Delivering a Bright Future

- 37,000 cfs (60,000 cfs total)

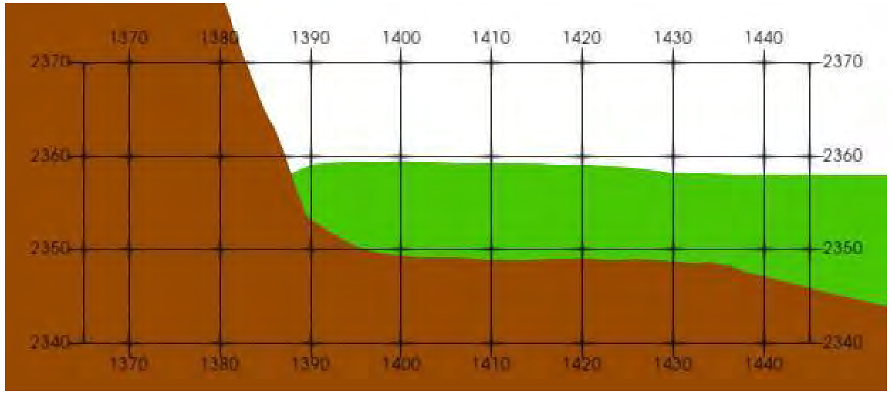


Phase 2 CFD Modeling

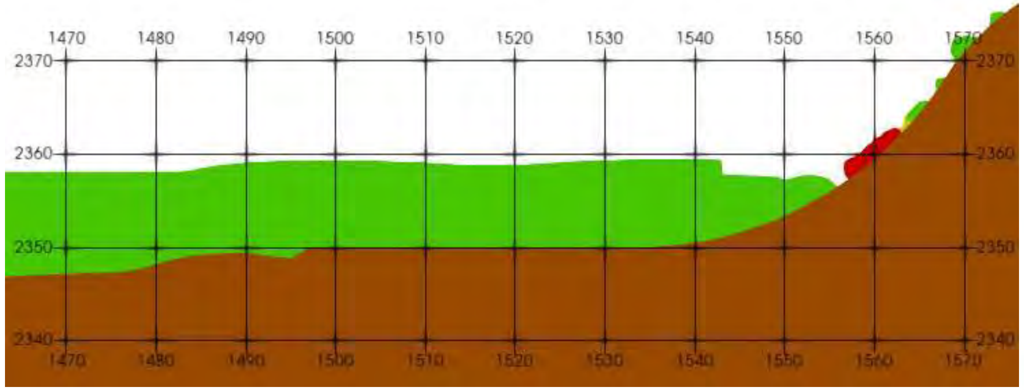
- 37,000 cfs (60,000 cfs total) - Ladder

Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

Plan

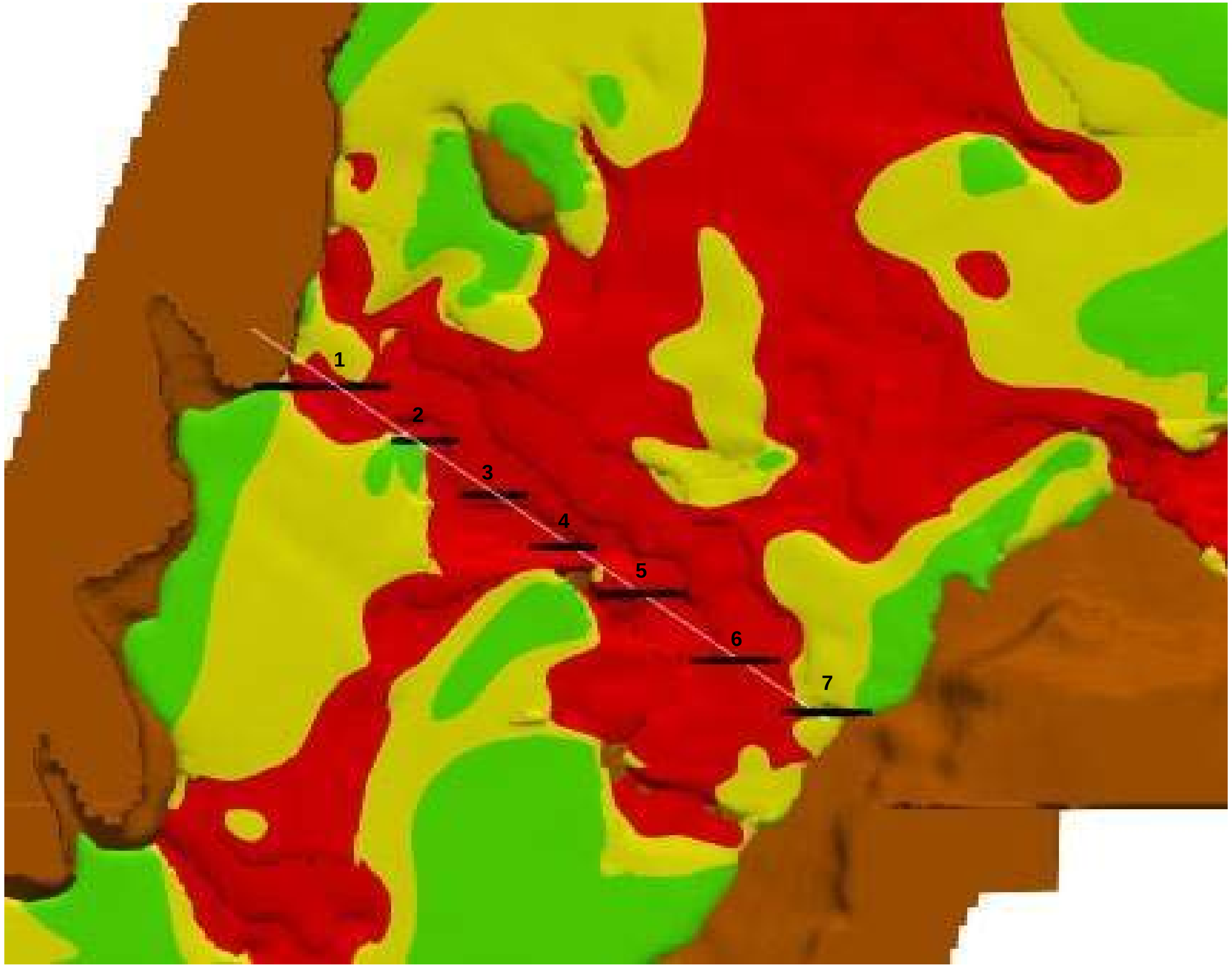


Section 1



Section 2

- 37,000 cfs (60,000 cfs total) - Falls



Velocity > 14 ft/s

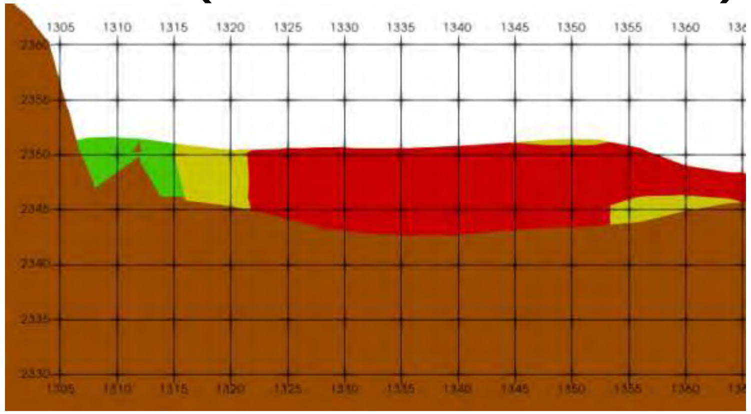
Velocity = 7.1 ft/s to 14.0 ft/s

Velocity < 7 ft/s

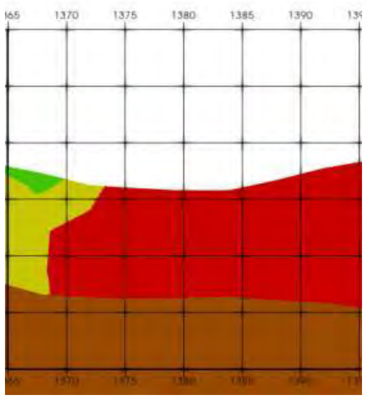
NorthWestern Energy

Delivering a Bright Future

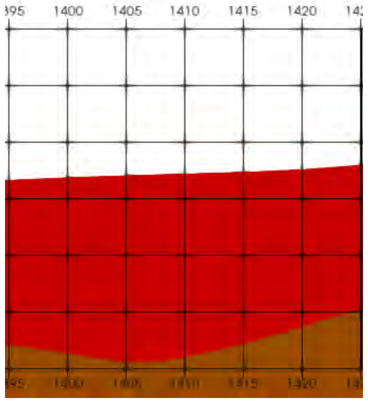
- 37,000 cfs (60,000 cfs total) - Falls



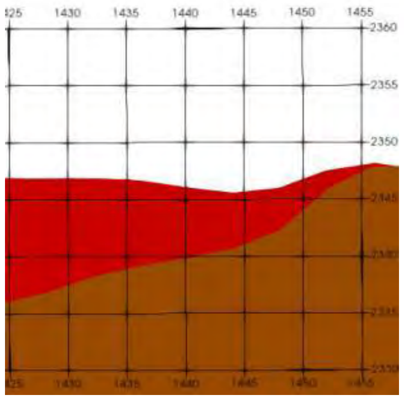
1



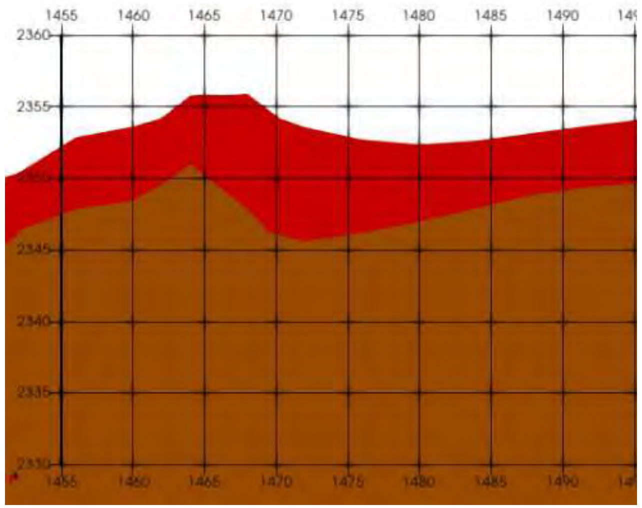
2



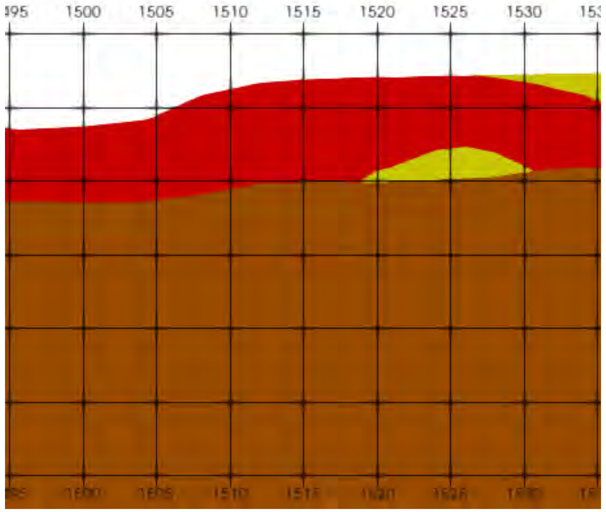
3



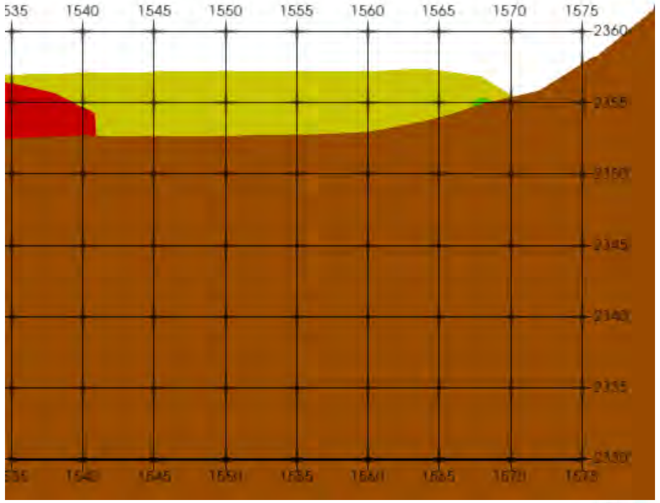
4



5



6



7

Velocity > 14 ft/s

Velocity = 7.1 ft/s to 14.0 ft/s

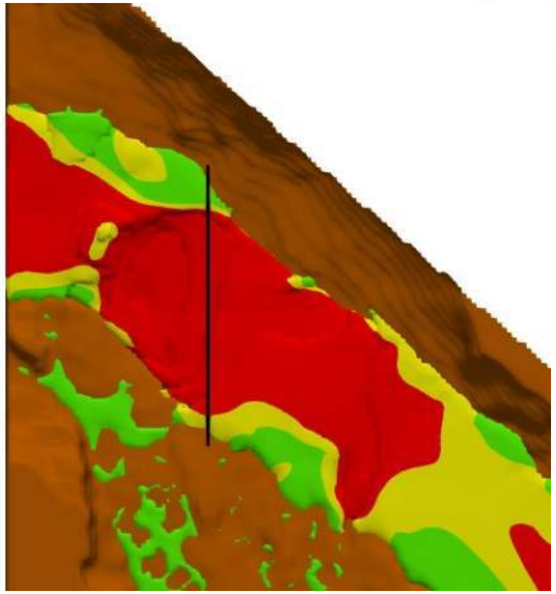
Velocity < 7 ft/s

NorthWestern Energy

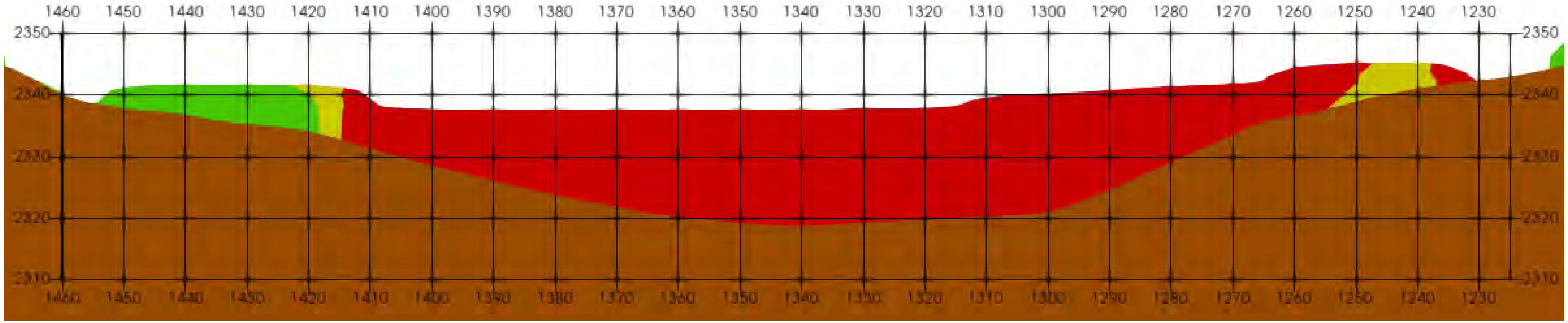
Delivering a Bright Future

Phase 2 CFD Modeling

- 37,000 cfs (60,000 cfs total) – High Bridge

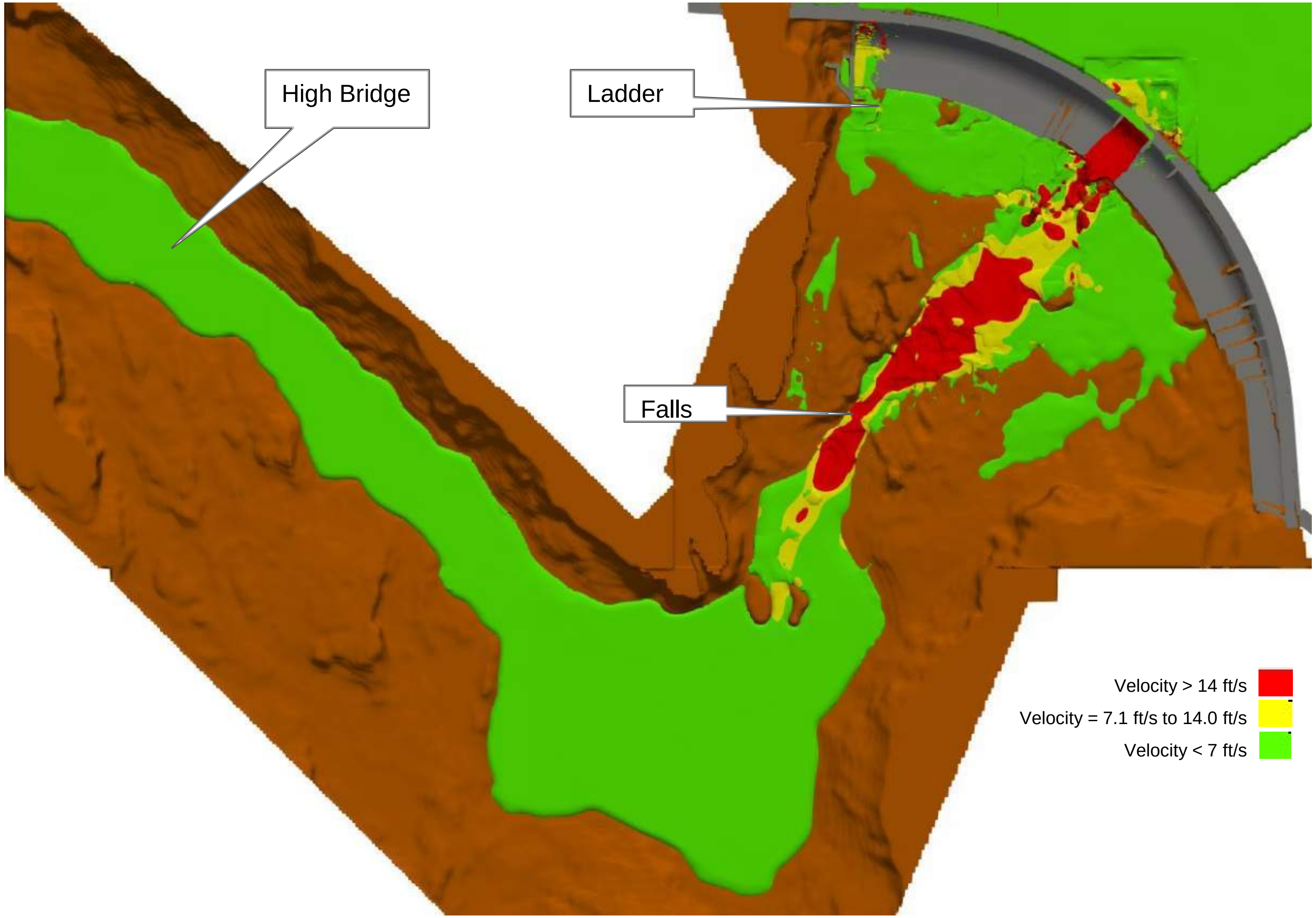


Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

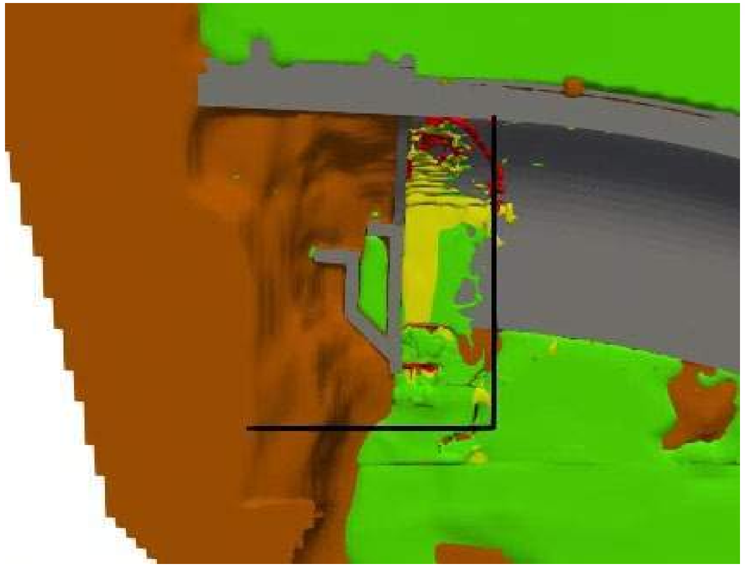


NorthWestern Energy
Delivering a Bright Future

- 2,000 cfs (25,000 cfs total)

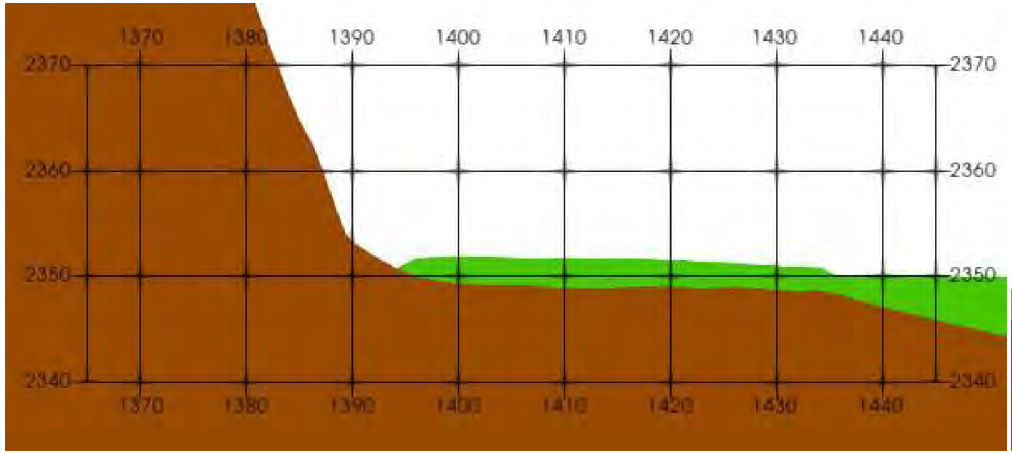


- 2,000 cfs (25,000 cfs total) - Ladder

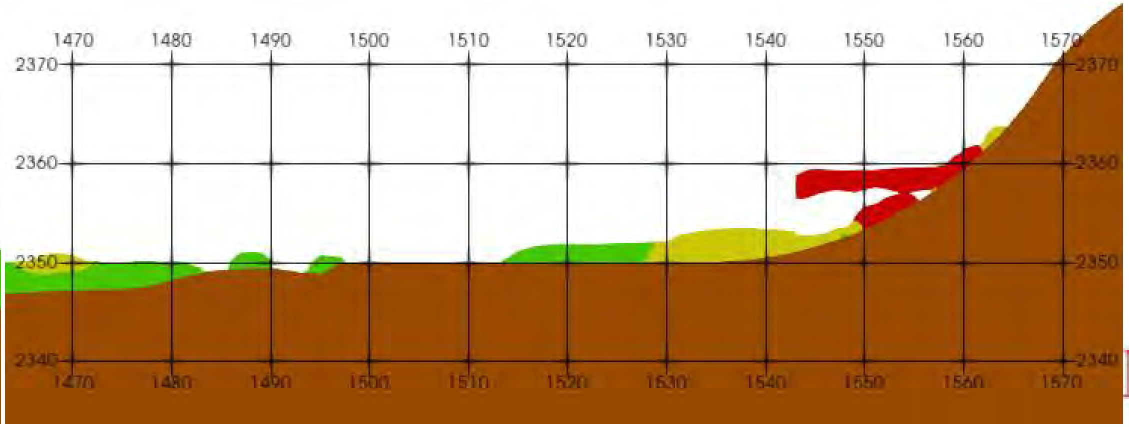


Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

Plan



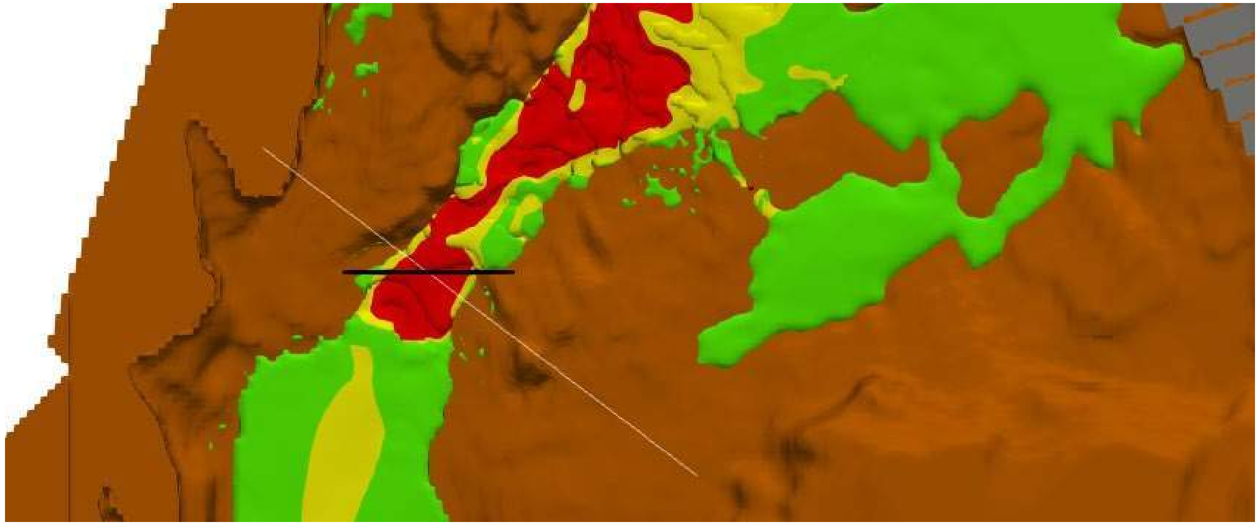
Section 1



Section 2

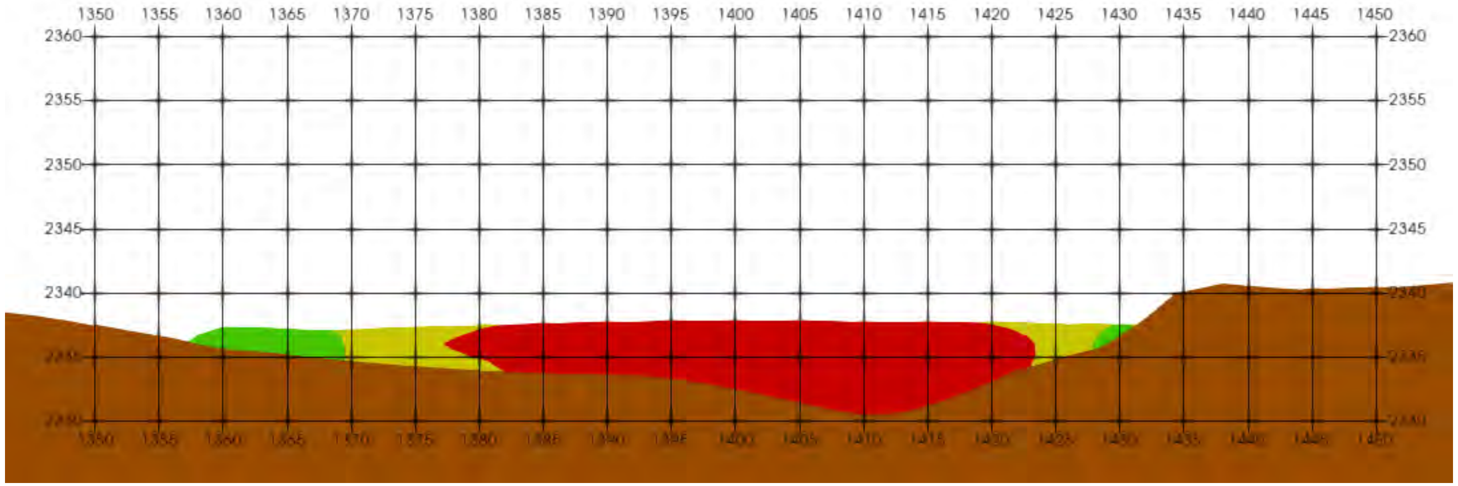
NorthWestern Energy
Delivering a Bright Future

- 2,000 cfs (25,000 cfs total) - Falls



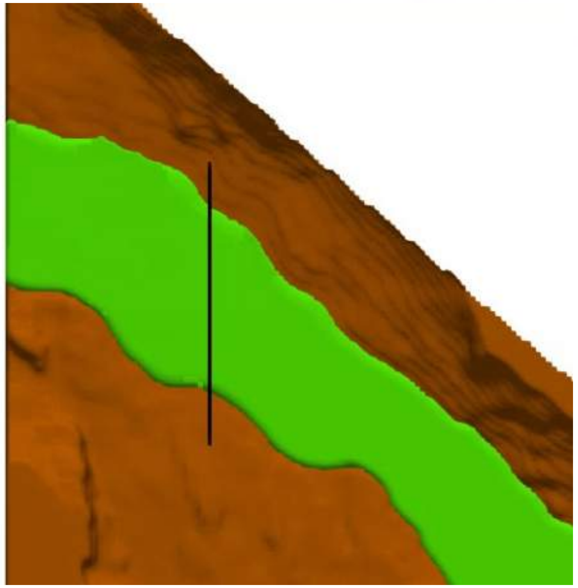
Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

Plan



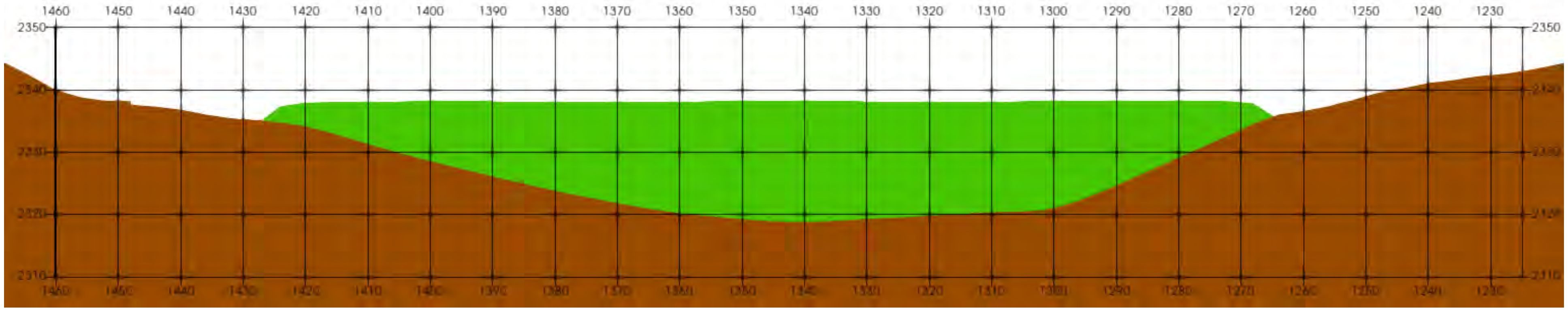
Section (Looking Upstream)

- 2,000 cfs (25,000 cfs total) – High Bridge



Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

Plan



Section 1

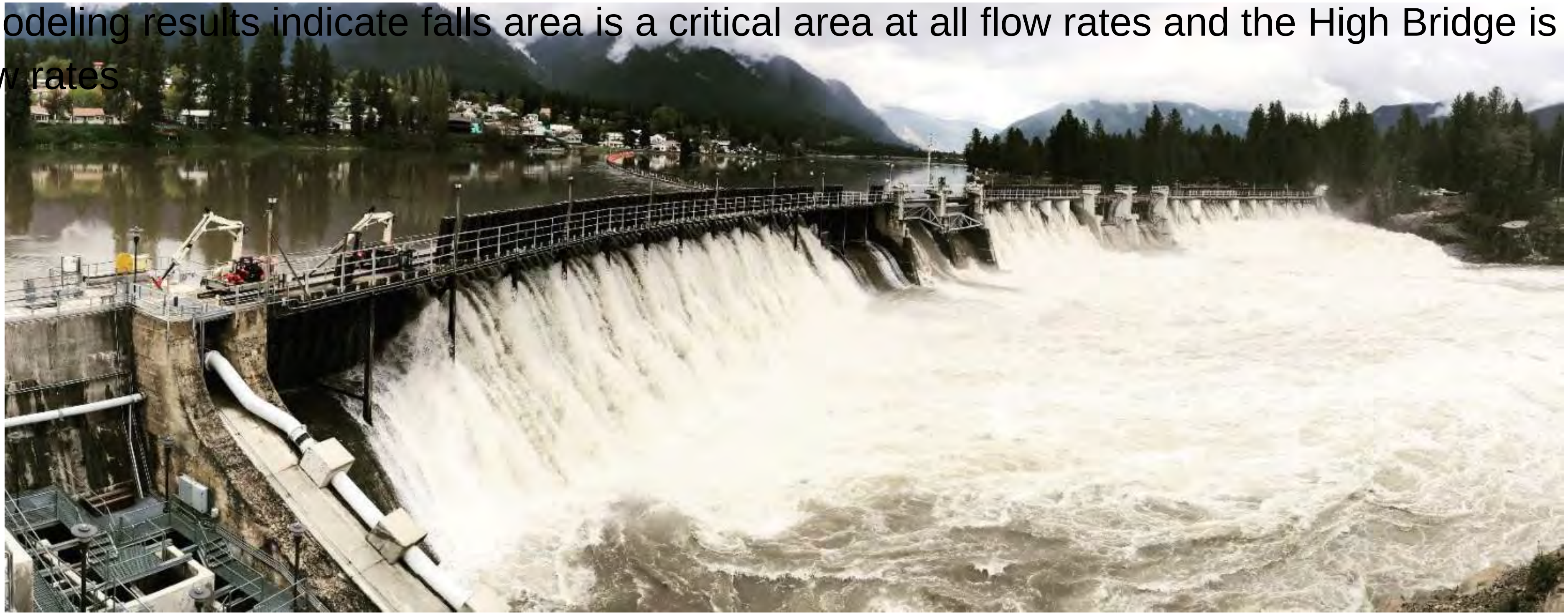
NorthWestern Energy
Delivering a Bright Future

- Phase 2 CFD Modeling Results

Location	Ladder Entrance		Falls Area		High Bridge	
Flow Rate (cfs)	37,000	2,000	37,000	2,000	37,000	2,000
Velocity Range (ft/sec)	Percent of Cross-Sectional Area (%)					
0-7.0	100	79	2	8	7	100
7.1-14.0	0	21	14	16	4	0
>14.0	0	0	84	76	89	0

• Phase 2 CFD Modeling Results

- Ladder entrance generally below 7 fps, with negligible areas exceeding 14 fps, indicating no obstacles to fish passage.
- Falls area largely exceeded 14 fps, with limited areas below 7 fps, indicating a potential obstacle to fish passage.
- High Bridge area results varied with flow rate, with majority exceeding 14 fps at higher flow and all velocities under 7 fps at low flow.
- CFD modeling results indicate falls area is a critical area at all flow rates and the High Bridge is a critical area at high flow rates



NorthWestern Energy
Delivering a Bright Future

- Questions?

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question; once recognized, please unmute yourself, introduce yourself, and ask your question.
  - Click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, introduce yourself, and ask your question
    - Phone controls for participants –*9 –to raise hand.
    - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

Delivering a **bright future**

NorthWestern Energy®

Connect With Us:

NorthWesternEnergy.com

NorthWestern Energy

Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Updated Study Plan Meeting – Fish Behavior Study

May 24, 2023

Fish Behavior Study Background

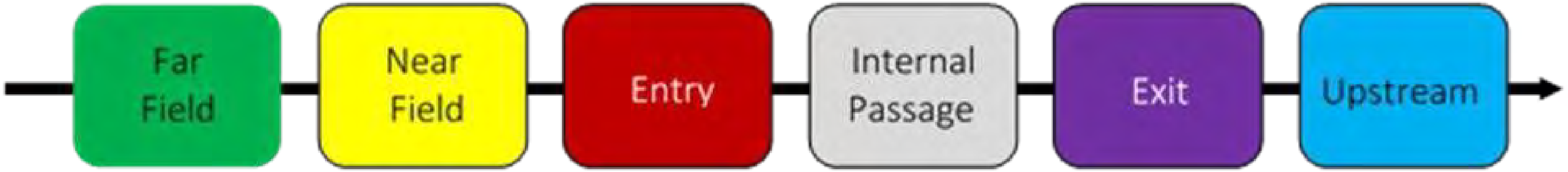
- Current FERC License and Biological Opinion required NorthWestern in collaboration with the TAC to form a scientific panel to evaluate the fish passage facility, with emphasis on Bull trout.
- One data gap identified by the panel was a quantitative evaluation of the proportion of motivated fish entering the zone of passage (ZOP) and finding the passage facility entrance.
- Study is a result of the Thompson Falls Scientific Review Panel recommendation (2020).

NorthWestern Energy
Delivering a Bright Future

Fish Behavior Goals & Objectives

- Evaluate upstream fish movement through the Project's zone of influence
  - Evaluate proportion of radio tagged fish that enter the ZOP and find the fish passage facility entrance
  - Measure the duration of time and pathway(s) of these movements during various flow conditions

Fish Behavior Study – Zone of Passage (ZOP)

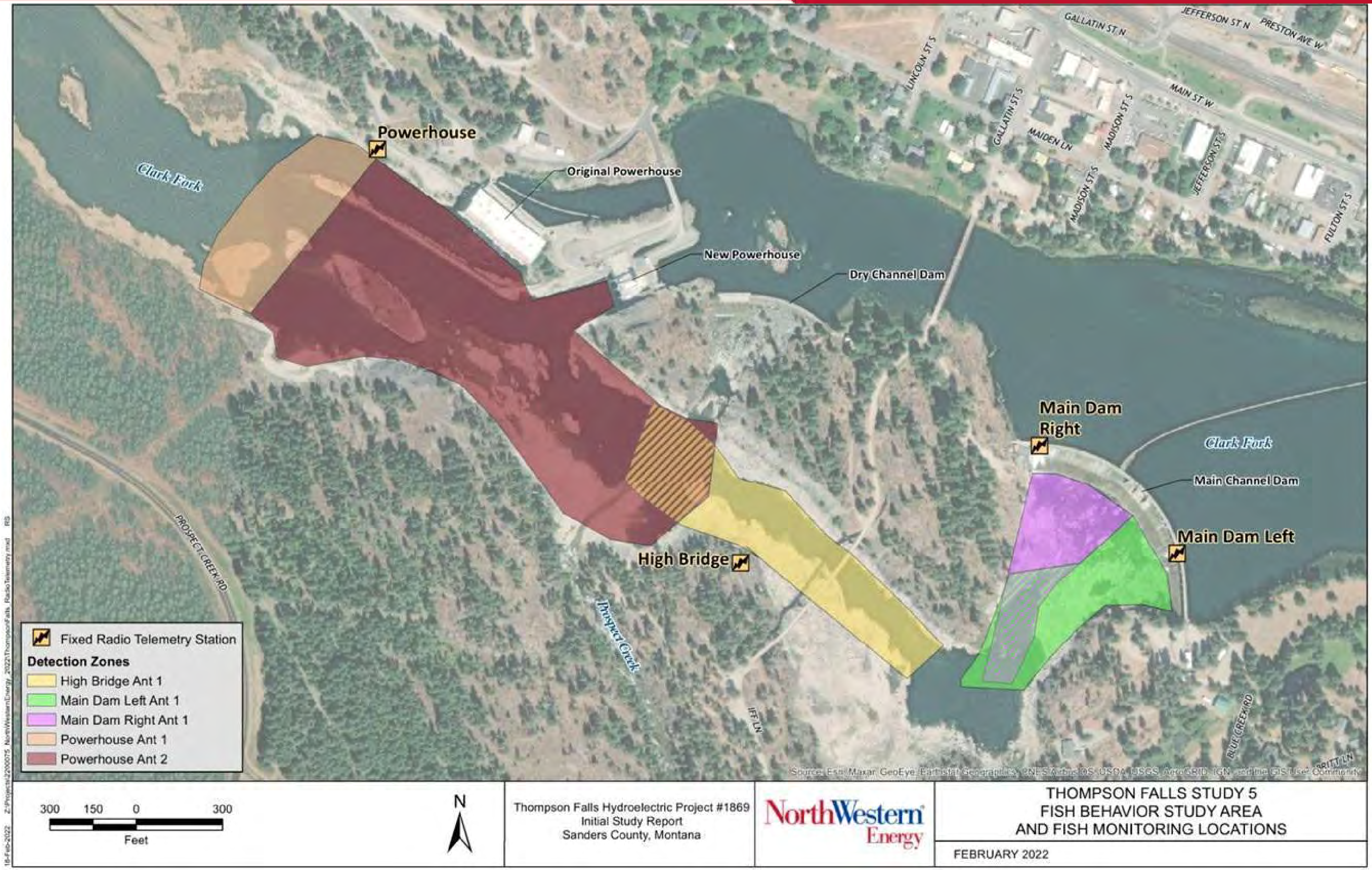


NorthWestern Energy
Delivering a Bright Future

Fish Behavior Study Description

- The telemetry monitoring efforts focused on assessing fish movement, including:
  - Travel time from the far field to the near field.
  - Movement patterns (e.g., left bank, right bank) in the near field (Main Channel Dam area).
  - Travel time from the near field (the falls area) to the entrance of the fish passage facility.
  - Proportion of fish that enter the ZOP and locate the entrance of the fish passage facility entrance.
  - Locations where fish hold within the ZOP.

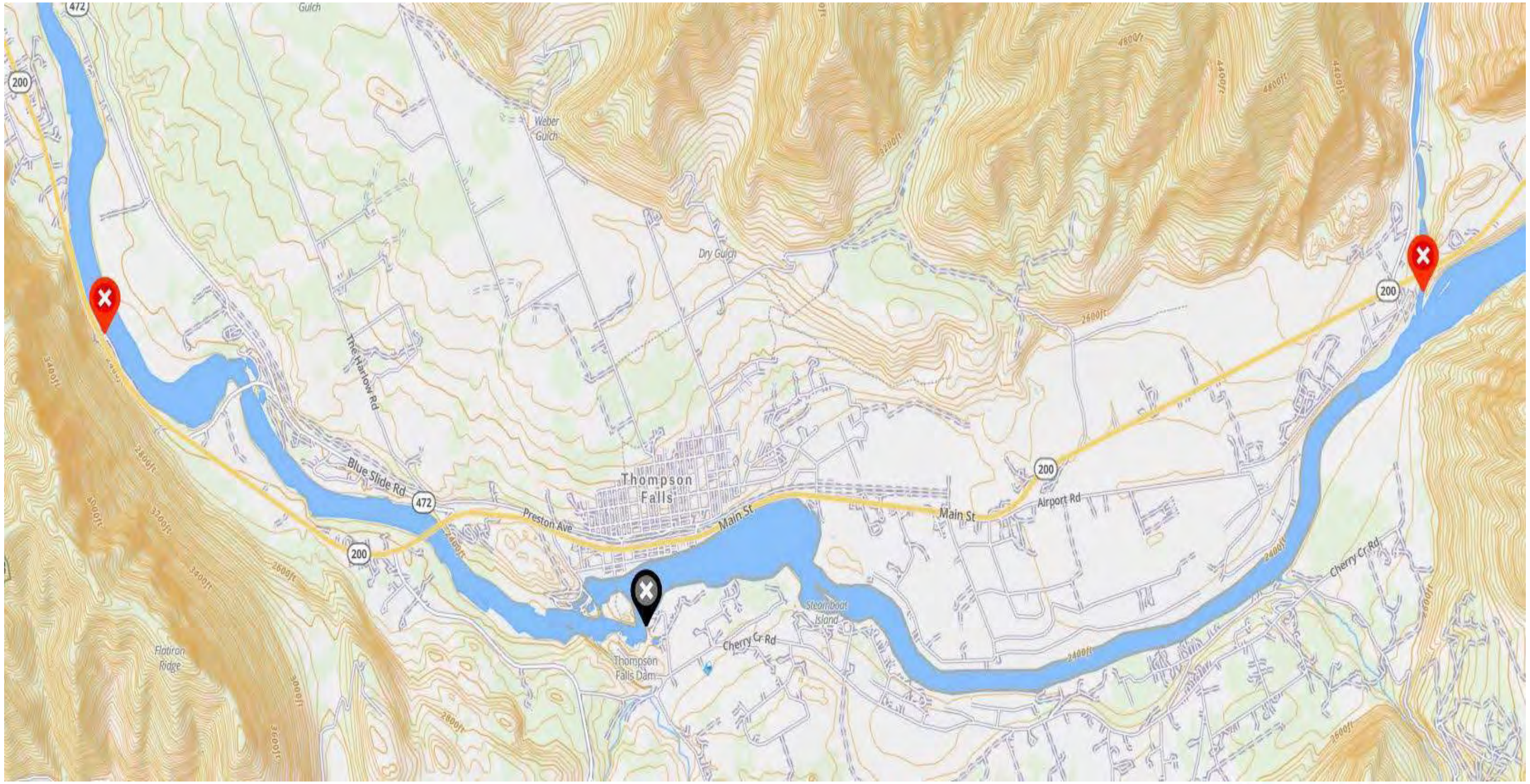
Fish Behavior Study Area



NorthWestern Energy
Delivering a Bright Future

Fish Behavior Methods

- Radio and PIT tag Brown Trout and Rainbow Trout
  - Clark Fork River upstream of Thompson Falls Project
  - Upstream Fish Passage Facility
- Radio tags have depth and activity sensors.
- Tagged fish released at Flat Iron Boat Launch (4 miles downstream).



Fish Behavior Methods

- Combining the behavioral data and hydraulic modeling data to help identify potential project influences (e.g., velocity fields) in the near field that may affect conditions for upstream fish passage.

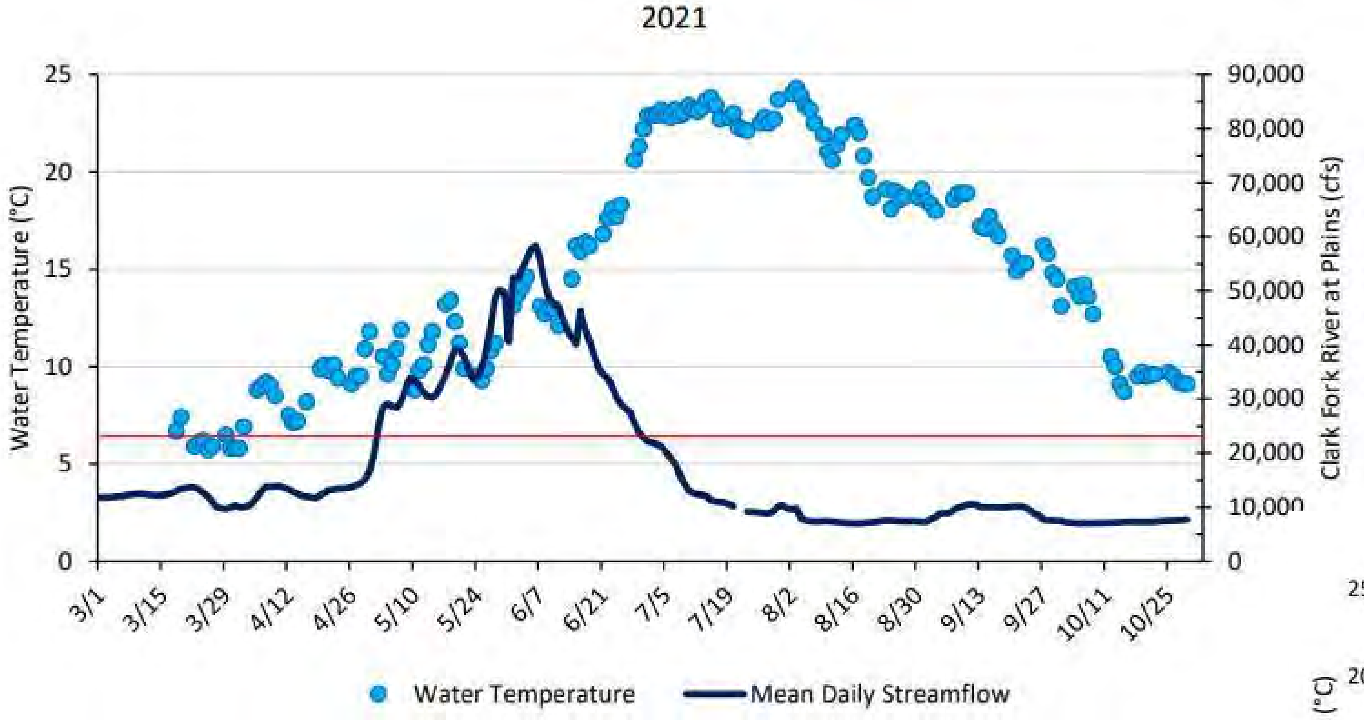
- Complete a literature review of the relative swimming capabilities and behaviors of salmonids to gain further understanding of combining the behavioral and hydraulic modeling results included as part of Initial Study Report.

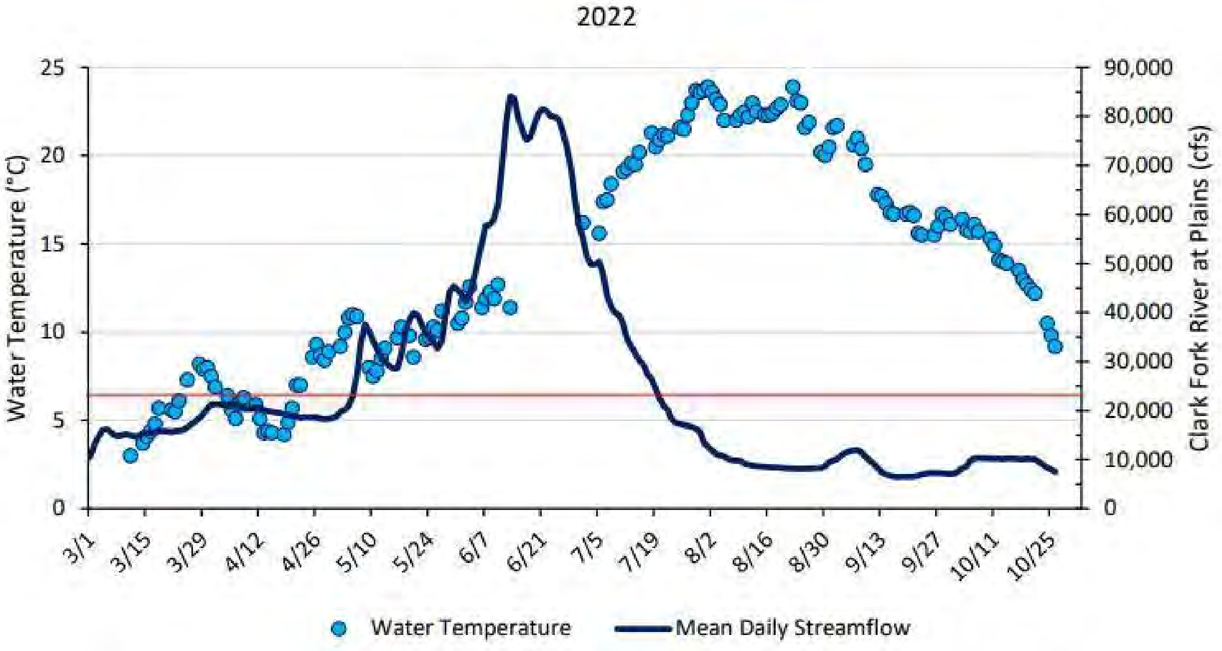
Fish Behavior Results Tagging

Season & Year	Method	Location	RB	LL	MCFT3 Tag size (g)	Total # Fish
June '21	Electrofishing	Clark Fork River	7	6	11	13
	Angling	Thompson River	-	-	-	-
Sept/Oct '21	Ladder[11]	Clark Fork River	-	3	6.8	3
2021 TOTAL			**7**	**9**		**16**
March '22	Ladder	Ladder	27	1	11	28
	Electrofishing	Clark Fork River	2	7	11	9
Sept '22	Ladder	Ladder		11	6.8	11
	Electrofishing	Clark Fork River		6	6.8	6
2022 TOTAL			**29**	**25**		**54**
		Grand Total	**38**	**34**		**70**

Notes: g = grams; LL = Brown Trout; RB = Rainbow Trout.

Fish Behavior Results River Conditions





Fish Behavior Detection Results

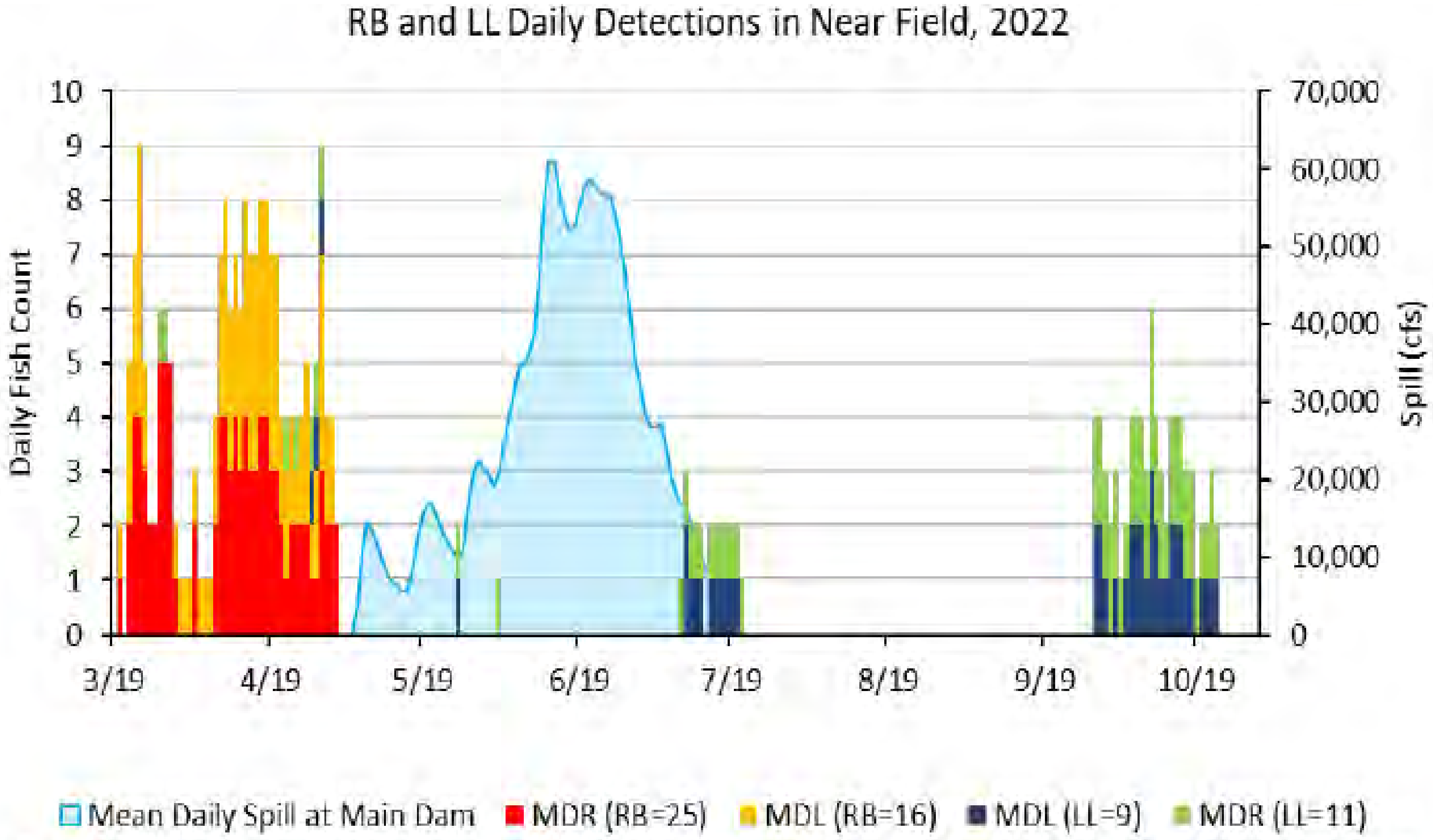
- 53 of 54 fish detected in the ZOP in 2022

- 38 fish (25 RB, 13 LL) detected in the near field
  38/53= 72% in near field

- 21 (14 RB, 7 LL) entered the fish passage facility
  21/53= 40% at ladder entrance

NorthWestern Energy
Delivering a Bright Future

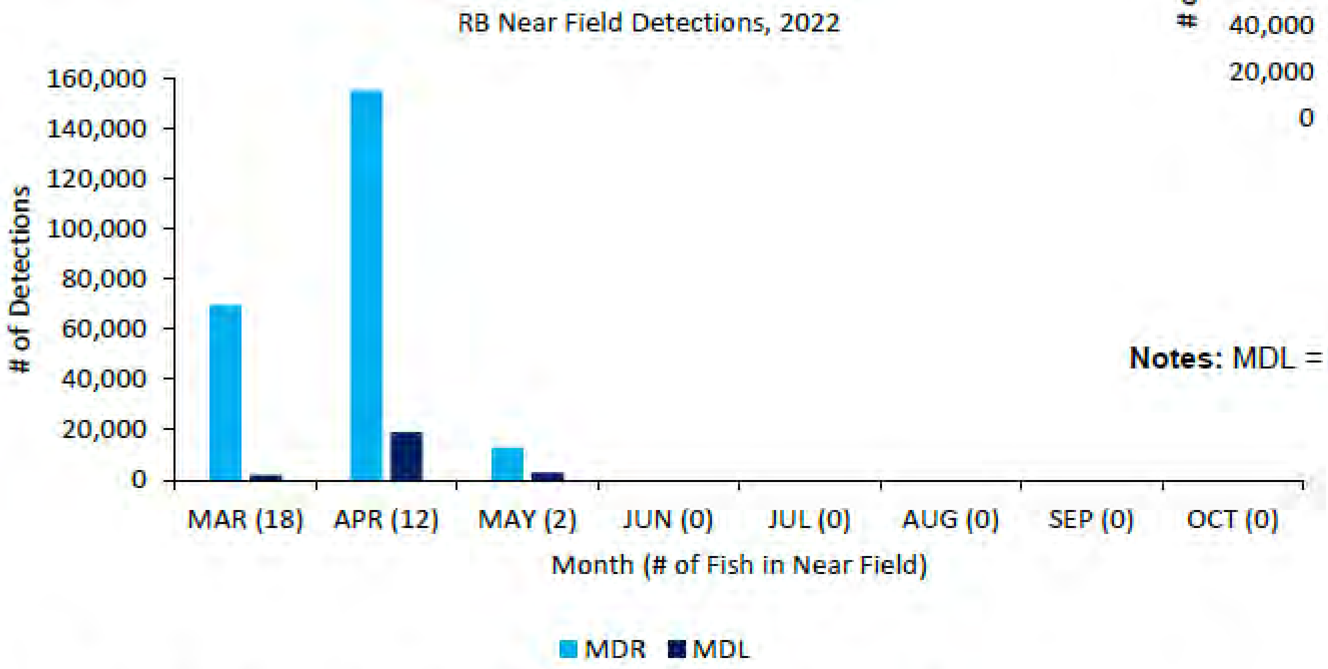
Fish Behavior Detection Results



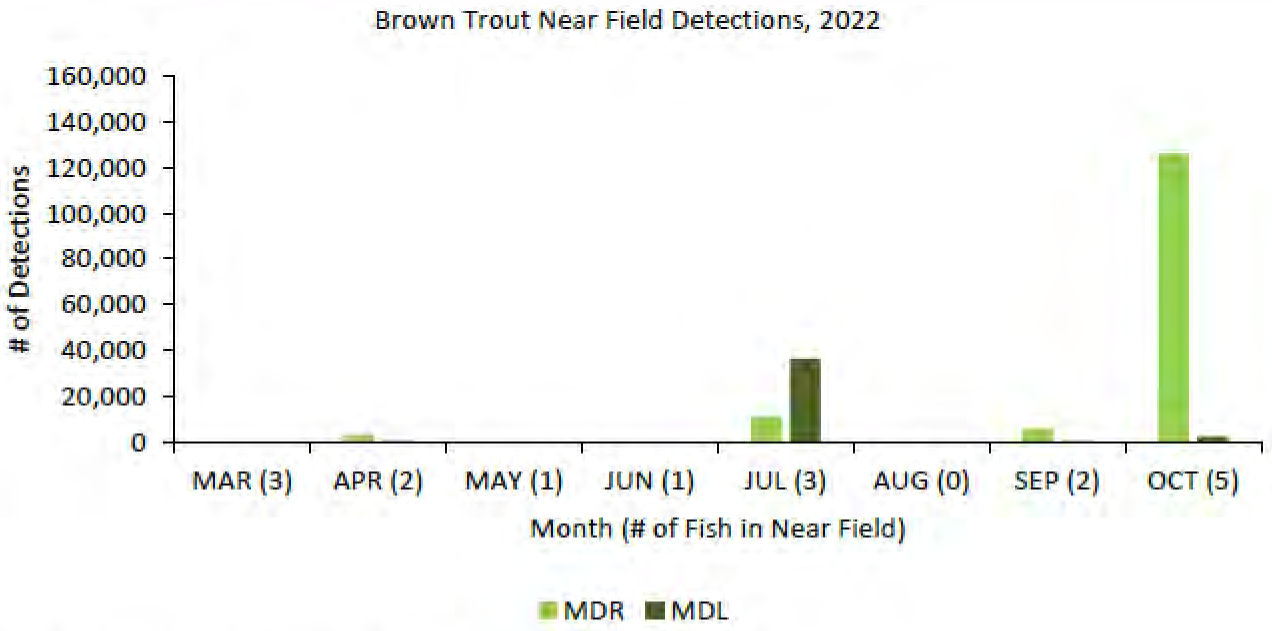
Notes: cfs = cubic feet per second; LL = Brown Trout; MDL = Main Dam Left; MDR = Main Dam Right; RB = Rainbow Trout.

Near Field Detections

Fish Behavior Detection Results



Notes: MDL = Main Dam Left; MDR = Main Dam Right; RB = Rainbow Trout



Notes: MDL = Main Dam Left; MDR = Main Dam Right.

NorthWestern Energy
Delivering a Bright Future

Fish Behavior Detection Results 2021 & 2022

Collection Time	Species	Total Tagged	% (#) in Far Field	% (#) in Near Field	% (#) Ladder Entrance
June ‘21	RB	7	100 (7)	14 (1)	-
	.	6	100 (6)	50 (3)	33 (2)
Sept/Oct ‘21	LL	3	100 (3)	33 (1)	33 (1)
2021 Total		**16**	**100 (16)**	**31 (5)**	**19 (3)**
March ‘22	RB	29	100 (29)	86 (25)	48 (14)
	LL	8	100 (8)	88 (7)	38 (3)
Sept ‘22	LL	17	94 (16)	35 (6)	24 (4)
2022 Total		**54**	**98 (53)**	**70 (38)**	**39 (21)**
Total Both Years		**70**	**98 (69)**	**62 (43)**	**35 (24)**

Notes: % = percentage; # = number of fish detected; LL = Brown Trout; RB = Rainbow Trout.

Far Field to Near Field Travel Time

Collection Time	Species	Total # Detected in Near Field	Travel Time from the Far to Near Field (Days)			
			Average	Min	Max	Median
June '21	RB	1	36.6	36.6	36.6	36.6
	LL	3	71.7	0.05	114.1	100.8
Sept/Oct '21	LL	1	17.5	17.5	17.5	17.5
March '22	RB	25	7.3	0.08	32.7	4.9
	LL	7	28.4	1.1	102.9	10.1
Sept '22	LL	6	14.4	2.4	25.8	15.1

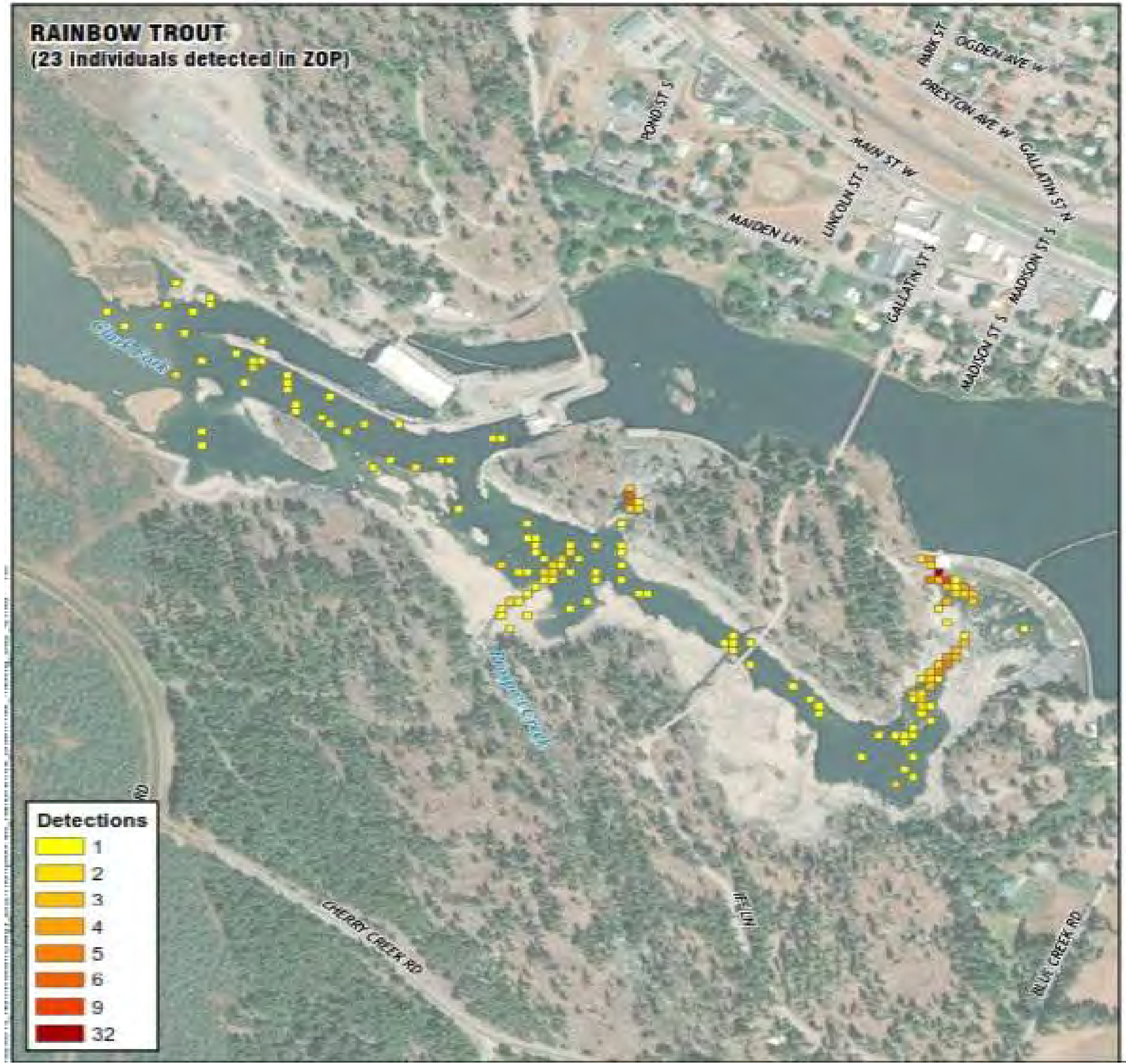
NorthWestern Energy
Delivering a Bright Future

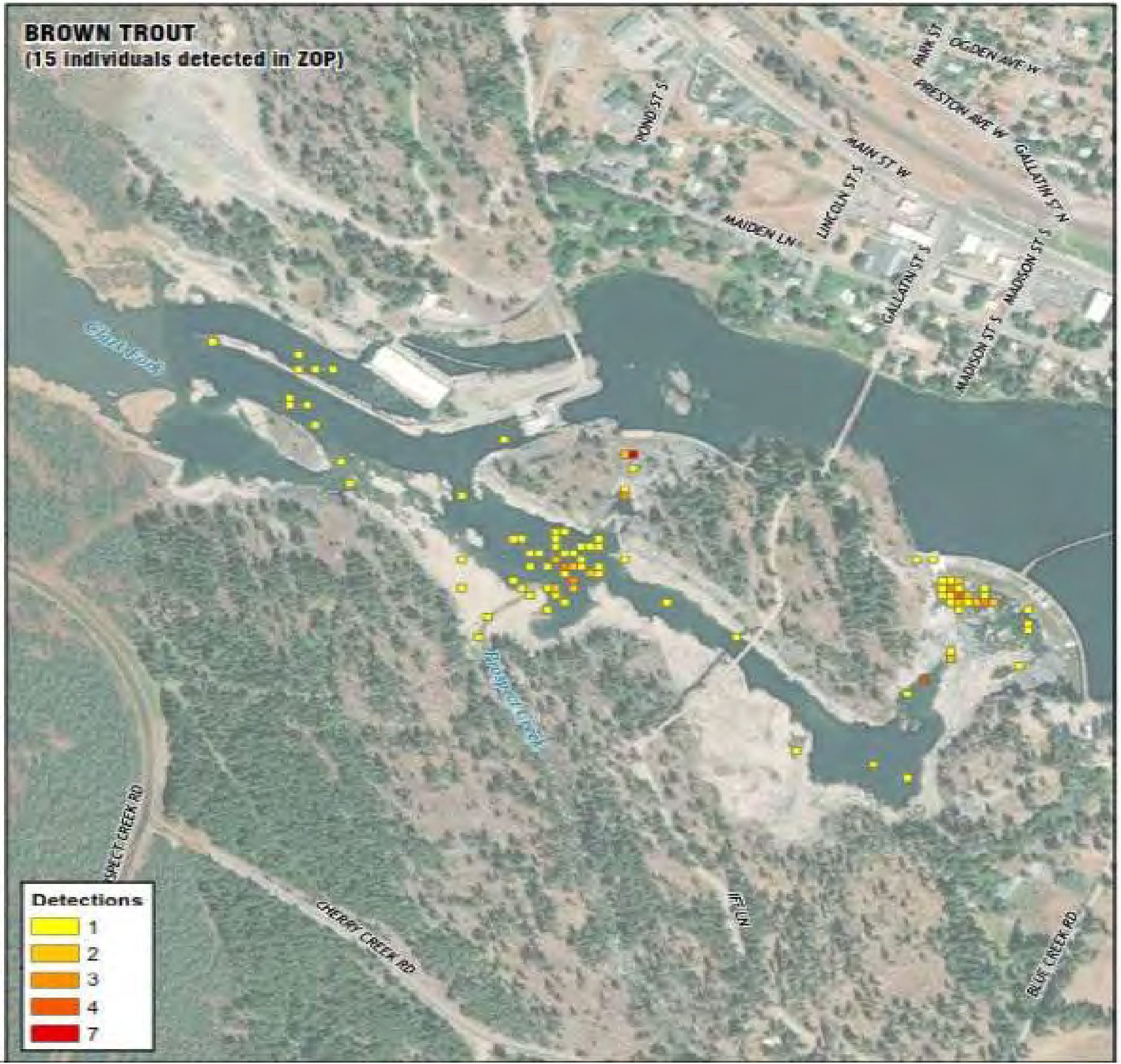
Near Field to Ladder Entrance Travel Time

Collection Time	Species	Total # Detected in Ladder Entrance	Travel Time from Near Field to Ladder Entrance (Days)			
			Average	Min	Max	Median
June '21	RB	-	-	-	-	-
	LL	2	6.1	2.4	9.8	6.1
Sept/Oct '21	LL	1	4.7	-	-	-
March '22	RB	14	8.2	0.03	37.7	1.8
	LL	3	136.0	112.6	171.6	123.9
Sept '22	LL	4	0.8	0.3	1.2	0.9

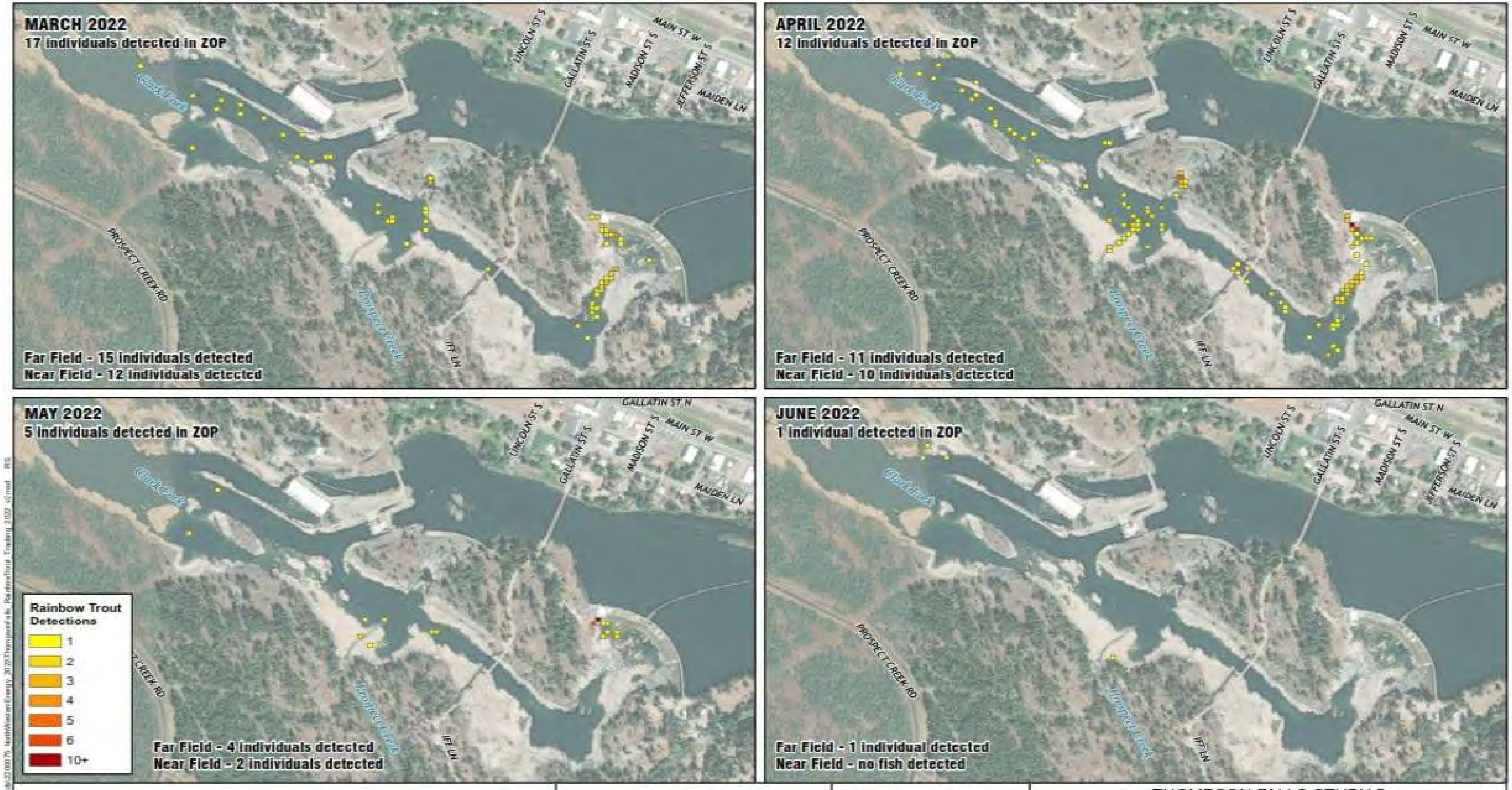
NorthWestern Energy
Delivering a Bright Future

Fish Locations Within ZOP





RBT Locations Within ZOP



No RBT manual detections July – October in 2022

Delivering a Bright Future

LL Locations Within ZOP

Very few LL detections April – June and none in August

NorthWestern Energy
Delivering a Bright Future

Fish Behavior and CFD Modeling

Common Name	Prolonged Speed (fps)	Burst Speed (fps)
Brown Trout	7.7	13.2
Bull Trout	2.8	7.5
Largescale Sucker	1.9	6.0
Mountain Whitefish	5.0	10.0
Northern Pikeminnow	3.8	4.4
Rainbow Trout	4.0	13.5
Westslope Cutthroat Trout	6.4	13.5

Fish swimming speeds via literature review

Basic Model Map	Velocity Gradient (fps)
Most Species – mix of Prolonged and Burst speeds	0-7.0
Many Species – Burst Speeds	7.1-14.0
Exceeds Burst Speeds	>14.0

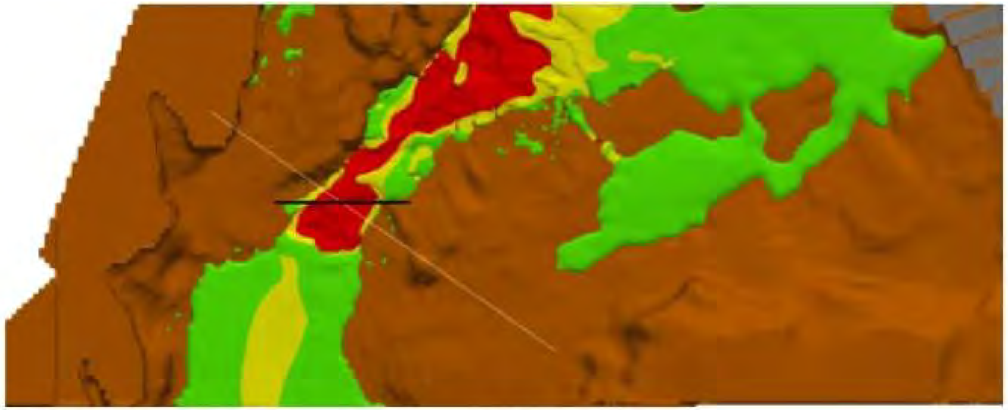
Modeled velocity categories

3D Modeling at 2,000 cfs (spill volumes)

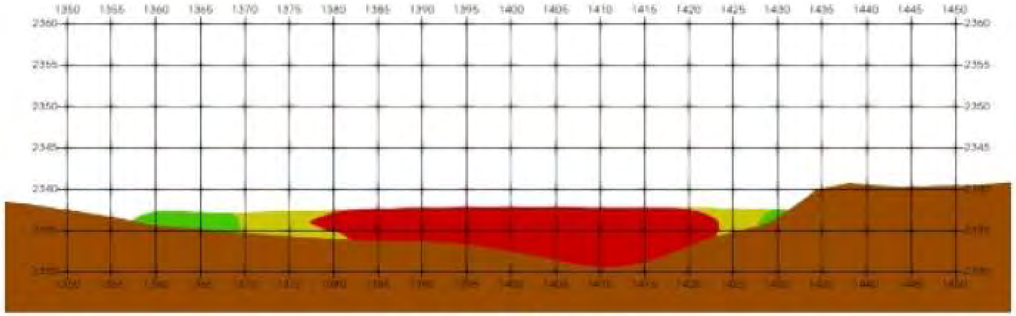
- High Bridge
- Falls
- Fish Passage Entrance

Percent of Wetted Area Available for Fish to Access Based on Swimming Abilities: 2,000 cfs Model Scenario

Basic Model Map	Velocity Gradient (fps)	2,000 cfs Model – % Area Available for Fish Passage		
		High Bridge	Falls	Fish Passage Facility Entrance
Most Species – mix of Prolonged and Burst speeds	0-7.0	100	8	79
Many Species – Burst Speeds	7.1-14.0	0	16	21
Exceeds Burst Speeds	>14.0	0	76	0



Plan



Section (Looking Upstream)

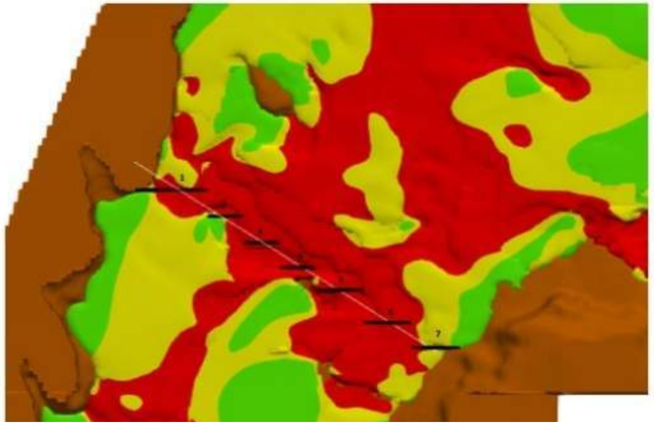
Falls example

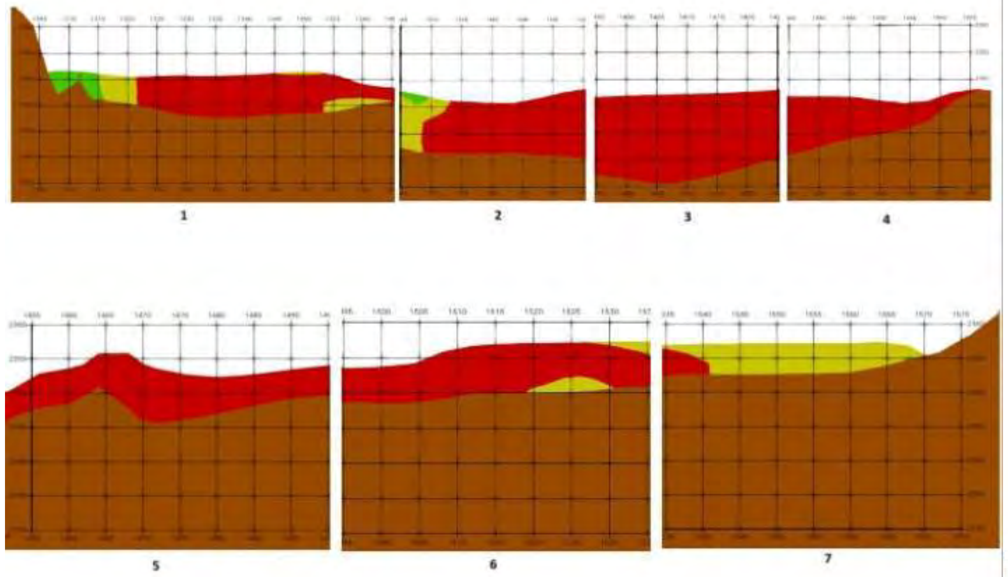
3D Modeling at 37,000 cfs (spill volumes)

- High Bridge
- Falls
- Fish Passage Entrance

Percent of Wetted Area Available for Fish to Access Based on Swimming Abilities: 37,000 cfs Model Scenario

Basic Model Map	Velocity Gradient (fps)	37,000 cfs Model – % Area Available for Fish Passage		
		High Bridge	Falls	Fish Passage Facility Entrance
Most Species -mix of Prolonged and Burst Speeds	0-7.0	7	2	100
Many Species - Burst Speeds	7.1-14.0	4	14	0
Exceeds Burst Speeds	>14.0	89	84	0





Falls example

2D Modeling Summary

- High Bridge
- Falls
- Fish Passage Entrance

Model flow (cfs)	Max Velocity Near High Bridge (fps)	Max Velocity Through Falls (fps)	Max Velocity at Fish Passage Facility Entrance (fps)
37,000*	20	20	5
25,000	19	27	5
2,000*	2	23	12
200	<1	17	8

Fish Movement Summary

- Nearly all of the fish moved up the main river channel and spent little time near the powerhouse areas
- Fish that enter the near field strongly selected for the right bank near the fish passage facility
- Fish spent considerable time near the mouth of Prospect Creek and made brief forays upstream to the main dam
- High water temperatures during July and August likely influence fish behavior to hold near Prospect Creek which provides a cool water source preferred by salmonids

NorthWestern Energy
Delivering a Bright Future

Hydraulic Condition Summary

- CFD modeling results indicate velocity obstacles exist during spill at the Main Dam, most notably at the natural falls where the channel is constricted by boulders and bedrock

- The lack of fish in the project area during spill is likely a result of these high water velocities

- Velocities not a complete barrier to fish movement up to 37,000 cfs spill as channel margins contain small areas that can be navigated

- As spill increases flow attraction (flow streamlines) from the passage facility are overwhelmed and may be insufficient to provide adequate upstream cues to the passage facility entrance

2023 Study Update

- 30 Rainbow Trout radio tagged in March and April
- To date 11 entered the passage facility entrance

- Data collection to continue through July, and study details will be included in Final License Application, December 2023.

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

Delivering a bright future

Connect With Us:

NorthWestern Energy

NorthWesternEnergy.com

NorthWestern Energy

Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Final Study Report Meeting – Total Dissolved Gas Study

May 24th and 25th, 2023

Total Dissolved Gas (TDG) Study

- Purpose of the Study:
  - Collect background (incoming) TDG concentrations in the Clark Fork River upstream of the dams.
  - Collect downstream (outgoing) TDG concentrations in the Clark Fork River below the Main Dam and at Birdland Bay Bridge.
  - Test configurations of radial gates on the main dam for TDG entrainment downstream.

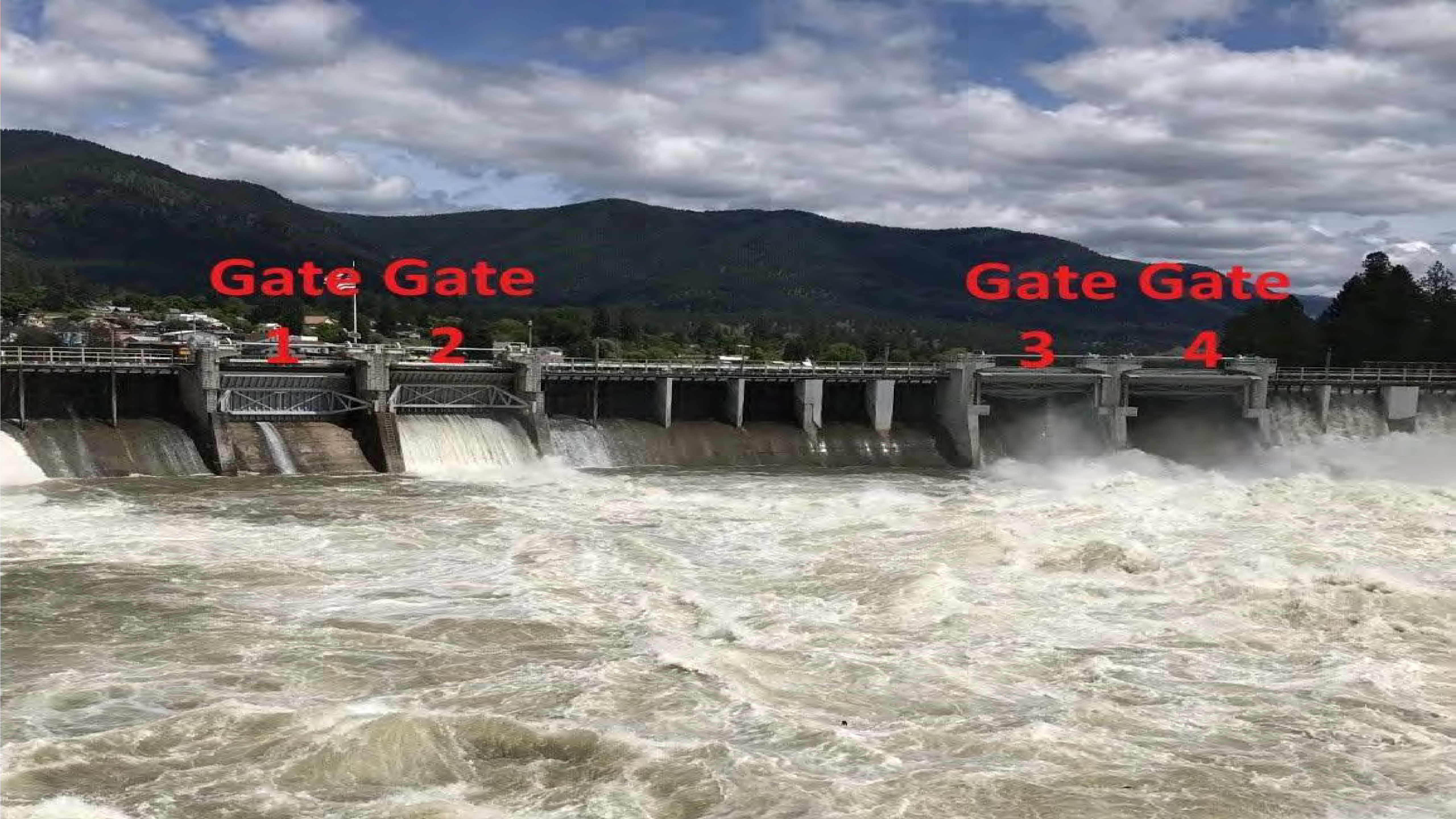
- TDG Control Plan for Thompson Falls operations was approved by Montana DEQ in 2010.

- Since the approval of this Plan, two new radial gates have been installed on the main dam.

- More information was needed on TDG entrainment with the new radial gates to update the TDG Control Plan.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36


Gate 1
Gate 2
Gate 3
Gate 4

Total Dissolved Gas (TDG)
Study Area & Description

- TDG is measured in three locations
  - Above the Powerhouses
  - Below the Main Dam
  - Birdland Bay Bridge (downstream of the Project)

- Datasondes provide TDG readings at 15-minute intervals.

- Instruments are calibrated bi-weekly to ensure that the sensors are operating properly and accurately.

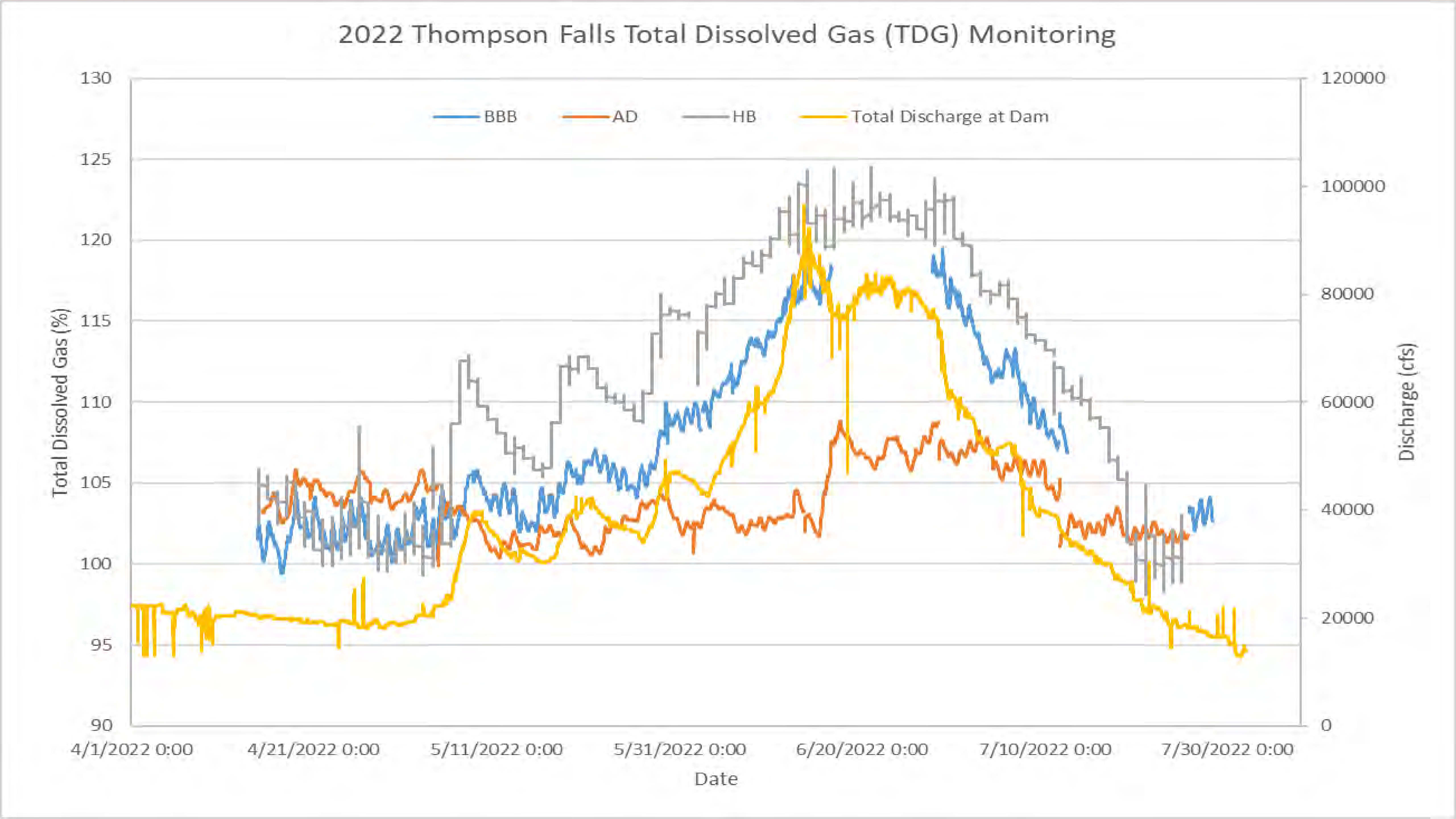
NorthWestern Energy
Delivering a Bright Future


To Birdland Bay Bridge (TDG Monitoring Site BBB) and Noxon Rapids Dam
Original (Old) Powerhouse
New Powerhouse
Thompson Falls Dry Channel Dam (TDG Monitoring Site AD)
Prospect Creek
TDG Monitoring Site HB
Thompson Falls Main Channel Dam


To Noxon Rapids Dam
Birdland Bay Bridge
(TDG Monitoring Site BBB)
Highway 200 Bridge
To Thompson Falls Dam

Total Dissolved Gas (TDG) Results

- During the study period, radial gate testing was conducted to monitor the TDG concentrations in response to different spill configurations.
- The peak river flows in the Clark Fork River were higher in 2022 than in 2021, which gave NWE an optimal testing window for completing this study.
- Radial gate testing occurred on the descending limb of the hydrograph to fill data gaps at flows greater than 80,000 cfs and to supplement 2019 data in the 55,000-60,000 cfs range.
- The data collected throughout these two study seasons, in addition to data collected in 2019 and 2020, effectively captured all flow conditions from 30,000 cfs to 85,000 cfs.


2022 Thompson Falls Total Dissolved Gas (TDG) Monitoring
BBB
AD
HB
Total Discharge at Dam
Total Dissolved Gas (%)
Discharge (cfs)
Date
130
125
120
115
110
105
100
95
90
120000
100000
80000
60000
40000
20000
0
4/1/2022 0:00
4/21/2022 0:00
5/11/2022 0:00
5/31/2022 0:00
6/20/2022 0:00
7/10/2022 0:00
7/30/2022 0:00

Total Dissolved Gas (TDG) Results

Total Flow Range (cfs)	Max TDG at HB (% saturation)	Gate Setting at Max TDG	Min TDG at HB (% saturation)	Gate Settings Min TDG
30,000-35,000	112.5	1 full open, 2 4' open	107.5	4-partially open
40,000-45,000	114.4	1 and 2 open	111.7	1 and 4 open
45,000-50,000	118.8	1 and 4 open	116.2	2 and 4 open
[1]55,000-60,000	121.6	3 and 4 open	119.6	1 and 2 open
[2]55,000-60,000	122.2	1 and 2 open	119.9	2 and 4 open
65,000-70,000	122.7	3 and 4 open	119.8	1 and 3 open
75,000-80,000	123.1	1 and 2 open	121.2	2 and 3 open
80,000-85,000	124.1	3 and 4 open	120.6	1 and 3 open

[1] Partial testing was conducted in 2019
[2] Full testing was conducted in 2022

NorthWestern Energy
Delivering a Bright Future

Total Dissolved Gas (TDG) Results

Total River Flow (cfs)	Lowest %TDG Entrained	Intermediate %TDG Entrained				Highest %TDG Entrained
30,000	4 open	1 open	3 open	N/A	N/A	2 open
35,000	1 and 4 open	2 and 4 open	3 and 4 open	2 and 3 open	N/A	1 and 2 open
40,000-45,000	1 and 4 open	2 and 4 open	1 and 3 open	2 and 3 open	3 and 4 open	1 and 2 open
45,000-50,000	2 and 4 open	2 and 3 open	1 and 2 open	1 and 3 open	N/A	1 and 4 open
[1]55,000-60,000	1 and 2 open	N/A	N/A	N/A	N/A	3 and 4 open
[2]55,000-60,000	2 and 4 open	3 and 4 open	2 and 3 open	1 and 4 open	1 and 3 open	1 and 2 open
65,000-70,000	1 and 3 open	2 and 3 open	1 and 4 open	1 and 2 open	2 and 4 open	3 and 4 open
75,000-80,000	2 and 3 open	1 and 3 open	1 and 4 open	2 and 4 open	3 and 4 open	1 and 2 open
80,000-85,000	1 and 3 open	1 and 2 open	1 and 4 open	2 and 3 open	2 and 4 open	3 and 4 open

NorthWestern Energy
Delivering a Bright Future

Study conclusions are:

- 2022 TDG data displayed a similar range of percent TDG saturation as the 2019 data, but in the 55,000-60,000 cfs range, the radial gate combination that entrained the lowest amount of TDG in 2019 entrained the highest amount of TDG in 2022.

- The discrepancy in the results of these two tests highlights how other outside environmental factors such as incoming upstream percent TDG saturation, differing water surface elevations downstream of the Main Channel Dam, and the overall natural variability of a dataset may mask the actual contributions of TDG from a particular radial gate configuration.

Study conclusions are:

- Using non-adjacent radial gates together generally entrains less TDG downstream than using adjacent radial gates.

- While opening non-adjacent radial gates during spill operations will most likely reduce the amount of TDG entrained downstream, operation in this manner may not be practical at all times due to the need to flush large woody debris from the trash boom to prevent the debris from building up on the face of the dams.

Study conclusions are:

- The buildup of large woody debris or extreme high flow events can lead to situations where the stanchions need to be removed to ensure adequate flow passage and to maintain the structural integrity of the dams.

- When the stanchions are removed, there is a large increase in the percent of TDG entrained downstream due to uncontrolled releases through the dam. The drastic increase in TDG entrainment from stanchion removal is far more significant than the differences in TDG entrainment from operating adjacent radial gates vs non-adjacent radial gates.

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

Delivering a bright future

Connect With Us:

NorthWesternEnergy.com

NorthWestern Energy

Cultural Resource Inventory Study Report

May 24, 2023

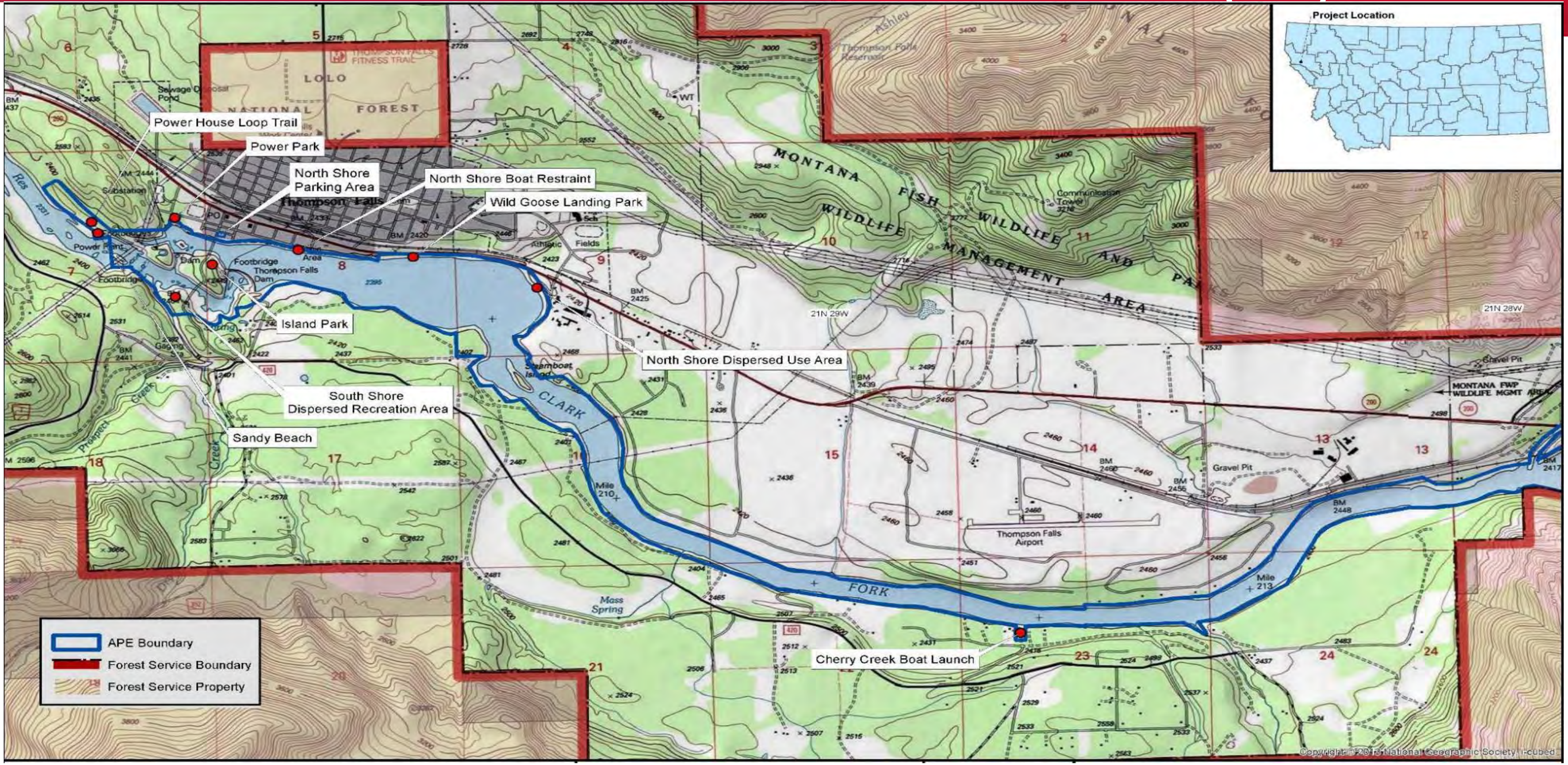
Cultural Resources Inventory and National Register Evaluation

- Cultural resource inventory of the Thompson Falls Project to determine the locations, types, and significance of precontact and historic sites within the Project's Area of Potential Effect (APE)

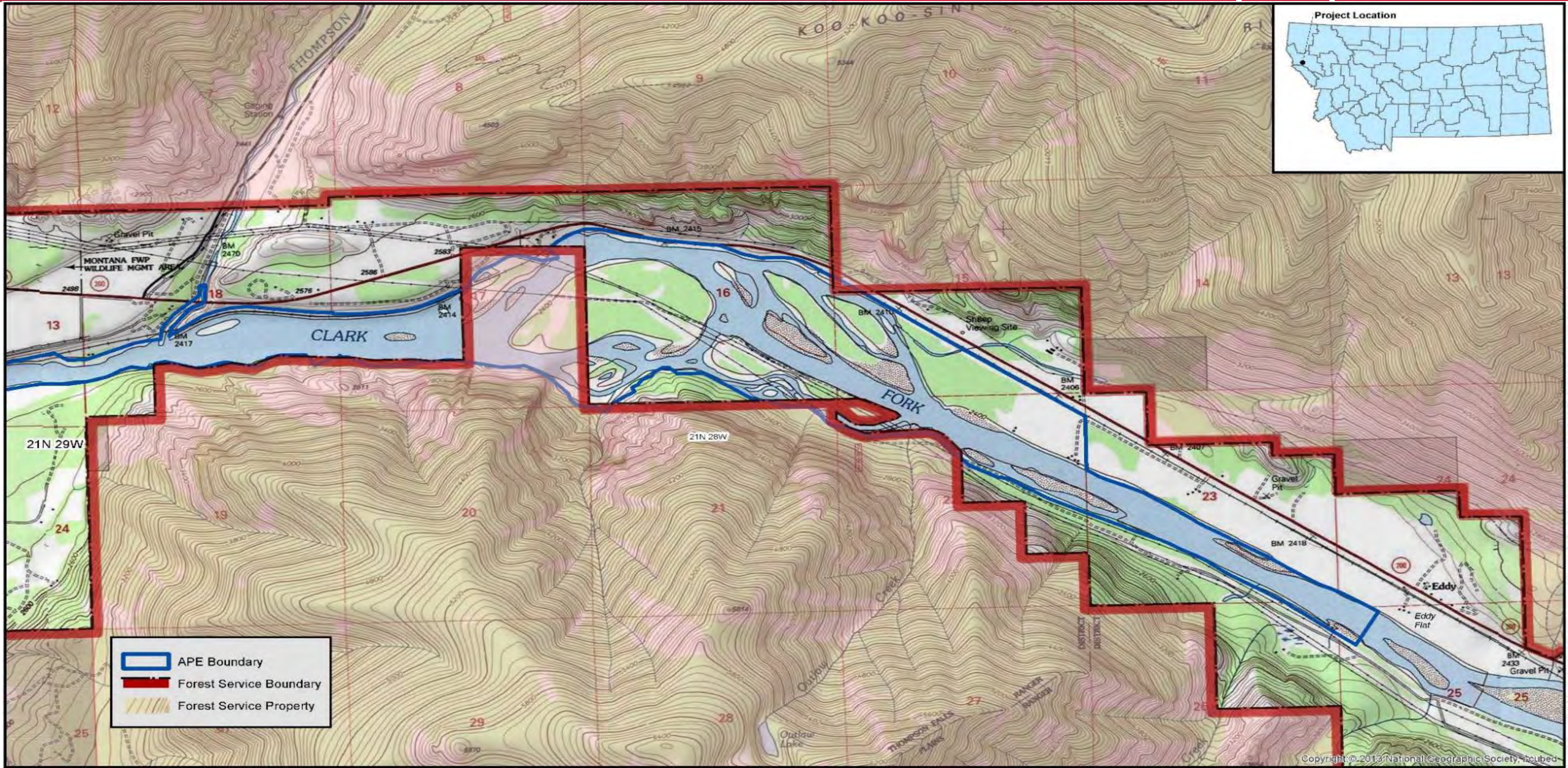
Cultural Resource Study Goals and Objectives

- Identification and documentation of historic architectural and engineering properties and precontact and historic archaeological sites within the APE
- Evaluations of those properties' eligibility for listing in the National Register of Historic Places
- Provide baseline data to develop an Historic Properties Management Plan under the new license

Cultural Resource Study
Area of Potential Effect (APE) - West End



Cultural Resource Study
Area of Potential Effect (APE) - East End



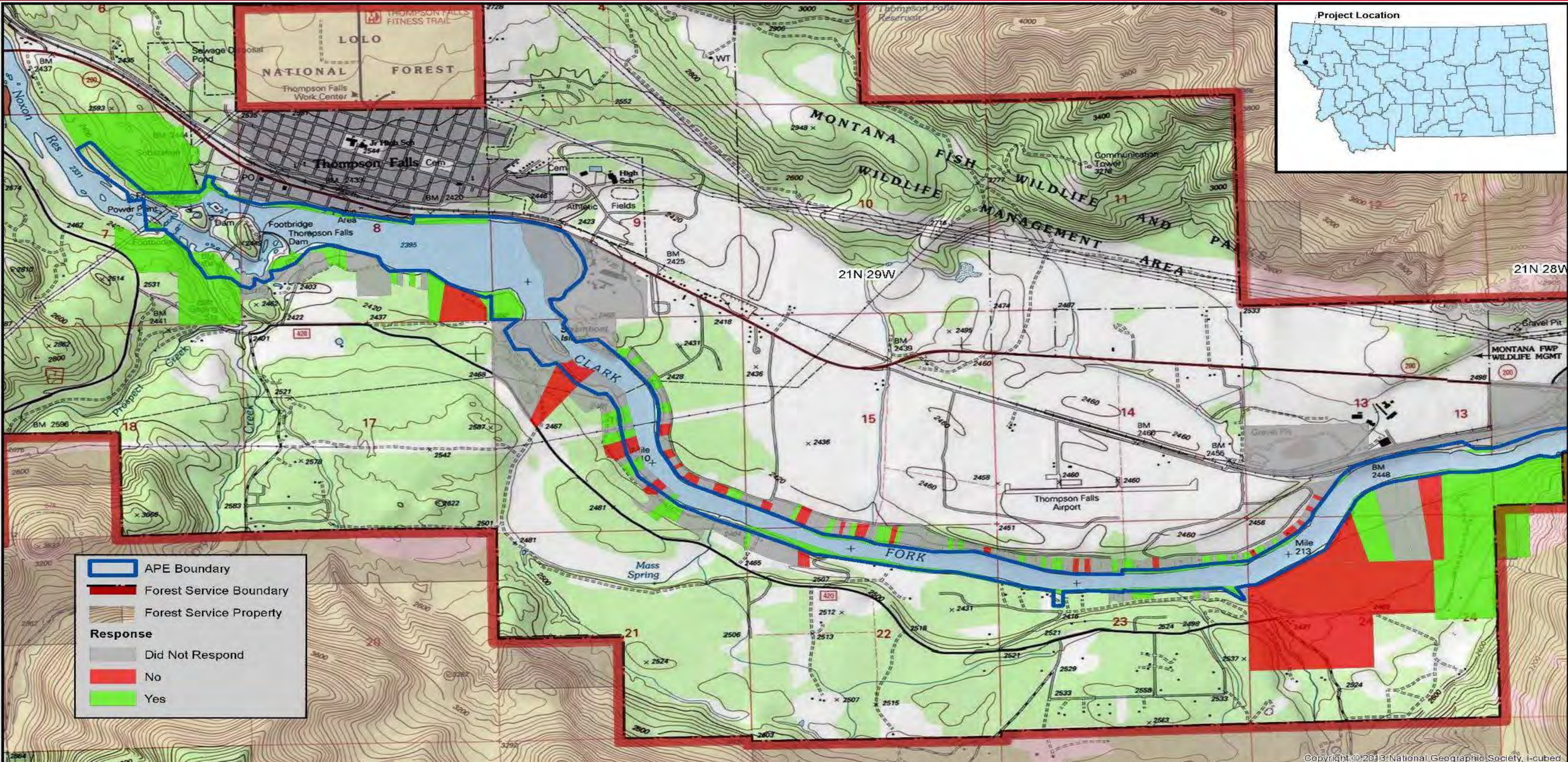
Cultural Resource Study
Pre-field Research

- SHPO files searches conducted in 2017 and 2022
  - 11 previously recorded cultural properties that lay within, or are adjacent to, the Project APE
    - 9 historic sites
    - 2 sites containing both precontact and historic site components

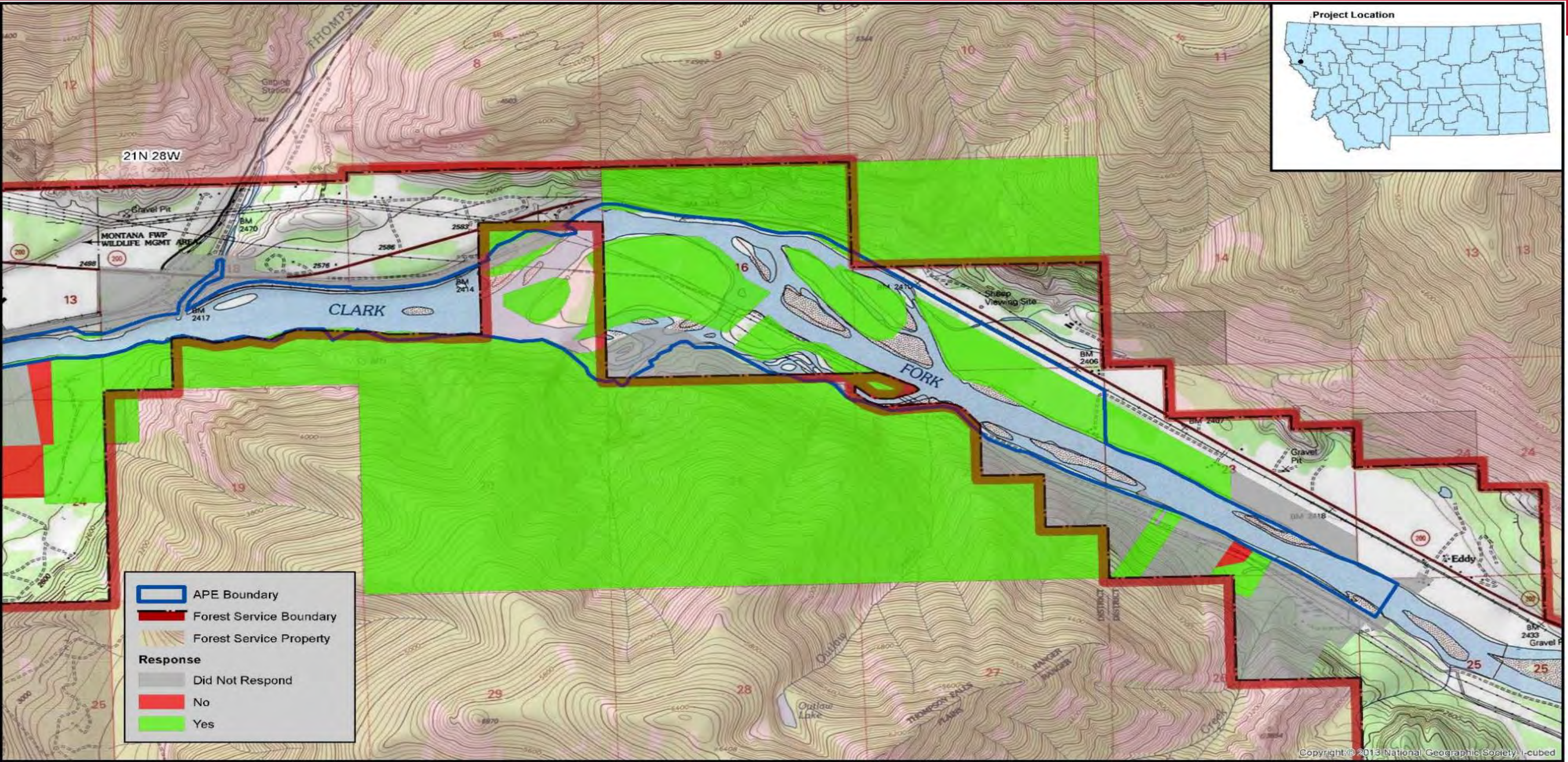
- NorthWestern sent access request letters to all landowners within the Project APE in 2022

  - Largest landholdings are administered by NorthWestern, Lolo National Forest, and Montana DNRC all of whom granted access
  - 223 private parties own the remaining property within the APE
    - 51 of those private parties granted access to conduct cultural resource inventory
    - The remaining 172 private parties either did not reply to NorthWestern's access request, or denied access

Cultural Resource Study
Landowner Contacts – West End



Cultural Resource Study
Landowner Contacts – East End



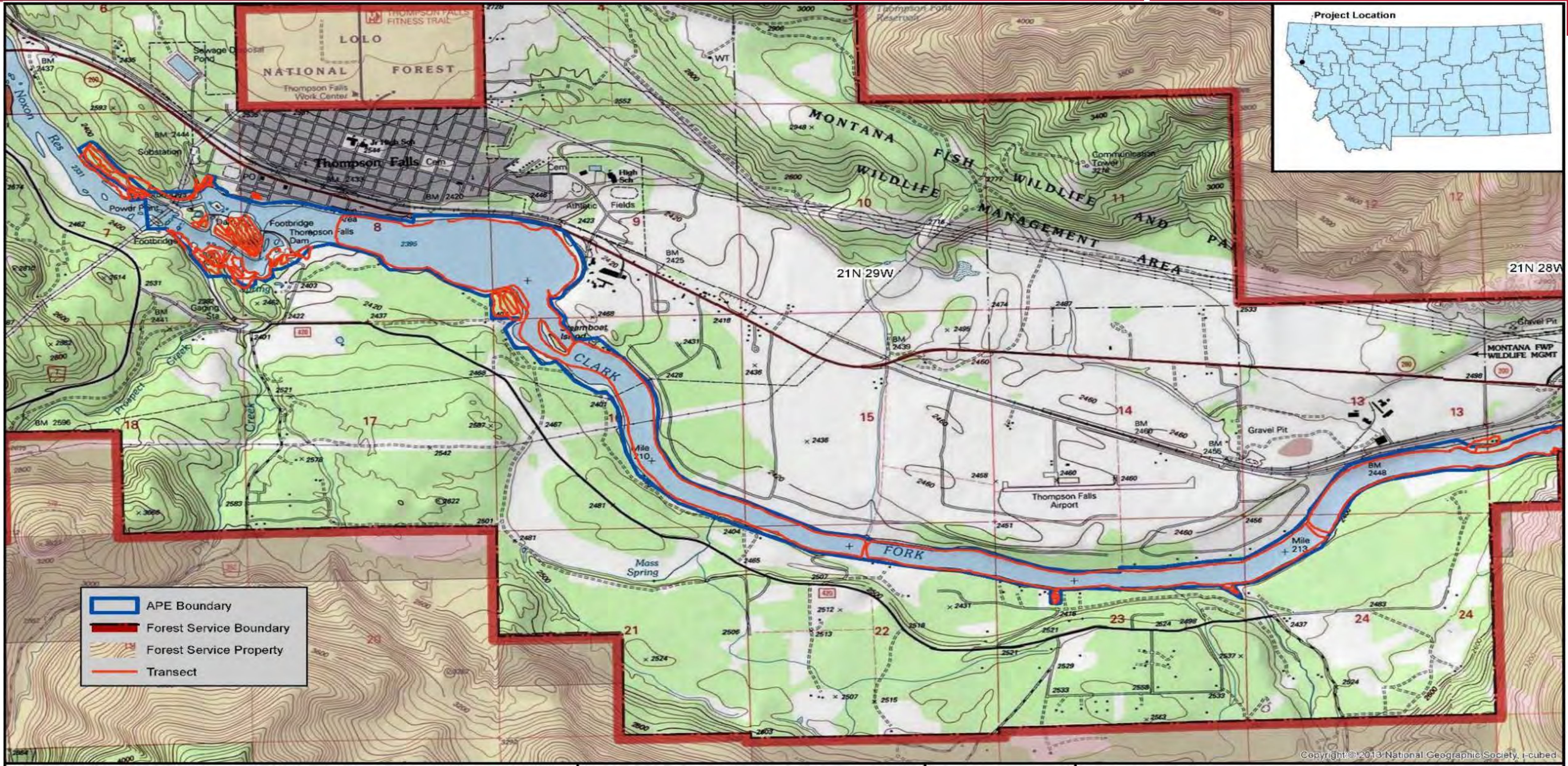
- Four factors that complicated the inventory fieldwork
  - Lack of access permission
  - Rugged terrain
  - Minimal road access
  - Dense vegetation

- Specialized field methods employed to ensure the inventory was as intensive as possible

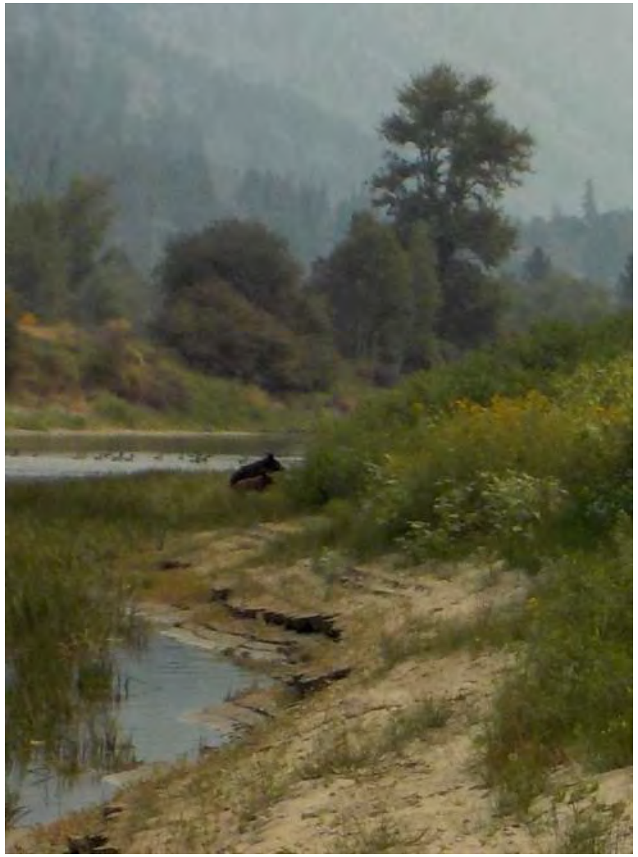
  - Pedestrian transects where access permission was granted and conditions allowed
  - Water borne transects via non-motorized packraft to supplement the pedestrian inventory

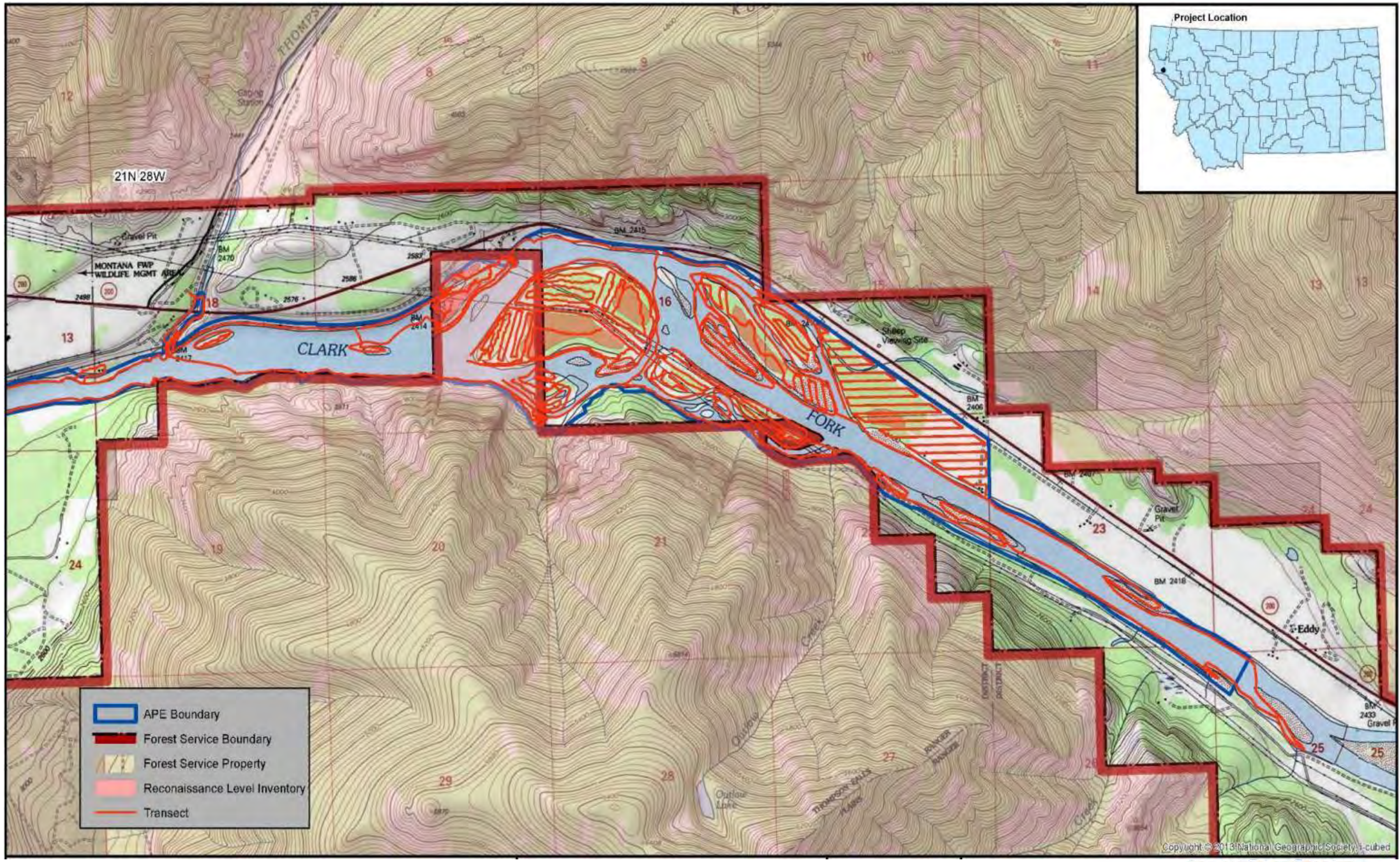
- Advantages of the water borne inventory transects
  - Direct unobscured observation of shoreline cutbanks, slopes, and cliff faces not accessible on foot because of terrain issues or lack of access permission
  - Provided access to instream islands for pedestrian inventory

Cultural Resource Study
Inventory Transects West End



Cultural Resource Study
Inventory Transects – East End





- The cultural resource inventory revealed that 5 of the 11 previously recorded cultural properties identified in the SHPO file searches lay outside the APE. Those include:
  - Salish House
  - The Historic Resources of Thompson Falls (Thompson Falls townsite)
  - Multi-component precontact campsite and historic artifact scatter
  - Railroad Chinese camp
  - Historic livestock corral

- The cultural resource inventory documented 6 historic sites within the APE. Those include:
  - 1. The National Register-listed Thompson Falls Hydroelectric Dam Historic District (including Prospect Creek plant ruin)

NorthWestern Energy
Delivering a Bright Future

2. Northern Pacific Railway (National Register-eligible)

- 3. Plains-Thompson Falls pre-1924 Roadbed segments (National Register-ineligible)

Cultural Resource Study Results

- 4. Yellowstone Pipeline (National Register-ineligible)

Cultural Resource Study Results

- 5. Thompson Falls-Burke A and B Transmission Line, and
- 6. Thompson Falls-Kerr A Transmission Line (both National Register-ineligible)

NorthWestern Energy
Delivering a Bright Future

Cultural Resource Study

- An Historic Properties Management Plan for the Thompson Falls Project is currently in development.

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

Delivering a bright future

NorthWestern Energy

Connect With Us:

NorthWesternEnergy.com

Environmental Justice Study - Purpose

- The Environmental Justice Study was requested by FERC after the first study season was completed. Thus, this may be new information to you.
- FERC requested this study per Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*
- Federal agencies, including FERC, are required to consider if impacts of federal actions would be disproportionately high and adverse for minority and low-income populations
- NorthWestern supports treating all populations with fairness and respect, including minority and low-income populations.

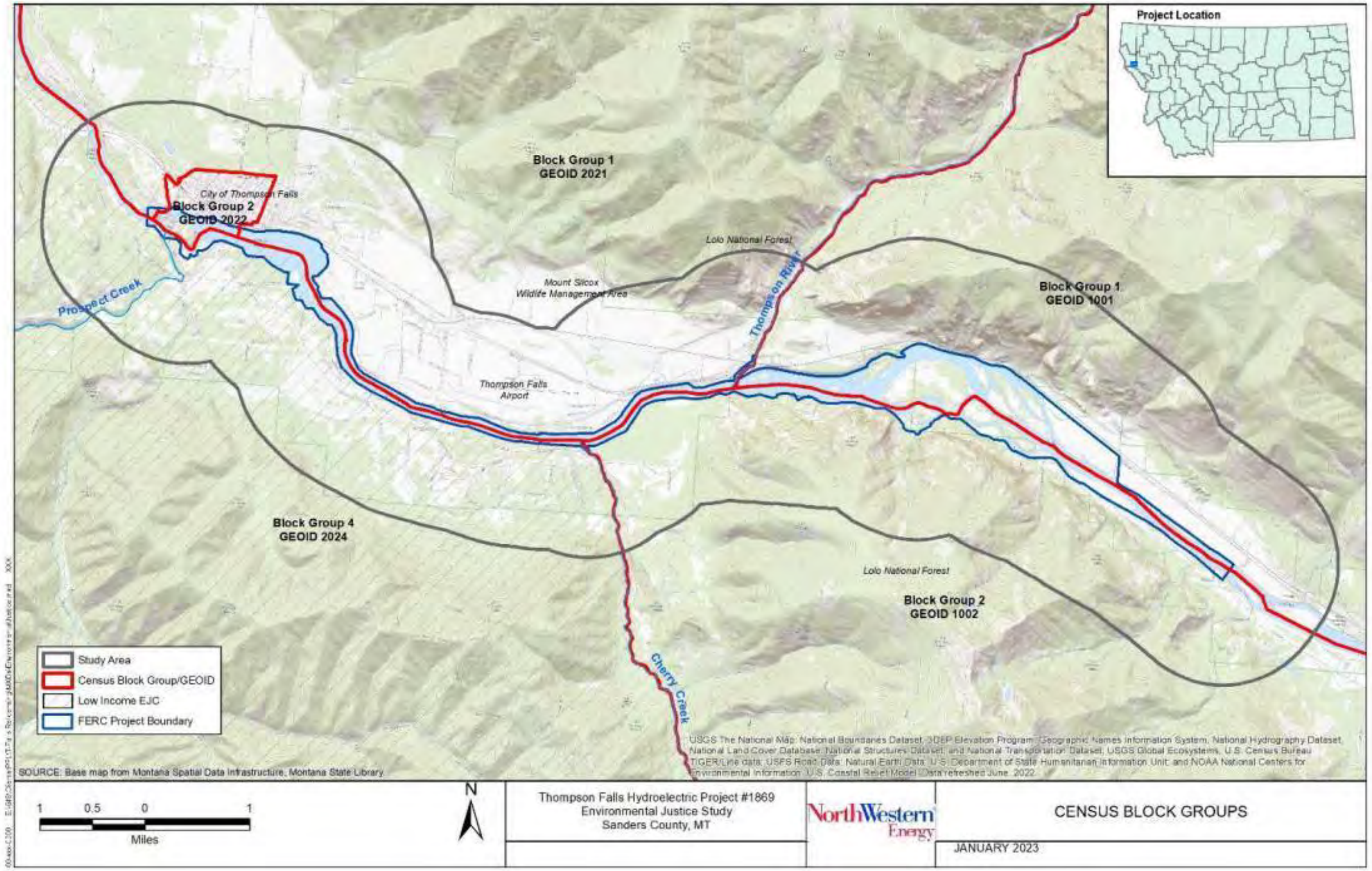
NorthWestern Energy
Delivering a Bright Future

Environmental Justice Study – Methods

- FERC's approved methodology is modeled after the Environmental Protection Agency's process to analyze Environmental Justice issues.
- U.S. Census Bureau data is used to determine the presence of minority and low-income populations, and whether those populations exceed certain thresholds.
- If such population exists that exceeds a threshold, it is then deemed an Environmental Justice Community (EJC).
- NorthWestern then analyzed whether Project operations would have a disproportionately adverse impact on EJCs.

Environmental Justice Study - Results

- No EJCs exist based on minority populations.
- Two EJCs exist based on low-income populations.



NorthWestern Energy
Delivering a Bright Future

Environmental Justice Study - Results

- The Project primarily has positive environmental, economic, recreation, and community effects on the EJCs.
- Hydropower is a renewable energy source that produces reliable, low-cost energy and plays a key role in addressing climate change and provides benefits beyond electricity generation such as flood control, irrigation support, and recreational resources.
- The Project employs 6 people and a variety of contractors and it is reasonable to believe they have a positive economic impact in these EJCs.
- Island Park, Power Park and other NorthWestern- supported recreation sites provide free opportunities for public recreation within and near these EJCs.

NorthWestern Energy
Delivering a Bright Future

Environmental Justice Study - Conclusion

- The study concluded that there are no disproportionately adverse impacts to EJCs.

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
    - Phone controls for participants –*9 –to raise hand.
    - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

NorthWestern Energy

Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Updated Study Plan Meeting – Operations Study

May 24, 2022

Study Goals and Objectives

Operations Study Goals

- Further evaluate the impacts on Project resources during flexible capacity operations.

Operations Study Objectives

- Better understand the current required frequency and magnitude of increases and decreases of generation.
- Assess shoreline stability, riparian habitats, fisheries, recreation and aesthetics, and wetlands under real-world application of grid stabilizing operations.

Study Methods

- Operate the Thompson Falls Project to provide baseload and flexible generation to support grid reliability and market conditions.

- Daily operations were determined in real-time as stable, increases, or decreases in generation were called upon to provide NorthWestern's grid reliability and meet market conditions needs

- All operations during the 2022 Study Season:
  - maintained the reservoir elevation within the top 2.5 feet, and
  - provided a minimum flow of 6,000 cubic feet per second downstream of the Project

NorthWestern Energy
Delivering a Bright Future

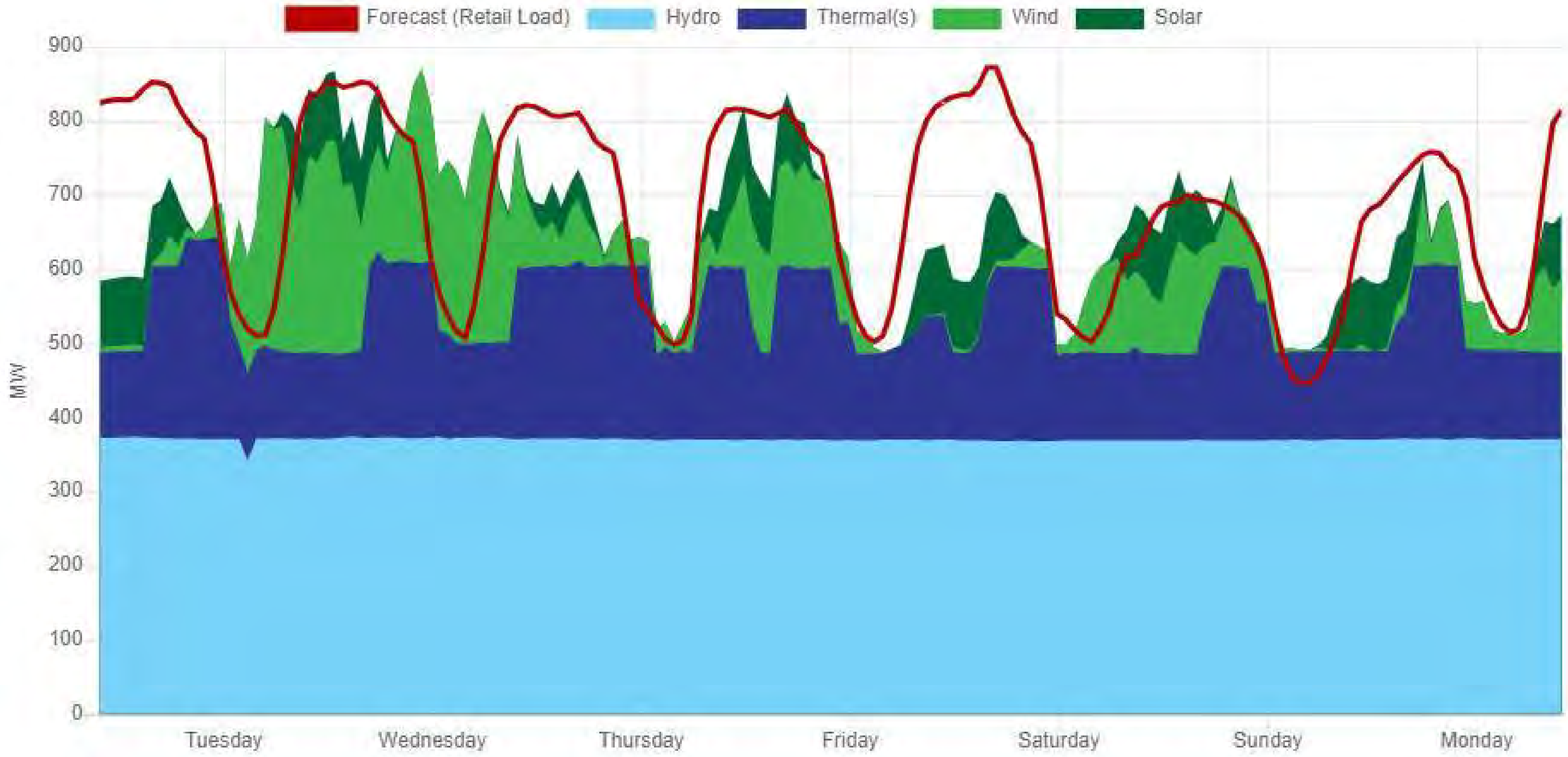
Operations Study – Plant Operations

- Flexible Capacity – flexibility to increase (INC) or decrease (DEC) plant output to help balance the inputs and outputs on the grid
  - Load (outputs) and Generation (inputs) dynamically change all the time
- The foundation of grid stability and reliability
  - Helps maintain system frequency and voltage
- Strict regulations on maintaining grid stability and reliability

Operations Study – Plant Operations

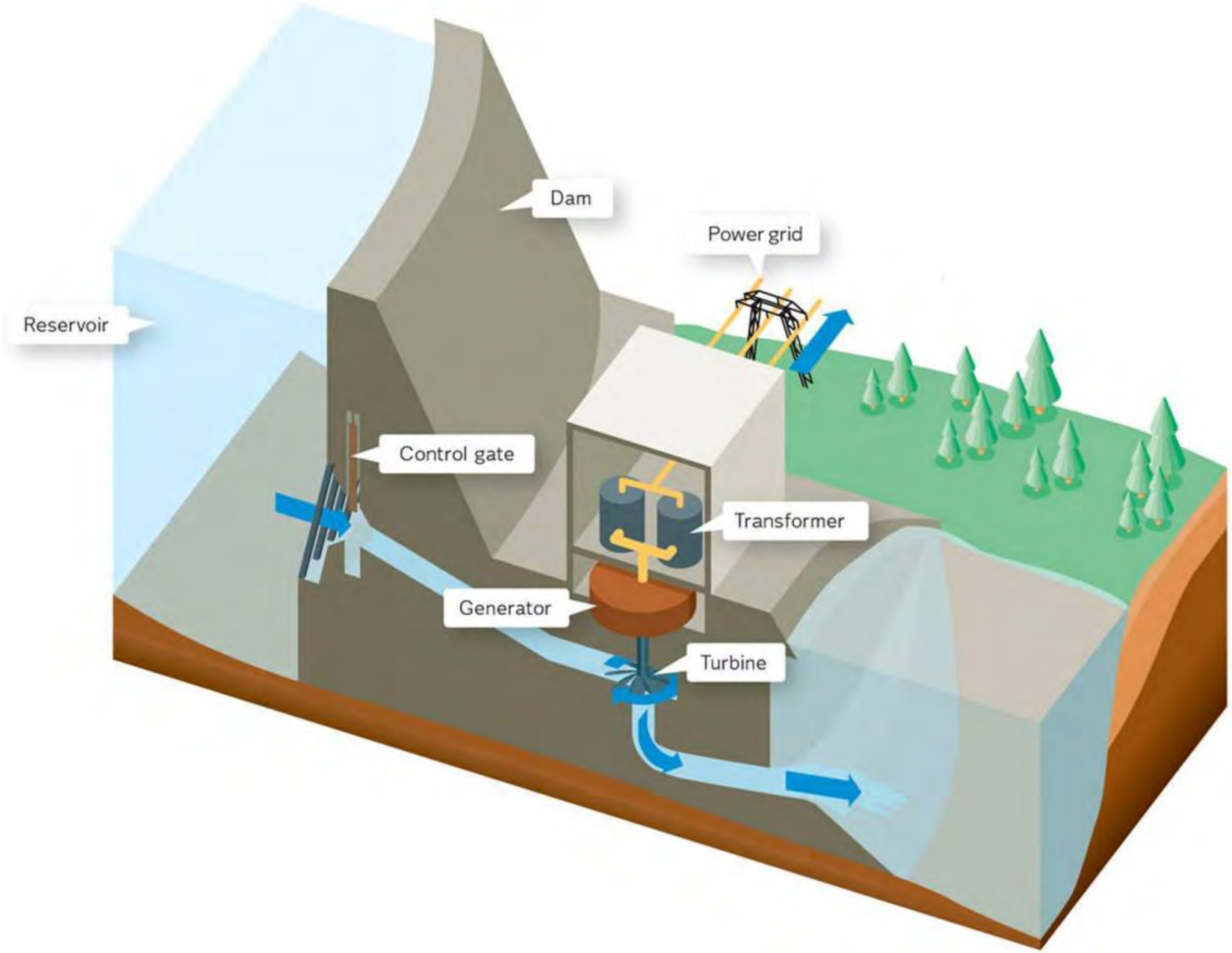
Hourly electrical generation by source (Montana)

This chart is data between 5/15/23 and 5/22/23



NorthWestern Energy
Delivering a Bright Future

Operations Study – Plant Operations



MW INC = Reservoir drop

MW DEC = Reservoir rise

Rate of reservoir change is function of the MW INC or DEC

Duration of flex capacity is a function of reservoir storage available

NorthWestern Energy
Delivering a Bright Future

Operations Study – Plant Operations

- Flexible Capacity is calculated and made available on a real time basis

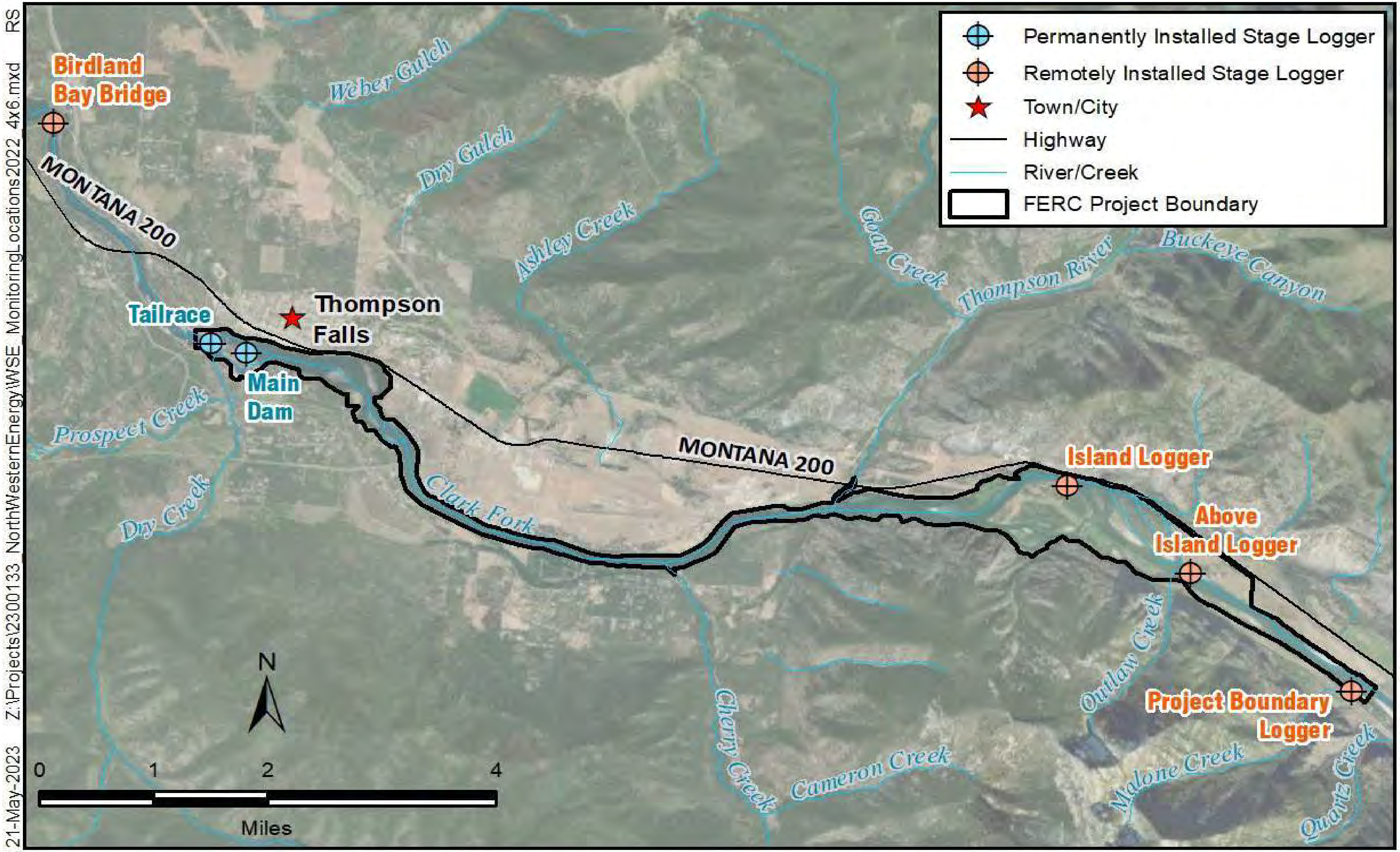
- Based on:
  - Reservoir elevation
  - Generating unit configuration
    - Available units
    - INC/DEC available on individual units
    - Driven by baseflows most of the time
    - Can include spilling water at times

NorthWestern Energy
Delivering a Bright Future

Operations Study – Plant Operations

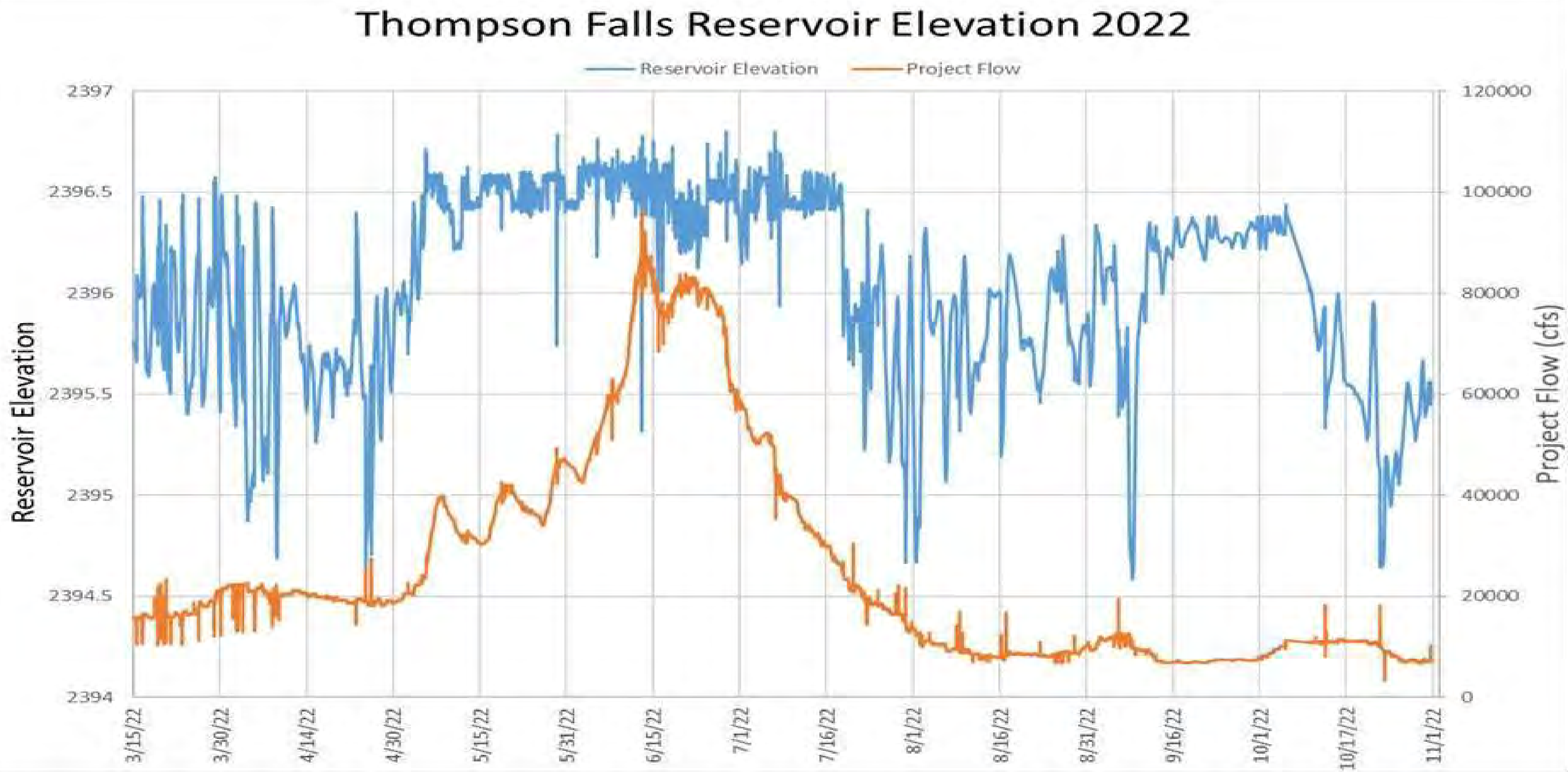
- This study represented real-time capability and provision of flexible capacity
  - Frequency of INC/DEC based on real system need
  - Duration of INC/DEC was suppressed due to reservoir elevation use
- Operationally, the plant performed well with no major issues in the provision of flexible capacity
- Proving flexible capacity from the Thompson Falls plant provides great benefits

Water Surface Elevation Monitoring Locations 2022

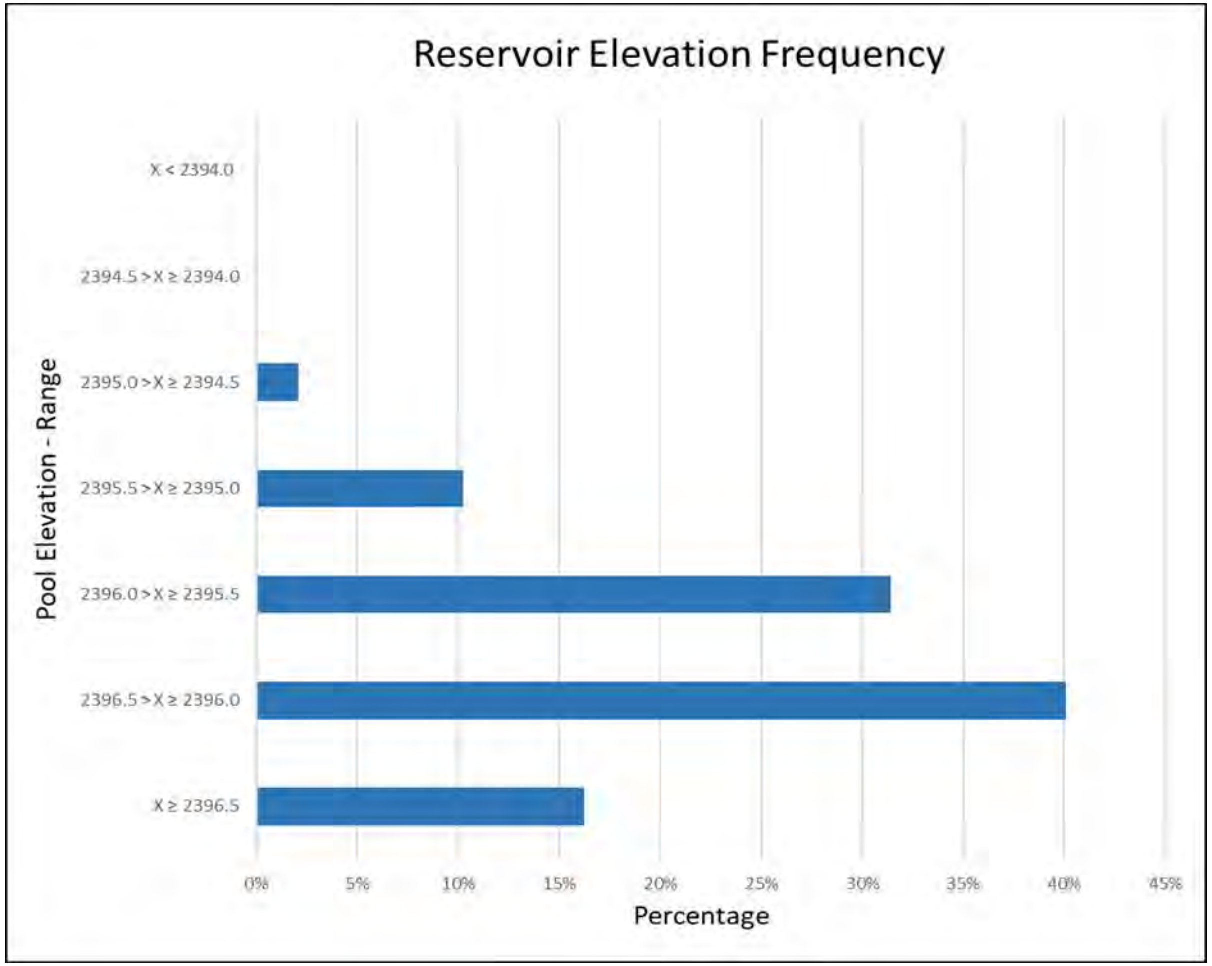


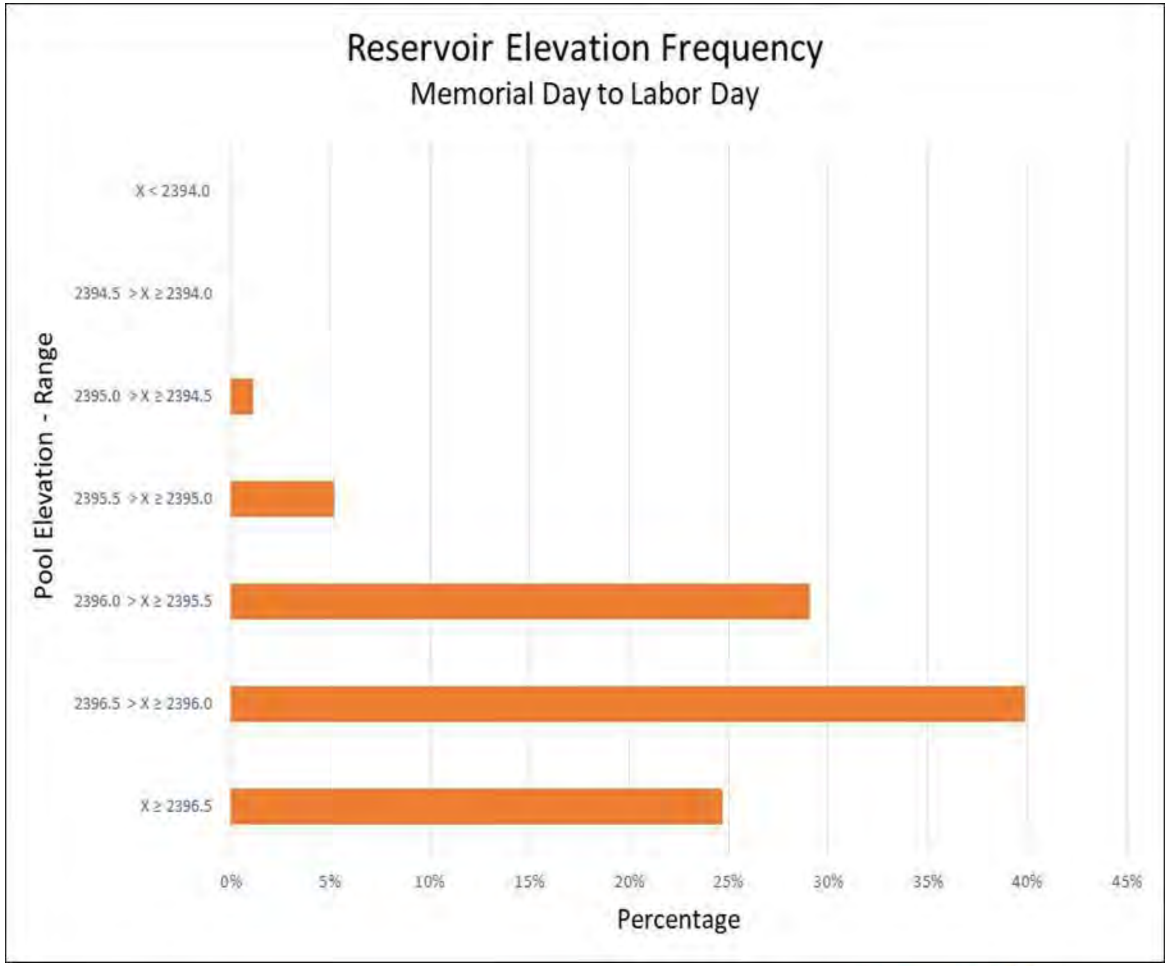
NorthWestern Energy
Delivering a Bright Future

Reservoir Elevation (feet) and Flow (cfs), March – October 2022



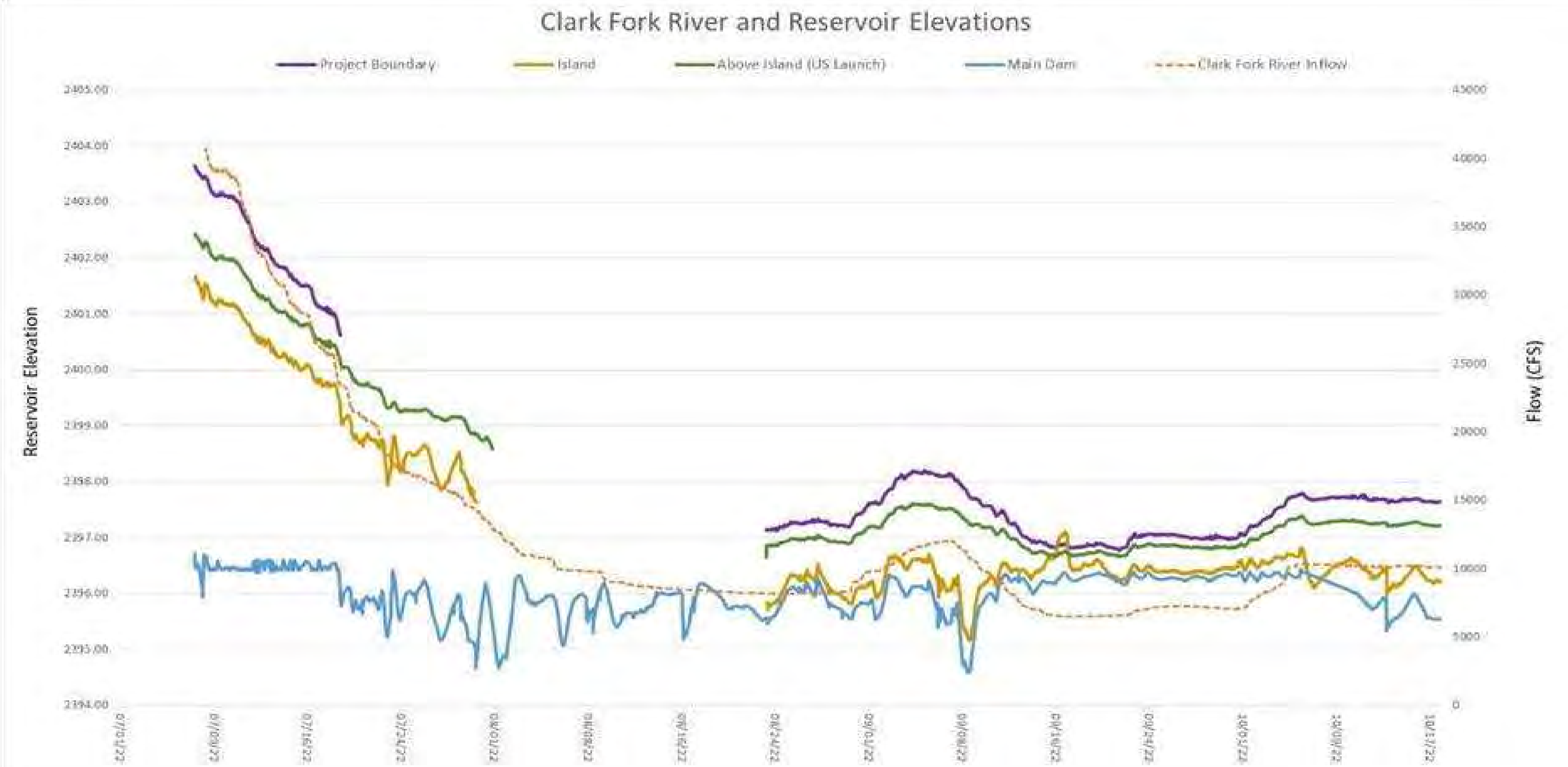
Reservoir Elevation (feet) – Second Study Season 2022



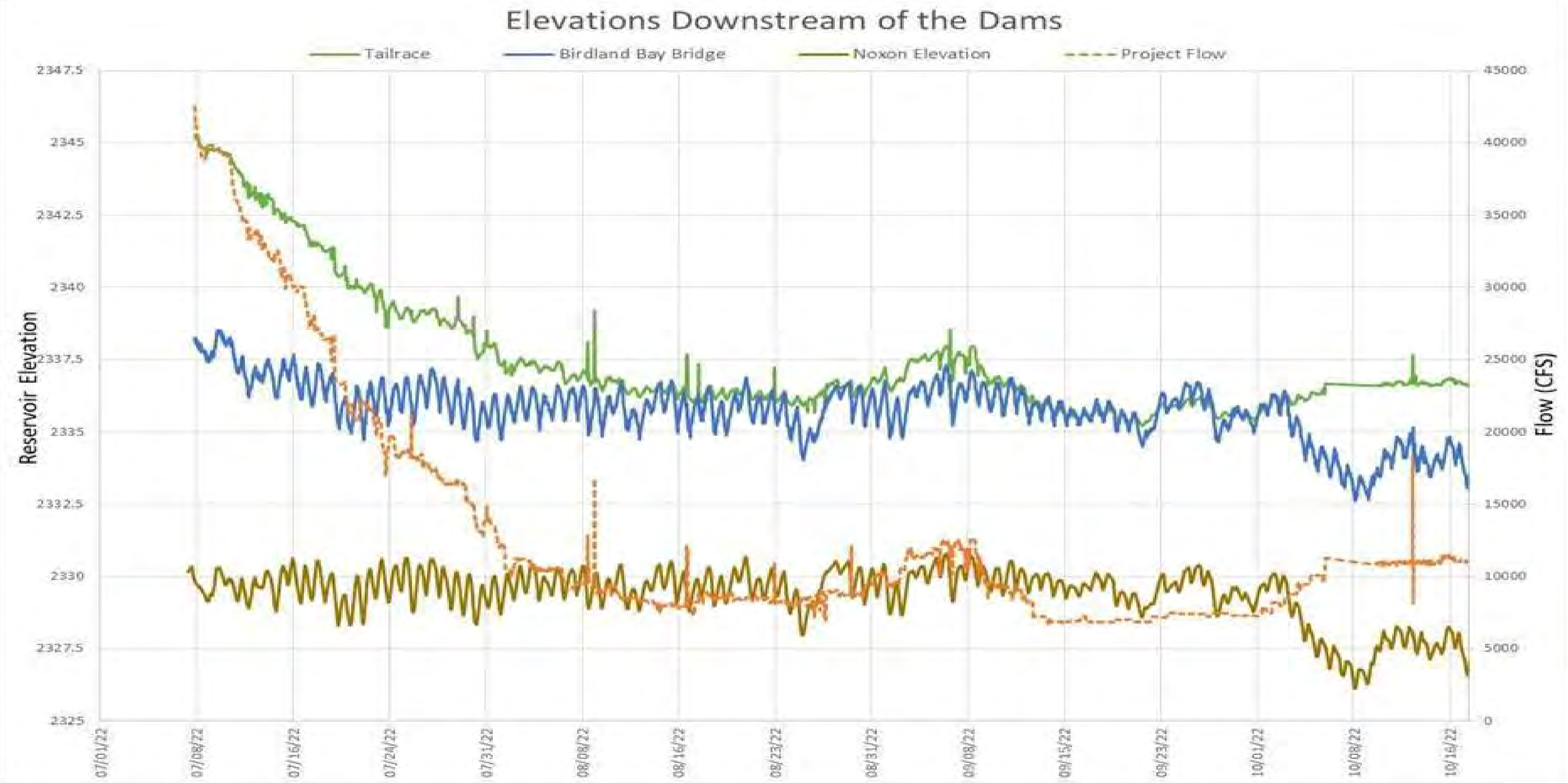


NorthWestern Energy
Delivering a Bright Future

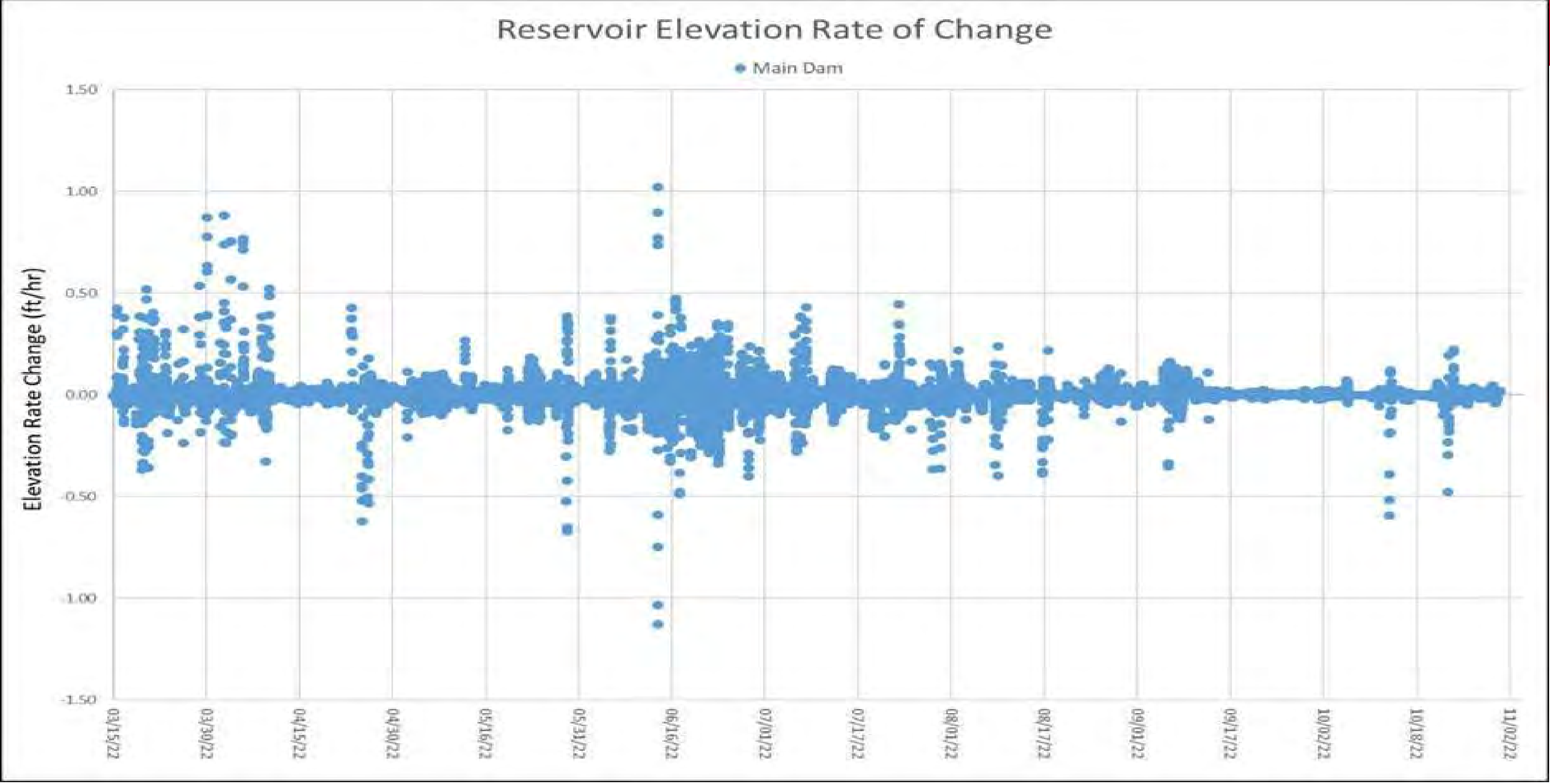
Water Surface Elevations Upstream of the Project



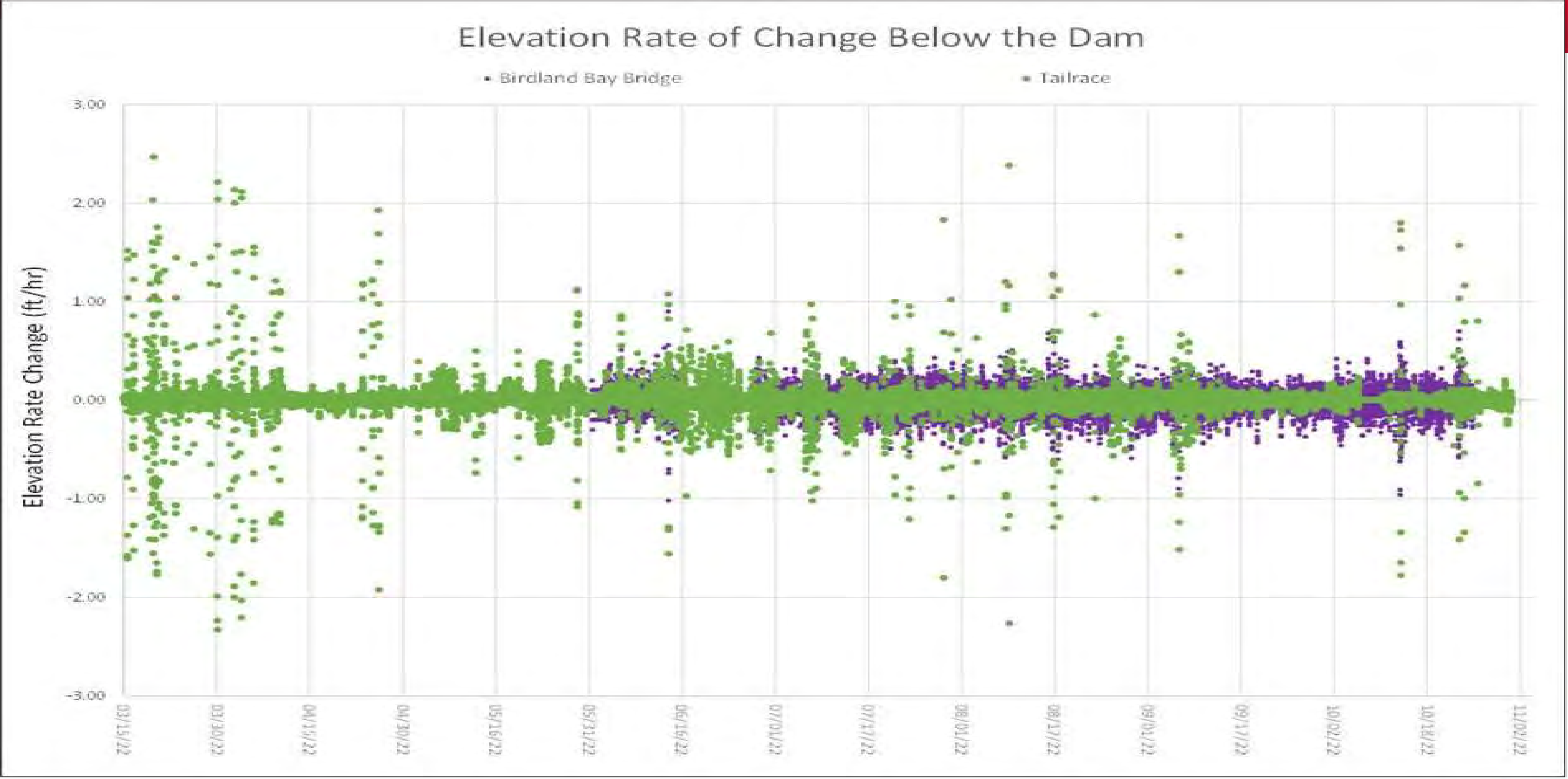
Water Surface Elevations Downstream of the Project



Thompson Falls Reservoir Elevation Rate of Change



Rate of Change in Stage (feet) Below Dams



Maximum Rate of Change in Stage

Max Rate in Reservoir and Upstream

Season	Maximum Rate of Change Main Dam (ft/hr)		Maximum Rate of Change Project Boundary* (ft/hr)	
	Increase	**Decrease**	**Increase**	**Decrease**
Phase 1 2021	0.3	-0.5	0.05	-0.08
Phase 2 2021	0.4	-0.91	0.05	-0.2
Phase 3 2021	0.65	-1.46	0.05	-0.15
Study Season 2022 (3/15-10/31)	1	-1.1	.07*	-.07*

*Data available for 7/7/2022-10/25/2022 at the Project boundary site

Max Rate Downstream

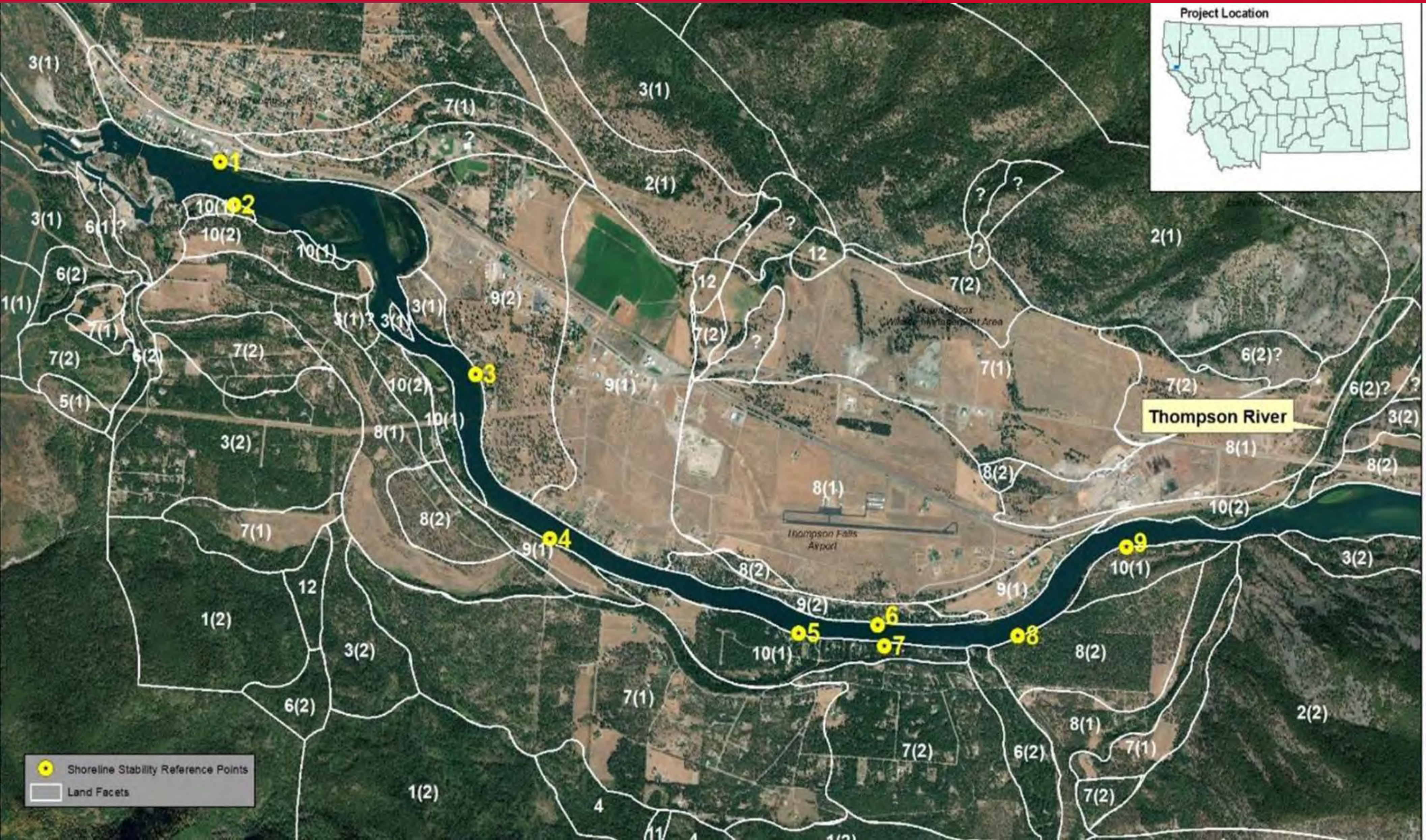
Season	Maximum Rate of Change Tailrace (ft/hr)		Maximum Rate of Change Birdland Bay Bridge (ft/hr)	
	Increase	**Decrease**	**Increase**	**Decrease**
Phase 1 2021	1.5	-2.1	0.8	-0.7
Phase 2 2021	3.3	-3.6	1.4	-1.5
Phase 3 2021	4.2	-4.4	1.2	-1.7
Study Season 2022 (3/15-10/31)	2.5	-2.3	0.9	-1.0

Shoreline Stability-Methods

- 9 reference points - diversity of soil types, slope, aspect, vegetation, and land use.
- Same reference points as the 2021 field season.
- Monitoring events July 20, 2022 and September 13, 2022
- Document the presence, type and magnitude of erosion, soil type, land management activities, and existing erosion control measures, if any.
- Photo documentation of each site visit.

NorthWestern Energy
Delivering a Bright Future

Shoreline Stability Reference Points



NorthWestern Energy
Delivering a Bright Future

Shoreline Stability - Results

- Fluctuating water levels due to operations did not decrease shoreline stability
- Shoreline armoring by rock, woody materials and aquatic/riparian vegetation maintained shoreline stability

NorthWestern Energy
Delivering a Bright Future

Shoreline Stability – Results

- Shoreline stability was impacted by other factors such as bank stabilization projects, spring runoff and windstorms.

NorthWestern Energy
Delivering a Bright Future

Riparian Habitats – Methods

- Observations of:
  - riparian vegetation (above waterline)
  - aquatic vegetation (emergent and submergent)
  - aquatic invasive species (AIS).
- Same 9 reference points as Shoreline Stability Study.

NorthWestern Energy
Delivering a Bright Future

Riparian Habitats - Results

- A diversity of riparian and aquatic vegetation types and plant communities.
- No impacts to riparian vegetation (above waterline); riparian species adapted to fluctuating water levels.
- Impacts to aquatic vegetation likely, especially submergent aquatic vegetation.



Riparian Habitats - Results

- Aquatic invasive species (AIS) are present and vary in density with yellow flag iris and flowering rush the most common species observed and small amounts of curly leaf pond also present.
- No changes to AIS observed during study.

Western Energy
Delivering a Bright Future

Fisheries Stranding

- Conduct two stranding surveys during 2022 season
- 12 transects walked looking for stranded or trapped fish, August 24 (2395.6') and 31 (2395.8')
- No stranded fish observed
- Many of the transects still submerged

Fish Passage Facility Operation

- Operate fish passage facility using standard operating procedure
- Daily checks March – October
- Fully functional at all times and associated forebay elevations
- During fall vegetation plugged some screens and slowed filling of the lock. Operations not impeded more than 30 minutes.

NorthWestern Energy
Delivering a Bright Future

Recreation and Aesthetics – Methods

Assessment of impacts to docks and aesthetic qualities:

- Public docks at Wild Goose Landing and Cherry Creek and 11 private docks conditions documented and photographed.
- Days with anticipated generation increase selected for assessment.
- Modification from FERC-approved Study Plan: water depth at end of each dock was not measured due to the short timeframe the reservoir elevation was below full pool.
- Changes in aesthetics at 9 public viewing areas were documented through photos and assessment of odors.

NorthWestern Energy
Delivering a Bright Future

Recreation - Methods

Impacts related to:

~ Physical condition of dock/gangway.
~ Access to dock from shoreline.
~ Access to water from dock.
~ Access to boats moored at dock.

Assessment Scale:

0: No impact. No structural impact or access not limited or affected in any case.

-1: Slight impact. Access minimally impacted in less than 25% of cases.

-2: Moderate impact. Access impacted minimally or moderately in 50% of less cases.

-3: Significant impact: Access impacted moderately or significantly in more than 50% of cases.

-4: Severe impact: Access prohibited in all or nearly all cases.

Recreation Results

		Reservoir Elevation Below Full Pool					
Component Assessed	*Dock Type*	0	-0.5 ft	-1 ft	-1.5 ft	-2.0 ft	-2.5 ft
Physical Condition of Dock and Gangway	*Floating*	0	0	0	0	-1	-2
	Stationary	0	0	0	0	0	0
Access to Dock	*Floating*	0	0	0	-1	-1	-2
	Stationary	0	0	0	0	0	0
Access to Water from Dock	*Floating*	0	0	0	0	-1	-2
	Stationary	0	0	0	-1	-2	-2
Access to Boat Moored to Dock	*Floating*	0	0	0	0	n/a	n/a
	Stationary	0	-1	-1	-1	-3	-3

NorthWestern Energy
Delivering a Bright Future

Recreation – Results

Full Pool

-1.0 ft

2022 Flexible Capacity Generation

-2.5 ft

Lowest elevation proposed

<u>Wild Goose Landing stationary public boat launching dock</u>

No impacts to dock condition or access to dock.

Slight impacts to access to the water from dock and to boat moored at dock at -2.5 ft below full pool.

NorthWestern Energy
Delivering a Bright Future

Recreation – Results

Full Pool

<u>Wild Goose Landing floating swim dock</u>

-1.0 ft

2022 Flexible Capacity Generation

No impacts to dock condition, access to dock, or access to the water from dock at -2.5 ft below full pool.

-2.5 ft

Lowest elevation proposed

No boat mooring at swim dock.

NorthWestern Energy
Delivering a Bright Future

Results

Full Pool

<u>Cherry Creek Boat Launch site floating launch dock</u>

-1.0 ft

2022 Flexible Capacity Generation

No impacts to dock condition or access to dock at all elevations.

-2.5 ft

Lowest elevation proposed

Slight impacts to access to the water from dock and to boats moored at dock at 2.5 ft below full pool.

NorthWestern Energy
Delivering a Bright Future

Private stationary dock at -0.5 ft and -2.0 ft.

Recreation – Results

Private floating dock at -2.5 ft.

NorthWestern Energy
Delivering a Bright Future

Recreation Results Conclusions

- Recreation impacts at Wild Goose Landing and Cherry Creek Boat Launch were minimal during Flexible Capacity Operations in 2022 and during staged testing in 2021. Stationary docks remained watered, floating docks remained floating, and use of the public launching docks for mooring was only slightly impacted for the short-term duration of Flexible Capacity Operations.
- Flexible Capacity Operations in 2022 resulted in only slight impacts to private docks related to access to boats moored at docks, but accounts for only about 5% of docks. Flexible Capacity Operations were short-term.
- Reservoir elevations -2.0 ft and lower created moderate to significant impacts for less than half of private docks. Most impacts were at stationary docks (20% of all docks).

Aesthetic Impacts Results

- The lowest reservoir elevation of 2022 Flexible Capacity Operations monitoring events was 1.0 ft below full pool reservoir elevation. Duration of reduced elevations was short (less than 1 hour).
- Typically 5 feet or less of exposed mud along the shoreline. Some shallow areas or shorelines with gradual slopes had up to 10 feet of exposed mud.
- Offensive odors of decaying organic matter did not exist, likely due to the short duration of the mud exposure.

Aesthetics – Results

Shoreline of Island Park and Wild Goose Landing at -1.0 ft elevation.

NorthWestern Energy
Delivering a Bright Future

Aesthetics – Results

South shoreline above Steamboat Island and Cherry Creek Boat Launch at -1.0 ft

NorthWestern Energy
Delivering a Bright Future

Aesthetics – Results

North shoreline above Steamboat Island at -1.0 ft below full pool.

NorthWestern Energy
Delivering a Bright Future

Aesthetics – Conclusions

Aesthetics Impacts - Conclusions

- Impacts were minimal under flexible capacity operations in 2022, with some exposed mud and rock along shorelines but no offensive odors for the short-term reductions in elevation.

Wetlands

- Wetlands located within the Project were studied to determine if reservoir operations were affecting wetland functionality.

- Results from the 2021 study season found wetlands that did not have a direct surface water connection to Thompson Falls Reservoir were unaltered by Project operations. However, wetlands studied in 2021 that had a direct surface water connection to the reservoir exhibited water level fluctuations during reservoir elevation changes at the dam.

- The 2022 study season focused on studying wetlands with surface water connectivity to Thompson Falls Reservoir to further understand this relationship.

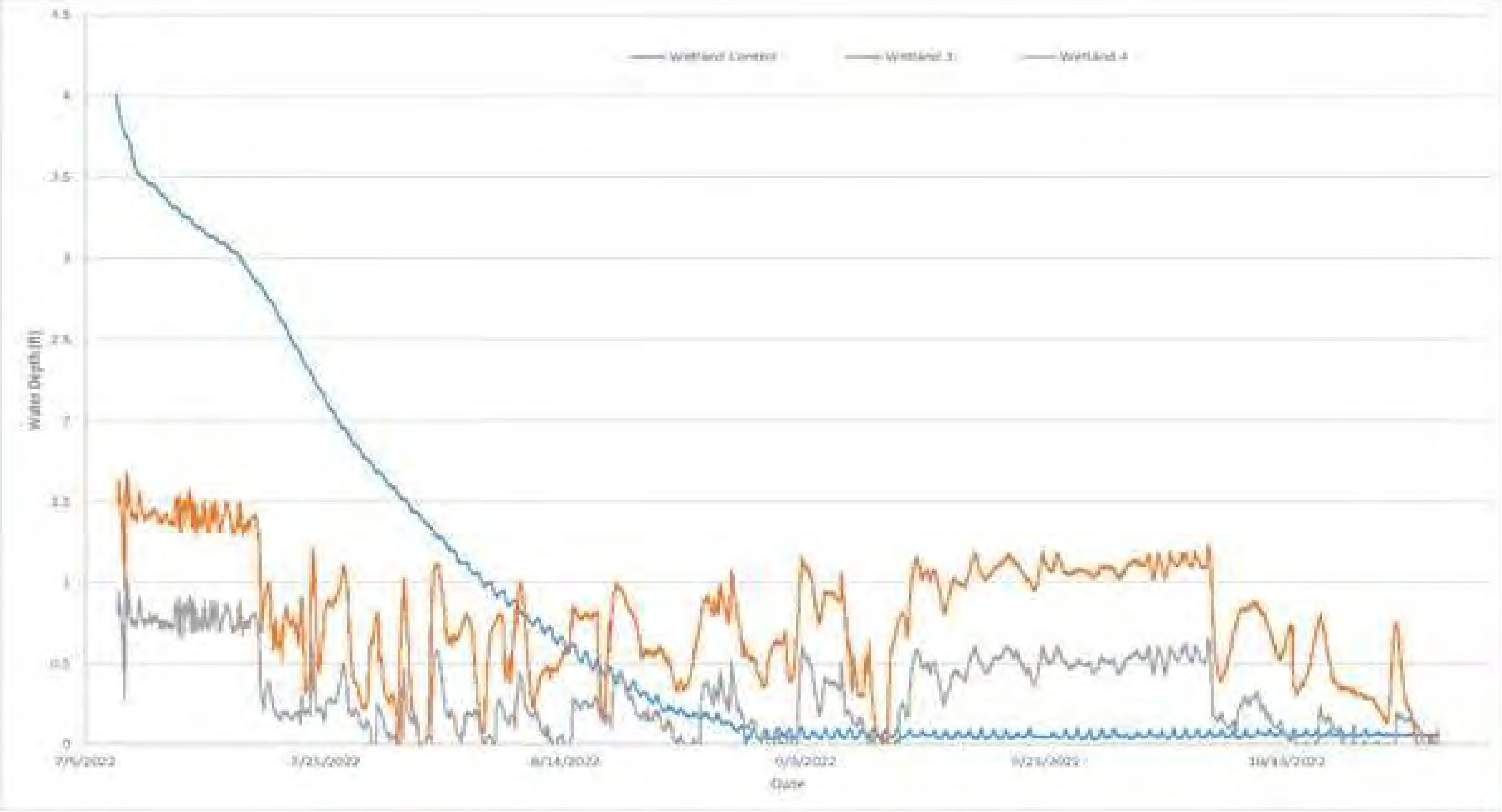
Wetland Study Methods

- Water level recording dataloggers were installed in three wetland sites, two study sites and one control site, in 2022 to measure water levels throughout the study season.

- Data collected were compared to reservoir elevation data from the dam as well as inflow data to the reservoir from an upstream USGS stream gage.

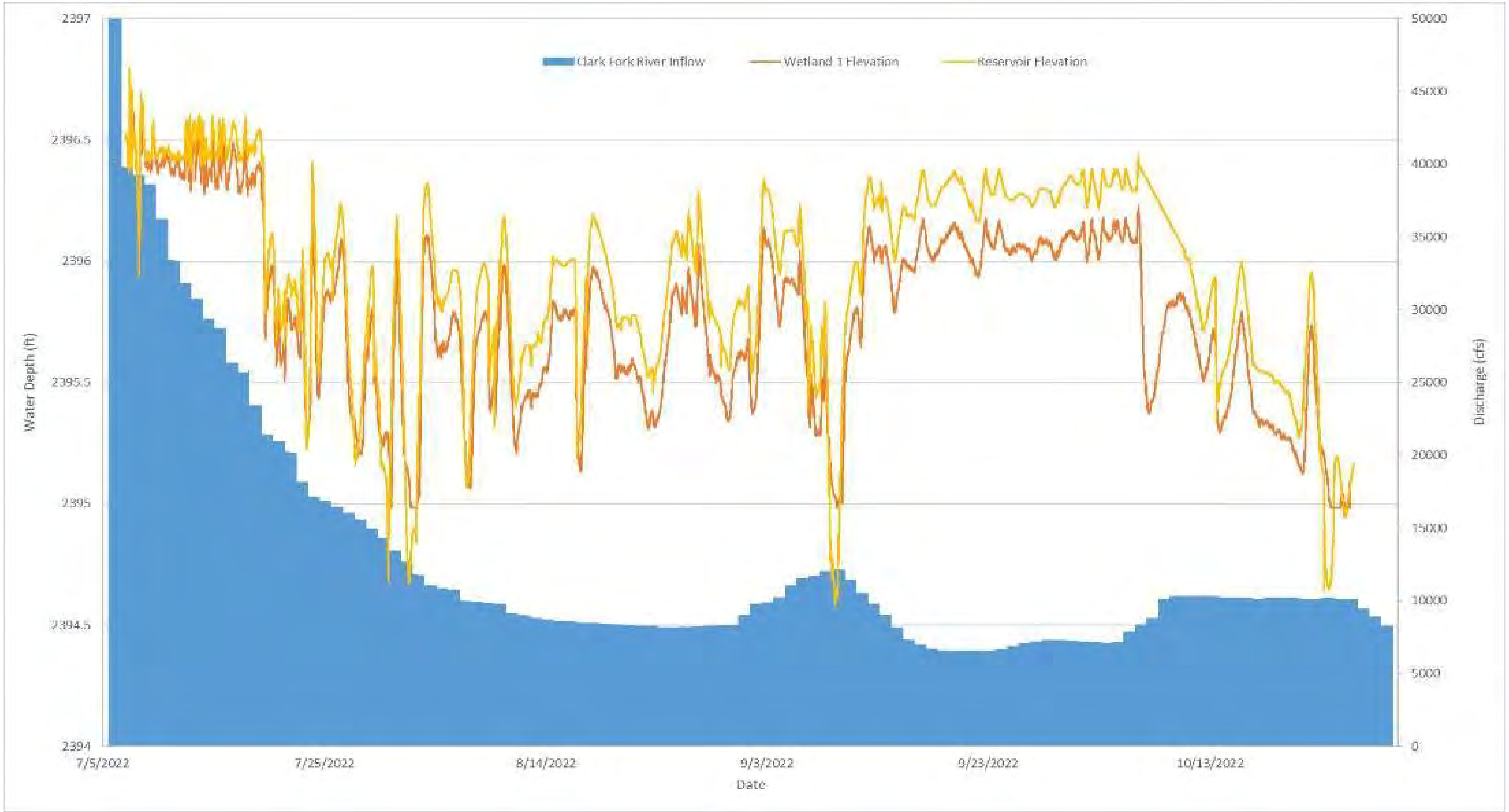
NorthWestern Energy
Delivering a Bright Future

Wetland Study Results



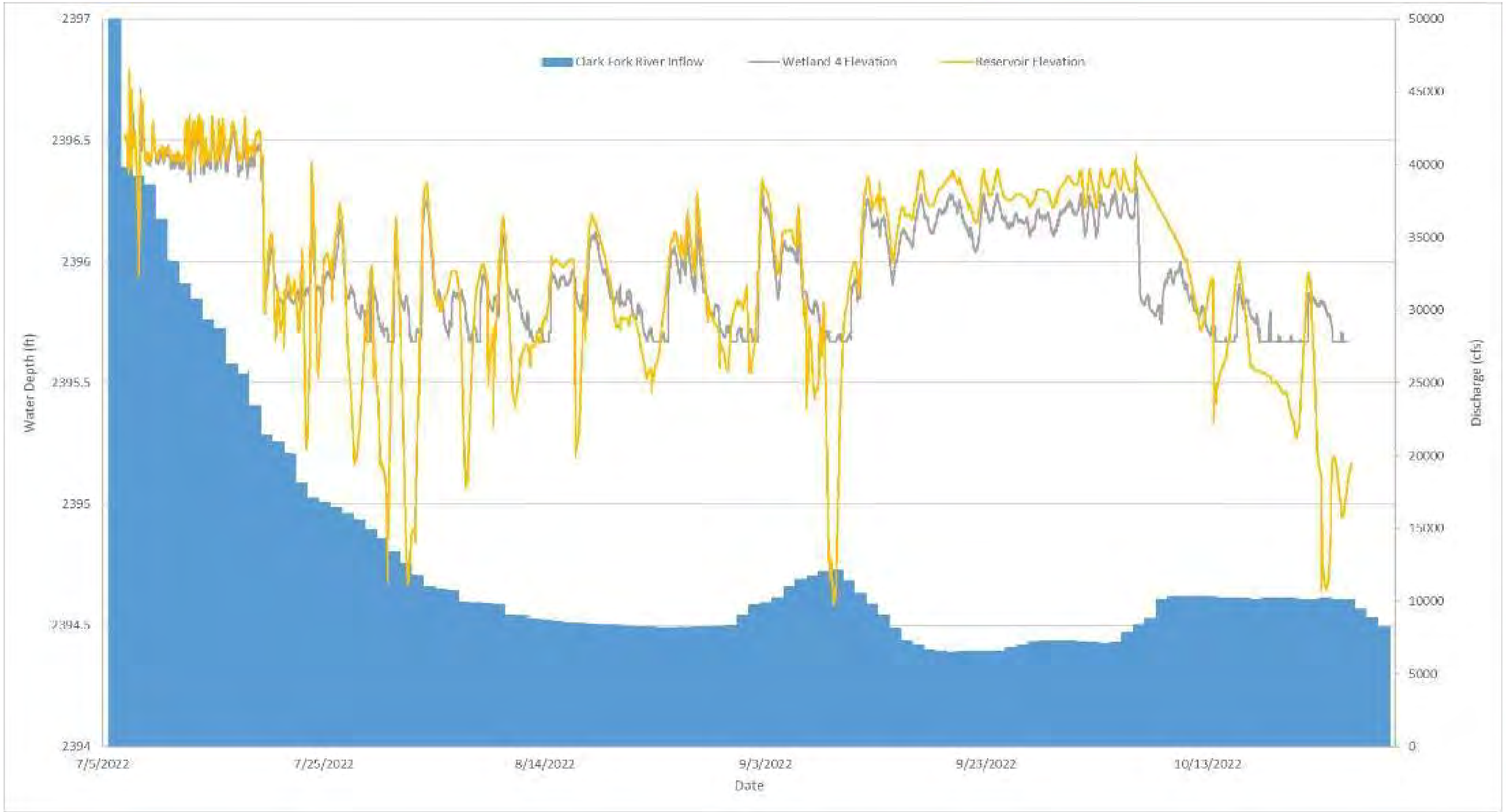
NorthWestern Energy
Delivering a Bright Future

Wetland Study Results



NorthWestern Energy
Delivering a Bright Future

Wetland Study Results



NorthWestern Energy
Delivering a Bright Future

Wetland Study Conclusions

- Wetlands which have a direct surface water connection to Thompson Falls Reservoir have a high risk of being affected by Project operations.

- The environmental effects on these wetlands are generally temporary in nature, and include loss of fish habitat, reduction of shallow water habitat for amphibians, birds, and other wildlife, and the potential reduction of submergent vegetation at some sites.

- As water levels in the reservoir recede, new shallow water habitats are also created. When water levels increase, the original shallow water habitat areas are restored.

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

Thompson Falls Hydropower Project Relicensing
Updated Study Report Meeting
Evening Meeting
May 25, 2023, 6:00 PM to 8:00 PM (Mountain Time)

Location: Sanders County Courthouse - District Courtroom
1111 W. Main Street
Thompson Falls, Montana 59873

AGENDA

Start Time	Topic
6:00:00 PM	Introductions, Zoom Tips, Overview of the FERC Process
6:15:00 PM	Hydraulic Conditions Study
6:30:00 AM	Fish Behavior Study
6:45:00 AM	TDG Study
7:00:00 AM	Cultural Resource Study
7:15:00 AM	Environmental Justice Study
7:30:00 AM	Operations Study
8:00:00 PM	Adjourn

Remote connection option:
Join Zoom Meeting
https://us06web.zoom.us/j/89620436330

Meeting ID: 896 2043 6330

One tap mobile
+16694449171,,89620436330# US
+12532050468,,89620436330# US

Dial by your location
+1 669 444 9171 US
+1 253 205 0468 US
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 719 359 4580 US
+1 720 707 2699 US (Denver)
+1 301 715 8592 US (Washington DC)

Meeting ID: 896 2043 6330
Find your local number: https://us06web.zoom.us/u/ko0ldZtFu

Thompson Falls Updated Study Report Meeting
NorthWestern Energy
In-Person Attendees, Thompson Falls, Montana

May 25, 2023 6:00 – 8:00 PM
Sign-In Sheet

Name	Affiliation
Mary Gail Sullivan	NorthWestern Energy
Kristi Webb	New Wave
Mark Ashenfelter	GEI Consultants, Inc
Jordan Tollefson	NorthWestern Energy
Kim McMahon	Pinnacle
Michael Tust	Federal Energy Regulatory Commission
Ginger Gillin	GEI Consultants, Inc
Ken Dickerson	Mitzi Rossillon Consulting
Paul Fielder	Legislature
Bill Beckman	self
Al Dodson	self
Roscoe Kronfuss	self
Kayla Mosher	KLT/ Thompson Falls Community Trails
Margaret Smallwood	self
Annie Wooden	Sanders County Ledger
Noel Jacobson	NorthWestern Energy
Kathy Conlin	Thompson Falls Community Trails
Zach Whipple-Kilmer	ESLL
Bruce Bugbee	American Public Land Exchange, Inc
Mark Sommer	American Public Land Exchange, Inc
Chuck Sensiba	Troutman Pepper
Andrea Wortzel	Troutman Pepper
John Tabaracci	NorthWestern Energy
Andy Welch	NorthWestern Energy
Jon Hanson	NorthWestern Energy

Thompson Falls Updated Study Report Meeting May 25, 2023 6:00 – 8:00 PM
NorthWestern Energy Attendance recorded by Lauren Gordon, GEI Consultants, Inc.
Zoom Participants

NorthWestern Energy Meeting – Participants:

Andy Welch, Northwestern Energy

Eric Holmstead, GEI Consultants, Inc.

Monica Ott, Avista Corp.

Leann Gebhardt, GEI Consultants, Inc.

NorthWestern Energy®

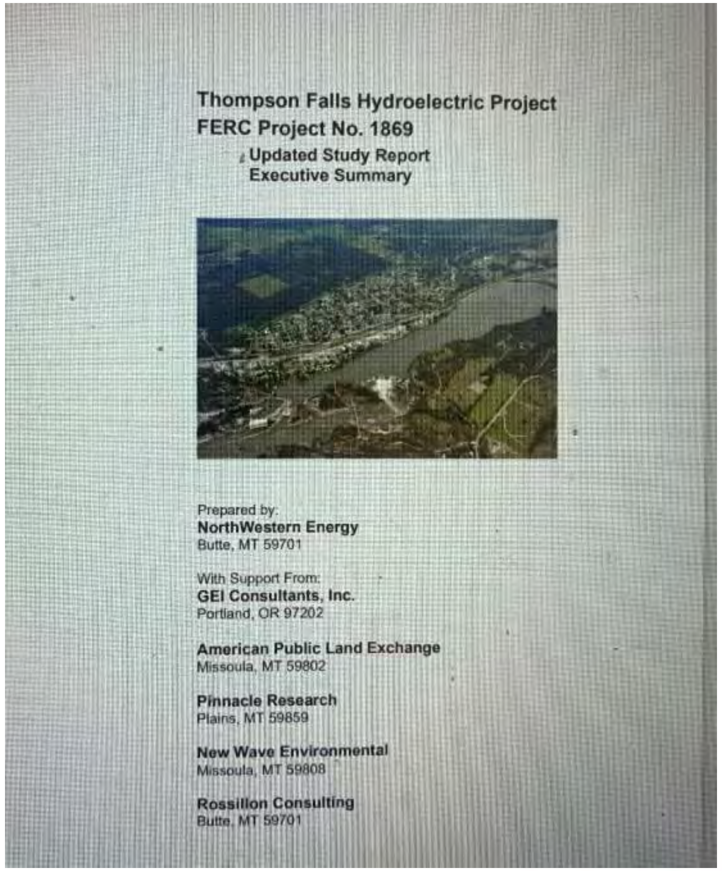
Delivering a Bright Future

Thompson Falls Hydroelectric Project Relicensing

Updated Study Report Meeting May 25, 2023

Welcome

- Introductions
- Safety Moment
- Purpose of the Meeting
- Review Relicensing Schedule
- Detailed Agenda
- Zoom Etiquette


Thompson Falls Hydroelectric Project
FERC Project No. 1869
Updated Study Report
Executive Summary

Prepared by:
NorthWestern Energy
Butte, MT 59701

With Support From:
GEI Consultants, Inc.
Portland, OR 97202

American Public Land Exchange
Missoula, MT 59802

Pinnacle Research
Plains, MT 59859

New Wave Environmental
Missoula, MT 59808

Rossillon Consulting
Butte, MT 59701

NorthWestern Energy
Delivering a Bright Future

Planning Your Plant
Pick the right tree and the right place.

1. **Get measurements**. Get height and width for once the tree is fully grown.
2. **Call 811**. Before digging, call 811 or visit Call811.com to have underground utility lines marked for free.
3. **Look up**. If power lines are over the area where you want to plant, plan to plant roughly 20 feet away based on the mature size of your tree.
4. **Look down**. To be safe, plant at least 25 feet away from the flags that indicate underground natural gas lines.
5. **Look around**. If there are any ground-level transformers nearby, plant at least 10 feet away from the front

Discuss the second year study results

1. Hydraulic Conditions
2. Fish Behavior
3. Total Dissolved Gas
4. Cultural Resources
5. Environmental Justice
6. Operations Study

Submit written comments directly to FERC by July 9, 2023

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

NorthWestern Energy
Delivering a Bright Future

2023 ILP Schedule

	Pre-Filing Activity	Due Date
NorthWestern	File Updated Study Report	5/10/2023
Relicensing Participants	Hold Updated Study Report Meeting	5/25/2023
NorthWestern	File Updated Study Report Meeting Summary	6/9/2023
Relicensing Participants	File Comments on USR Summary /Study Requests	7/9/2023
NorthWestern	File Response to Comments/Study Requests	8/8/2023
FERC	Resolve USR Summary Disagreements and Study Plan Determination	9/7/2023
NorthWestern	File Draft License Application	8/3/2023
Relicensing Participants	File Comments Draft License Application	11/1/2023
NorthWestern	File License Application with DEQ for Major Facility Siting	12/31/2023
NorthWestern	File Final License Application	12/31/2023

NorthWestern Energy
Delivering a Bright Future

Today's Schedule

Start Time	Topic
6:00:00 PM	Introductions, Zoom Tips, Overview of the FERC Process
6:15:00 PM	Hydraulic Conditions Study
6:30:00 AM	Fish Behavior Study
6:45:00 AM	TDG Study
7:00:00 AM	Cultural Resource Study
7:15:00 AM	Environmental Justice Study
7:30:00 AM	Operations Study
8:00:00 PM	Adjourn

Guidelines for Today's Meeting

- **In-person Participation**
  - **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Virtual Participation via Zoom**
  - **Video and Audio:** Keep OFF, unless you are speaking as a presenter or called on to ask a question. Phone controls for participants –*6 –to toggle mute/unmute.
  - **Technical Difficulties:** If you are having technical issues, please contact Lauren Gordon at 925.266.0419, lgordon@geiconsultants.com, or use the "Chat" function.
- **Accurate Attendance**
  - **In-person:** Be sure to sign-in.
  - **Zoom:** If you are shown by a phone number or abbreviated name, please send Lauren Gordon a message via "Chat" to capture your attendance.
- **Asking a Question**
  - **In-person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.
  - **Zoom:** During the Q&A–click on the "Chat" icon and type your question or click on the "Raise Your Hand" icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question. Phone controls for participants –*9 –to raise hand.
- **Agenda**
  - The time for each segment of the schedule will be maintained.

NorthWestern Energy
Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Hydraulic Conditions Study

Updated Study Plan Meeting

May 24th, 2023

- Background
- Computational Fluid Dynamics (CFD) Modeling
- Phase 1 CFD Modeling
- Phase 2 CFD Modeling

- 2008 Biological Opinion required a scientific review of the fish passage facility.
- Recommended a hydraulic study in the area downstream of the fish passage facility
- Hydraulic Modeling results to be combined with fish tracking data to evaluate the effectiveness of the fish passage facility.

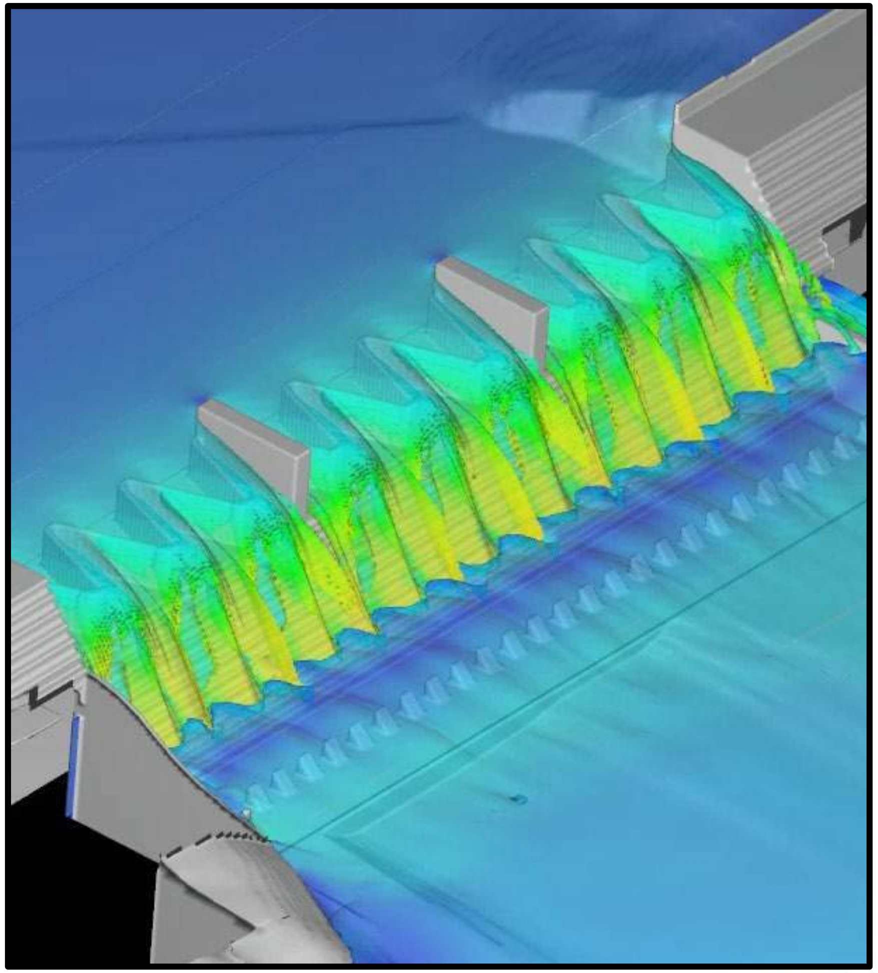
NorthWestern Energy
Delivering a Bright Future

Study Area in the FERC-approved Study Plan

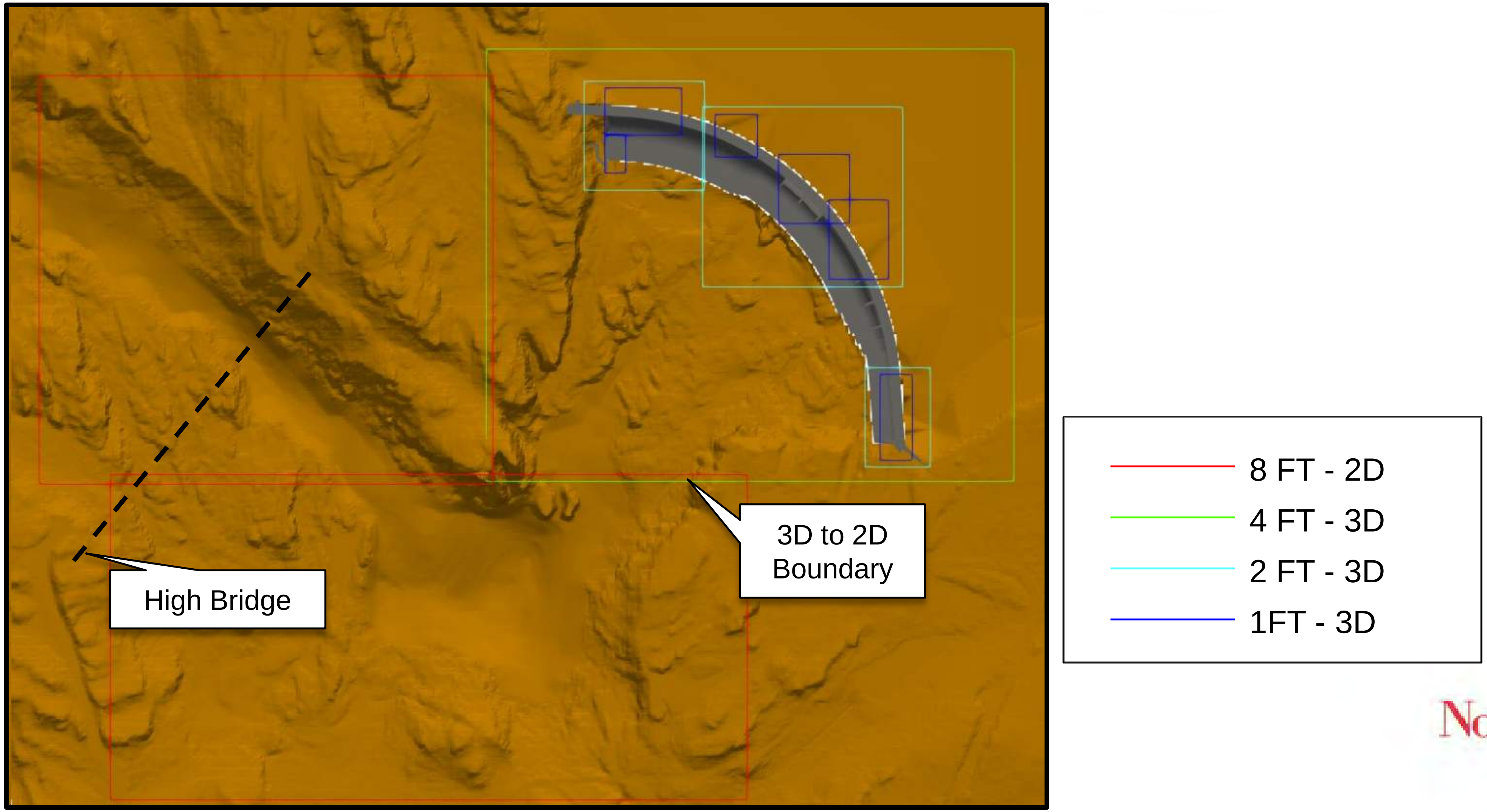
NorthWestern Energy
Delivering a Bright Future

Computational Fluid Dynamics

- Computational fluid dynamics (CFD) is a numerical modeling technique.
- The technique involves dividing a fluid domain into a mesh of small computational cells.
- Governing equations for fluid motion such as conservation of mass, momentum, and energy are solved inside each cell at each time step.

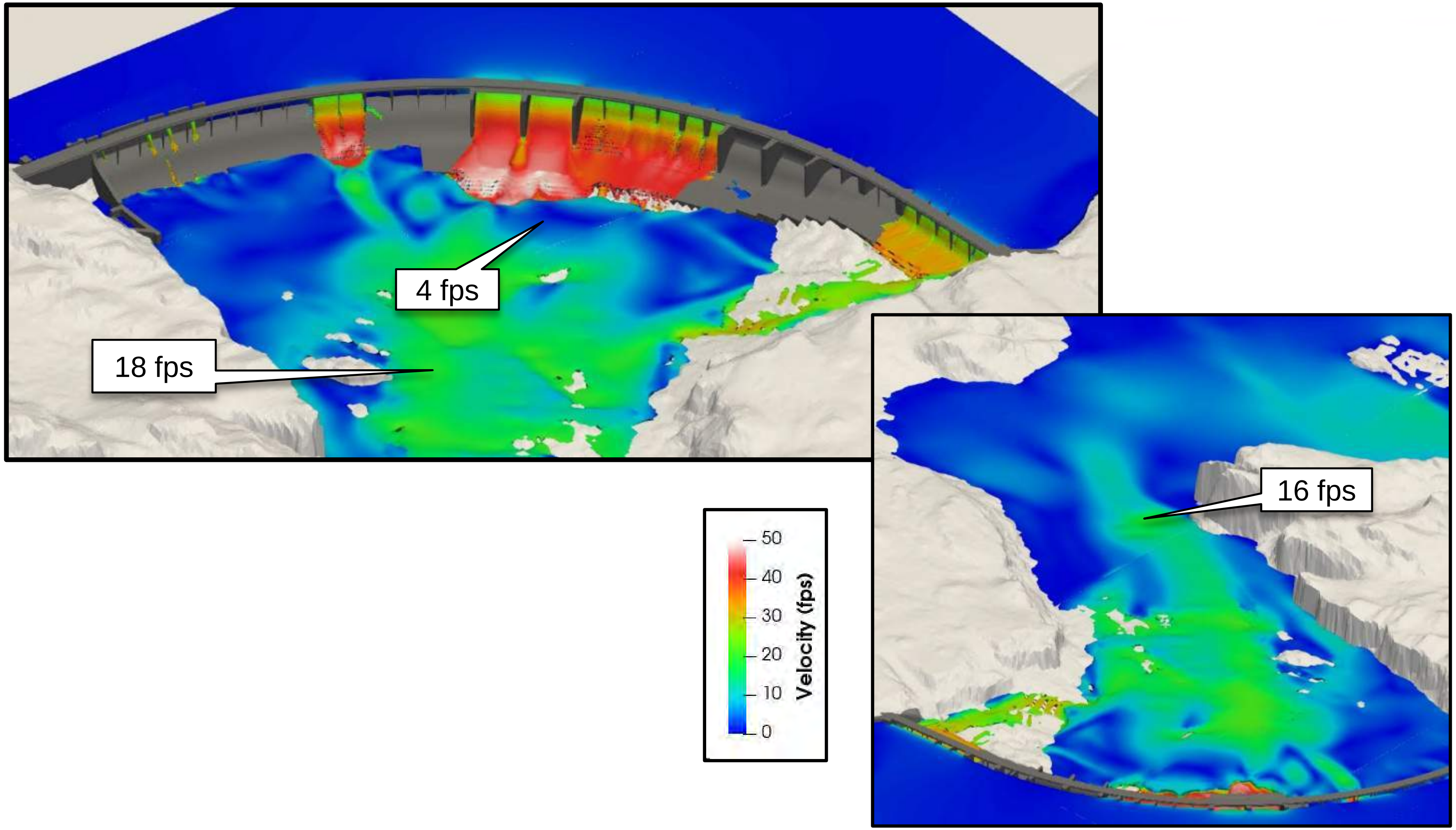


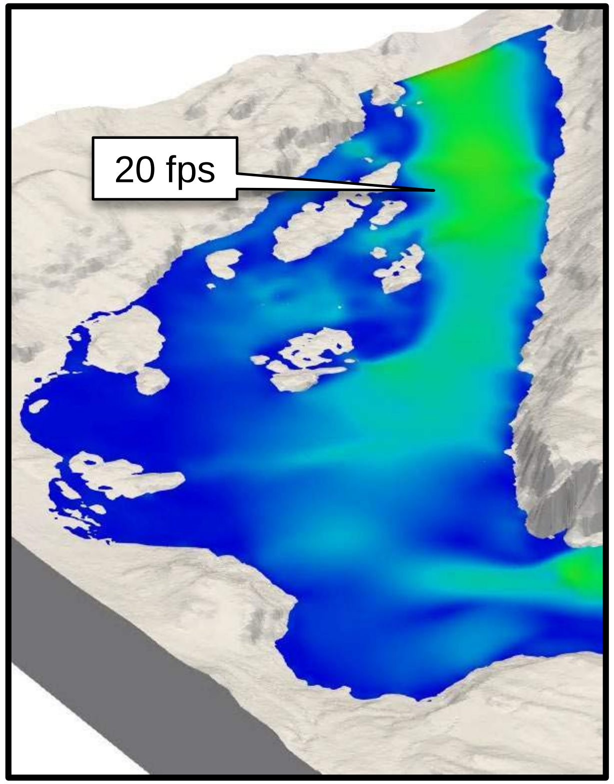
- Mesh block configuration



Phase 1 CFD Modeling

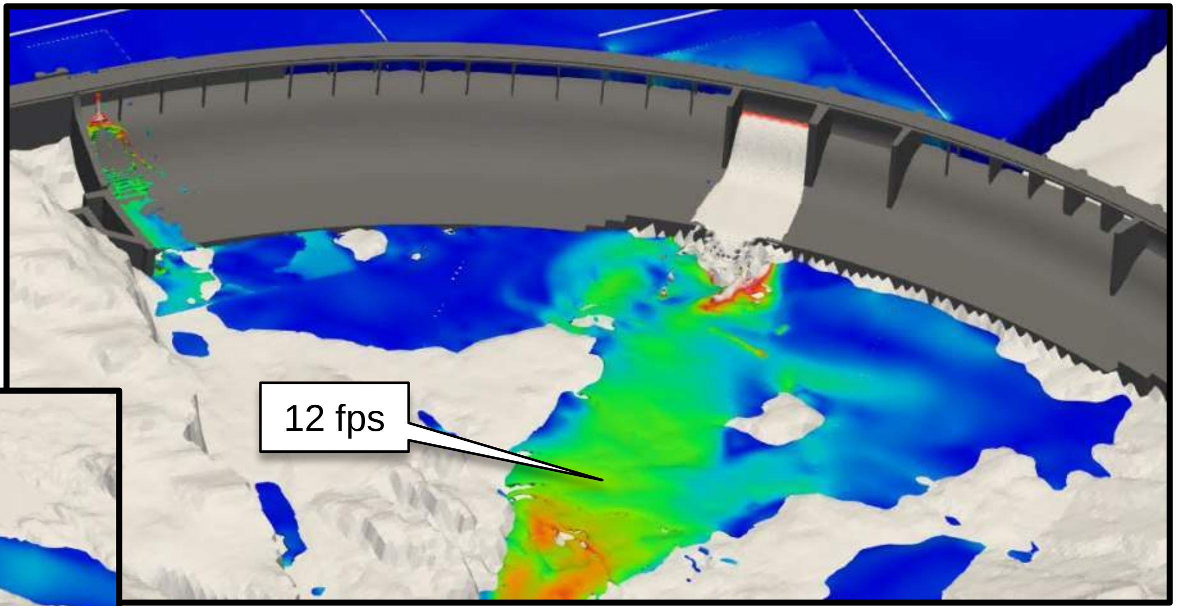
- 37,000 cfs (60,000 cfs total)

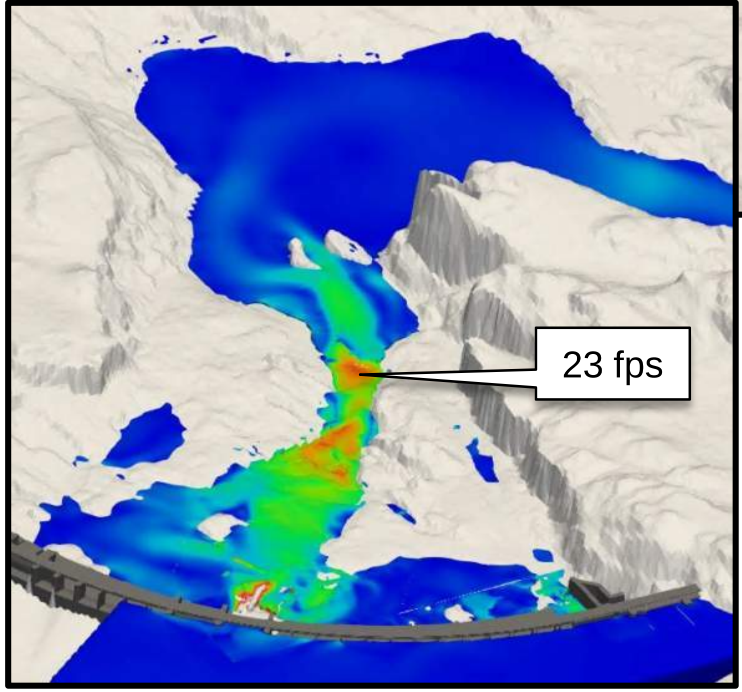


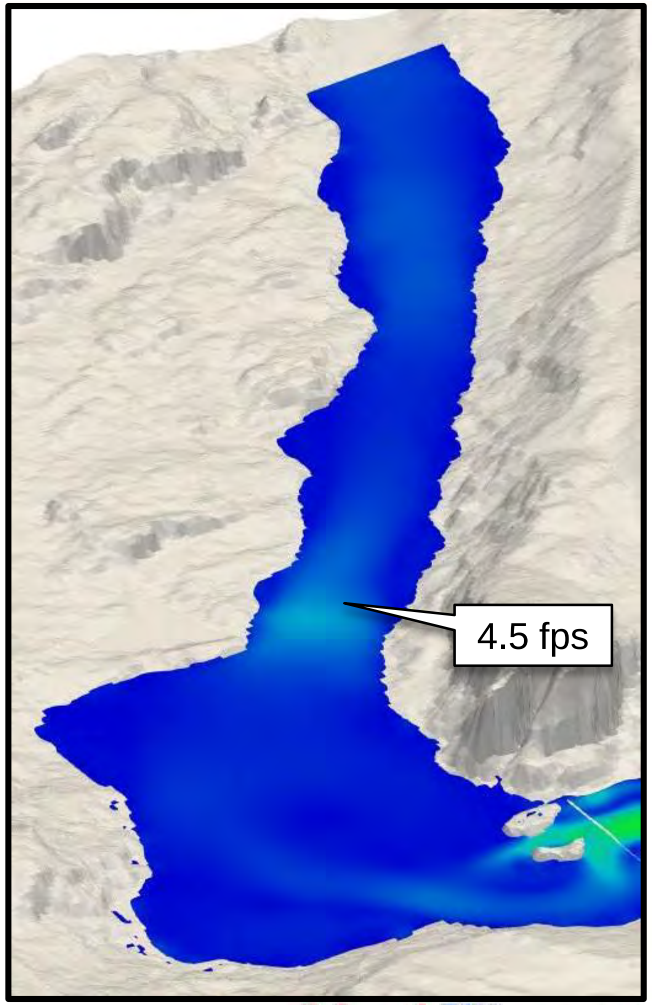


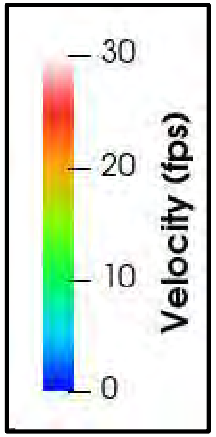
NorthWestern Energy
Delivering a Bright Future

- 2,000 cfs (25,000 cfs total)









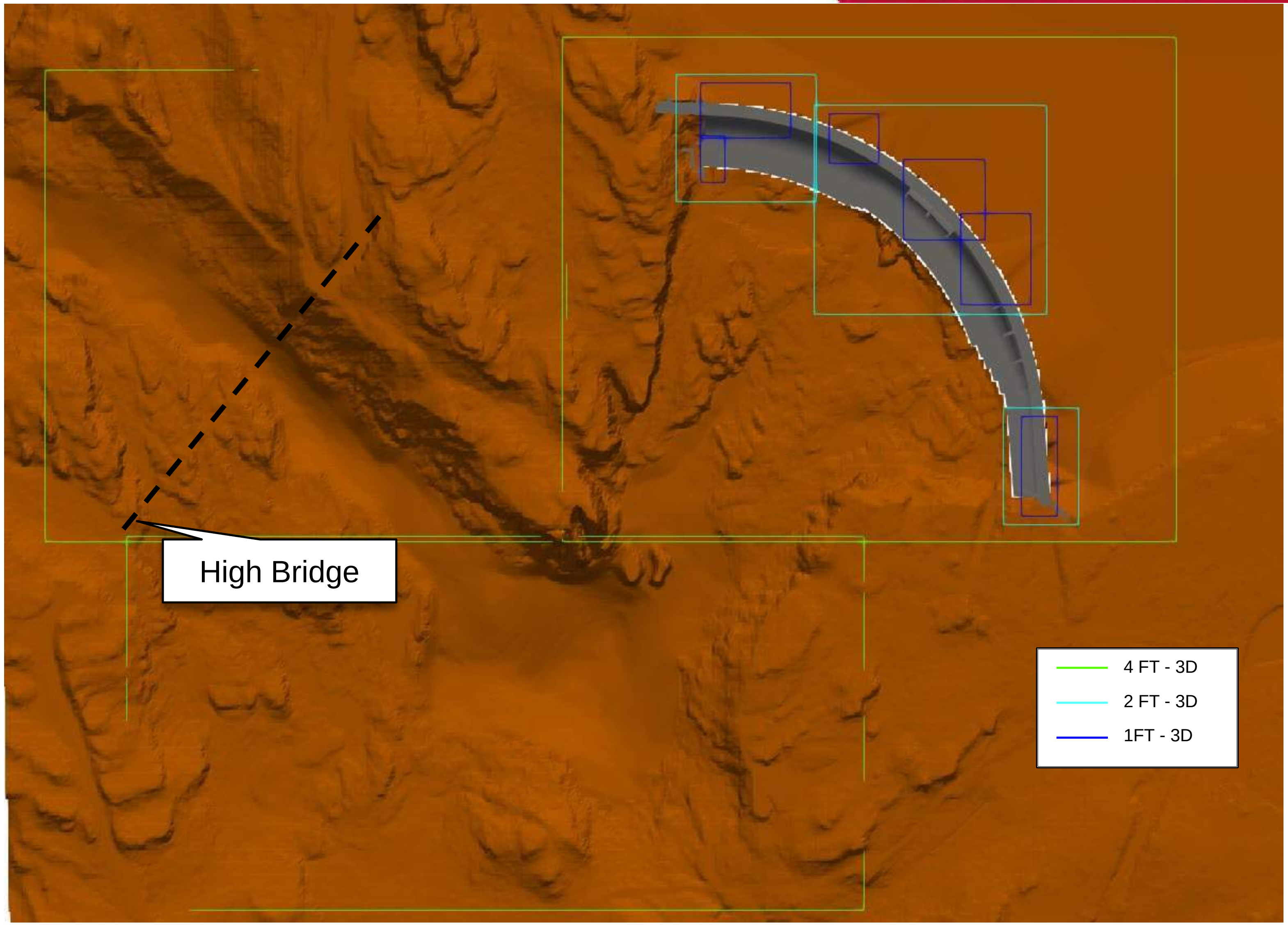
NorthWestern Energy
Delivering a Bright Future

Phase 2 CFD Modeling

- Phase 2 analyzed full model domain with 3D modeling in order to analyze vertical velocity distribution in critical areas
- Evaluated flows of 37,000 and 2,000 cfs.
- Identified 3 critical areas: ladder entrance, falls, and High Bridge.
- Results evaluated based on 3 categories of fish swimming ability.

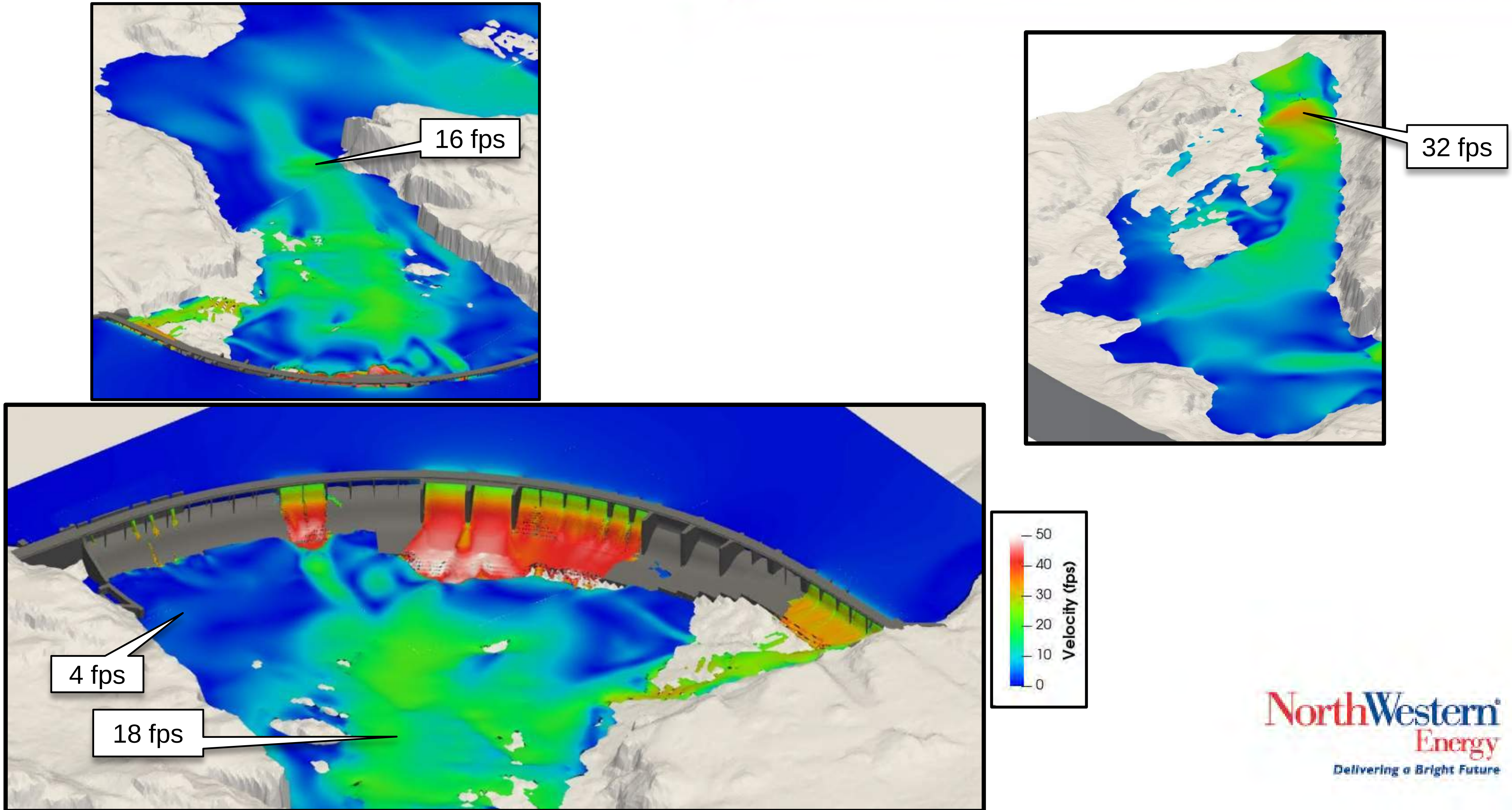
NorthWestern Energy
Delivering a Bright Future

Phase 2 CFD Modeling



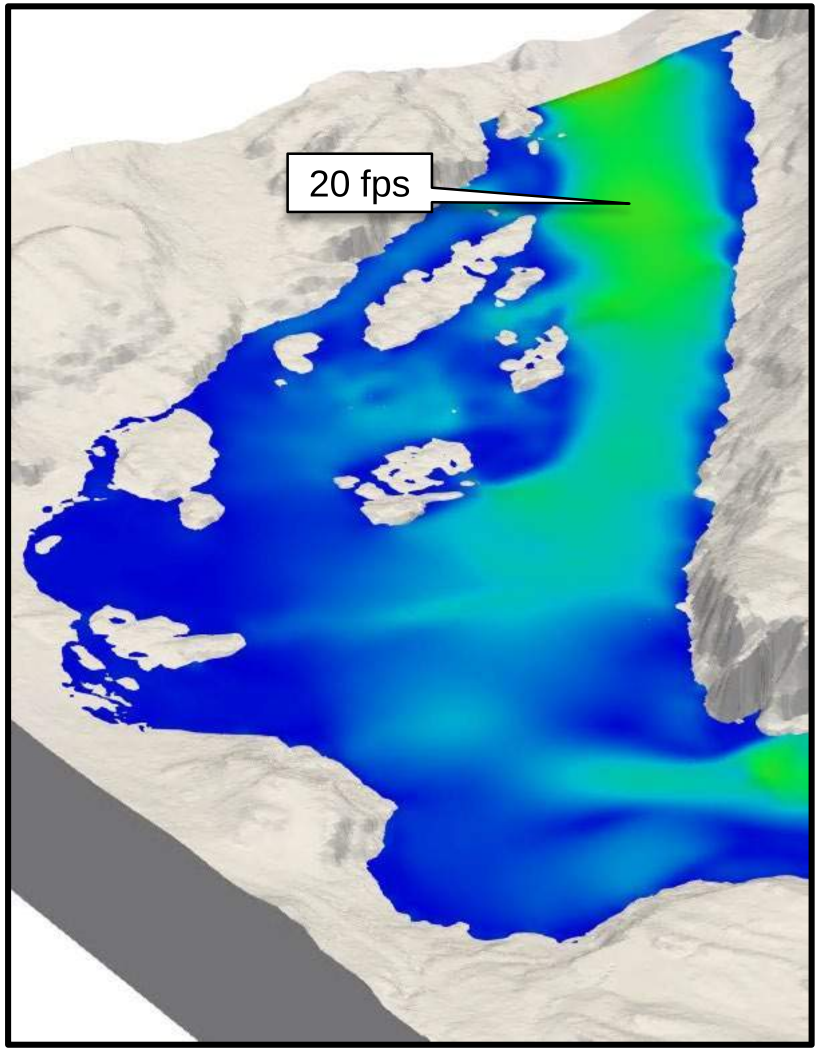
NorthWestern Energy
Delivering a Bright Future

- 37,000 cfs (60,000 cfs total)

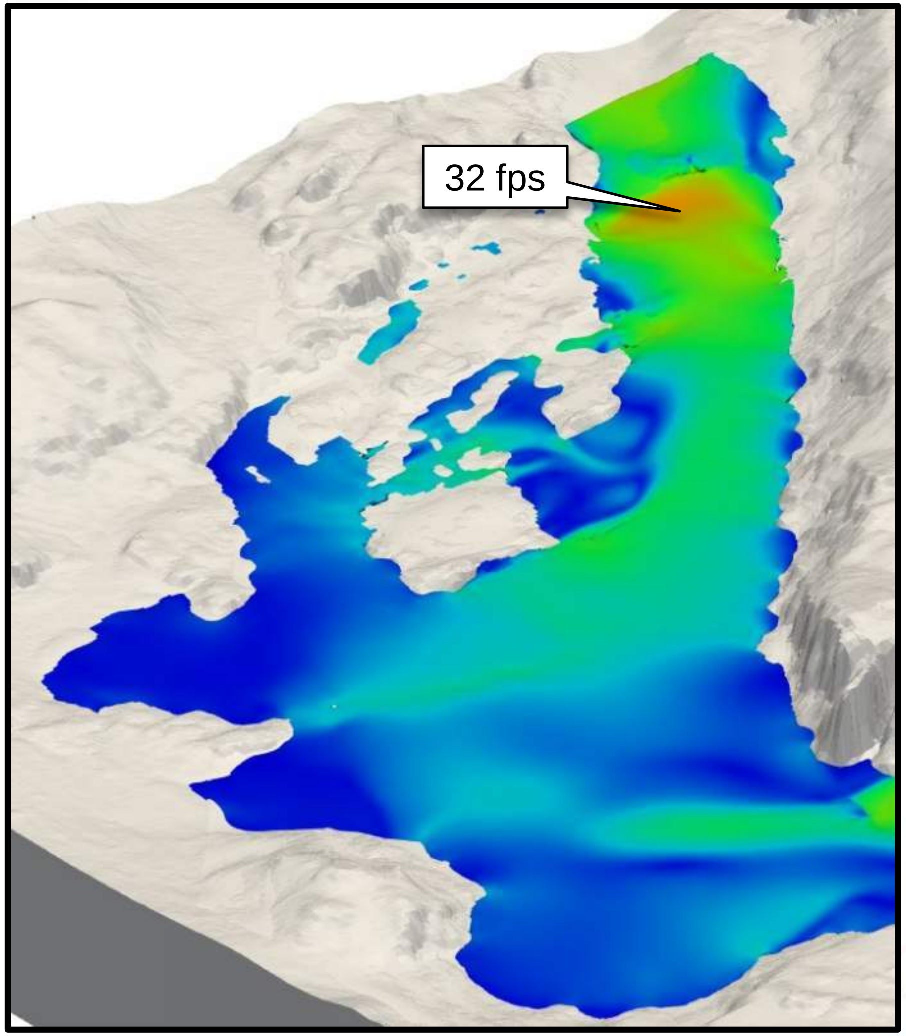


NorthWestern Energy
Delivering a Bright Future

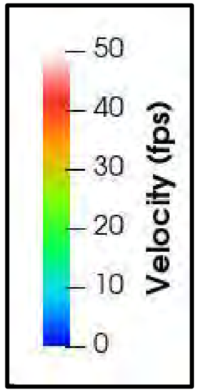
- 37,000 cfs (60,000 cfs total)



Phase 1 – 2D Mesh

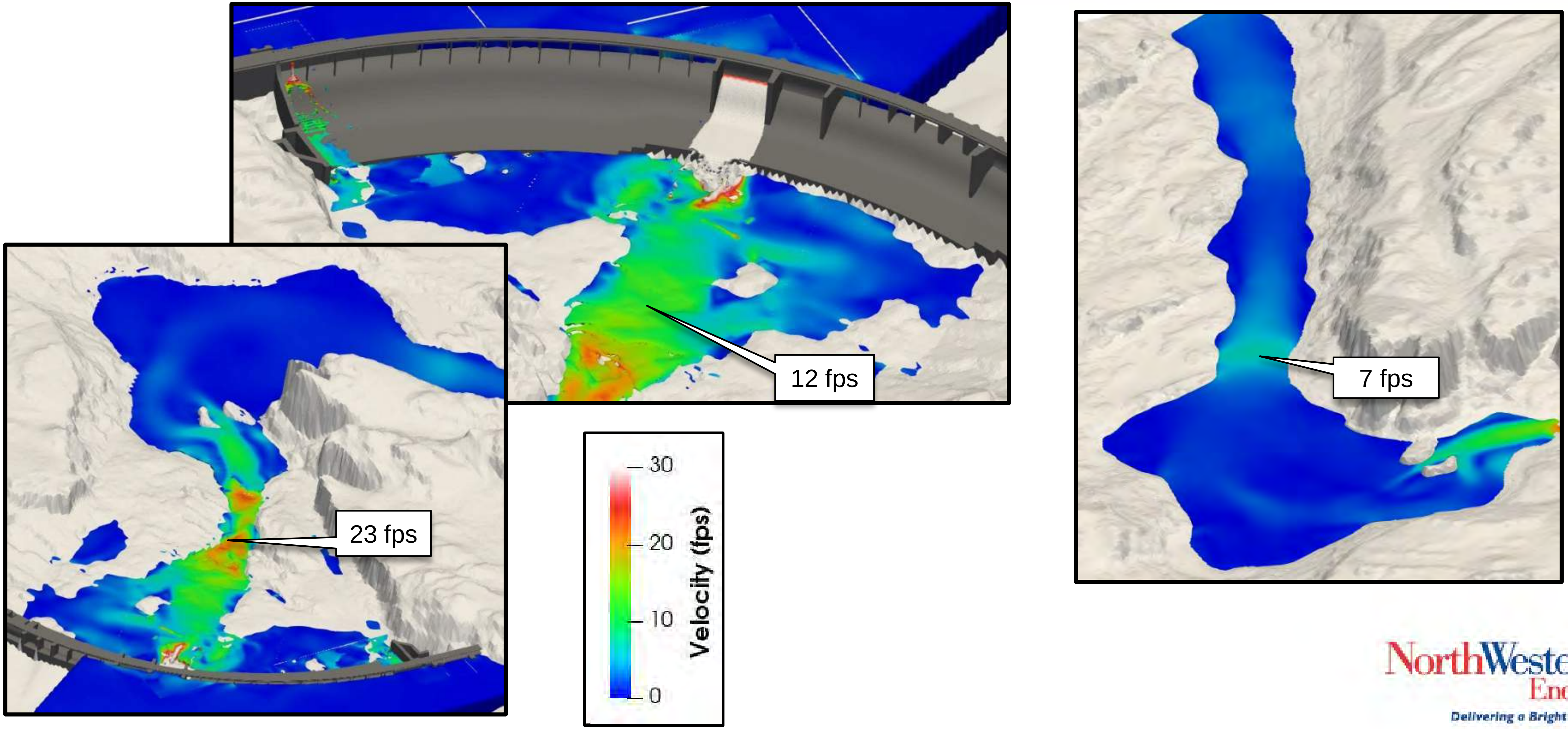


Phase 2 – 3D Mesh



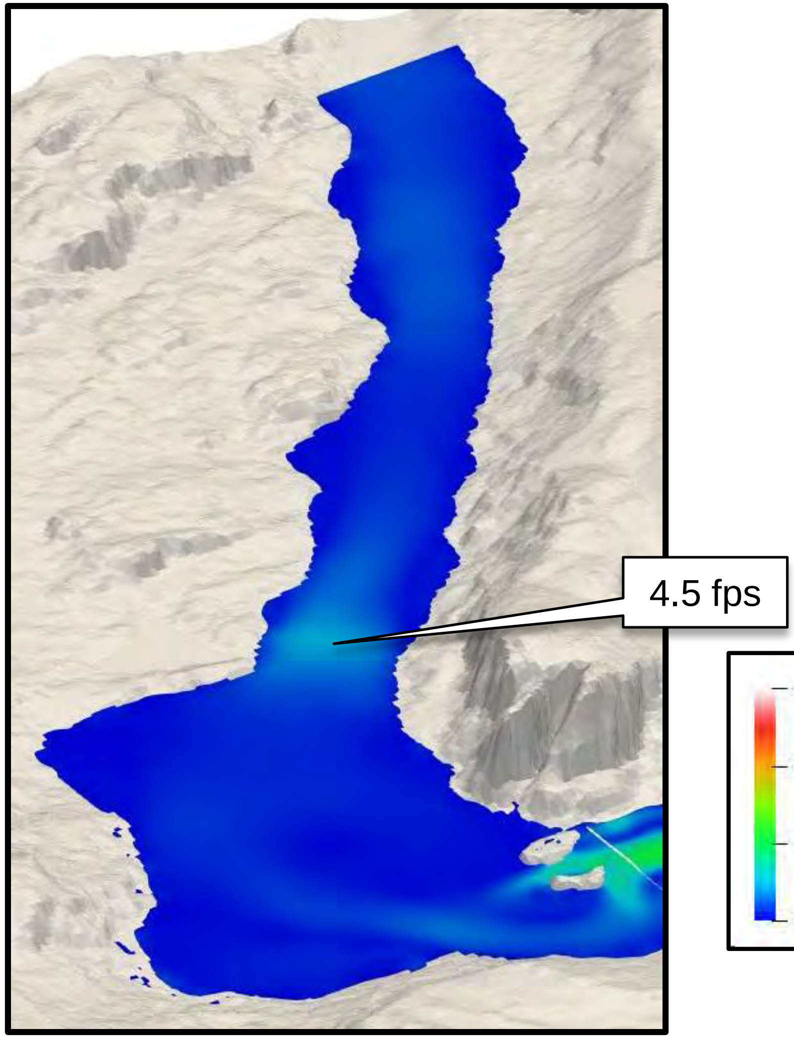
NorthWestern Energy
Delivering a Bright Future

- 2,000 cfs (25,000 cfs total)

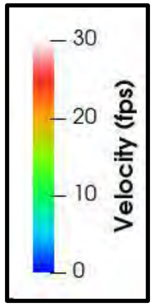


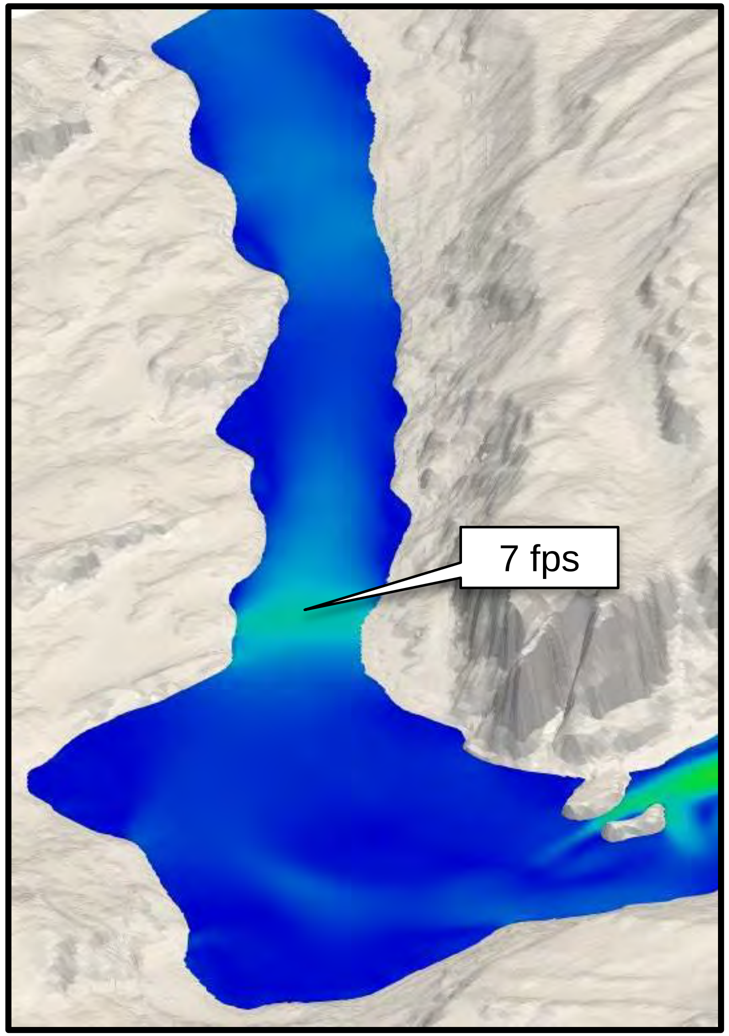
NorthWestern Energy
Delivering a Bright Future

• 2,000 cfs (25,000 cfs total)



Phase 1 – 2D Mesh

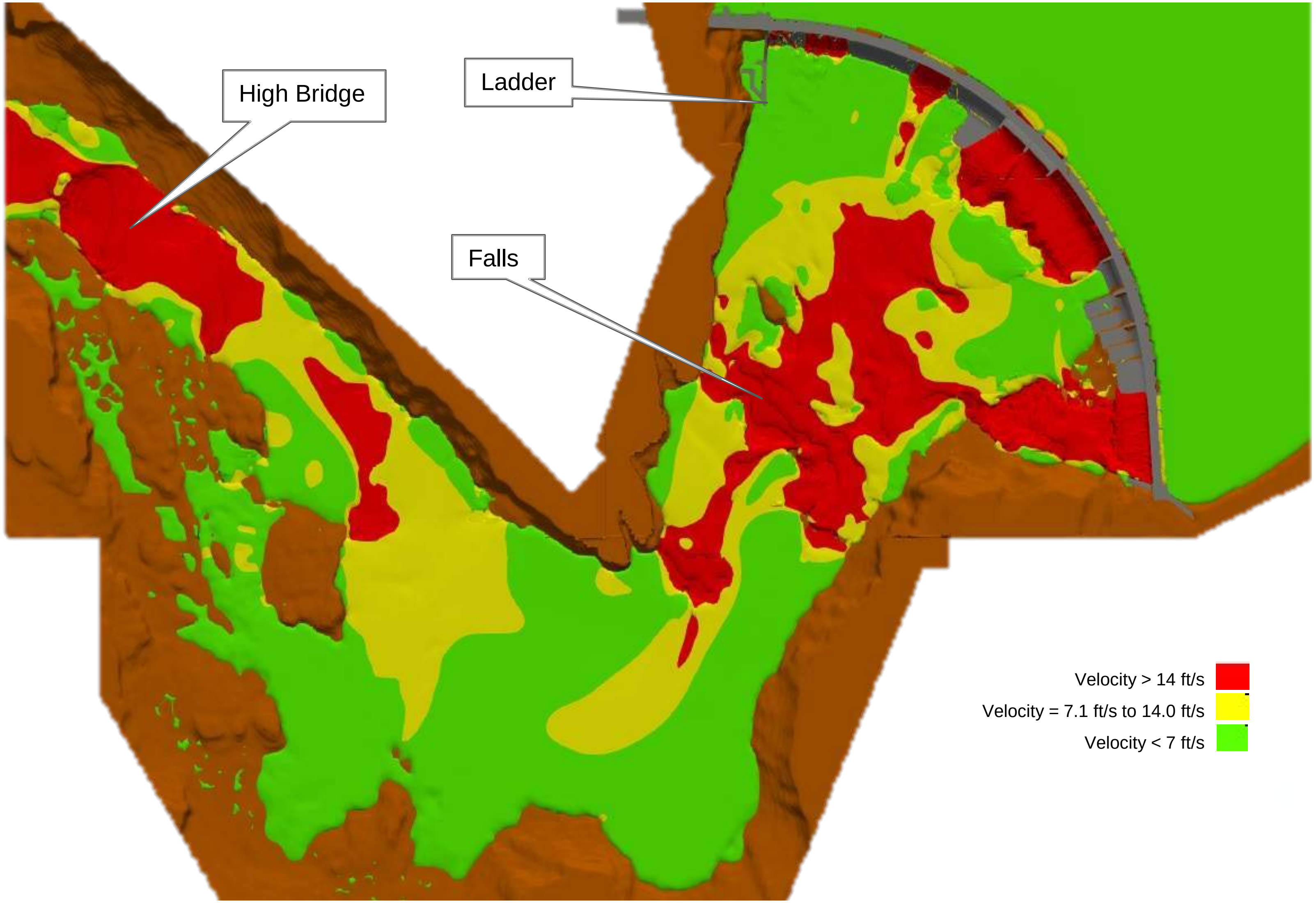




Phase 2 – 3D Mesh

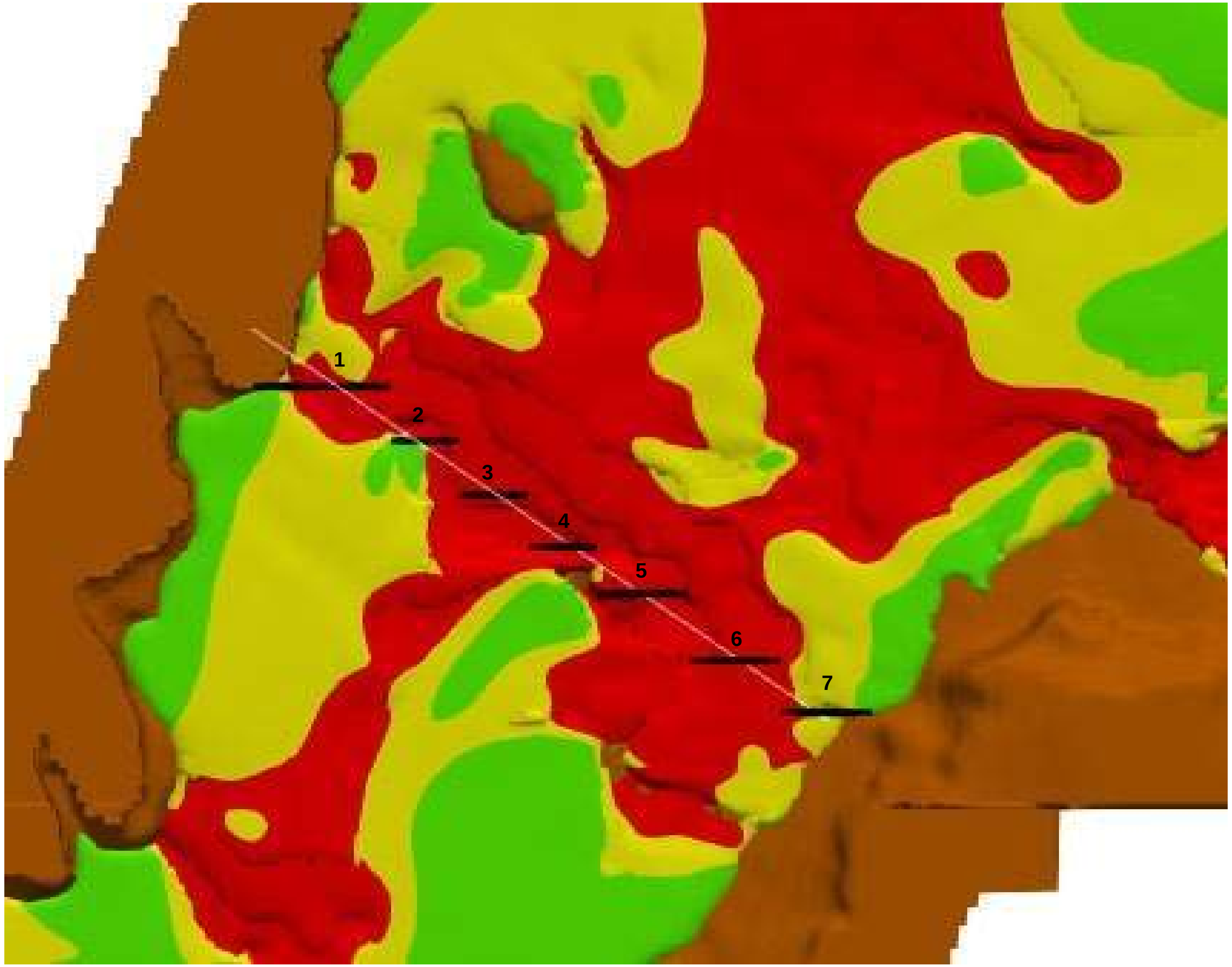
NorthWestern Energy
Delivering a Bright Future

- 37,000 cfs (60,000 cfs total)



NorthWestern Energy
Delivering a Bright Future

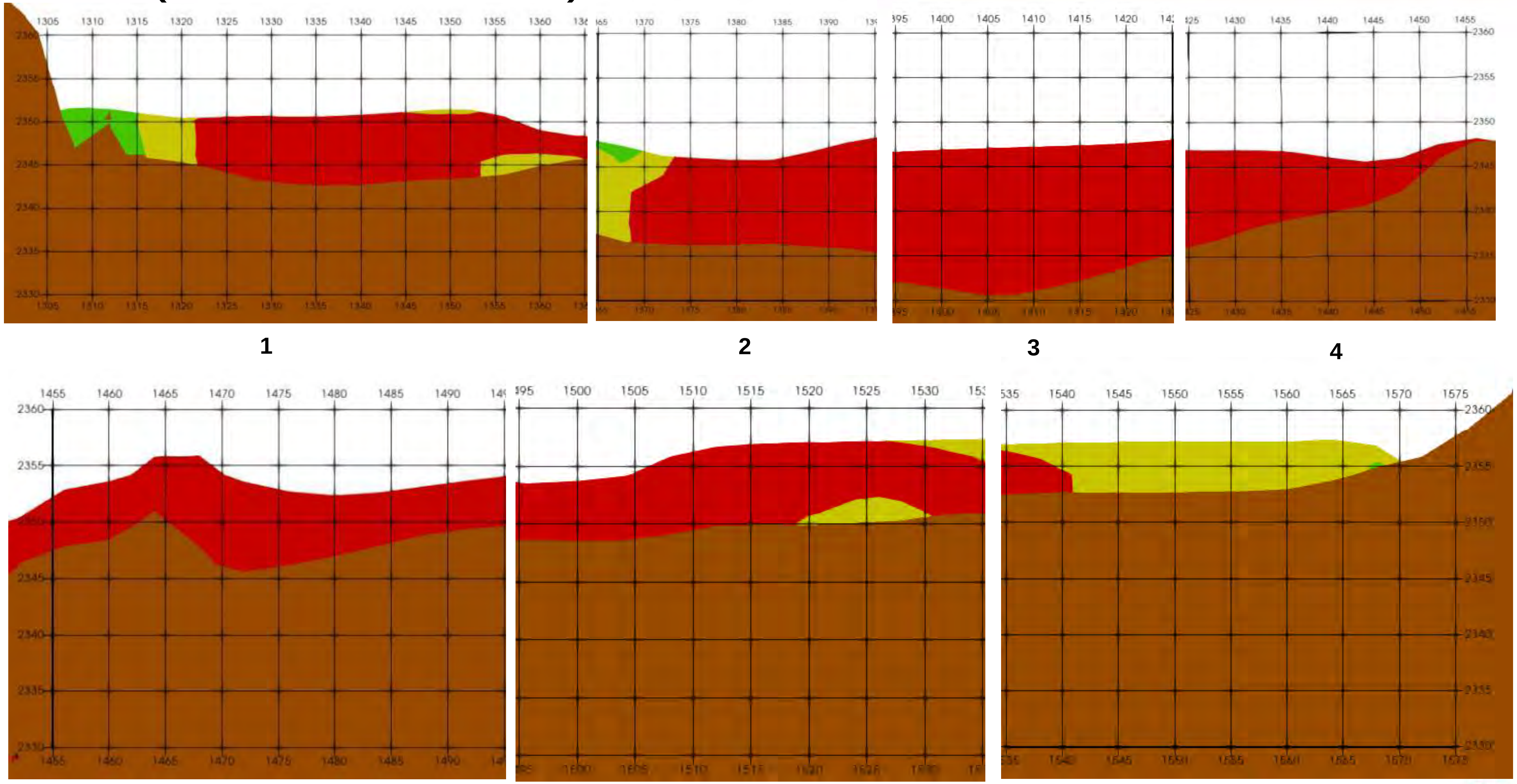
- 37,000 cfs (60,000 cfs total) - Falls



Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

NorthWestern Energy
Delivering a Bright Future

- 37,000 cfs (60,000 cfs total) - Falls



1 2 3 4

5 6 7

Velocity > 14 ft/s

Velocity = 7.1 ft/s to 14.0 ft/s

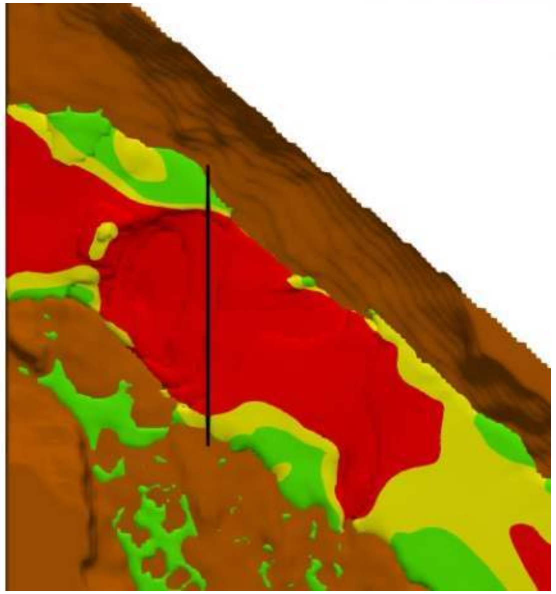
Velocity < 7 ft/s

NorthWestern Energy

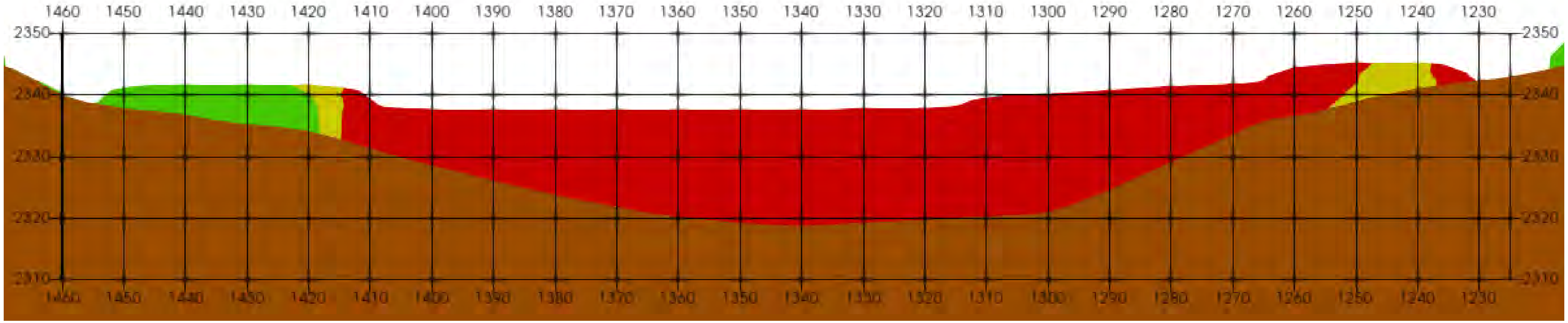
Delivering a Bright Future

Phase 2 CFD Modeling

- 37,000 cfs (60,000 cfs total) – High Bridge



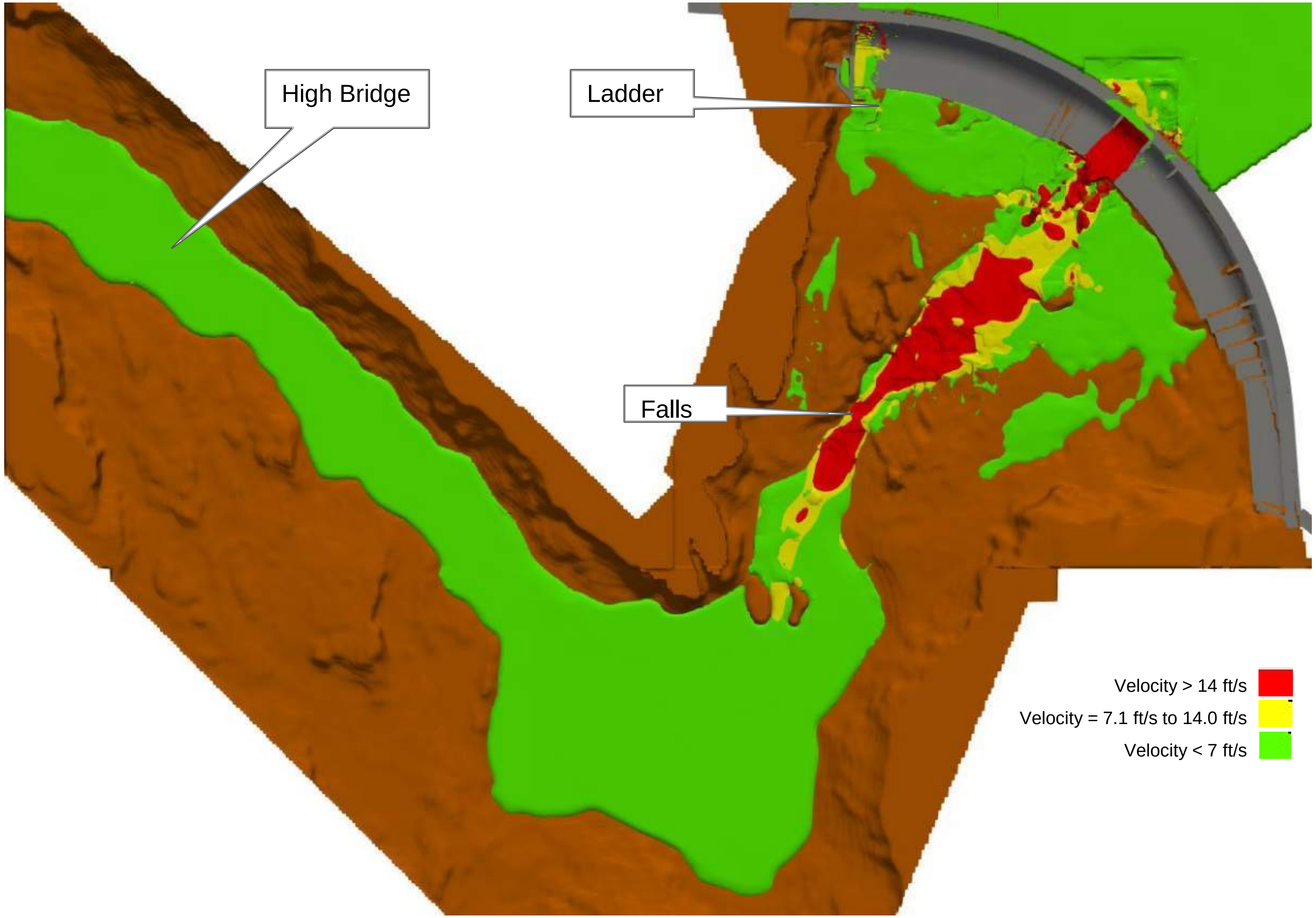
Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s



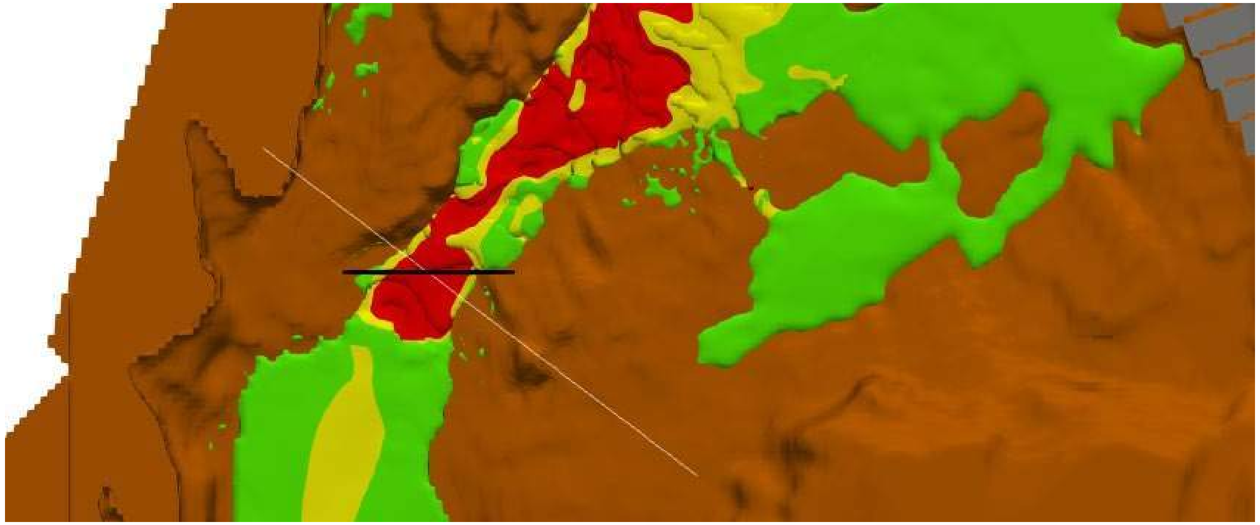
NorthWestern Energy
Delivering a Bright Future

Phase 2 CFD Modeling

- 2,000 cfs (25,000 cfs total)

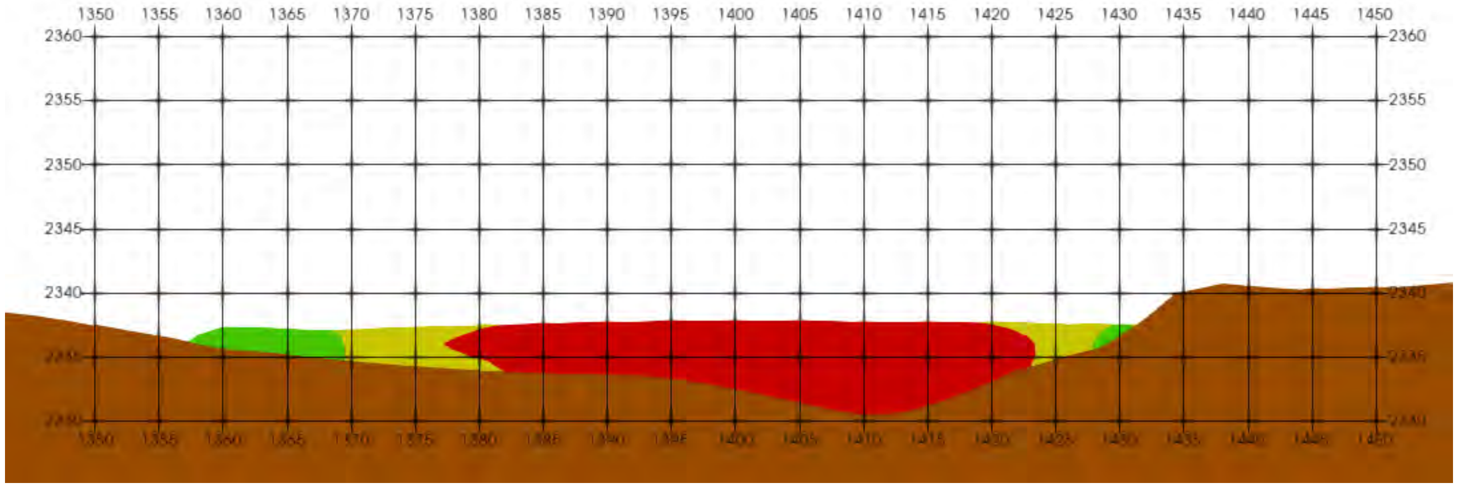


- 2,000 cfs (25,000 cfs total) - Falls



Velocity > 14 ft/s
Velocity = 7.1 ft/s to 14.0 ft/s
Velocity < 7 ft/s

Plan



Section (Looking Upstream)

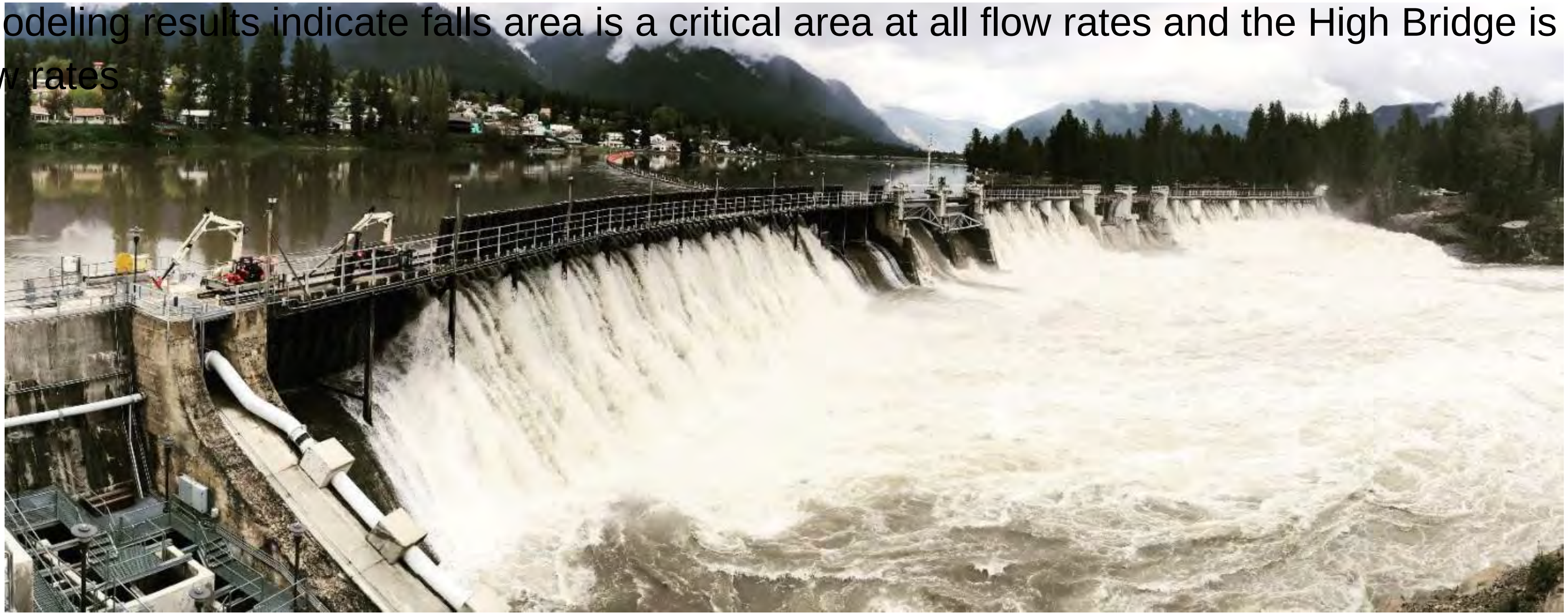
NorthWestern Energy
Delivering a Bright Future

- Phase 2 CFD Modeling Results

Location	Ladder Entrance		Falls Area		High Bridge	
Flow Rate (cfs)	37,000	2,000	37,000	2,000	37,000	2,000
Velocity Range (ft/sec)	Percent of Cross-Sectional Area (%)					
0-7.0	100	79	2	8	7	100
7.1-14.0	0	21	14	16	4	0
>14.0	0	0	84	76	89	0

• Phase 2 CFD Modeling Results

- Ladder entrance generally below 7 fps, with negligible areas exceeding 14 fps, indicating no obstacles to fish passage.
- Falls area largely exceeded 14 fps, with limited areas below 7 fps, indicating a potential obstacle to fish passage.
- High Bridge area results varied with flow rate, with majority exceeding 14 fps at higher flow and all velocities under 7 fps at low flow.
- CFD modeling results indicate falls area is a critical area at all flow rates and the High Bridge is a critical area at high flow rates



NorthWestern Energy
Delivering a Bright Future

- Questions?

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question; once recognized, please unmute yourself, introduce yourself, and ask your question.
  - Click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, introduce yourself, and ask your question
    - Phone controls for participants –*9 –to raise hand.
    - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please speak up to ask your question.

Delivering a **bright future**

Connect With Us:

NorthWesternEnergy.com

NorthWestern Energy®

NorthWestern® Energy

Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Updated Study Plan Meeting – Fish Behavior Study

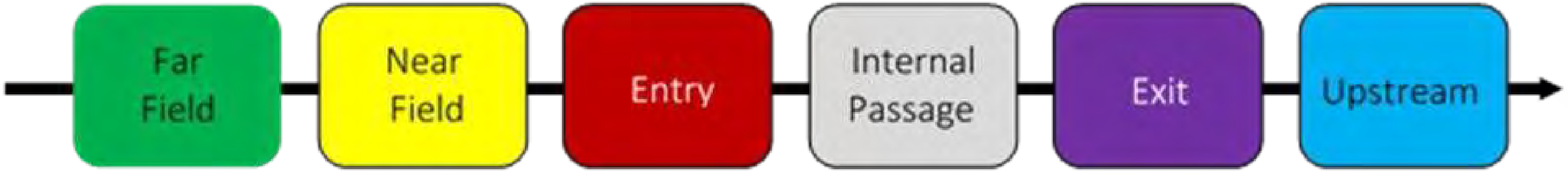
May 25, 2023

Fish Behavior Goals & Objectives

- Evaluate upstream fish movement through the Project's zone of influence
  - Evaluate proportion of radio tagged fish that enter the ZOP and find the fish passage facility entrance

  - Measure the duration of time and pathway(s) of these movements during various flow conditions

Fish Behavior Study – Zone of Passage (ZOP)



NorthWestern Energy
Delivering a Bright Future

- The telemetry monitoring efforts focused on assessing fish movement, including:
  - Travel time from the far field to the near field.
  - Movement patterns (e.g., left bank, right bank) in the near field (Main Channel Dam area).
  - Proportion of fish that enter the ZOP and locate the entrance of the fish passage facility entrance.

Fish Behavior Methods

- Radio and PIT tag Brown Trout and Rainbow Trout
  - Clark Fork River upstream of Thompson Falls Project
  - Upstream Fish Passage Facility
- Radio tags have depth and activity sensors.
- Tagged fish released at Flat Iron Boat Launch
- Manual tracking by foot to locate fish and 4 fixed station receivers around project area

Season & Year	Method	Location	RB	LL	MCFT3 Tag size (g)	Total # Fish
June '21	Electrofishing	Clark Fork River	7	6	11	13
	Angling	Thompson River	-	-	-	-
Sept/Oct '21	Ladder[11]	Clark Fork River	-	3	6.8	3
2021 TOTAL			**7**	**9**		**16**
March '22	Ladder	Ladder	27	1	11	28
	Electrofishing	Clark Fork River	2	7	11	9
Sept '22	Ladder	Ladder		11	6.8	11
	Electrofishing	Clark Fork River		6	6.8	6
2022 TOTAL			**29**	**25**		**54**
		Grand Total	**38**	**34**		**70**

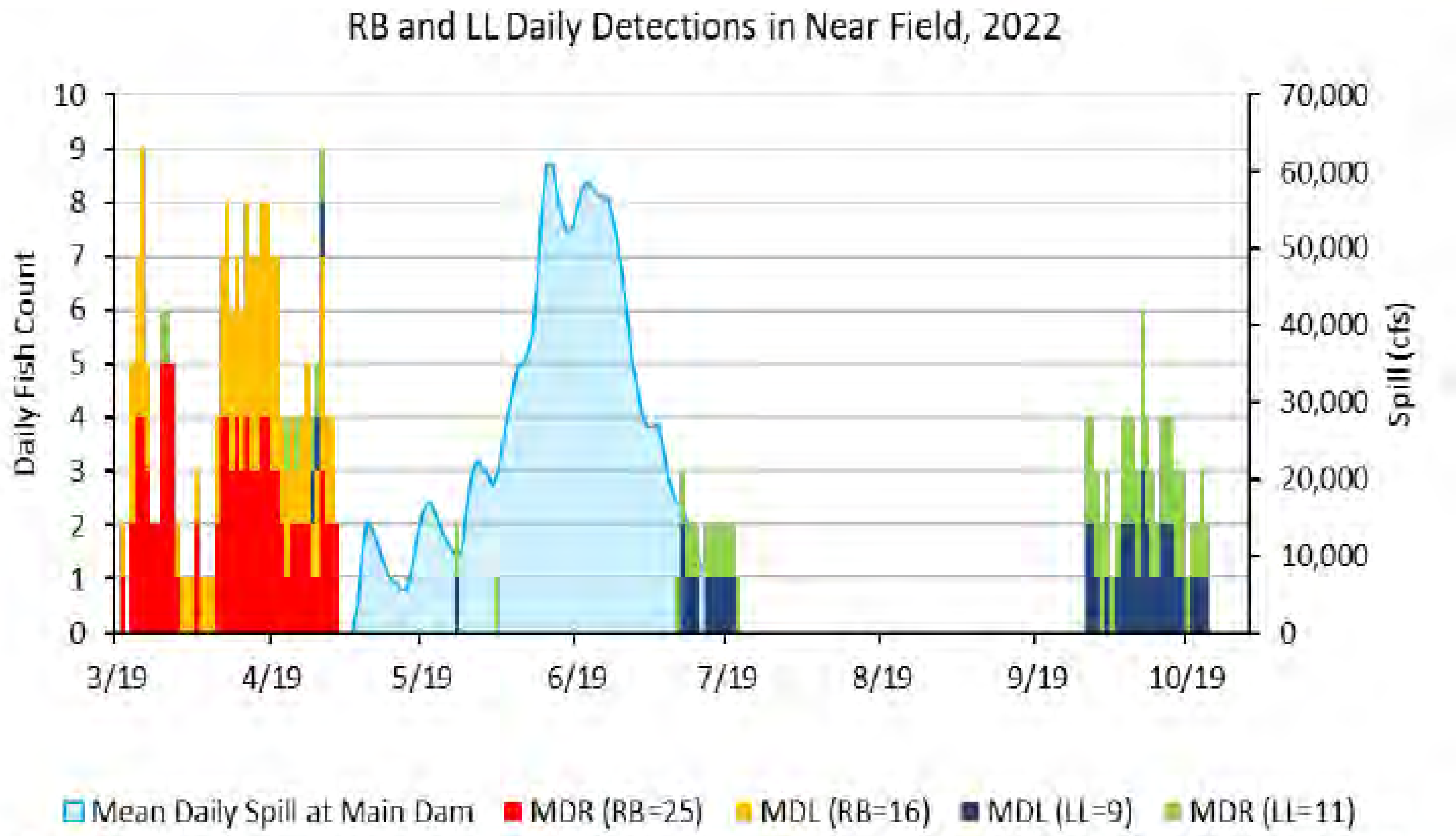
Notes: g = grams; LL = Brown Trout; RB = Rainbow Trout.

- 53 of 54 fish detected in the ZOP in 2022

- 38 fish (25 RB, 13 LL) detected in the near field
  38/53= <u>72% in near field</u>

- 21 (14 RB, 7 LL) entered the fish passage facility
  21/53= <u>40% at ladder entrance</u>

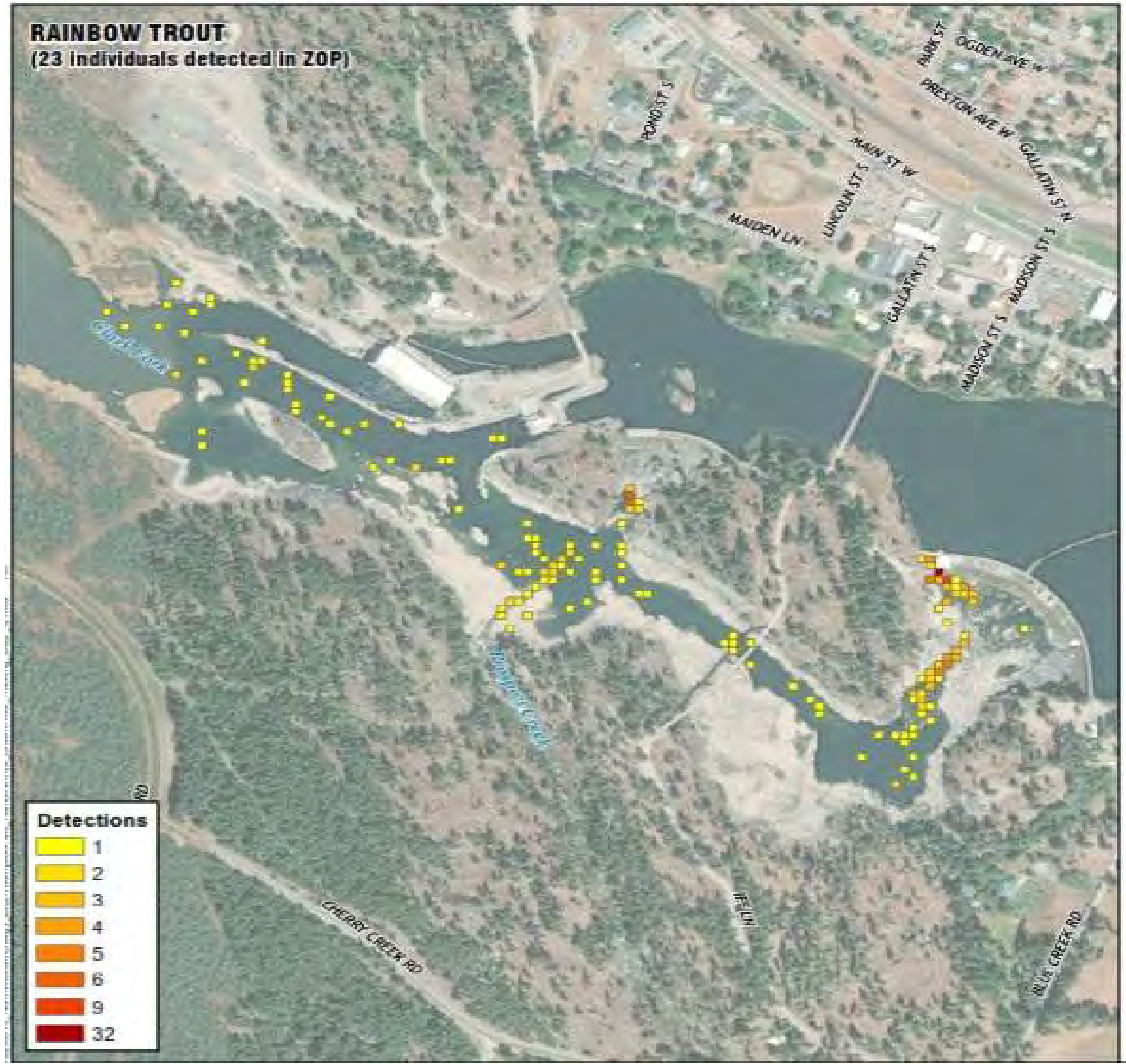
Fish Behavior Detection Results

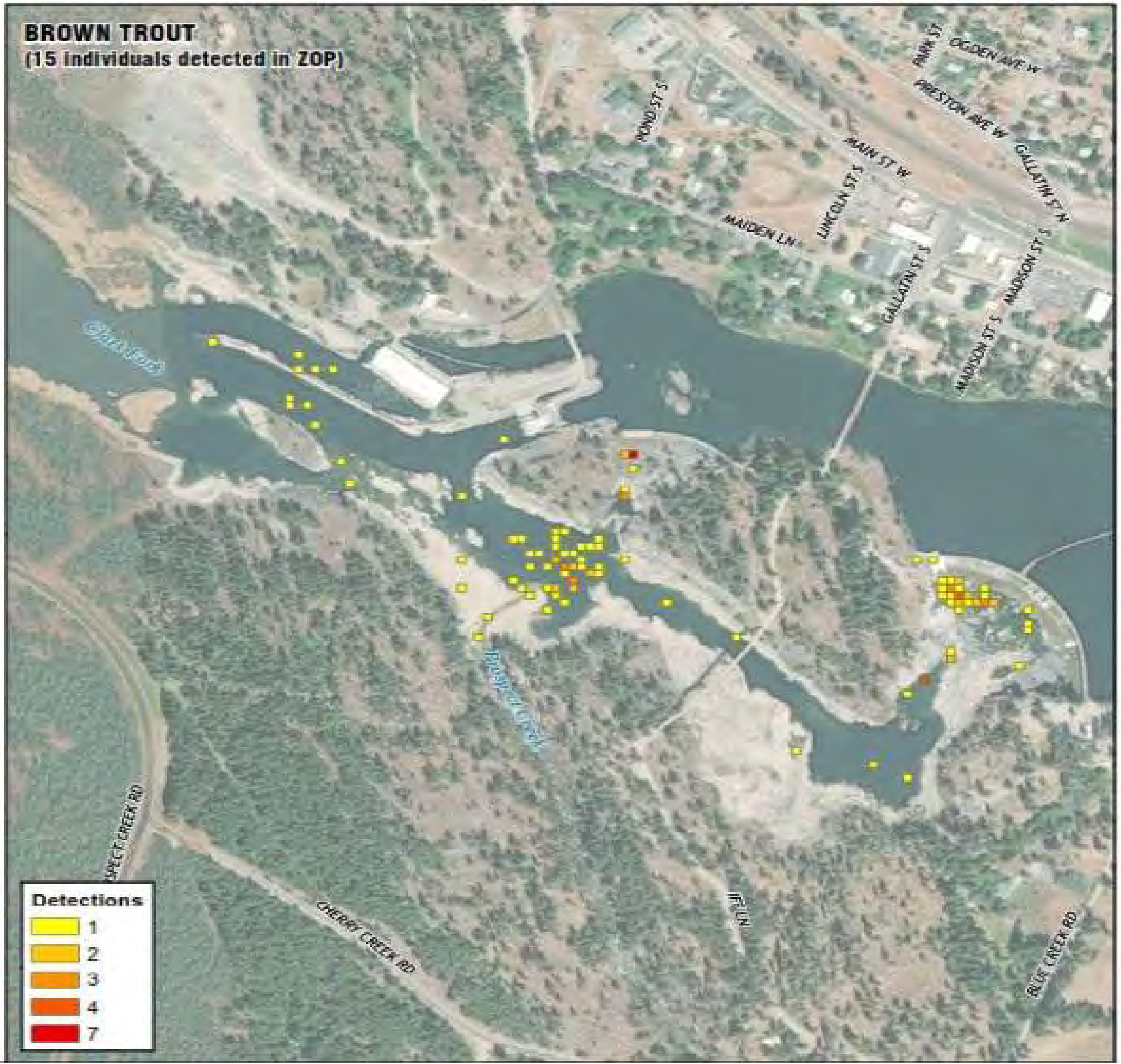


Notes: cfs = cubic feet per second; LL = Brown Trout; MDL = Main Dam Left; MDR = Main Dam Right; RB = Rainbow Trout.

Near Field Detections

Fish Locations Within ZOP





Fish Movement Summary

- Nearly all of the fish moved up the main river channel and spent little time near the powerhouse areas

- Fish that enter the near field strongly selected for the right bank near the fish passage facility

- Fish spent considerable time near the mouth of Prospect Creek and made brief forays upstream to the main dam

- High water temperatures during July and August likely influence fish behavior to hold near Prospect Creek which provides a cool water source preferred by salmonids

Hydraulic Condition Summary

- CFD modeling results indicate velocity obstacles exist during spill at the Main Dam, most notably at the natural falls where the channel is constricted by boulders and bedrock

- The lack of fish in the project area during spill is likely a result of these high water velocities

- Velocities not a complete barrier to fish movement up to 37,000cfs spill as channel margins contain small areas that can be navigated

- As spill increases flow attraction (flow streamlines) from the passage facility are overwhelmed and may be insufficient to provide adequate upstream cues to the passage facility entrance

2023 Study Update

- 30 Rainbow Trout radio tagged in March and April
- To date 11 entered the passage facility entrance

- Data collection to continue through July, and study details will be included in Final License Application, December 2023.

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

Delivering a **bright future**

Connect With Us:

NorthWesternEnergy.com

NorthWestern Energy
Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Final Study Report Meeting – Total Dissolved Gas Study

May 24th and 25th, 2023

Total Dissolved Gas (TDG) Study

- Purpose of the Study:
  - Collect background (incoming) TDG concentrations in the Clark Fork River upstream of the dams.
  - Collect downstream (outgoing) TDG concentrations in the Clark Fork River below the Main Dam and at Birdland Bay Bridge.
  - Test configurations of radial gates on the main dam for TDG entrainment downstream.

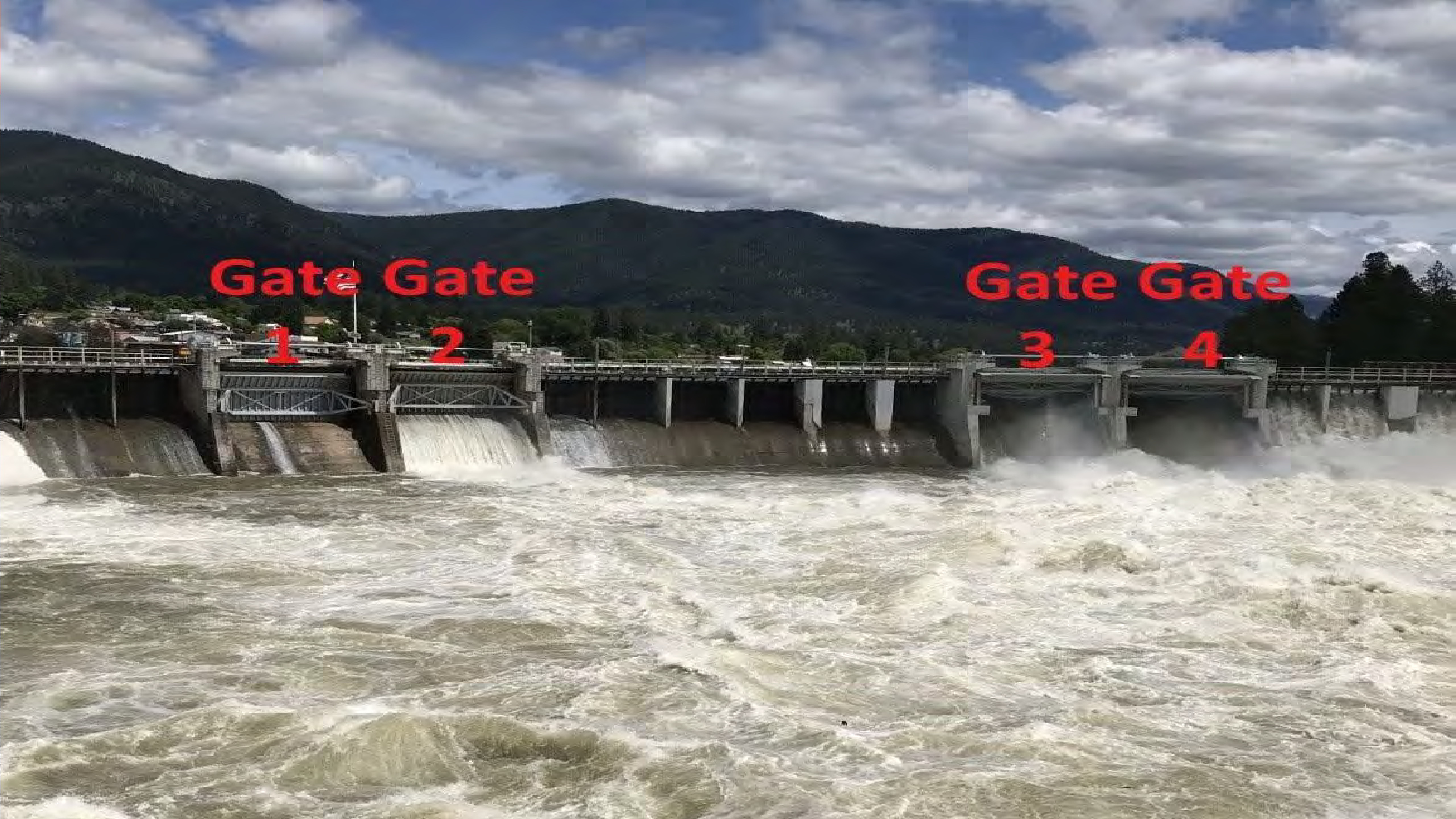
- TDG Control Plan for Thompson Falls operations was approved by Montana DEQ in 2010.

- Since the approval of this Plan, two new radial gates have been installed on the main dam.

- More information was needed on TDG entrainment with the new radial gates to update the TDG Control Plan.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
17
16


Gate 1
Gate 2
Gate 3
Gate 4

Total Dissolved Gas (TDG)
Study Area & Description

- TDG is measured in three locations
  - Above the Powerhouses
  - Below the Main Dam
  - Birdland Bay Bridge (downstream of the Project)

- Datasondes provide TDG readings at 15-minute intervals.

- Instruments are calibrated bi-weekly to ensure that the sensors are operating properly and accurately.

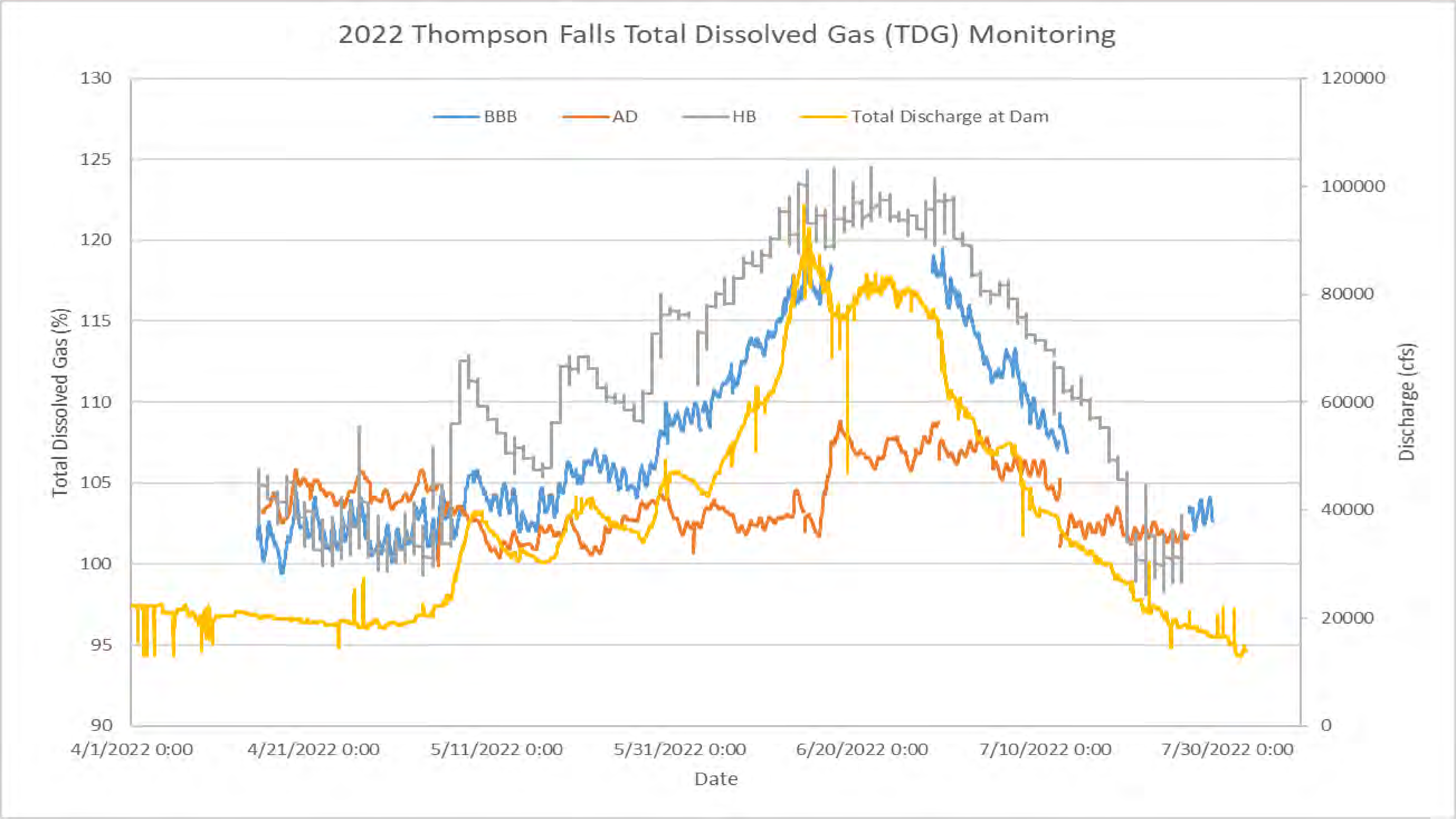
NorthWestern Energy
Delivering a Bright Future


To Birdland Bay Bridge (TDG Monitoring Site BBB) and Noxon Rapids Dam
Original (Old) Powerhouse
New Powerhouse
Thompson Falls Dry Channel Dam (TDG Monitoring Site AD)
Prospect Creek
TDG Monitoring Site HB
Thompson Falls Main Channel Dam


To Noxon Rapids Dam
Birdland Bay Bridge
(TDG Monitoring Site BBB)
Highway 200 Bridge
To Thompson Falls Dam

Total Dissolved Gas (TDG) Results

- During the study period, radial gate testing was conducted to monitor the TDG concentrations in response to different spill configurations.
- The peak river flows in the Clark Fork River were higher in 2022 than in 2021, which gave NWE an optimal testing window for completing this study.
- Radial gate testing occurred on the descending limb of the hydrograph to fill data gaps at flows greater than 80,000 cfs and to supplement 2019 data in the 55,000-60,000 cfs range.
- The data collected throughout these two study seasons, in addition to data collected in 2019 and 2020, effectively captured all flow conditions from 30,000 cfs to 85,000 cfs.


2022 Thompson Falls Total Dissolved Gas (TDG) Monitoring
BBB
AD
HB
Total Discharge at Dam
Total Dissolved Gas (%)
Discharge (cfs)
130
125
120
115
110
105
100
95
90
120000
100000
80000
60000
40000
20000
0
4/1/2022 0:00
4/21/2022 0:00
5/11/2022 0:00
5/31/2022 0:00
6/20/2022 0:00
7/10/2022 0:00
7/30/2022 0:00
Date

Total Dissolved Gas (TDG) Results

Total Flow Range (cfs)	Max TDG at HB (% saturation)	Gate Setting at Max TDG	Min TDG at HB (% saturation)	Gate Settings Min TDG
30,000-35,000	112.5	1 full open, 2 4' open	107.5	4-partially open
40,000-45,000	114.4	1 and 2 open	111.7	1 and 4 open
45,000-50,000	118.8	1 and 4 open	116.2	2 and 4 open
[1]55,000-60,000	121.6	3 and 4 open	119.6	1 and 2 open
[2]55,000-60,000	122.2	1 and 2 open	119.9	2 and 4 open
65,000-70,000	122.7	3 and 4 open	119.8	1 and 3 open
75,000-80,000	123.1	1 and 2 open	121.2	2 and 3 open
80,000-85,000	124.1	3 and 4 open	120.6	1 and 3 open

[1] Partial testing was conducted in 2019
[2] Full testing was conducted in 2022

Total Dissolved Gas (TDG) Results

Total River Flow (cfs)	Lowest %TDG Entrained	Intermediate %TDG Entrained				Highest %TDG Entrained
30,000	4 open	1 open	3 open	N/A	N/A	2 open
35,000	1 and 4 open	2 and 4 open	3 and 4 open	2 and 3 open	N/A	1 and 2 open
40,000-45,000	1 and 4 open	2 and 4 open	1 and 3 open	2 and 3 open	3 and 4 open	1 and 2 open
45,000-50,000	2 and 4 open	2 and 3 open	1 and 2 open	1 and 3 open	N/A	1 and 4 open
[1]55,000-60,000	1 and 2 open	N/A	N/A	N/A	N/A	3 and 4 open
[2]55,000-60,000	2 and 4 open	3 and 4 open	2 and 3 open	1 and 4 open	1 and 3 open	1 and 2 open
65,000-70,000	1 and 3 open	2 and 3 open	1 and 4 open	1 and 2 open	2 and 4 open	3 and 4 open
75,000-80,000	2 and 3 open	1 and 3 open	1 and 4 open	2 and 4 open	3 and 4 open	1 and 2 open
80,000-85,000	1 and 3 open	1 and 2 open	1 and 4 open	2 and 3 open	2 and 4 open	3 and 4 open

NorthWestern Energy
Delivering a Bright Future

Study conclusions are:

- 2022 TDG data displayed a similar range of percent TDG saturation as the 2019 data, but in the 55,000-60,000 cfs range, the radial gate combination that entrained the lowest amount of TDG in 2019 entrained the highest amount of TDG in 2022.

- The discrepancy in the results of these two tests highlights how other outside environmental factors such as incoming upstream percent TDG saturation, differing water surface elevations downstream of the Main Channel Dam, and the overall natural variability of a dataset may mask the actual contributions of TDG from a particular radial gate configuration.

Study conclusions are:

- Using non-adjacent radial gates together generally entrains less TDG downstream than using adjacent radial gates.

- While opening non-adjacent radial gates during spill operations will most likely reduce the amount of TDG entrained downstream, operation in this manner may not be practical at all times due to the need to flush large woody debris from the trash boom to prevent the debris from building up on the face of the dams.

Study conclusions are:

- The buildup of large woody debris or extreme high flow events can lead to situations where the stanchions need to be removed to ensure adequate flow passage and to maintain the structural integrity of the dams.

- When the stanchions are removed, there is a large increase in the percent of TDG entrained downstream due to uncontrolled releases through the dam. The drastic increase in TDG entrainment from stanchion removal is far more significant than the differences in TDG entrainment from operating adjacent radial gates vs non-adjacent radial gates.

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

Delivering a **bright future**

Connect With Us:

You Tube

NorthWesternEnergy.com

NorthWestern® Energy

NorthWestern® Energy

Delivering a Bright Future

Cultural Resource Inventory Study Report

May 24, 2023

Cultural Resources Inventory and National Register Evaluation

- Cultural resource inventory of the Thompson Falls Project to determine the locations, types, and significance of precontact and historic sites within the Project's Area of Potential Effect (APE)

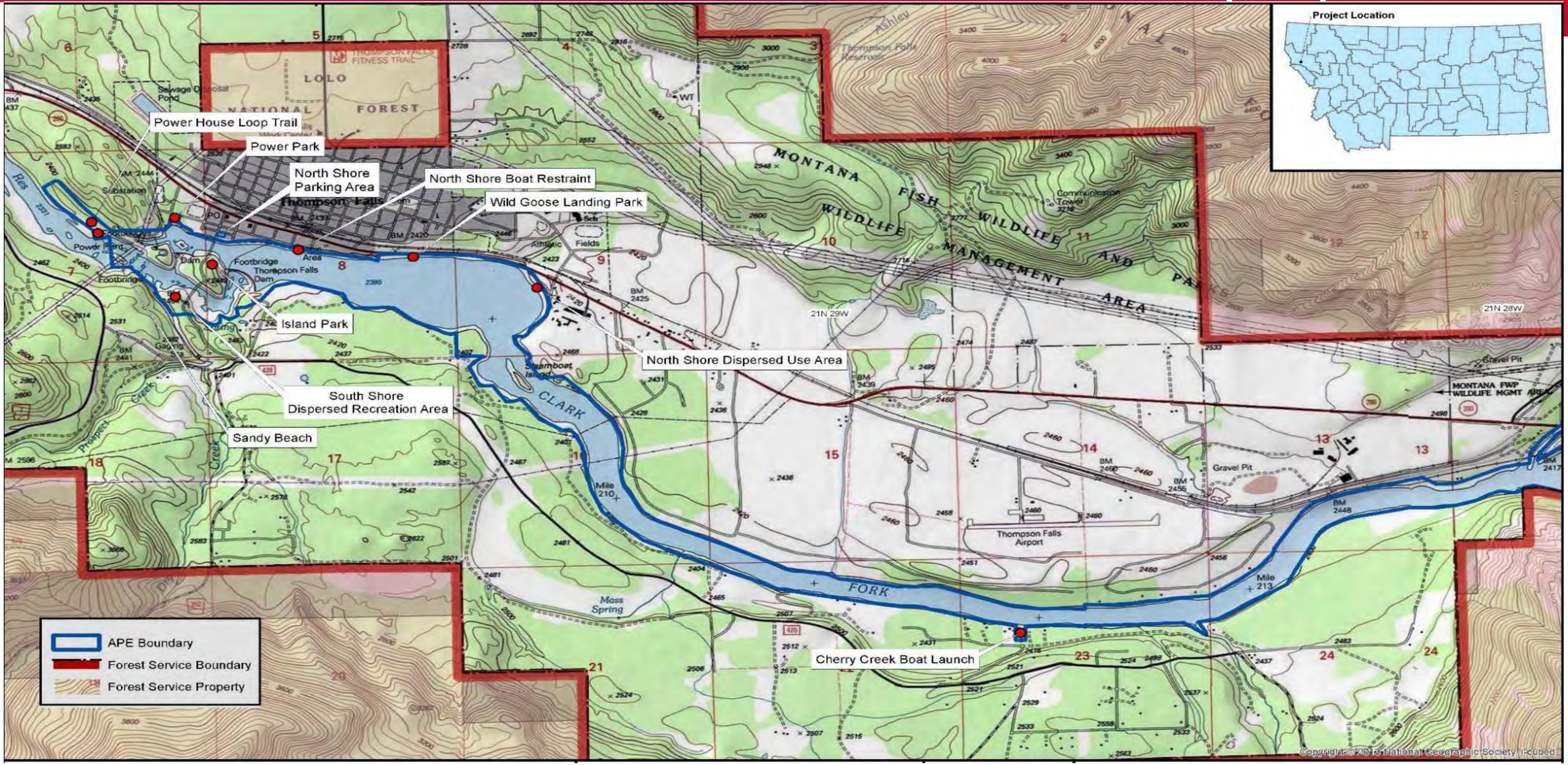
Cultural Resource Study
Goals and Objectives

- Identification and documentation of historic architectural and engineering properties and precontact and historic archaeological sites within the APE

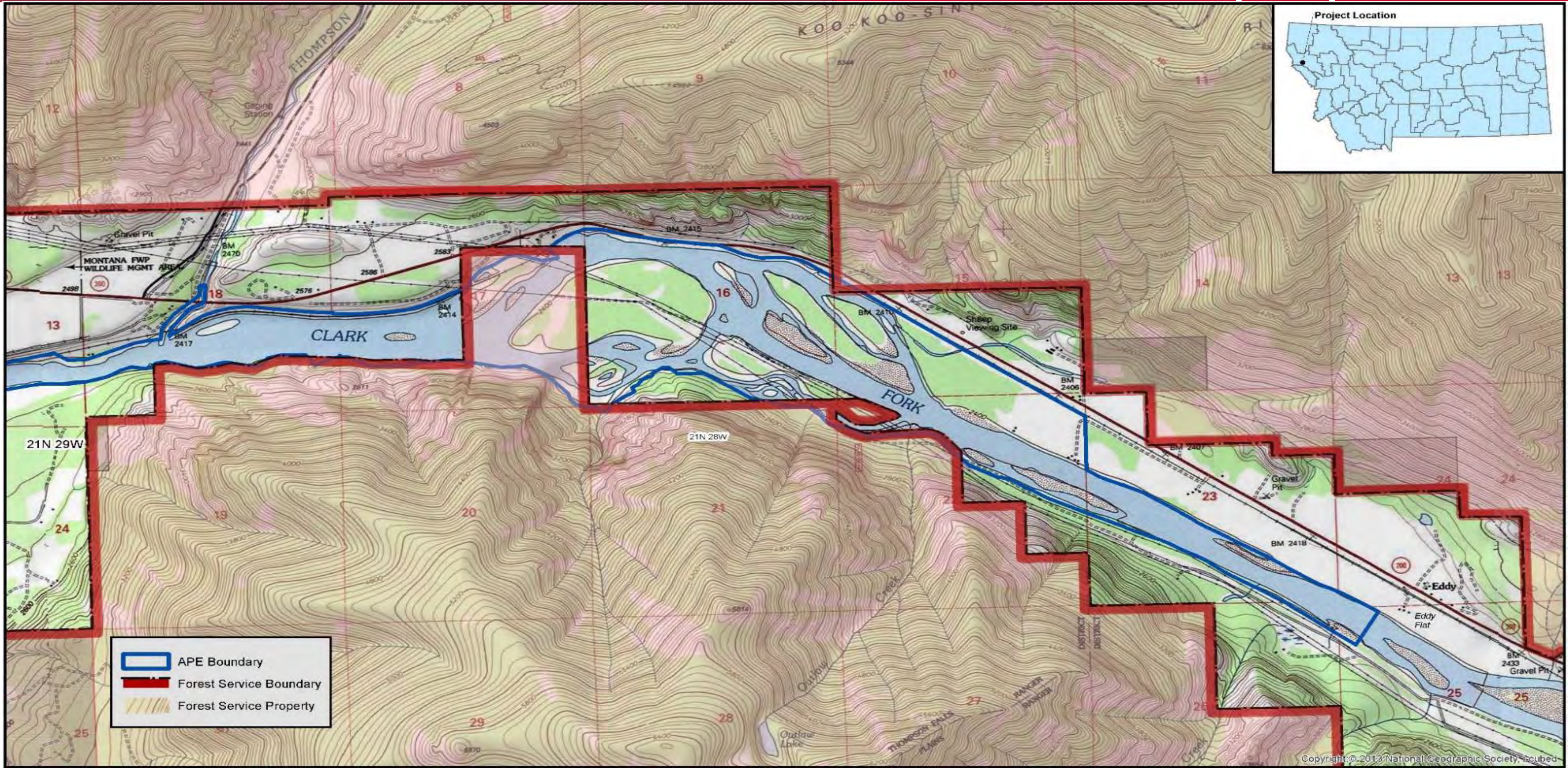
- Evaluations of those properties' eligibility for listing in the National Register of Historic Places

- Provide baseline data to develop an Historic Properties Management Plan under the new license

Cultural Resource Study
Area of Potential Effect (APE) - West End



Cultural Resource Study
Area of Potential Effect (APE) - East End



Cultural Resource Study
Pre-field Research

- SHPO files searches conducted in 2017 and 2022

  - 11 previously recorded cultural properties that lay within, or are adjacent to, the Project APE
    - 9 historic sites
    - 2 sites containing both precontact and historic site components

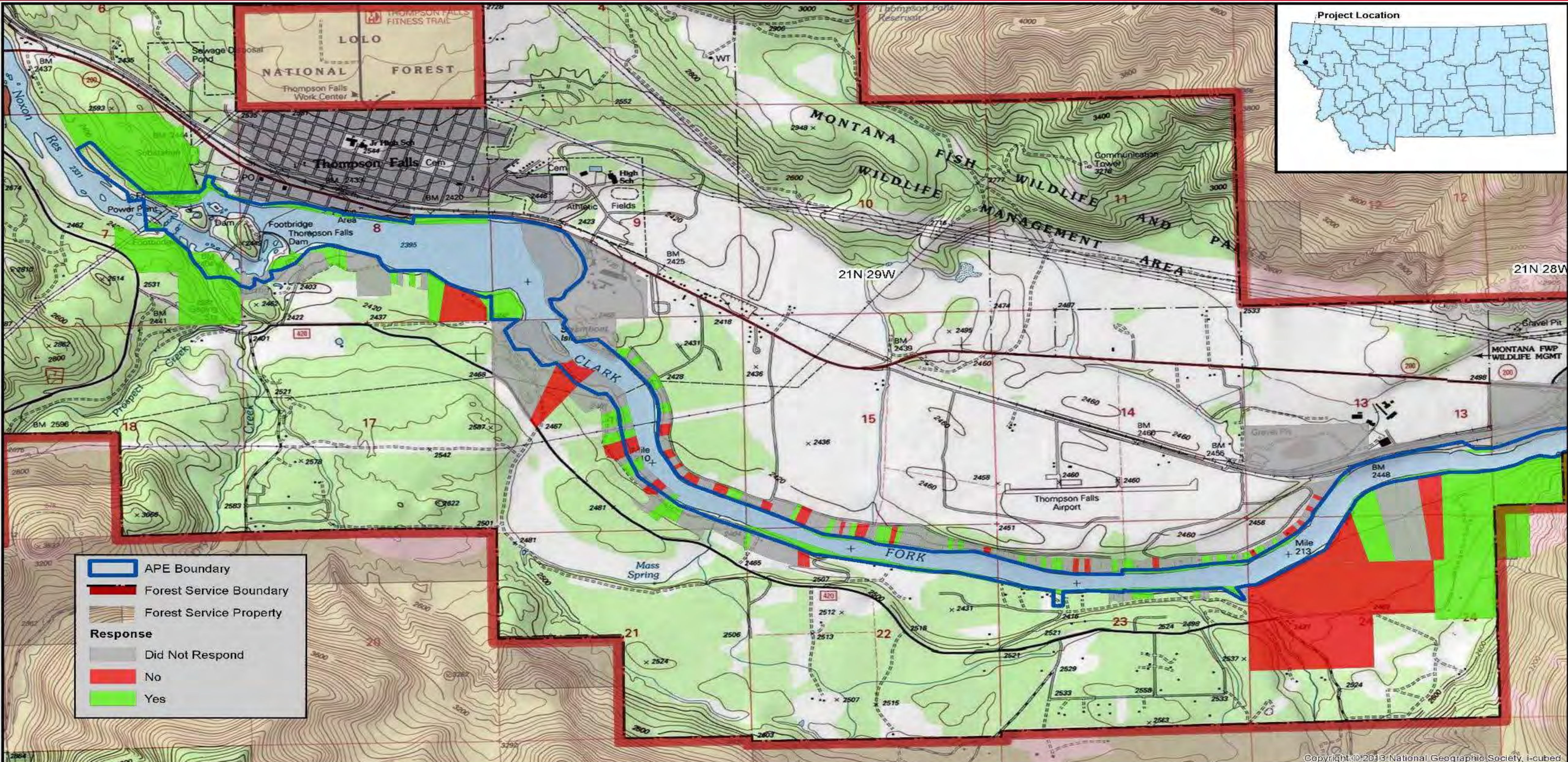
Cultural Resource Study
Landowner Contacts

- NorthWestern sent access request letters to all landowners within the Project APE in 2022

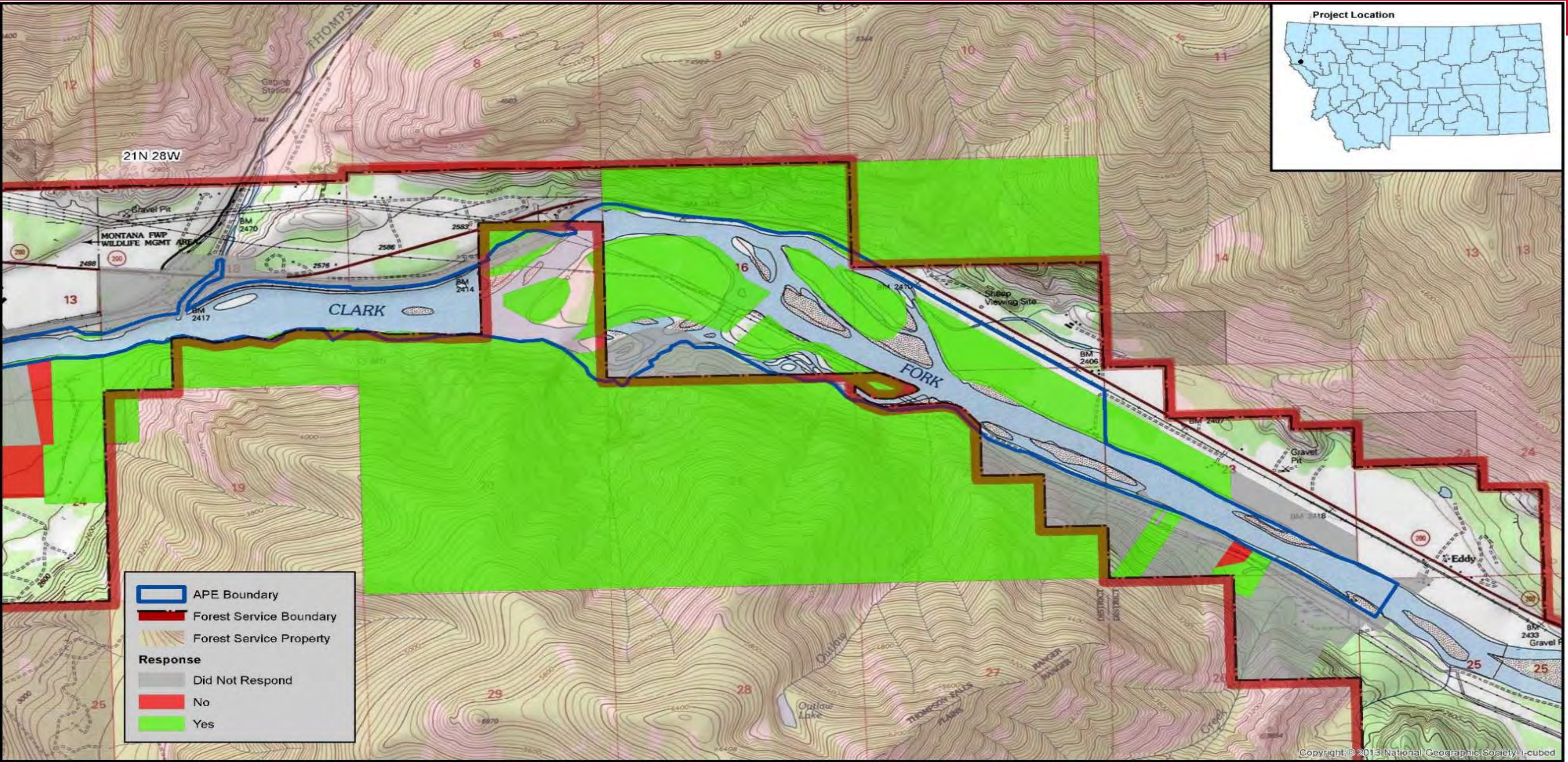
  - Largest landholdings are administered by NorthWestern, Lolo National Forest, and Montana DNRC all of whom granted access
  - 223 private parties own the remaining property within the APE
    - 51 of those private parties granted access to conduct cultural resource inventory
    - The remaining 172 private parties either did not reply to NorthWestern's access request, or denied access

NorthWestern Energy
Delivering a Bright Future

Cultural Resource Study
Landowner Contacts – West End



Cultural Resource Study
Landowner Contacts – East End



- Four factors that complicated the inventory fieldwork
  - Lack of access permission
  - Rugged terrain
  - Minimal road access
  - Dense vegetation

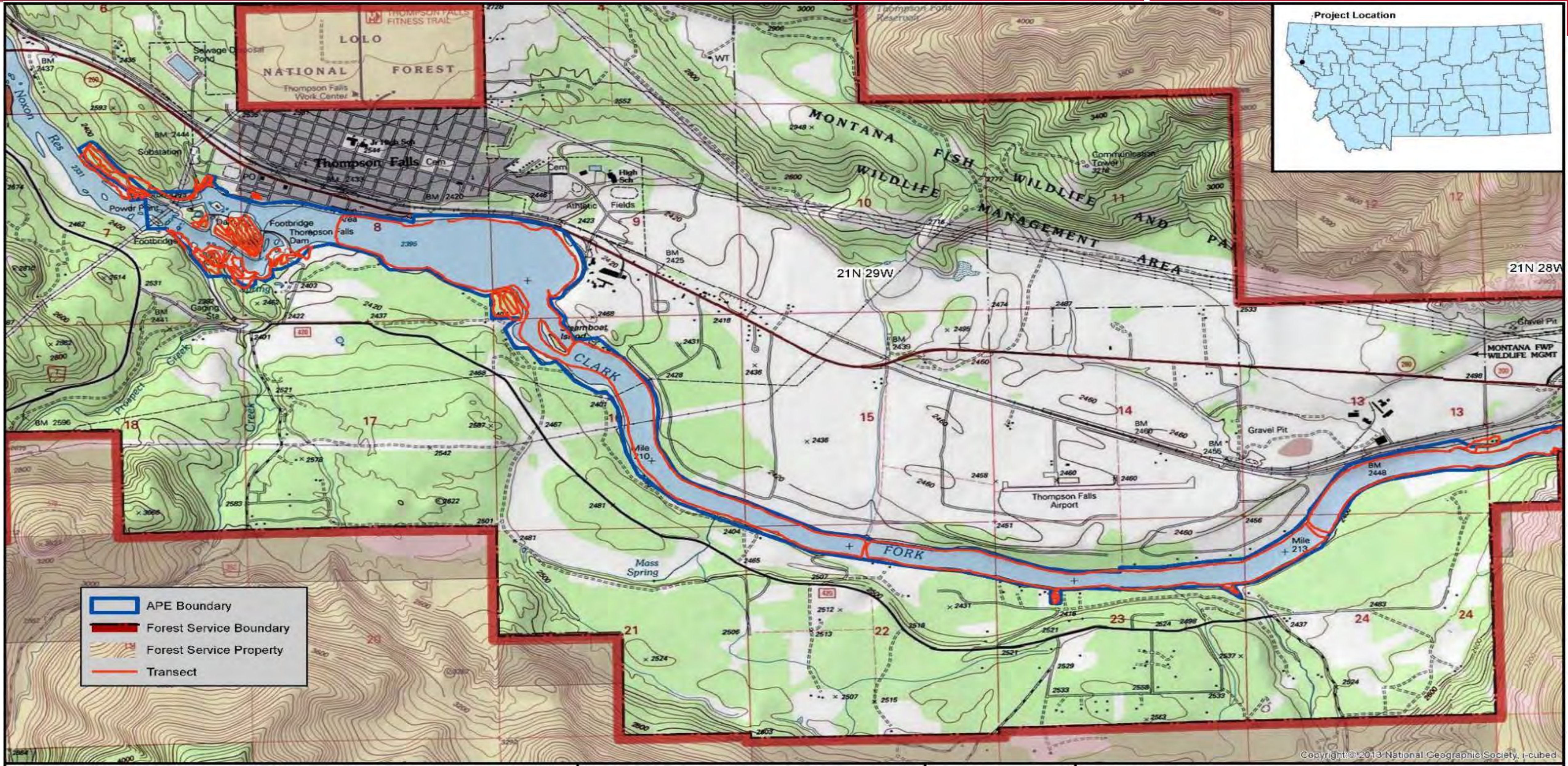
Cultural Resource Study
Inventory Methods

- Specialized field methods employed to ensure the inventory was as intensive as possible

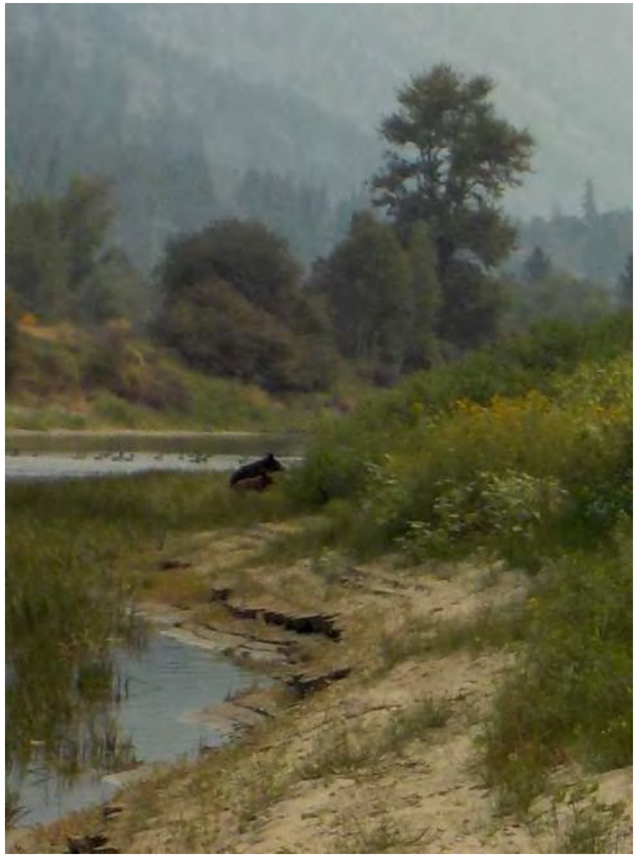
  - Pedestrian transects where access permission was granted and conditions allowed
  - Water borne transects via non-motorized packraft to supplement the pedestrian inventory

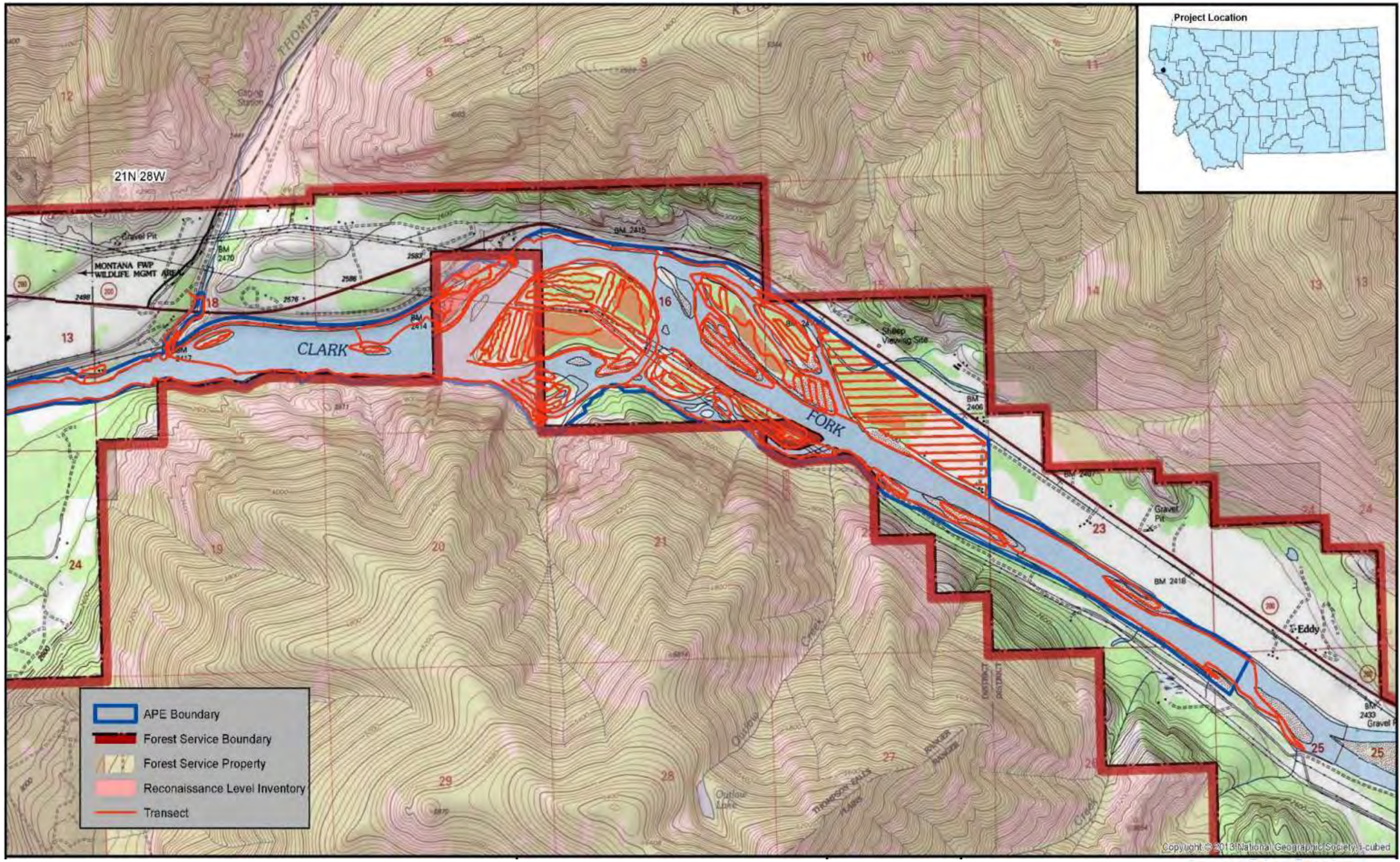
- Advantages of the water borne inventory transects
  - Direct unobscured observation of shoreline cutbanks, slopes, and cliff faces not accessible on foot because of terrain issues or lack of access permission
  - Provided access to instream islands for pedestrian inventory

Cultural Resource Study
Inventory Transects West End



Cultural Resource Study
Inventory Transects – East End





- The cultural resource inventory revealed that 5 of the 11 previously recorded cultural properties identified in the SHPO file searches lay outside the APE. Those include:
  - Salish House
  - The Historic Resources of Thompson Falls (Thompson Falls townsite)
  - Multi-component precontact campsite and historic artifact scatter
  - Railroad Chinese camp
  - Historic livestock corral

Cultural Resource Study Results

- The cultural resource inventory documented 6 historic sites within the APE. Those include:
  - 1. The National Register-listed Thompson Falls Hydroelectric Dam Historic District (including Prospect Creek plant ruin)

2. Northern Pacific Railway (National Register-eligible)

- 3. Plains-Thompson Falls pre-1924 Roadbed segments (National Register-ineligible)

- 4. Yellowstone Pipeline (National Register-ineligible)

Cultural Resource Study Results

- 5. Thompson Falls-Burke A and B Transmission Line, and
- 6. Thompson Falls-Kerr A Transmission Line (both National Register-ineligible)

NorthWestern Energy
Delivering a Bright Future

- An Historic Properties Management Plan for the Thompson Falls Project is currently in development.

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the "Chat" icon and type your question or click on the "Raise Your Hand" icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

Delivering a bright future

Connect With Us:

NorthWesternEnergy.com

NorthWestern Energy

Environmental Justice Study - Purpose

- The Environmental Justice Study was requested by FERC after the first study season was completed. Thus, this may be new information to you.
- FERC requested this study per Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*
- Federal agencies, including FERC, are required to consider if impacts of federal actions would be disproportionately high and adverse for minority and low-income populations
- NorthWestern supports treating all populations with fairness and respect, including minority and low-income populations.

NorthWestern Energy
Delivering a Bright Future

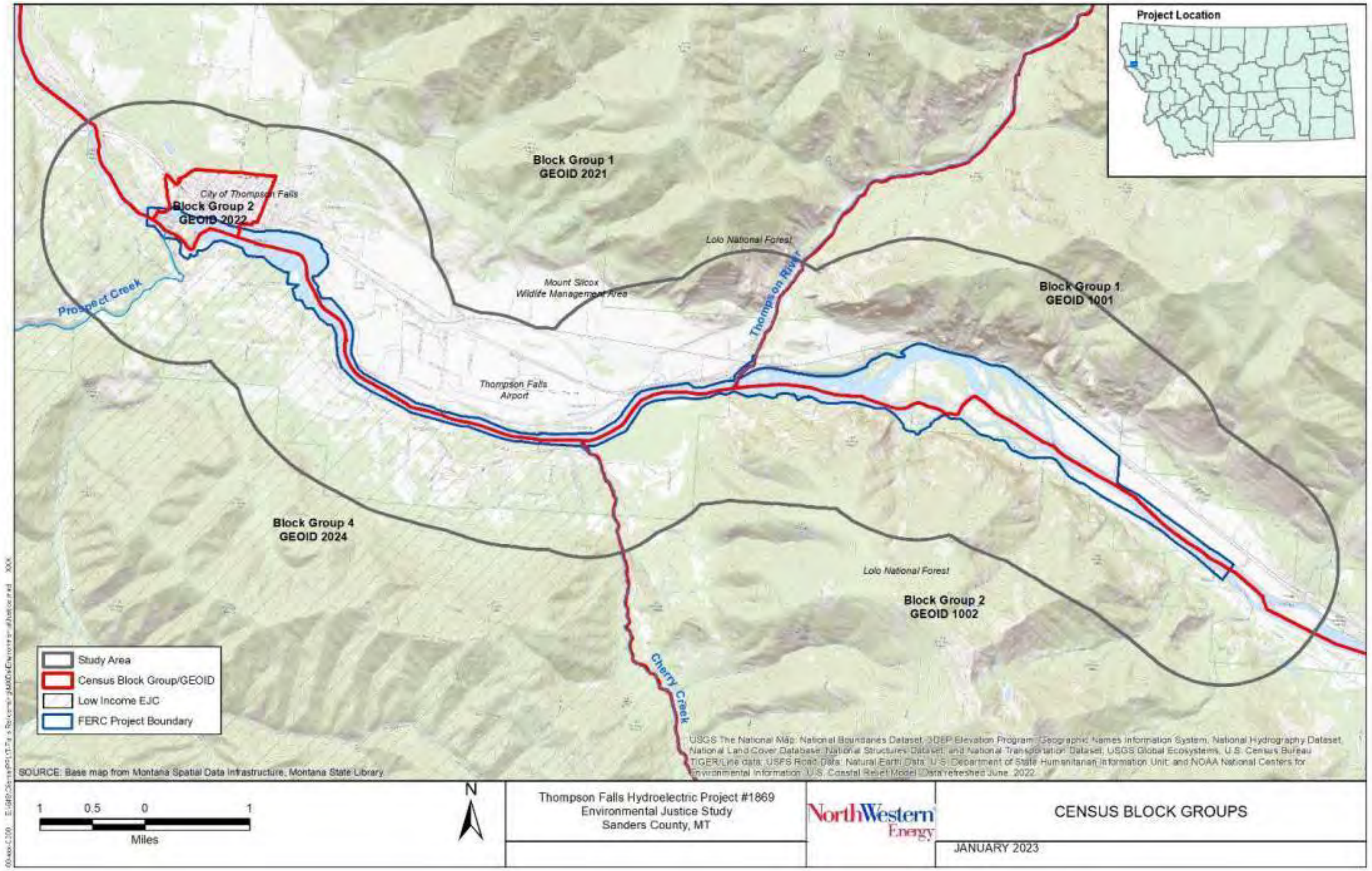
Environmental Justice Study – Methods

- FERC’s approved methodology is modeled after the Environmental Protection Agency’s process to analyze Environmental Justice issues.
- U.S. Census Bureau data is used to determine the presence of minority and low-income populations, and whether those populations exceed certain thresholds.
- If such population exists that exceeds a threshold, it is then deemed an Environmental Justice Community (EJC).
- NorthWestern then analyzed whether Project operations would have a disproportionately adverse impact on EJCs.

NorthWestern Energy
Delivering a Bright Future

Environmental Justice Study - Results

- No EJCs exist based on minority populations.
- Two EJCs exist based on low-income populations.



Environmental Justice Study - Results

- The Project primarily has positive environmental, economic, recreation, and community effects on the EJCs.
- Hydropower is a renewable energy source that produces reliable, low-cost energy and plays a key role in addressing climate change and provides benefits beyond electricity generation such as flood control, irrigation support, and recreational resources.
- The Project employs 6 people and a variety of contractors and it is reasonable to believe they have a positive economic impact in these EJCs.
- Island Park, Power Park and other NorthWestern- supported recreation sites provide free opportunities for public recreation within and near these EJCs.

Environmental Justice Study - Conclusion

- The study concluded that there are no disproportionately adverse impacts to EJCs.

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

NorthWestern Energy

Delivering a Bright Future

Thompson Falls Hydroelectric Project No. 1869

Updated Study Plan Meeting – Operations Study

May 25, 2022

Study Goals and Objectives

Operations Study Goals

- Further evaluate the impacts on Project resources during flexible capacity operations.

Operations Study Objectives

- Better understand the current required frequency and magnitude of increases and decreases of generation.
- Assess shoreline stability, riparian habitats, fisheries, recreation and aesthetics, and wetlands under real-world application of grid stabilizing operations.

NorthWestern Energy
Delivering a Bright Future

Study Methods

- Operate the Thompson Falls Project to provide baseload and flexible generation to support grid reliability and market conditions.

- Daily operations were determined in real-time as stable, increases, or decreases in generation were called upon to provide NorthWestern's grid reliability and meet market conditions needs

- All operations during the 2022 Study Season:
  - maintained the reservoir elevation within the top 2.5 feet, and
  - provided a minimum flow of 6,000 cubic feet per second downstream of the Project

NorthWestern Energy
Delivering a Bright Future

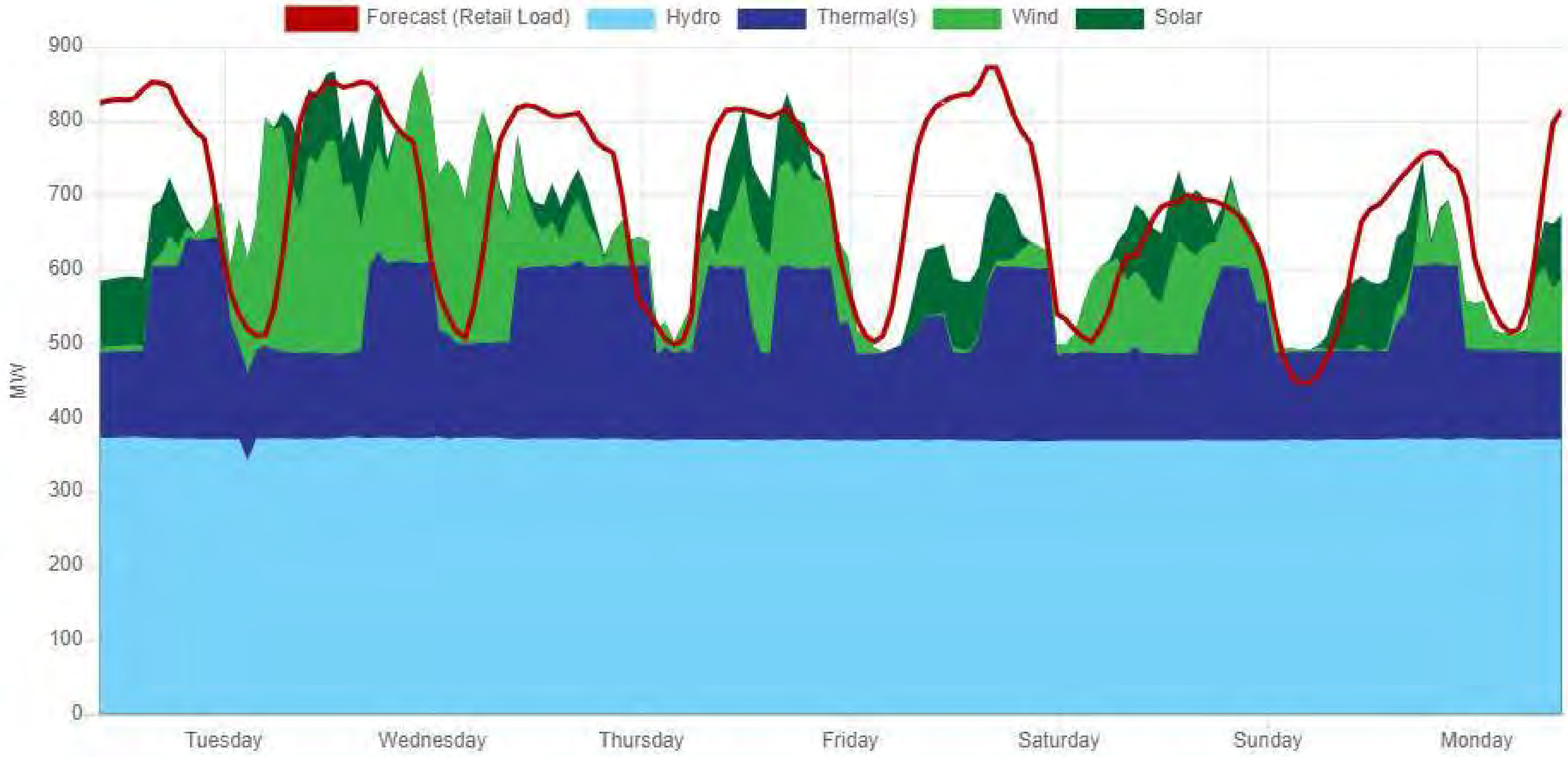
Operations Study – Plant Operations

- Flexible Capacity – flexibility to increase (INC) or decrease (DEC) plant output to help balance the inputs and outputs on the grid
  - Load (outputs) and Generation (inputs) dynamically change all the time
- The foundation of grid stability and reliability
  - Helps maintain system frequency and voltage
- Strict regulations on maintaining grid stability and reliability

Operations Study – Plant Operations

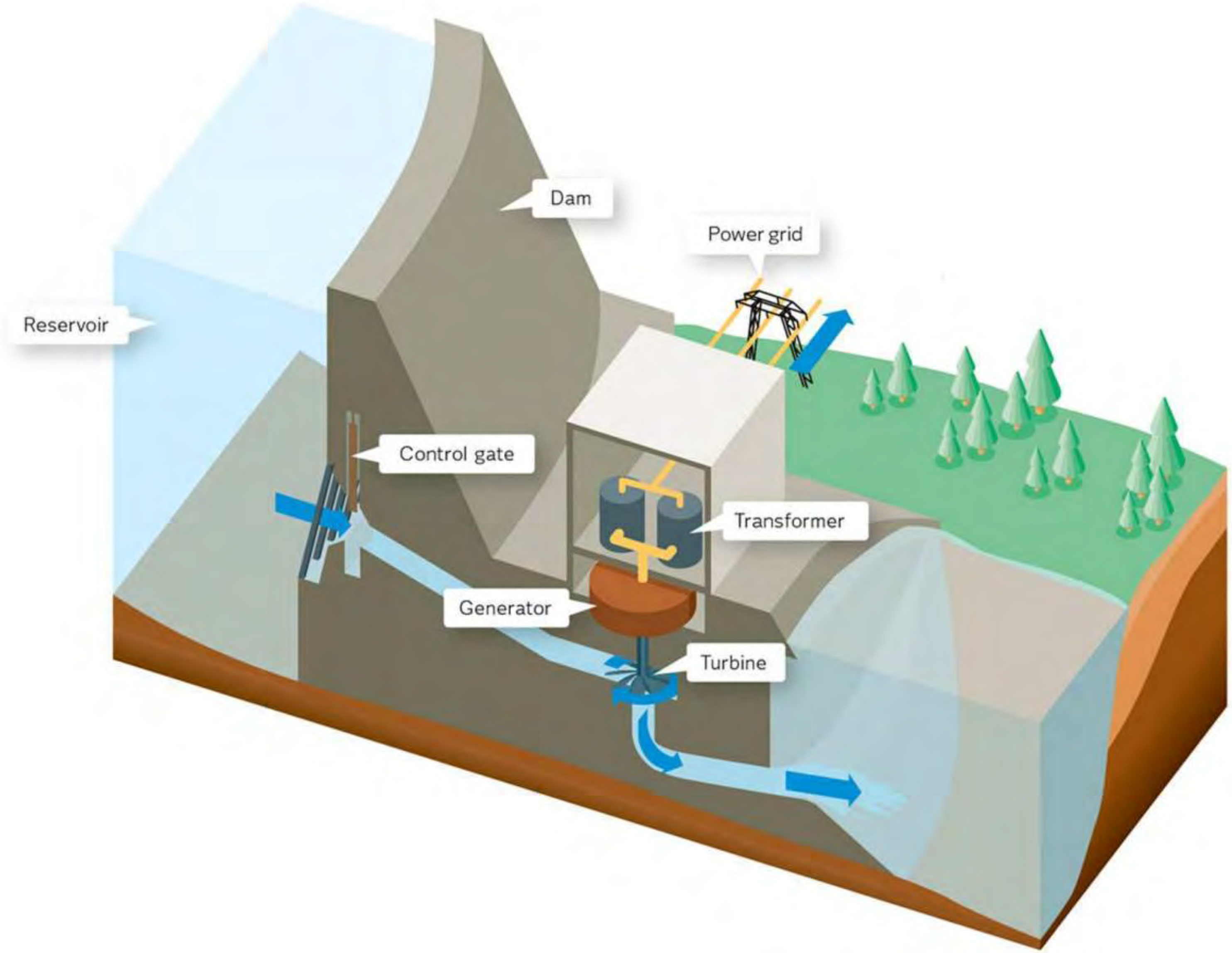
Hourly electrical generation by source (Montana)

This chart is data between 5/15/23 and 5/22/23



NorthWestern Energy
Delivering a Bright Future

Operations Study – Plant Operations



MW INC = Reservoir drop

MW DEC = Reservoir rise

Rate of reservoir change is function of the MW INC or DEC

Duration of flex capacity is a function of reservoir storage available

NorthWestern Energy
Delivering a Bright Future

Operations Study – Plant Operations

- Flexible Capacity is calculated and made available on a real time basis

- Based on:
  - Reservoir elevation
  - Generating unit configuration
    - Available units
    - INC/DEC available on individual units
    - Driven by baseflows most of the time
    - Can include spilling water at times

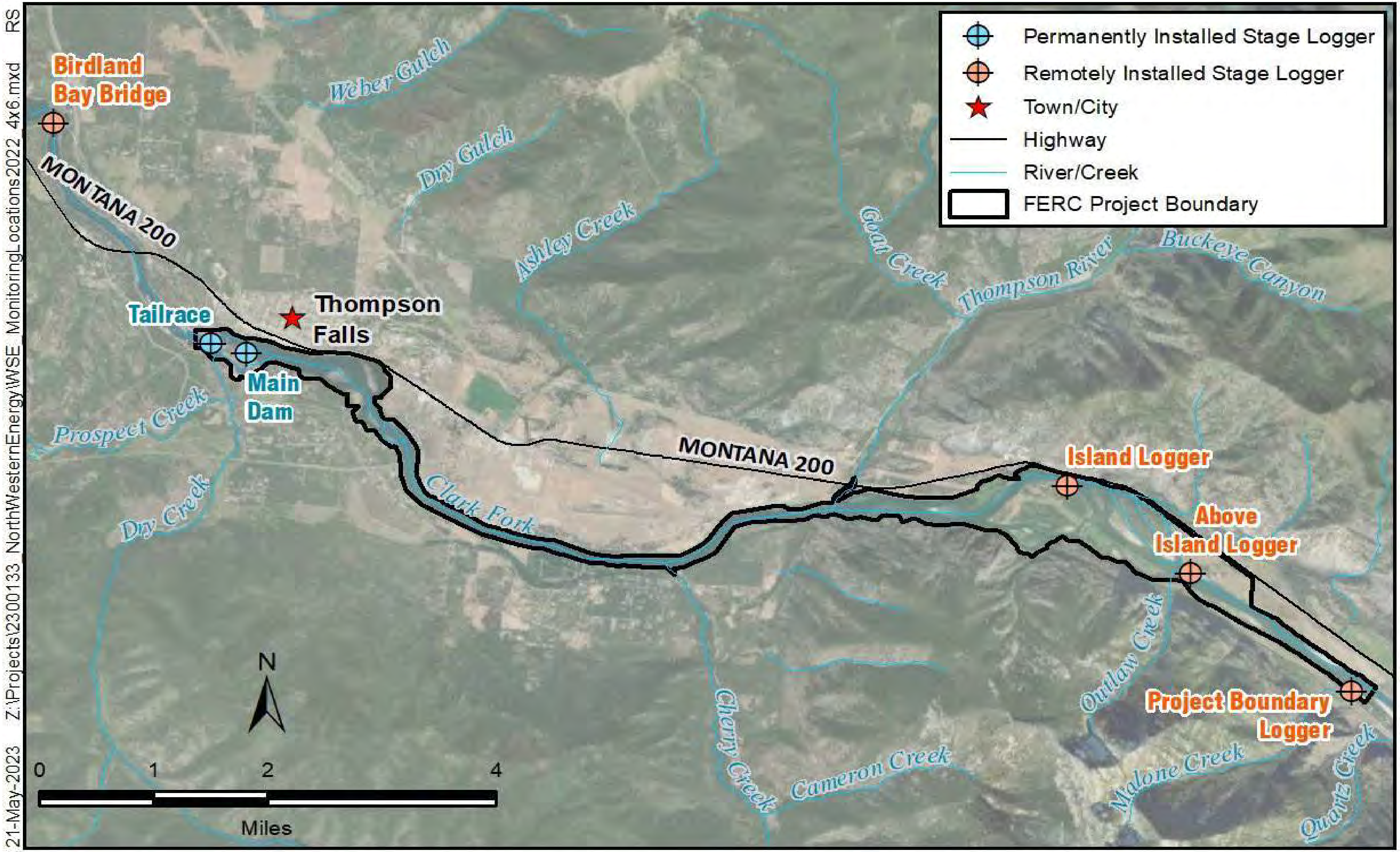
NorthWestern Energy
Delivering a Bright Future

Operations Study – Plant Operations

- This study represented real-time capability and provision of flexible capacity
  - Frequency of INC/DEC based on real system need
  - Duration of INC/DEC was suppressed due to reservoir elevation use

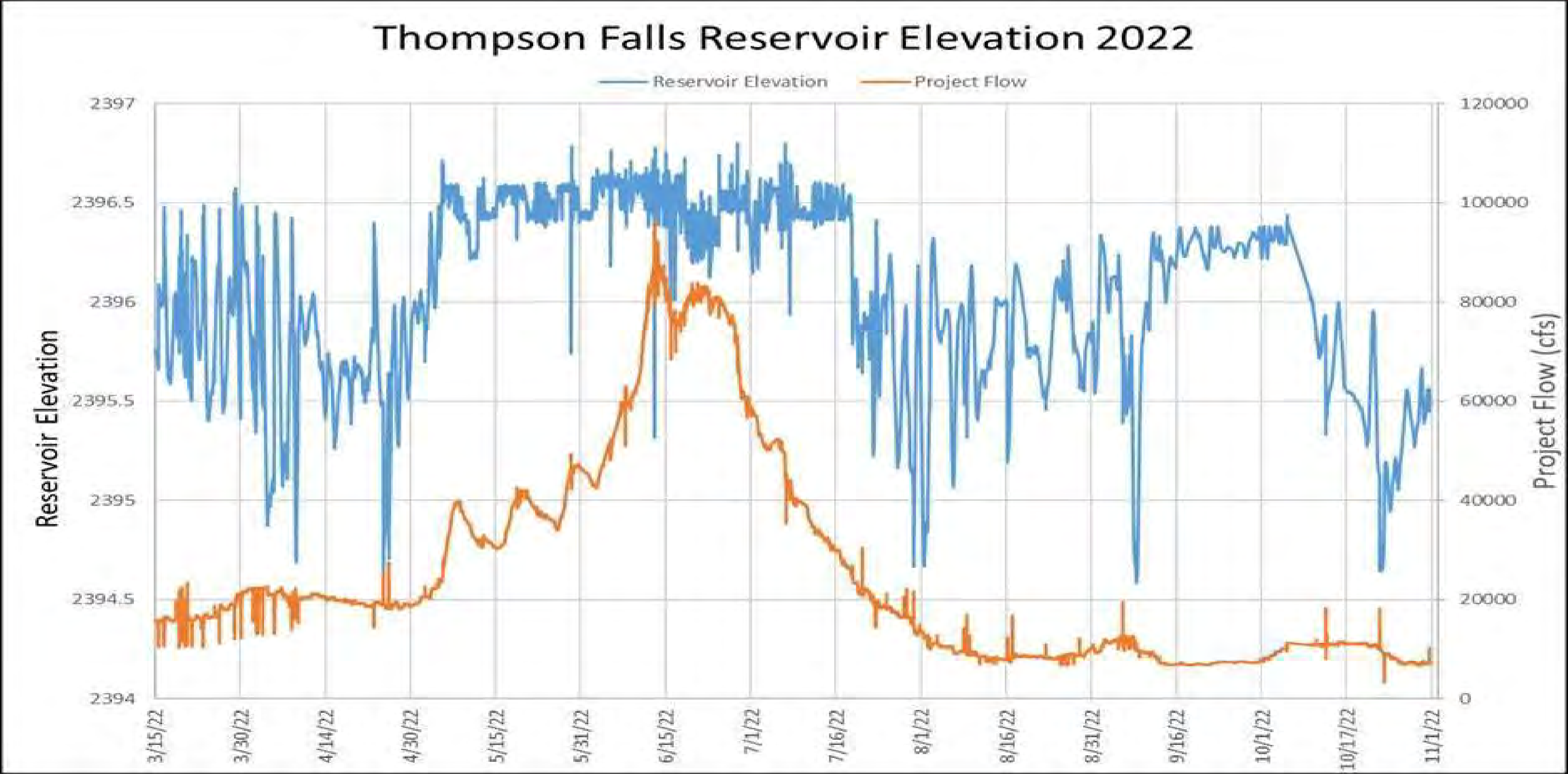
- Operationally, the plant performed well with no major issues in the provision of flexible capacity
- Proving flexible capacity from the Thompson Falls plant provides great benefits

Water Surface Elevation Monitoring Locations 2022

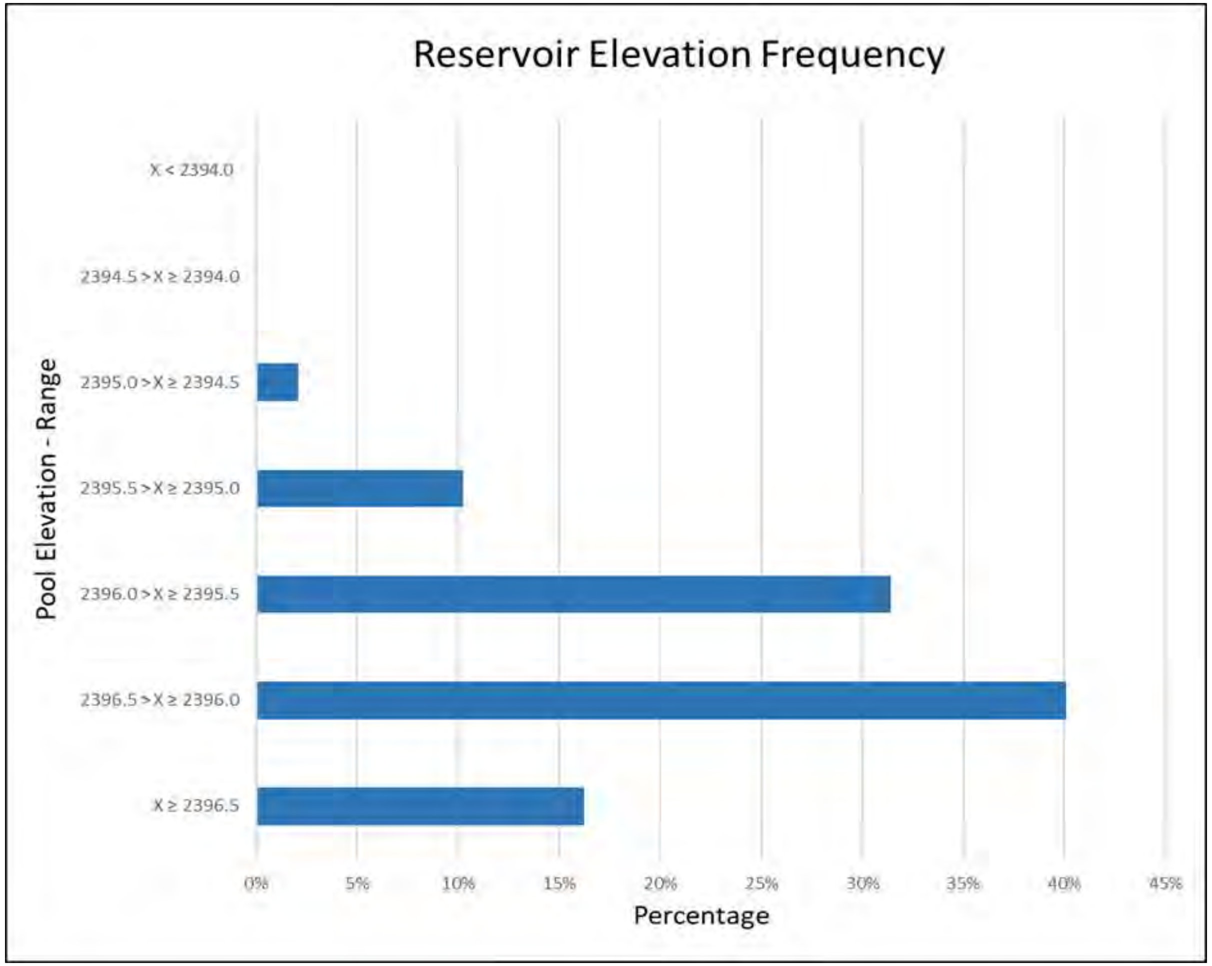


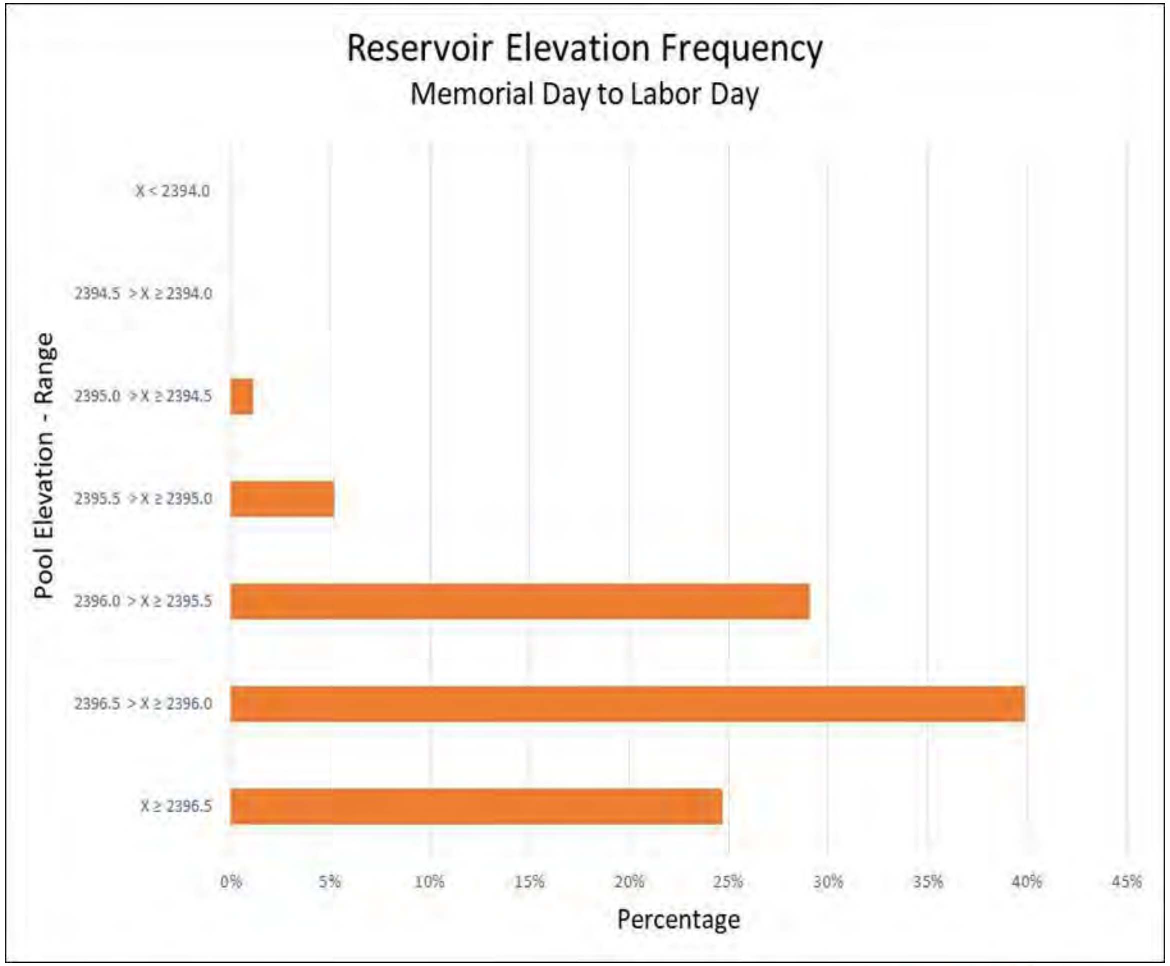
NorthWestern Energy
Delivering a Bright Future

Reservoir Elevation (feet) and Flow (cfs), March – October 2022

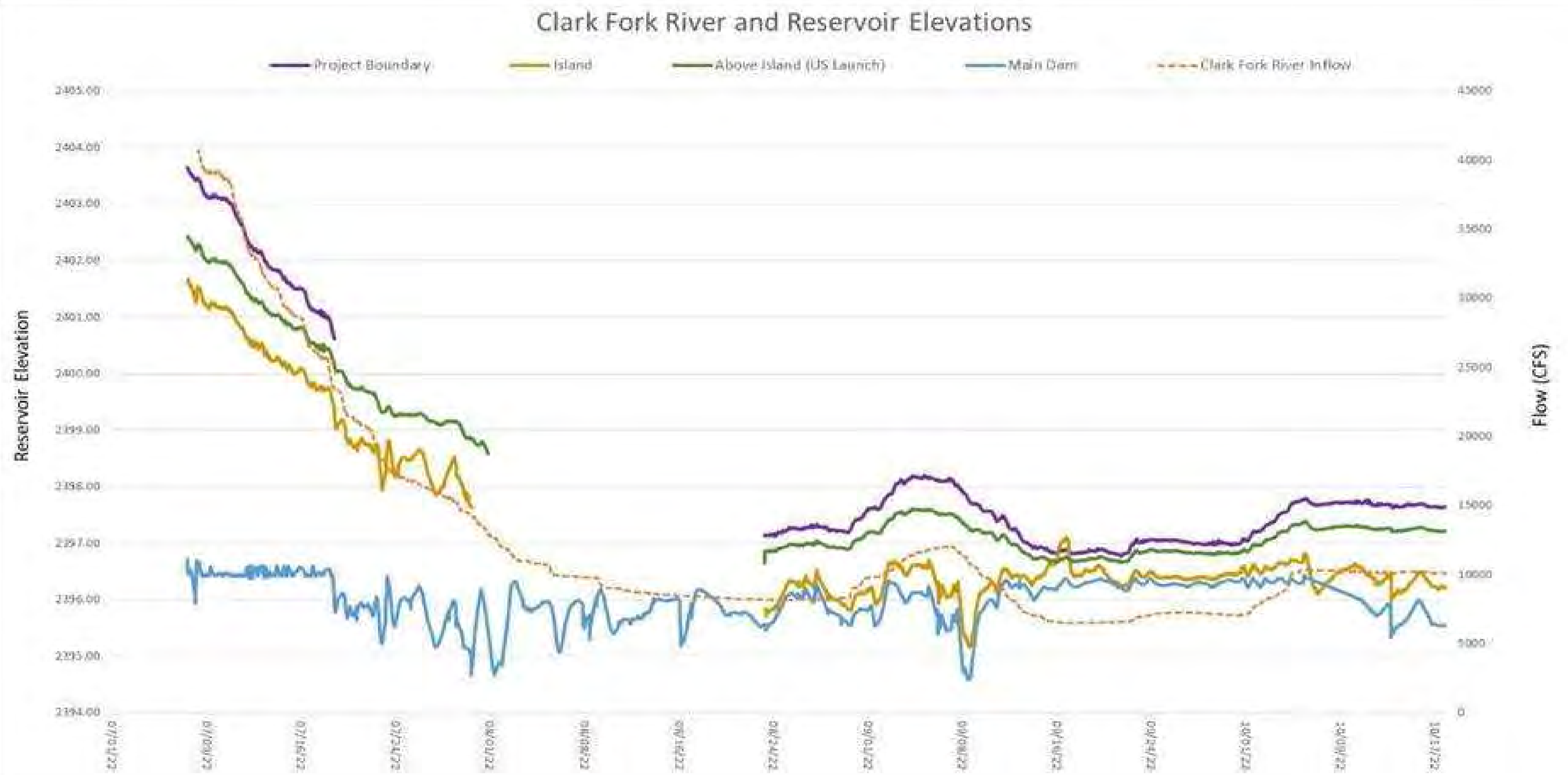


Reservoir Elevation (feet) – Second Study Season 2022

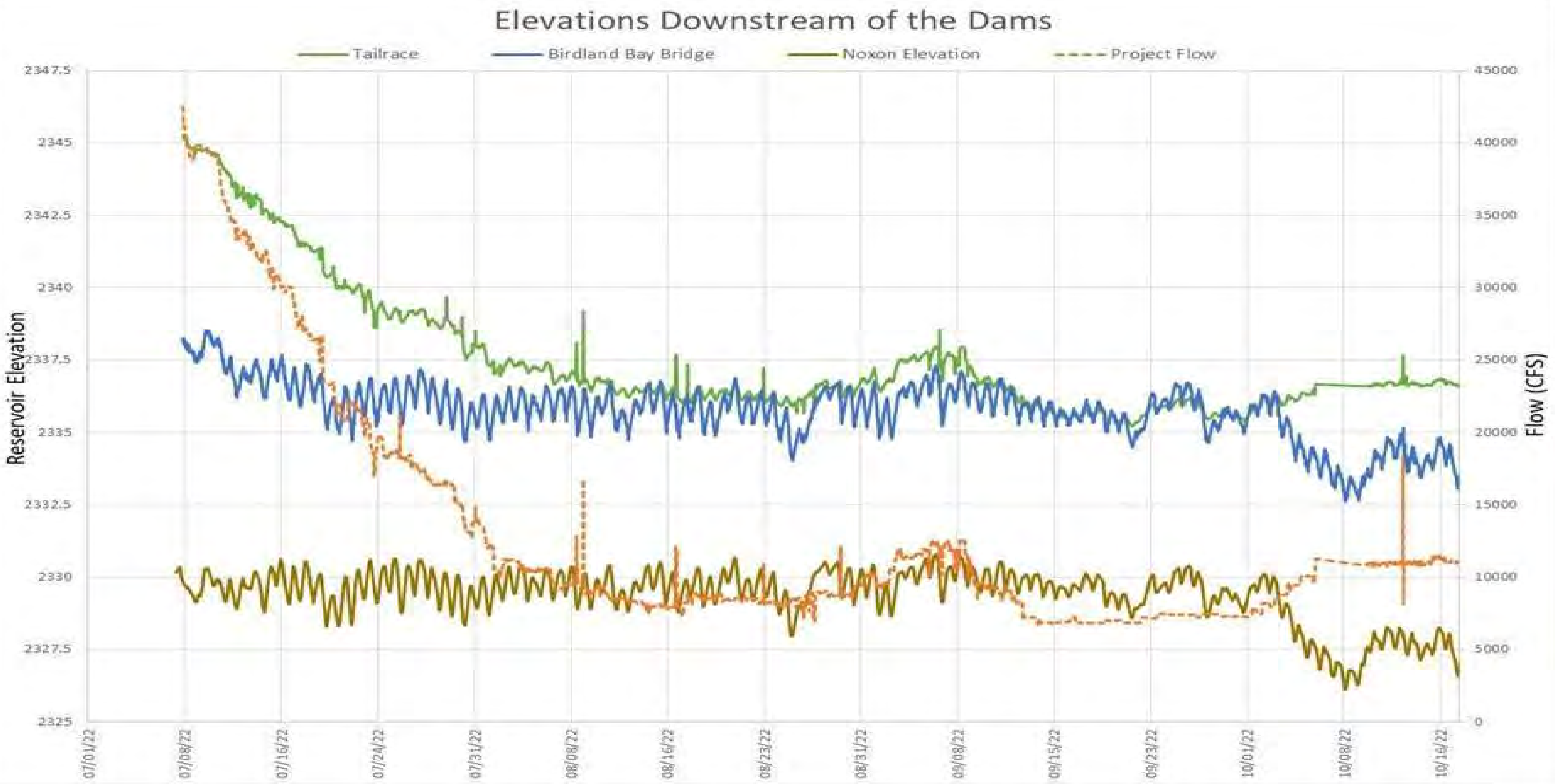




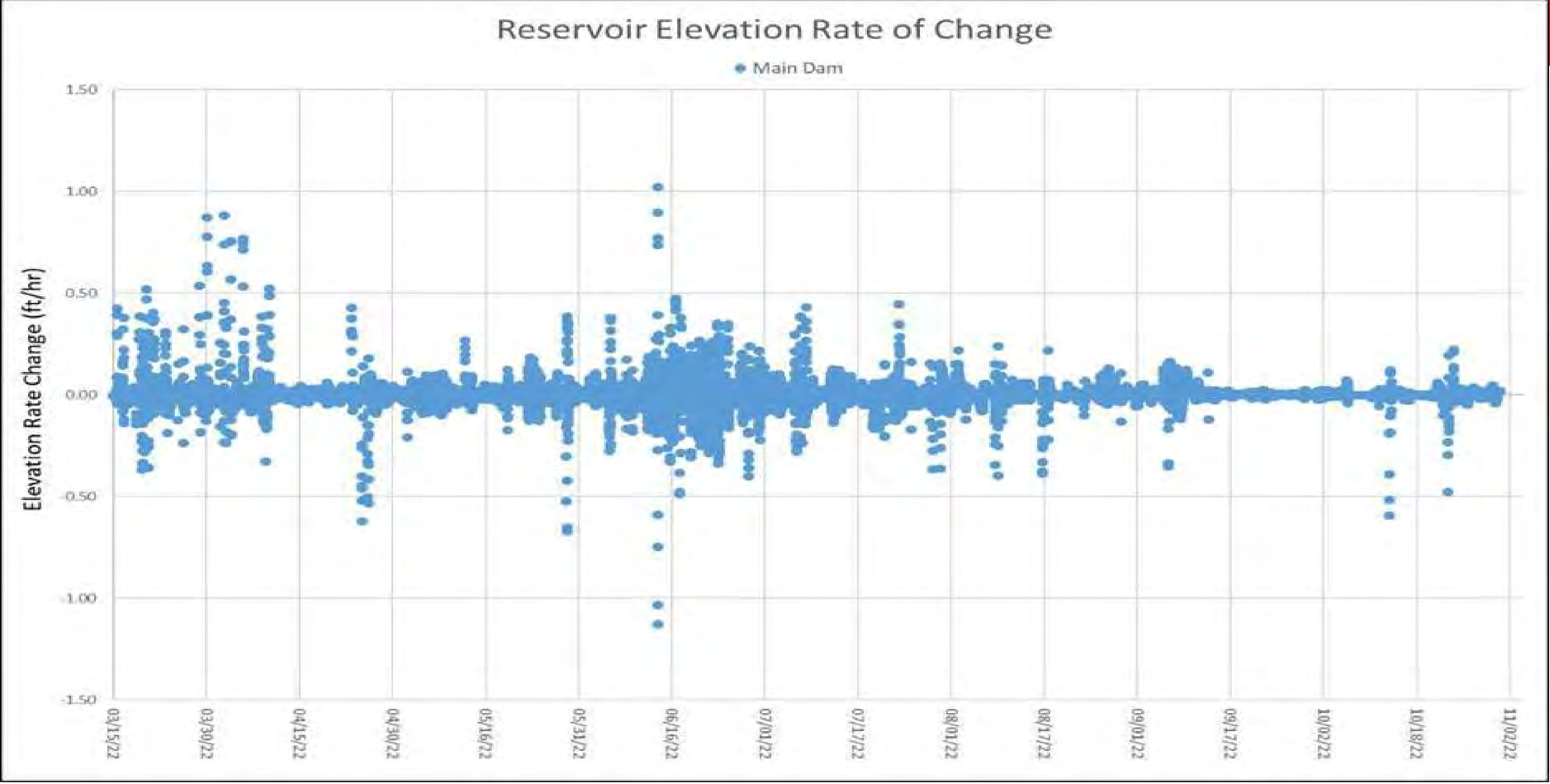
Water Surface Elevations Upstream of the Project



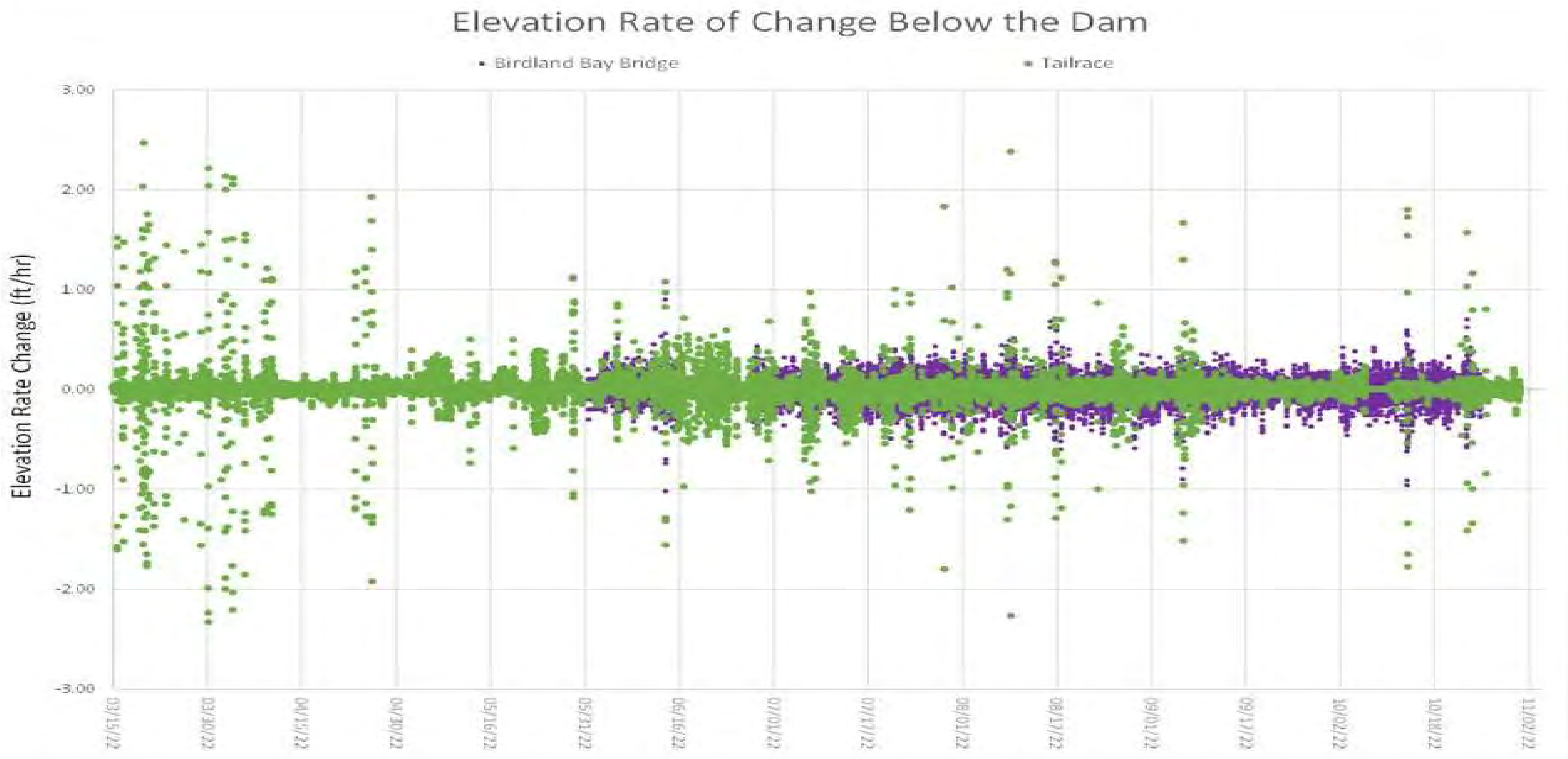
Water Surface Elevations Downstream of the Project



Thompson Falls Reservoir Elevation Rate of Change



Rate of Change in Stage (feet) Below Dams



Maximum Rate of Change in Stage

Max Rate in Reservoir and Upstream

Season	Maximum Rate of Change Main Dam (ft/hr)		Maximum Rate of Change Project Boundary* (ft/hr)	
	Increase	Decrease	Increase	Decrease
Phase 1 2021	0.3	-0.5	0.05	-0.08
Phase 2 2021	0.4	-0.91	0.05	-0.2
Phase 3 2021	0.65	-1.46	0.05	-0.15
Study Season 2022 (3/15-10/31)	1	-1.1	.07*	-.07*

*Data available for 7/7/2022-10/25/2022 at the Project boundary site

Max Rate Downstream

Season	Maximum Rate of Change Tailrace (ft/hr)		Maximum Rate of Change Birdland Bay Bridge (ft/hr)	
	Increase	Decrease	Increase	Decrease
Phase 1 2021	1.5	-2.1	0.8	-0.7
Phase 2 2021	3.3	-3.6	1.4	-1.5
Phase 3 2021	4.2	-4.4	1.2	-1.7
Study Season 2022 (3/15-10/31)	2.5	-2.3	0.9	-1.0

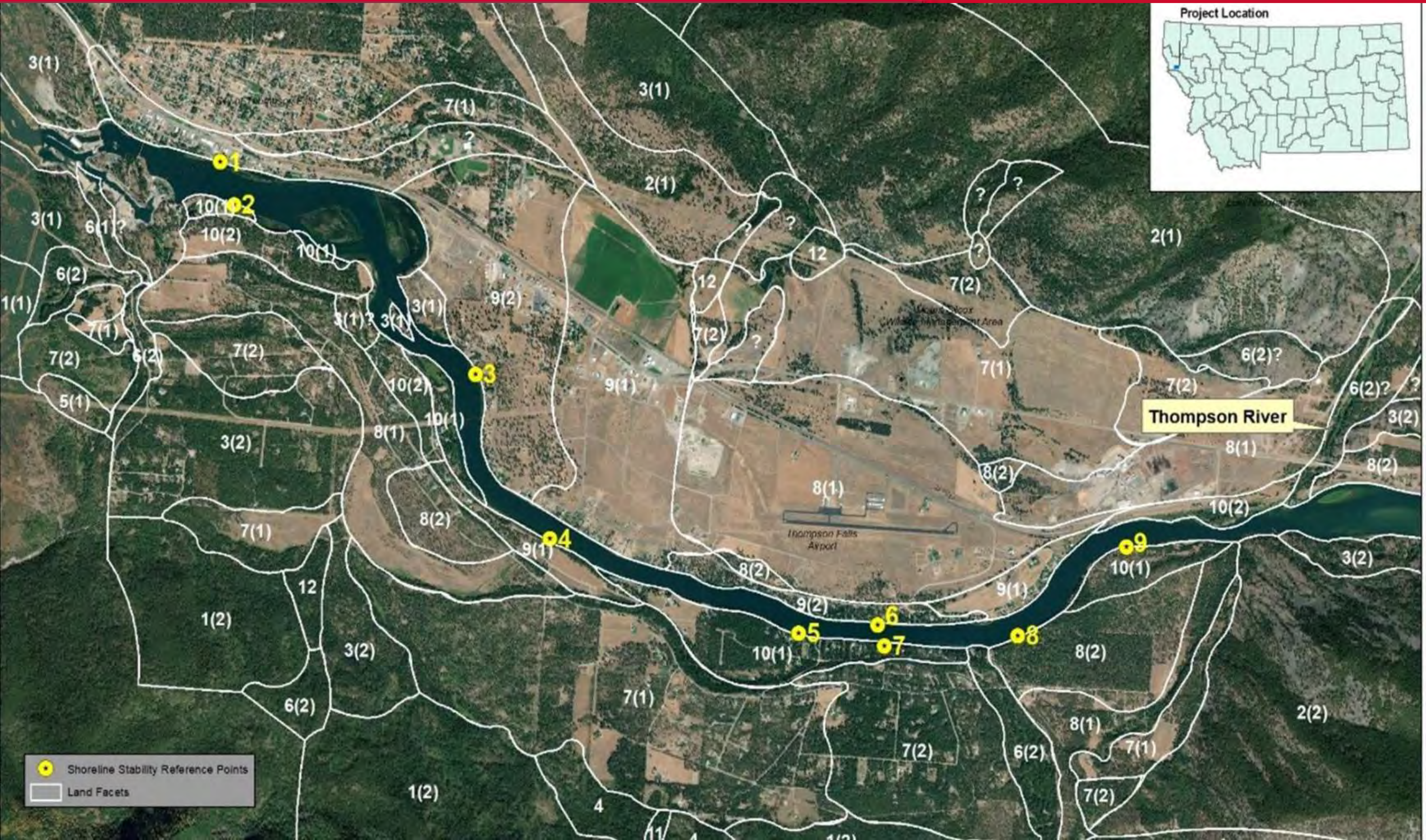
NorthWestern Energy
Delivering a Bright Future

Shoreline Stability-Methods

- 9 reference points - diversity of soil types, slope, aspect, vegetation, and land use.
- Same reference points as the 2021 field season.
- Monitoring events July 20, 2022 and September 13, 2022
- Document the presence, type and magnitude of erosion, soil type, land management activities, and existing erosion control measures, if any.
- Photo documentation of each site visit.

NorthWestern Energy
Delivering a Bright Future

Shoreline Stability Reference Points



NorthWestern Energy
Delivering a Bright Future

Shoreline Stability - Results

- Fluctuating water levels due to operations did not decrease shoreline stability
- Shoreline armoring by rock, woody materials and aquatic/riparian vegetation maintained shoreline stability

- Shoreline stability was impacted by other factors such as bank stabilization projects, spring runoff and windstorms.

NorthWestern Energy
Delivering a Bright Future

Riparian Habitats – Methods

- Observations of:
    - riparian vegetation (above waterline)
    - aquatic vegetation (emergent and submergent)
    - aquatic invasive species (AIS).
- Same 9 reference points as Shoreline Stability Study.

NorthWestern Energy
Delivering a Bright Future

Riparian Habitats - Results

- A diversity of riparian and aquatic vegetation types and plant communities.
- No impacts to riparian vegetation (above waterline); riparian species adapted to fluctuating water levels.
- Impacts to aquatic vegetation likely, especially submergent aquatic vegetation.

Riparian Habitats - Results

- Aquatic invasive species (AIS) are present and vary in density with yellow flag iris and flowering rush the most common species observed and small amounts of curly leaf pond also present.
- No changes to AIS observed during study.

Western Energy
Delivering a Bright Future

Fisheries Stranding

- Conduct two stranding surveys during 2022 season
- 12 transects walked looking for stranded or trapped fish, August 24 (2395.6') and 31 (2395.8')
- No stranded fish observed
- Many of the transects still submerged

NorthWestern Energy
Delivering a Bright Future

Fish Passage Facility Operation

- Operate fish passage facility using standard operating procedure
- Daily checks March – October
- Fully functional at all times and associated forebay elevations
- During fall vegetation plugged some screens and slowed filling of the lock. Operations not impeded more than 30 minutes.

Assessment of impacts to docks and aesthetic qualities:

- Public docks at Wild Goose Landing and Cherry Creek and 11 private docks conditions documented and photographed.
- Days with anticipated generation increase selected for assessment.
- Modification from FERC-approved Study Plan: water depth at end of each dock was not measured due to the short timeframe the reservoir elevation was below full pool.
- Changes in aesthetics at 9 public viewing areas were documented through photos and assessment of odors.

Recreation - Methods

Impacts related to:

~ Physical condition of dock/gangway.

~ Access to dock from shoreline.

~ Access to water from dock.

~ Access to boats moored at dock.

Assessment Scale:

0: No impact. No structural impact or access not limited or affected in any case.

-1: Slight impact. Access minimally impacted in less than 25% of cases.

-2: Moderate impact. Access impacted minimally or moderately in 50% of less cases.

-3: Significant impact: Access impacted moderately or significantly in more than 50% of cases.

-4: Severe impact: Access prohibited in all or nearly all cases.

Recreation Results

		Reservoir Elevation Below Full Pool					
Component Assessed	*Dock Type*	0	-0.5 ft	-1 ft	-1.5 ft	-2.0 ft	-2.5 ft
Physical Condition of Dock and Gangway	*Floating*	0	0	0	0	-1	-2
	Stationary	0	0	0	0	0	0
Access to Dock	*Floating*	0	0	0	-1	-1	-2
	Stationary	0	0	0	0	0	0
Access to Water from Dock	*Floating*	0	0	0	0	-1	-2
	Stationary	0	0	0	-1	-2	-2
Access to Boat Moored to Dock	*Floating*	0	0	0	0	n/a	n/a
	Stationary	0	-1	-1	-1	-3	-3

Recreation – Results

Full Pool

Wild Goose Landing stationary public boat launching dock

-1.0 ft

2022 Flexible Capacity Generation

No impacts to dock condition or access to dock.

-2.5 ft

Lowest elevation proposed

Slight impacts to access to the water from dock and to boat moored at dock at -2.5 ft below full pool.

NorthWestern Energy
Delivering a Bright Future

Recreation – Results

Full Pool

<u>Wild Goose Landing floating swim dock</u>

-1.0 ft

2022 Flexible Capacity Generation

No impacts to dock condition, access to dock, or access to the water from dock at -2.5 ft below full pool.

-2.5 ft

Lowest elevation proposed

No boat mooring at swim dock.

Results

Full Pool

-1.0 ft

2022 Flexible Capacity Generation

-2.5 ft

Lowest elevation proposed

<u>Cherry Creek Boat Launch site floating launch dock</u>

No impacts to dock condition or access to dock at all elevations.

Slight impacts to access to the water from dock and to boats moored at dock at 2.5 ft below full pool.

Private stationary dock at -0.5 ft and -2.0 ft.

Recreation – Results

Private floating dock at -2.5 ft.

NorthWestern Energy
Delivering a Bright Future

Recreation Results Conclusions

- Recreation impacts at Wild Goose Landing and Cherry Creek Boat Launch were minimal during Flexible Capacity Operations in 2022 and during staged testing in 2021. Stationary docks remained watered, floating docks remained floating, and use of the public launching docks for mooring was only slightly impacted for the short-term duration of Flexible Capacity Operations.
- Flexible Capacity Operations in 2022 resulted in only slight impacts to private docks related to access to boats moored at docks, but accounts for only about 5% of docks. Flexible Capacity Operations were short-term.
- Reservoir elevations -2.0 ft and lower created moderate to significant impacts for less than half of private docks. Most impacts were at stationary docks (20% of all docks).

Aesthetic Impacts Results

- The lowest reservoir elevation of 2022 Flexible Capacity Operations monitoring events was 1.0 ft below full pool reservoir elevation. Duration of reduced elevations was short (less than 1 hour).
- Typically 5 feet or less of exposed mud along the shoreline. Some shallow areas or shorelines with gradual slopes had up to 10 feet of exposed mud.
- Offensive odors of decaying organic matter did not exist, likely due to the short duration of the mud exposure.

Aesthetics – Results

Shoreline of Island Park and Wild Goose Landing at -1.0 ft elevation.

NorthWestern Energy
Delivering a Bright Future

Aesthetics – Results

South shoreline above Steamboat Island and Cherry Creek Boat Launch at -1.0 ft

NorthWestern Energy
Delivering a Bright Future

Aesthetics – Results

North shoreline above Steamboat Island at -1.0 ft below full pool.

NorthWestern Energy
Delivering a Bright Future

Aesthetics – Conclusions

<u>Aesthetics Impacts - Conclusions</u>

- Impacts were minimal under flexible capacity operations in 2022, with some exposed mud and rock along shorelines but no offensive odors for the short-term reductions in elevation.

Wetlands

- Wetlands located within the Project were studied to determine if reservoir operations were affecting wetland functionality.

- Results from the 2021 study season found wetlands that did not have a direct surface water connection to Thompson Falls Reservoir were unaltered by Project operations. However, wetlands studied in 2021 that had a direct surface water connection to the reservoir exhibited water level fluctuations during reservoir elevation changes at the dam.

- The 2022 study season focused on studying wetlands with surface water connectivity to Thompson Falls Reservoir to further understand this relationship.

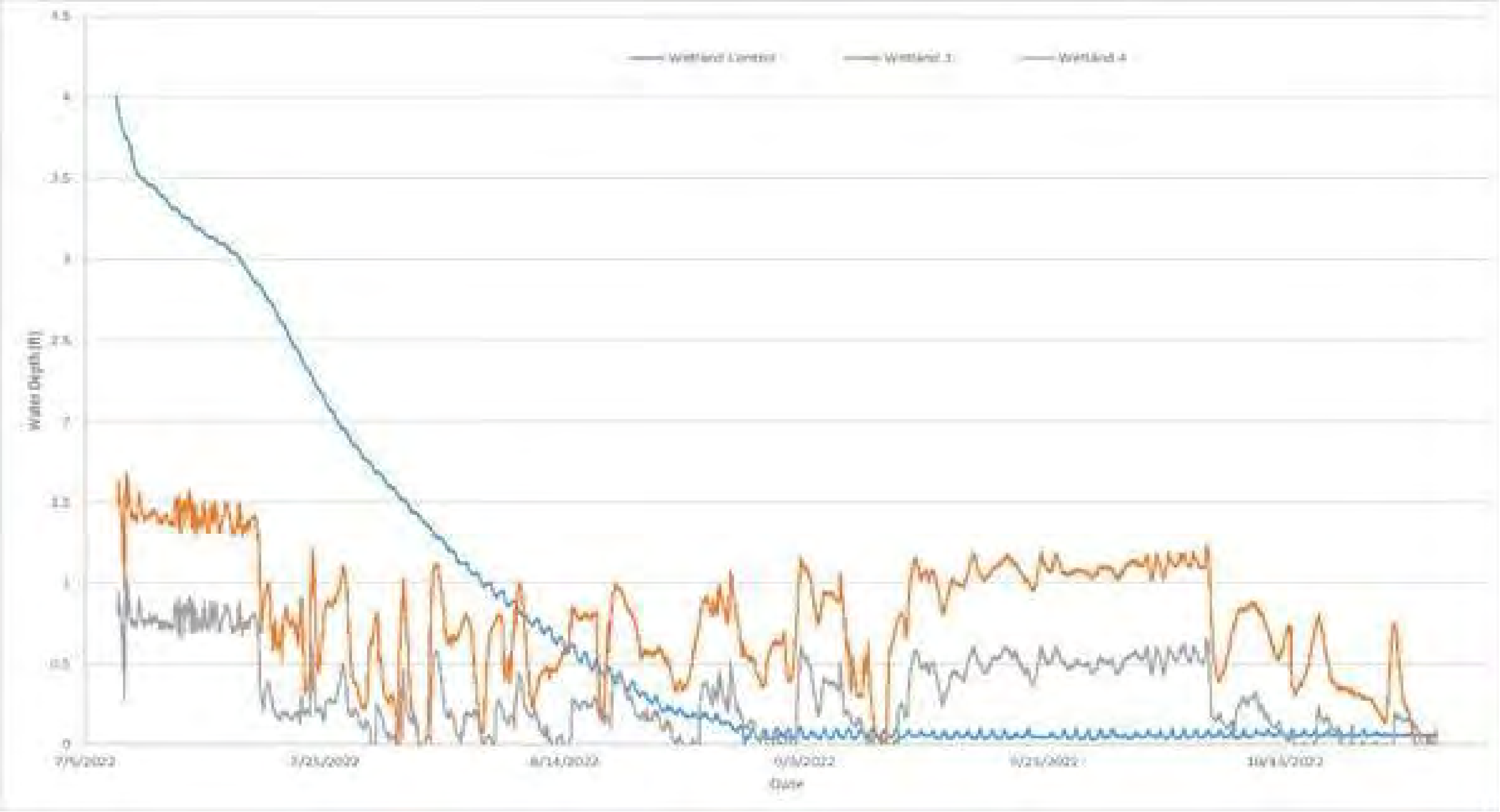
Wetland Study Methods

- Water level recording dataloggers were installed in three wetland sites, two study sites and one control site, in 2022 to measure water levels throughout the study season.

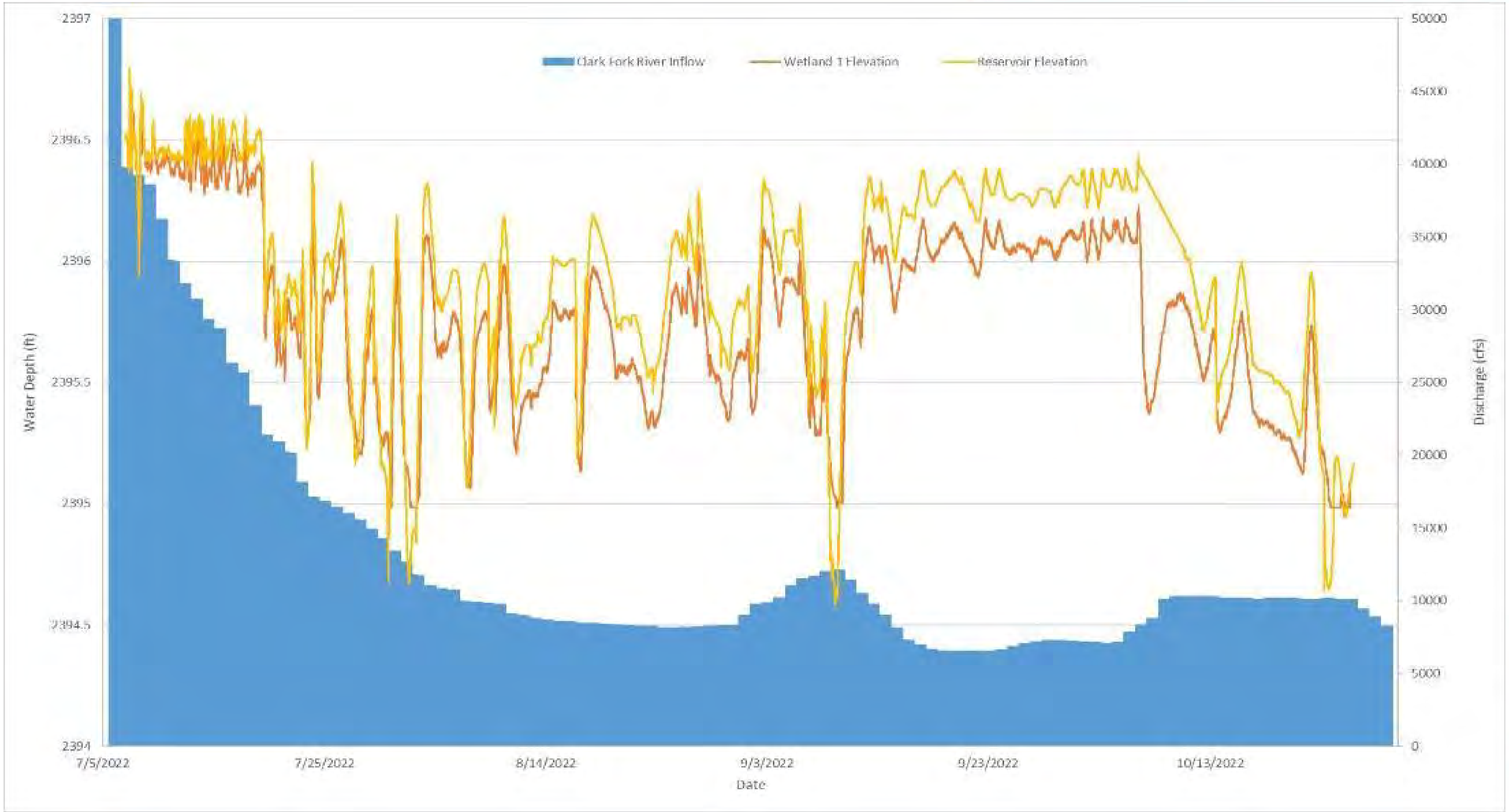
- Data collected were compared to reservoir elevation data from the dam as well as inflow data to the reservoir from an upstream USGS stream gage.

NorthWestern Energy
Delivering a Bright Future

Wetland Study Results

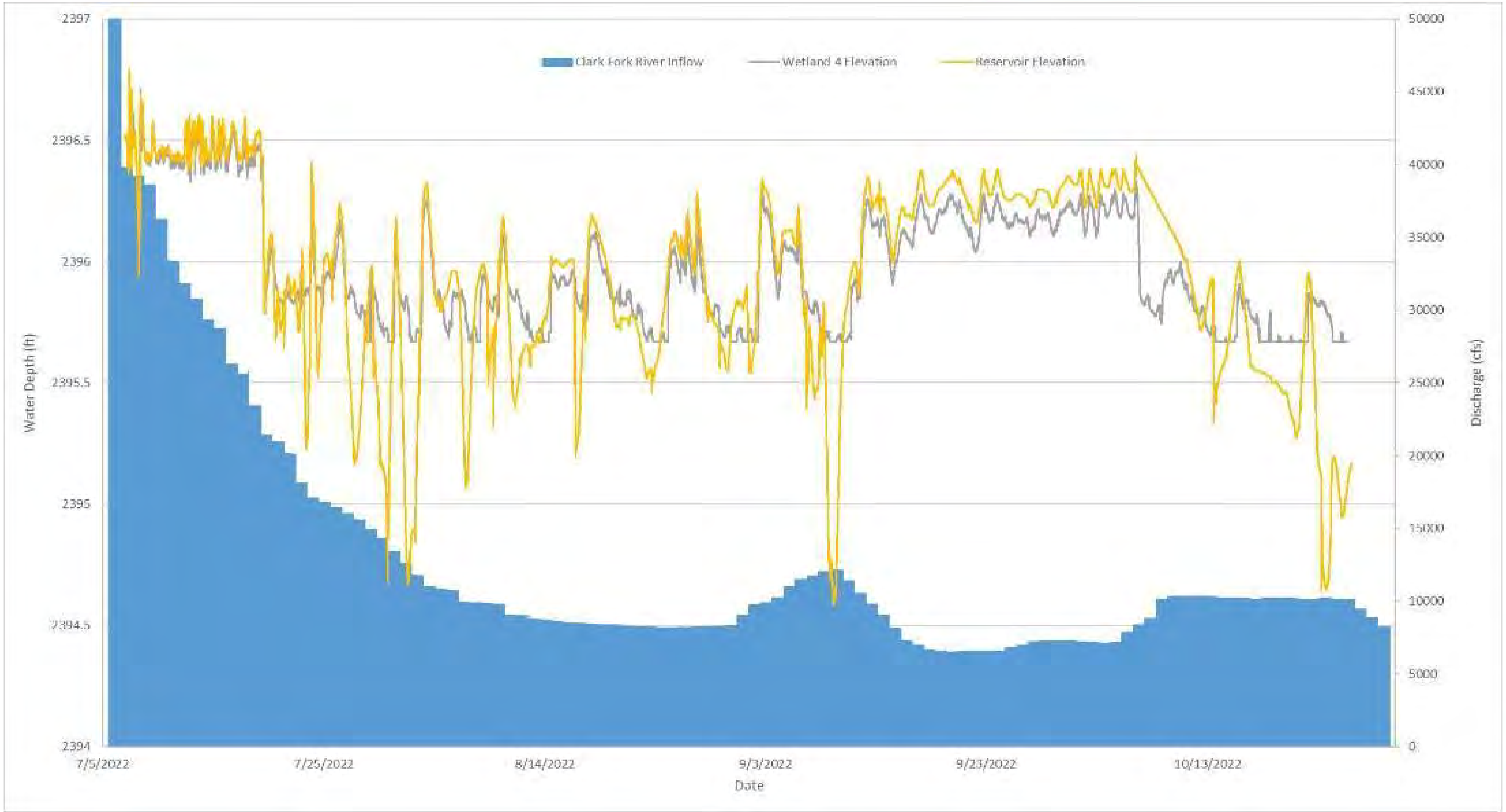


Wetland Study Results



NorthWestern Energy
Delivering a Bright Future

Wetland Study Results



NorthWestern Energy
Delivering a Bright Future

Wetland Study Conclusions

- Wetlands which have a direct surface water connection to Thompson Falls Reservoir have a high risk of being affected by Project operations.

- The environmental effects on these wetlands are generally temporary in nature, and include loss of fish habitat, reduction of shallow water habitat for amphibians, birds, and other wildlife, and the potential reduction of submergent vegetation at some sites.

- As water levels in the reservoir recede, new shallow water habitats are also created. When water levels increase, the original shallow water habitat areas are restored.

NorthWestern Energy
Delivering a Bright Future

Any Questions?

- **One Speaker at a Time:** Limit side conversations to reduce noise distortion so everyone in the room and participating via Zoom can hear.
- **Order of Questions:** Questions from Zoom participants will be responded to first.
- **Guidelines for Asking a Question via Zoom:** Click on the “Chat” icon and type your question or click on the “Raise Your Hand” icon to be recognized; once recognized, please unmute yourself, state your name and organization, and speak up to ask your question.
  - Phone controls for participants –*9 –to raise hand.
  - Phone controls for participants –*6 –to toggle mute/unmute.
- **Video and Audio:** Keep OFF, unless you are asking a question or responding to a question.
- **Guidelines for Asking a Question In-Person:** Raise your hand to be recognized; once recognized, please state your name and organization, and speak up to ask your question.

NorthWestern Energy
Delivering a Bright Future

Thompson Falls Hydroelectric Project #1869-060
NorthWestern Energy
Updated Study Report Meeting Summary
Attachment 2
Notification Distribution List

ROBERT T ADDLEMAN
PO BOX 2086
THOMPSON FALLS, MT 59873-2086

MATTHEW & AMANDA AMES
4 OSPREY DR W # 1326
THOMPSON FALLS, MT 59873-9517

LOUIS & SUE ANN APODACA
455 W EL CAMPO RD
ARROYO GRANDE, CA 93420-5536

JEROLD A. ARMSTRONG
10475 CEDAR RIDGE RD
MISSOULA, MT 59804-5875

JOSEE & JAMES P. BACHOFNER
PO BOX 10310
KALISPELL, MT 59904-3310

PAUL BALLARD
1752 RIVER RD W
PLAINS, MT 59859-9362

BILL MICHAEL II & NYKOLEE BATTLES
PO BOX 1334
THOMPSON FALLS, MT 59873-1334

SUZANNE G. BATTLES
27 NORTHSHORE DR
THOMPSON FALLS, MT 59873-9434

DENNIS & VICKI BAUER
2563 INDIAN HILLS DR
LOVELAND, CO 80538-2966

ROBERT T. & SUSAN J. BAXTER
PO BOX 547
THOMPSON FALLS, MT 59873-0547

KATHERINE E. BAXTER
PO BOX 2211
THOMPSON FALLS, MT 59873-2211

MICHAEL R. & JENEESE BAXTER
PO BOX 2011
THOMPSON FALLS, MT 59873-2011

NAOMI K. BELLEW
1714 RIVER RD W
PLAINS, MT 59859-9362

MARK A. BELLON
271 CAPDEVILLA
LOLO, MT 59847-9612

GLORIA D. BENNETT
PO BOX 1027
THOMPSON FALLS, MT 59873-1027

EDWARD E & DEBRA M BENTON
31 NORTHSHORE RD
THOMPSON FALLS, MT 59873-9434

SAMUEL C. BERNHARDT
106 RIVER WALK LN
THOMPSON FALLS, MT 59873

MICHAEL A. & YVETTE M. BINGHAM
PO BOX 1887
THOMPSON FALLS, MT 59873-1887

ROBERT J. & DIANE L. BLANFORD
6809 KALISPELL ST
BONNERS FERRY, ID 83805-7530

JOHN L. & SUSAN M. BLOOMQUIST
PO BOX 1894
THOMPSON FALLS, MT 59873-1894

ARNOLD G. & JANET L. BRONKEN
924 HILL AVE
SHELBY, MT 59474-1635

GARY W. & BEVERLY J. BROWN
PO BOX 194
THOMPSON FALLS, MT 59873-0194

JASON D. & JENNA J. S. BROWN
PO BOX 1812
THOMPSON FALLS, MT 59873-1812

PAUL DOUGLAS & NANCY MCINTIRE BROWN
PO BOX 5335
KENT, WA 98064-5335

ROBERT W. & CONNIE BROWN
PO BOX 66
THOMPSON FALLS, MT 59873-0066

E. LEON & PEGGY J. BUCKLES
7617 E SUNFLOWER DR
SPOKANE, WA 99217-9608

BRIAN K. & COURTNEY S. BURKY
1702 PEARL ST
MILES CITY, MT 59301-4508

CLAUDE I. BURLINGAME
PO BOX 1587
THOMPSON FALLS, MT 59873-1587

JAMES W. & MARGO S. BURNETTE
PO BOX 369
THOMPSON FALLS, MT 59873-0369

JAMES M. BURNETTE
PO BOX 385
THOMPSON FALLS, MT 59873-0385

ALFRED JR. & MICHAEL BURROWS
22 ROMA ST
NUTLEY, NJ 07110-1916

ERNEST BURWELL
PO BOX 2083
THOMPSON FALLS, MT 59873-2083

CHARLES A. CANCIGLIA
PO BOX 4
THOMPSON FALLS, MT 59873-0004

WILLIAM C. CARLSON
3055 E RIVERCREST DR
POST FALLS, ID 83854-9632

NORMAN E. & KATHLEEN A. CHARLSON
1101 MCKINLEY ST
ANOKA, MN 55303-1094

DIONE & DARLENE J. CHRISTENSON
PO BOX 304
THOMPSON FALLS, MT 59873-0304

JOHN ALLAN CLARK
2321 DEERPARK DR
SAN DIEGO, CA 92110-1138

ISAAC K. CLARK
PO BOX 174
THOMPSON FALLS, MT 59873-0174

RONALD L. & SANDRA L. CLINE
18733 AFTON AVE
SARATOGA, CA 95070-4601

NOAH B. & JENNIFER SCHOEFFER CLOSSON
7848 SUGAREE TRL
LOLO, MT 59847-9449

LARRY & VIRGINIA A. COOPER
3825 93RD PL NE
MARYSVILLE, WA 98270-7231

ANTHONY B. COX
PO BOX 144
THOMPSON FALLS, MT 59873-0144

VICTORIA Z. CROFT
PO BOX 1729
THOMPSON FALLS, MT 59873-1729

JAMES DAUGHERTY
11 DAGNY CT
TROUT CREEK, MT 59874-9417

JOHN E. DELACEY
PO BOX 16327
MISSOULA, MT 59808-6327

ANNE M. DENTON
468 HALO DR
TROY, MT 59935-9414

DAVID P. & LYNNE R. DICKMAN
530 WOODWORTH AVE
MISSOULA, MT 59801-6045

LLOYD W. III DINKELSPIEL
36 GRAHAM LN
TROUT CREEK, MT 59874-9688

THERESA DUFFIELD
PO BOX 1441
THOMPSON FALLS, MT 59873-1441

CAROL J. DUVEY
PO BOX 817
THOMPSON FALLS, MT 59873-0817

WAYNE A. AND NANCY J. DYKSTRA
PO BOX 1825
THOMPSON FALLS, MT 59873-1825

EDWARD & MELINDA DZIERGAS
PO BOX 661
THOMPSON FALLS, MT 59873-0661

EDWARD G. & PATSY ECCLES
1920 W JOHANSEN RD
SPOKANE, WA 99208-8429

ROBERT A. & JOAN O. EDGELL
23048 SW CUTHILL PL
SHERWOOD, OR 97140-8200

THOMAS P. & BINA M. EGGENSPERGER
PO BOX 221
THOMPSON FALLS, MT 59873-0221

DONALD P. & DEBRA A. EICKHOFF
PO BOX 972
THOMPSON FALLS, MT 59873-0972

GEORGE D & LINDA J ELLIOTT
PO BOX 884
THOMPSON FALLS, MT 59873-0884

THOMAS D. & GAIL M. ENGER
PO BOX 1350
THOMPSON FALLS, MT 59873-1350

WILLIAM K. & SHELLEY D. FISTER
85 ARROWHEAD DR
MISSOULA, MT 59803-1207

KENNETH F. & MABEL A. FLANAGAN
26 OSPREY DR W
THOMPSON FALLS, MT 59873-9517

NORMAN & REBECCA DOTY FLINT
PO BOX 26
EASTSOUND, WA 98245-0026

LARRY E. FLOERCHINGER
1646 RIVER RD W
PLAINS, MT 59859-9361

MARK & JANE FORTIN
PO BOX 1131
THOMPSON FALLS, MT 59873-1131

JOHN W FOUST
PO BOX 2243
THOMPSON FALLS, MT 59873-2243

JOE & MARILYN FRIELDS
396 BIG BEAVER CREEK RD
TROUT CREEK, MT 59874-9630

JOHN R. & SAHNNON K.
GALLAGHER
621 W CEDAR AVE
MONTESANO, WA 98563-2809

CONAL & LISA GALLAGHER
8600 PHEASANT DR
MISSOULA, MT 59808-1010

JAMES R. & DEBRA T. GAMM
33 BLUE CREEK RD
THOMPSON FALLS, MT 59873-9500

GLENN T. & SUZANNE H. GARRISON
4439 MT HWY 200
THOMPSON FALLS, MT 59873-9541

FRANK J. & JACQUIE GEBHARDT
6253 W SHAWNEE AVE
SPOKANE, WA 99208-8311

GIBE TRUST NO 2016
75 NORTHSHORE DR
THOMPSON FALLS, MT 59873-9434

TAMARA C. GORDON
1314 BITTERSWEET DR
RICHMOND, TX 77469-6533

JAMES, MICHAEL, MATTHEW, &
MARK GORDON
3218 SPURGIN RD
MISSOULA, MT 59804-3102

GEORGE & MONA LU GOULD
PO BOX 1696
THOMPSON FALLS, MT 59873-1696

ROBERT & SHELLEY A. GREENSIDE
49 OSPREY DR E
THOMPSON FALLS, MT 59873-9516

MICHAEL & THERESA GRENELL
118 SWEDE TRL
KALISPELL, MT 59901-8579

JOHN C. & KAREN K. GUSTAVSEN
PO BOX 876
THOMPSON FALLS, MT 59873-0876

JOHN & DEANNA HALE
420 1ST ST E
KALISPELL, MT 59901-4506

DENISE D. HALL
8503 N BROOKSIDE DR
HAYDEN, ID 83835-5028

WILLIAM O. & PATRICIA A. HALL
101 NORTHSHORE RD
THOMPSON FALLS, MT 59873-9420

IRA D. & JANET A. HALLOWELL
25 BRITT LN
THOMPSON FALLS, MT 59873

THOMAS W. & LAUREL L. HAUGEN
PO BOX 1001
THOMPSON FALLS, MT 59873-1001

DEAN A. & BONNIE HAUN
71 RIVER WALK LN
THOMPSON FALLS, MT 59873-9488

MONT L. & DEBRA K. HEINZMAN
31037 W MAIN ST
SEDRO WOOLLEY, WA 98284-7957

CLARENCE A HJELM
PO BOX 1999
THOMPSON FALLS, MT 59873-1999

RANDY R. & KATHEE M. HOJEM
PO BOX 2002
THOMPSON FALLS, MT 59873-2002

CLARENCE A HO-MORKERT
2115 CHARING CROSS DR
LK HAVASU CTY, AZ 86404-1910

CLIFFORD W. JR. & JANA L. HOWE,
CO-TRUSTEES
7 OSPREY DR E
THOMPSON FALLS, MT 59873-9516

TIM R. HOYT
PO BOX 1177
THOMPSON FALLS, MT 59873-1177

JEFFREY S. & TONYA R. HUBERT
11171 MIDWAY DR
LOS ALAMITOS, CA 90720-2633

CODY HUTCHINGS
24 OLD BULL RIVER ROAD
NOXON, MT 59853-9701

ABBY L. INGRAM
2 GEBHARDT LN
THOMPSON FALLS, MT 59873-9513

ROBERT JOE & JOYCEANNE
ROSLYN JODSAAS
249 FLANAGIN LN
STEVENSVILLE, MT 59870-6906

RUSSELL H. & CHRISTINE M.
JOHNSON
4501 N HWY 7 STE 8 PMB 167
HOT SPRINGS, AR 71909-8201

PATRICK J. JOHNSON
PO BOX 333
LOLO, MT 59847-0333

WILLIAM W. JR. & JACQUELINE C.
JONER
PO BOX 123
REXFORD, MT 59930-0123

VERNON LEROY & JANET F.
JORGENSEN
3600 AMERICAN WAY APT 339
MISSOULA, MT 59808-1387

JWE FAMILY TRUST
1073 GOLF COURSE RD
HAMILTON, MT 59840-9230

CARL E. KELLER
112 BOLSTER WAY
SEQUIM, WA 98382-7069

HARRY S. KIVETT
2826 E NORA AVE
SPOKANE, WA 99207-5352

FREDERICK P. & SUSAN P.
KLEINSCHMIT
1125 LOWER SUNNYSLOPE RD
WENATCHEE, WA 98801-9612

KERRY M. & TERRY R. KOFFLER
10337 W WESLEY DR
LAKEWOOD, CO 80227-2289

LAND GUY INC
440 CRESTON RD
KALISPELL, MT 59901-8226

CAROL L. LANZ
PO BOX 953
THOMPSON FALLS, MT 59873-0953

STEVEN J. LARSON
93 NORTHSHORE RD
THOMPSON FALLS, MT 59873-9434

TIM LAWTON
PO BOX 1656
THOMPSON FALLS, MT 59873-1656

PHILIP L. & LINDA R. LEWIS
47 NORTHSHORE RD
THOMPSON FALLS, MT 59873-9434

STEVEN ELLIOTT LEWIS
4252 N TURNBERRY CT
FLORENCE, AZ 85132-1278

ZACHA DAVID & KIM LIVING TRUST
1355 SUMMERDALE RD
CORVALLIS, MT 59828-9631

LETA A. LIVOTI
PO BOX 2209
THOMPSON FALLS, MT 59873-2209

RANDY J. LOVELL
PO BOX 969
THOMPSON FALLS, MT 59873-0969

CLARK D. & RITA LUNDGREN
PO BOX 2084
THOMPSON FALLS, MT 59873-2084

TERESA MANLOVE
7843 SUGAREE TRL
LOLO, MT 59847-9449

RICHARD & MICHELE MANNING
PO BOX 2502
THOMPSON FALLS, MT 59873-2502

CHARLES C. & DEIDRE E. MANRY
PO BOX 1973
THOMPSON FALLS, MT 59873-1973

MARK H. & TRACEY S. MCGRANN
1378 QUIET PINES LN
MISSOULA, MT 59802-8774

GERALD JACK & NANCY MILLER
PO BOX 7121
KALISPELL, MT 59904-0121

PATRICK H. & THELMA L. MILLER
PO BOX 485
THOMPSON FALLS, MT 59873-0485

DON C MINER
PO BOX 847
THOMPSON FALLS, MT 59873-0847

WALTER & MARTHA MONTGOMERY
10820 BOYCE RD
CHELSEA, MI 48118-9459

KENNETH & MARIAN MONTOURE
PO BOX 246
THOMPSON FALLS, MT 59873-0246

JEFFREY L. & SANDRA J. MORITZ
PO BOX 655
THOMPSON FALLS, MT 59873-0655

BERTHA A. ET AL. MORRISON
PO BOX 360
KILA, MT 59920-0360

JOHN & BARBARA MOSHER
PO BOX 2
THOMPSON FALLS, MT 59873-0002

CATHERINE MULVILLE
33547 ABBEY RD
TEMECULA, CA 92592-5633

JOHN E. & SANDRA S. MUSTER
PO BOX 696
THOMPSON FALLS, MT 59873-0696

RUPERT M. & JODI L. NASON
5112 N GARFIELD RD
SPOKANE, WA 99224-9176

PAULA K. NELSON
2209 PENNSYLVANIA ST NE
ALBUQUERQUE, NM 87110-4535

VANCE E. & MARJORIE NELSON
535 CLIFF VIEW DR
RENO, NV 89523-9668

MICHAEL B. NORMANDIN
57 EDDY PEAK RD
THOMPSON FALLS, MT 59873-9508

DONALD E. OLIVER
6434 MICHELSON ST
LAKEWOOD, CA 90713-1738

DAVID J. OLIVER
14 GUY HALL RD
TROUT CREEK, MT 59874-9650

ROBERT G. & SHARON D. OLSON
PO BOX 1879
THOMPSON FALLS, MT 59873-1879

RYAN M. & ELIZABETH L. OSTWALD
158 HAWK DR
GREAT FALLS, MT 59404-6427

DONNA M. PAGE
10103 E NORA AVE
SPOKANE VALLEY, WA 99206-4159

NOLAN F. & LINDA L. PARKER
PO BOX 32
THOMPSON FALLS, MT 59873-0032

DANIEL L. & CARLA M. PARKS
PO BOX 2525
THOMPSON FALLS, MT 59873-2525

RON & ELIZABETH PETRIE
27 STARLOOKER LN
THOMPSON FALLS, MT 59873-9454

JOHN J. POOLE
2302 CAL LN
GARDNERVILLE, NV 89410-6126

JOHN POWERS
PO BOX 55
POLSON, MT 59860-0055

THOMAS F. & SALLYE KERR
PRENGER
1214 E 32ND AVE
SPOKANE, WA 99203-3122

RONALD RAHN
9529 MILLER CREEK RD
MISSOULA, MT 59803-9714

HARRY W. & TERRY L. RAINEY
PO BOX 355
THOMPSON FALLS, MT 59873-0355

RCJD LLC
4447 E CHILCO RD
ATHOL, ID 83801-8477

LINDA A. REEDAL
22125 SE 241ST PL
MAPLE VALLEY, WA 98038-5895

MAX P. & PAMELA J. REVIS
6848 N GOVERNMENT WAY STE 114
PMB 91
DALTON GARDENS, ID 83815-7799

CHERYL R. RHOADS
6 OSPREY DR W
THOMPSON FALLS, MT 59873-9517

TODD J. ROLLERI
20738 14TH AVE S
SEATAC, WA 98198-3597

LYLE ROMER
13223 SW 16TH ST
DAVIE, FL 33325-5731

ANTHONY R. RUCINSKI
PO BOX 1118
THOMPSON FALLS, MT 59873-1118

GEORGE WILLIAM JR. & JUDITH L. RUMMEL
318 NOLAND DR
HAMILTON, MT 59840-3430

RAY & ANGELA SALMELA
3615 CLARK FORK WAY
MISSOULA, MT 59808-5164

SANDERS COUNTY
PO BOX 519
THOMPSON FALLS, MT 59873-0519

RENE A. SANSOM-BLAIR
PO BOX 998
THOMPSON FALLS, MT 59873-0998

AMY M. SCHILLING
PO BOX 123
THOMPSON FALLS, MT 59873-9500

DANIEL SCHLETZ
PO BOX 264
THOMPSON FALLS, MT 59873-0264

DENNIS J. & P. DIANE SCHWEHR
PO BOX 2166
THOMPSON FALLS, MT 59873-2166

ROSE ANN SCOVILLE
PO BOX 313
THOMPSON FALLS, MT 59873-0313

FLOYD C. JR. & CAROL M. SEARL
71 RIVERVIEW DR
THOMPSON FALLS, MT 59873-9414

MICHAEL D. SHEAR
PO BOX 653
THOMPSON FALLS, MT 59873-0653

ALAN L. & CONNIE SILLARS
4925 ARNICA RD
MISSOULA, MT 59803-1632

GARY G. & MARGARET E. SMALLWOOD
PO BOX 332
THOMPSON FALLS, MT 59873-0332

HARRY A. P. SMITH
PO BOX 493
LAKESIDE, MT 59922-0493

JULIE A. SMITH-NEEDHAM
1649 RIVER RD W
PLAINS, MT 59859-9314

STEVEN J. SNIEZAK
PO BOX 1023
THOMPSON FALLS, MT 59873-1023

JON A. SONJU
63 OSPREY DR E
THOMPSON FALLS, MT 59873-9516

SHAWN & LEAH SORENSON
PO BOX 2058
THOMPSON FALLS, MT 59873-2058

KENNETH & LINNEA STEVENSON
59 NORTHSHORE DR
THOMPSON FALLS, MT 59873-9434

TYLER SUBATCH
PO BOX 1086
PLAINS, MT 59859-1086

SHEREE SULLIVAN SHEREE
PO BOX 1106
THOMPSON FALLS, MT 59873-1106

KIMBERLY JOHN & LINDA LOUISE SUTHERLAND
PO BOX 1254
THOMPSON FALLS, MT 59873-1254

TED A. & FRANCES R. THOMA
PO BOX 1920
THOMPSON FALLS, MT 59873-1920

JODI D. THORP
3330 STATE ST
SAN DIEGO, CA 92103-5330

JOE & RONNELL THORP
9415 N OAKLAND CT
NEWMAN LAKE, WA 99025-8442

JOHN & SANDI TORRES
37 BAYVIEW CT
THOMPSON FALLS, MT 59873-9543

CLIFFORD C. & VIRGINIA A. TRAINER
120 GUY HALL RD
TROUT CREEK, MT 59874-9652

MICHAEL G. TURNER
PO BOX 2235
THOMPSON FALLS, MT 59873-2235

TODD E. WAKEFIELD
367 SPRUCE MEADOWS LOOP
KALISPELL, MT 59901-1023

CAROLYN J. & THOMAS G. WALKER
1894 WHITETAIL LN
MISSOULA, MT 59804-3034

NOEL SHUBERT WEAVER
16565 SNYDER RD
CHAGRIN, OH 44023-4315

MATTHEW ANDERS & CONNIE
MARIES WEBER
12278 TRIPLE FOX CT
MISSOULA, MT 59808-9642

KELLY J. WHEELER
77 NORTH SHORE DR
THOMPSON FALLS, MT 59873-0118

ROBERT L. & LANETTE
WINDEMAKER
3135 FIELDSTONE DR
BOZEMAN, MT 59715

WARREN R. WINTER
21 OMNIVIEW LN
THOMPSON FALLS, MT 59873

ROBERT J. WORRELL
PO BOX 2150
THOMPSON FALLS, MT 59873-2150

VICKI J. & CHRIS L. YOST
2705 E KINGBIRD DR
GILBERT, AZ 85297-8188

FRANCIS J. & ANITA C. YURCZYK
PO BOX 932
THOMPSON FALLS, MT 59873-0932

ZEURCHER FAMILY TRUST
PO BOX 2240
THOMPSON FALLS, MT 59873-2240

DIANNE M. ZIMMERMAN
PO BOX 1304
THOMPSON FALLS, MT 59873-1304

SALISH SHORES UTILITY CORP INC
BUDDY J. & JUDY A. LEUFKINS
PO BOX 1030
THOMPSON FALLS, MT 59873-1030

1111806 HERON, LLC
15142 TUBA ST
MISSION HILLS, CA 91345-2749

ADVISORY COUNCIL ON HISTORIC
PRESERVATION
401 F ST NW STE 308
WASHINGTON, DC 20001-2637

AMERICAN CANOE ASSOCIATION
WADE BLACKWOOD
520 WILLIAM ST STE D
FREDERICKSBURG, VA 22401-5775

AMERICAN RIVERS
1101 14TH ST NW STE 1400
WASHINGTON, DC 20005

AMERICAN RIVERS
PACIFIC NORTHWEST
WENDY MCDERMOTT
PO BOX 1234
BELLINGHAM, WA 98227

AMERICAN WHITEWATER
AFFILIATION, INC.
MARK SINGLETON
PO BOX 1540
CULLOWHEE, NC 28723

AREND FAMILY TRUST
6 COVEVIEW LN
THOMPSON FALLS, MT 59873-9511

BLACKFEET NATION
TRIBAL BUSINESS COUNCIL
TIMOTHY DAVIS
PO BOX 850
BROWNING, MT 59417

BONNEVILLE POWER
ADMINISTRATION
PO BOX 3621
PORTLAND, OR 97208-3621

CITY OF THOMPSON FALLS
PO BOX 99
THOMPSON FALLS, MT 59873

CLARK FORK PROPERTIES, LLC
30900 WELLINGTON CT
DAPHNE, AL 36527-8204

COEUR D'ALENE TRIBE
ALBENI FALLS WILDLIFE
MITIGATION
ANDERS MIKKELSEN
PO BOX 408 805 A STREET
PLUMMER, ID 83851

DEBRA A. DECRAY TRUST &
DOUGLAS W. BIGGER LIVING TRUST
PO BOX 6023
MALIBU, CA 90264-6023

DODSON IRRIGATION DISTRICT
PO BOX 1340
MALTA, MT 59523

FEDERAL EMERGENCY
MANAGEMENT AGENCY
500 C STREET SW
WASHINGTON, DC 20472

FEDERAL EMERGENCY
MANAGEMENT AGENCY
DENVER FEDERAL CENTER,
BUILDING 710
PO BOX 25267
DENVER, CO 80255-0267

FEDERAL ENERGY REGULATORY COMMISSION
DIRECTOR, DIVISION OF HYDROPOWER LICENSING
888 FIRST ST
WASHINGTON, DC 20426

FEDERATION OF FLY FISHERS
1201 US HWY 10 W STE E
LIVINGSTON, MT 59047-9922

FORT BELKNAP INDIAN COMMUNITY
TRACY KING
656 AGENCY MAIN ST
HARLEM, MT 59526-9455

GLACIER BANK
2501 S CATLIN ST STE 100
MISSOULA, MT 59801-7815

GLASGOW IRRIGATION DISTRICT
PO BOX 271
GLASGOW, MT 59230

JOHNSON REVOCABLE LIVING TRUST
PO BOX 1117
THOMPSON FALLS, MT 59873-1117

KALISPEL TRIBE OF INDIANS
PO BOX 39
USK, WA 99180

KOOTENAI TRIBE OF IDAHO
PO BOX 1269
BONNERS FERRY, ID 83805

LIVING TRUST
THEODORE & ELAINE BOYD
2625 DEARBORN ST APT 307
MISSOULA, MT 59804-7307

LIVING TRUST AGREEMENT OF JACK I ESLER
PO BOX 907
THOMPSON FALLS, MT 59873-0907

MALTA IRRIGATION DISTRICT
PO BOX 1340
MALTA, MT 59523

MISSOULA ELECTRIC COOPERATIVE
GENERAL MANAGER
1700 W BROADWAY ST
MISSOULA, MT 59808

MONTANA BASS NATION
BIG SKY BASSERS MISSOULA
TOM LUGHIBIL
3015 W RAILROAD ST #7
MISSOULA, MT 59808

MONTANA COOP. FISHERY RESEARCH UNIT
MONTANA STATE UNIVERSITY
PO BOX 173460
BOZEMAN, MT 59717-3460

MONTANA DEPARTMENT OF AGRICULTURE
AGRICULTURE & LIVESTOCK BLDG.
CAPITOL STATION
HELENA, MT 59620-0201

MONTANA DEPARTMENT OF TRANSPORTATION
STEVE FELIX
PO BOX 7039
MISSOULA, MT 59807-7039

MONTANA DEPT. OF NATURAL RESOURCES
SARAH BOND
PO BOX 201601
HELENA, MT 59620-1601

MONTANA DEPT. OF STATE LANDS
CAPITOL STATION
HELENA, MT 59620

MONTANA OFFICE OF ATTORNEY GENERAL
STATE CAPITOL
HELENA, MT 59601

MONTANA RAIL LINK
PO BOX 16390
MISSOULA, MT 59808-6390

MUDRYK LIVING TRUST
13601 SAN SIMEON AVE
BAKERSFIELD, CA 93314-3773

NO 1 DECLARATION OF TRUST
JAMES KUNTZ
340 MT HWY 28
PLAINS, MT 59859-9611

OFFICE OF SENATOR DAINES
STEVE DAINES
320 HART SENATE OFFICE BLDG
WASHINGTON, DC 20510

OFFICE OF SENATOR TESTER
JON TESTER
311 HART SENATE OFFICE BLDG
WASHINGTON, DC 20510

OFFICE OF THE GOVERNOR
GREG GIANFORTE
PO BOX 200801
HELENA, MT 59620-0801

PARADISE VALLEY IRRIGATION DISTRICT
PO BOX 1417
CHINOOK, MT 59523-4926

PENSCO TRUST CO FBO
WANDA L THORPE
PO BOX 981012
BOSTON, MA 02298-1012

SANDERS COUNTY COMMUNITY DEVELOPMENT CORPORATION
RAY BROWN
2504 TRADEWINDS WAY STE C1
THOMPSON FALLS, MT 59873

SANDERS COUNTY FLYCASTERS
MYLES SEXTON
PO BOX 38
THOMPSON FALLS, MT 59873

SANDERS COUNTY LEDGER
MIRIAH KARDELIS
603 E MAIN ST
THOMPSON FALLS, MT 59873

SMITH FAMILY TRUST
4725 PANAMA LN # D3-240
BAKERSFIELD, CA 93313-3404

SONJU FAMILY LIVING TRUST
6642 KIWI CIR
CYPRESS, CA 90630-5712

STATE OF MONTANA
2701 PROSPECT AVE
HELENA, MT 59601-9746

STATE OF MONTANA
ENVIRONMENTAL QUALITY
COUNCIL
PO BOX 201704
HELENA, MT 59620-1704

STATE OF MONTANA
MONTANA DEPARTMENT OF
AGRICULTURE
PO BOX 200201
HELENA, MT 59620-0201

STATE OF MONTANA DEQ
CHRIS DORRINGTON
PO BOX 200901
HELENA, MT 59620-0901

STATE OF MONTANA
MONTANA DEQ
ANDY ULVEN
PO BOX 200901
HELENA, MT 59620-0901

STATE OF MONTANA
MONTANA DRNC
AMANDA KASTER
PO BOX 201601
HELENA, MT 59601-1601

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
490 NORTH MERIDIAN RD
KALISPELL, MT 59902

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
TREVOR WATSON
PO BOX 200701
HELENA, MT 59620-0701

STATE OF MONTANA
MONTANA HISTORICAL SOCIETY
PO BOX 201201
HELENA, MT 59620-1201

STATE OF MONTANA
OFFICE OF ATTORNEY GENERAL
AUSTIN KNUDSEN
215 N SANDERS ST
HELENA, MT 59601

STATE OF MONTANA
OFFICE OF THE SECRETARY
CHRISTI JACOBSEN
PO BOX 202801
HELENA, MT 69620-2801

STILLWATER CORPORATION
PO BOX 7338
KALISPELL, MT 59904-0338

SUSANNA SCHAUMAN 2014 TRUST
12849 LOS OSOS ST
REDDING, CA 96003-7417

TOWN OF PLAINS
PO BOX 567
PLAINS, MT 59859

TROUT UNLIMITED, NATIONAL
PAUL PARSON
312 N. HIGGINS STE 200
MISSOULA, MT 59801

TROUTMAN PEPPER
FITZGERALD VEIRA
401 9TH ST NW STE 1000
WASHINGTON, DC 20004

TUNGSTEN HOLDINGS INC
PO BOX 1213
LIBBY, MT 59923-1213

U.S. ARMY CORPS OF ENGINEERS
CHIEF, OPERATIONS AND
REGULATORY DIVISION
441 G ST NW
WASHINGTON, DC 20314

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT HEADQUARTERS
1616 CAPITOL AVE STE 9000
OMAHA, NE 68102

U.S. DOI
BUREAU OF INDIAN AFFAIRS
1849 C STREET NW MS-4606-MIB
WASHINGTON, DC 20240

U.S. DOI
BUREAU OF INDIAN AFFAIRS,
NORTHWEST REGION
911 NE 11TH AVE
PORTLAND, OR 97232-4169

U.S. DOI
BUREAU OF INDIAN AFFAIRS,
ROCKY MOUNTAIN REGION
2021 4TH AVE NORTH
BILLINGS, MT 59101

U.S. DOI
BUREAU OF RECLAMATION
1849 C STREET NW
WASHINGTON, DC 20240

U.S. DOI
BUREAU OF RECLAMATION
LORRI GRAY
1150 N. CURTIS RD STE 100 MAILING
CODE: PN-1000
BOISE, ID 83706-1234

U.S. DOI
BUREAU OF RECLAMATION
MICHAEL J. RYAN
PO BOX 36900 2021 4TH AVE NORTH
BILLINGS, MT 59107-6900

U.S. DOI
NATIONAL PARK SERVICE
SUE MASICA
12795 ALAMEDA PKWY
DENVER, CO 80225

U.S. DOI
OFFICE OF ENV. POLICY AND
COMPLIANCE, DENVER REGION
COURTNEY HOOVER
PO BOX 25007, D-108
DENVER, CO 80225-0007

U.S. DOI
OFFICE OF THE SECRETARY
DAVID BERNHARDT
1849 C STREET NW
WASHINGTON, DC 20240

U.S. DOI
U.S. FISH & WILDLIFE SERVICE
585 SHEPARD WAY, STE 1
HELENA, MT 59601-6287

U.S. DOI
U.S. FISH & WILDLIFE SERVICE,
ECOLOGICAL SERVICES
911 NE 11TH AVE
PORTLAND, OR 97232-4181

U.S. DOI
U.S. FISH & WILDLIFE SERVICE,
ECOLOGICAL SERVICES
134 UNION BLVD SUITE 650
LAKEWOOD, CO 80228

U.S. DOI
U.S. GEOLOGICAL SURVEY
12201 SUNRISE VALLEY DR
RESTON, VA 20192

U.S. DOI
U.S. GEOLOGICAL SURVEY
5275 LEESBURG PIKE
FALLS CHURCH, VA 22041-3803

U.S. DOI
U.S. GEOLOGICAL SURVEY
790 E. BECKWITH
MISSOULA, MT 59801

U.S. DOI
U.S. GEOLOGICAL SURVEY
2327 UNIVERSITY WAY STE 2
BOZEMAN, MT 59715

U.S. DOI
U.S. GEOLOGICAL SURVEY
MARIJKE VAN HEESWIJK
6000 J ST SUITE 5000
SACRAMENTO, CA 95819

U.S. EPA
OFFICE OF THE ADMINISTRATOR,
1101A
ANDREW WHEELER
1200 PENNSYLVANIA AVE NW
WASHINGTON, DC 20004

US DEPARTMENT OF INTERIOR
U.S. FISH AND WILDLIFE SERVICE
PO BOX 25486
DENVER, CO 80225-0486

US FOREST SERVICE
1400 INDEPENDENCE AVE SW
WASHINGTON, DC 20250-1111

US FOREST SERVICE
FEDERAL BLDG 324 25TH ST
OGDEN, UT 84401

US FOREST SERVICE
324 25TH ST.
OGDEN, UT 84401

US FOREST SERVICE
LAND USE GROUP, RMLHW
26 FORT MISSOULA RD
MISSOULA, MT 59804

US FOREST SERVICE
LOLO NATIONAL FOREST
BUILDING 24, FORT MISSOULA
MISSOULA, MT 59804

US FOREST SERVICE
LOLO NATIONAL FOREST
24 FORT MISSOULA RD
MISSOULA, MT 59804

US FOREST SERVICE
LOLO NATIONAL FOREST
TRACI SYLTE
24 FORT MISSOULA RD
MISSOULA, MT 59804-7297

US FOREST SERVICE
OFFICE OF THE GENERAL COUNSEL
PATRICK REDMOND
1400 INDEPENDENCE AVE SW
WASHINGTON, DC 20250-1111

US FOREST SERVICE
REGION 4 INTERMOUNTAIN
M'LEAH WOODARD
324 25TH STREET
OGDEN, UT 84401

VINCENT FAMILY TRUST
95 NORTHSHORE DR
THOMPSON FALLS, MT 59873-9434

WHITTON MARTY & KAREN 2017
REVO TRUST
1804 FAIRCLOUGH DR
BAKERSFIELD, CA 93311-8520

YELLOWSTONE PIPELINE COMPANY
CORPORATE SERVICE PROPERTY
2331 CITY WEST BLVD
HOUSTON, TX 77042

YELLOWSTONE PIPELINE COMPANY
CORPORATE SERVICE PROPERTY
PO BOX 1691 26 W SIXTH AVE
HELENA, MT 59624-1691

ZACH WHIPPLE-KITNER
ZACHCORE@HOTMAIL.COM

DONALD T. AND SUSAN G. LAMONT
72STEAMBOAT@GMAIL.COM

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
ABIGAIL MADDIGAN
ABIGAIL.MADDIGAN@MT.GOV

AL DODSON
ALDODSON@LARGE.NET

CLARK FORK COALITION
ALEX LEONE
ALEX@CLARKFORK.ORG

NORTHWESTERN ENERGY
ANDY WELCH
ANDREW.WELCH@NORTHWESTER
N.COM

CLARK FORK COALITION
ANDREW GORDER
ANDREW@CLARKFORK.ORG

MONTANA BASS NATION
CURTIS SPINDLER
ANGLERSAFARI@HOTMAIL.COM

STATE OF MONTANA
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMY STEINMETZ
ASTEINMETZ@MT.GOV

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
ADAM STRAINER
ASTRAINER@MT.GOV

APLE
BRUCE BUGBEE
BBUGBEE@APLECO.COM

BENNETT REALTY
DAVE BENNETT
BENNETT@THOMPSONFALLS.COM

U.S. DOI
BLM MISSOULA FIELD OFFICE
ERIN CAREY
BLM_MT_MISSOULA_FO@BLM.GOV

U.S. DOI, BLM
JOHN MEHLHOFF
BLM_MT_SO_INFORMATION@BLM.GOV

BRIAN MAROTZ
BMAROTZ007@GMAIL.COM

LOWER CLARK FORK WATERSHED GROUP
BRITA OLSON
BRITA@LCFWG.ORG

US FOREST SERVICE
LOLO NATIONAL FOREST
BRUCE PAULSEN
BRUCE.PAULSEN@USDA.GOV

US FOREST SERVICE
LOLO NATIONAL FOREST
CAROLYN UPTON
CAROLYN.UPTON@USDA.GOV

NORTHWESTERN ENERGY
CARRIE HARRIS
CARRIE.HARRIS@NORTHWESTERN.COM

TROUT UNLIMITED NATIONAL
CHRISTINE BRISSETTE
CBRISSETTE@TU.ORG

COEUR D'ALENE TRIBE OF IDAHO
CHIEF ALLAN
CHIEF.ALLAN@CDATRIBE-NSN.GOV

TROUTMAN PEPPER
CHARLES R. SENSIBA
CHARLES.SENSIBA@TROUTMAN.COM

CURTIS A. & CHERYL KEGEL
CHERYLKEGEL@GMAIL.COM

COEUR D'ALENE TRIBE
CAM HEUSSER
CHEUSSER@CDATRIBE-NSN.GOV

CONFEDERATED SALISH AND KOOTENAI TRIBES
CRAIG BARFOOT
CRAIG.BARFOOT@CSKT.ORG

STATE OF MONTANA
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
CRAIG JONES
CRAJONES@MT.GOV

LION'S CLUB
PLAINS LION'S CLUB
DUANE HIGHCRANE
D4M57H@GMAIL.COM

FEDERAL ENERGY REGULATORY COMMISSION
DAVID TURNER
DAVID.TURNER@FERC.GOV

US FOREST SERVICE
LOLO NATIONAL FOREST
DAVID WROBLESKI
DAVID.WROBLESKI@USDA.GOV

TROUT UNLIMITED MONTANA
DAVID BROOKS
DAVID@MONTANATU.ORG

STATE OF MONTANA
MONTANA STATE PARKS
DAVE BENNETTS
DBENNETTS@MT.GOV

JOHN KILPATRICKU.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
JOHN KILPATRICK
DC_MT@USGS.GOV

YELLOWSTONE PIPELINE COMPANY
PHILLIPS 66
DEREK LILLEBERG
DEREK.LILLEBERG@P66.COM

SANDERS COUNTY
SANDERS COUNTY COMMISSIONERS
DAN B. ROWAN
DROWAN@CO.SANDERS.MT.US

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
DAVID SCHMETTERLING
DSCHMETTERLING@MT.GOV

DENNIS J. & SANDRA KAY WULFEKUHLE
DSWULFEKUHLE@BLACKFOOT.NET

ANNIE WOODEN
EDITOR@SCLEDGER.NET

TROUTMAN PEPPER
ELIZABETH MCCORMICK
ELIZABETH.MCCORMICK@TROUTMANSANDERS.COM

AVISTA CORPORATION
ERIC OLDENBURG
ERIC.OLDENBURG@AVISTACORP.COM

OFFICE OF U.S. SENATOR JON TESTER
ERIK NYLUND
ERIK_NYLUND@TESTER.SENATE.GOV

STATE OF MONTANA
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
ERIC SIVERS
ESIVERS@MT.GOV

GEI CONSULTANTS, INC.
GINGER GILLIN
GGILLIN@GEICONSULTANTS.COM

GREEN MOUNTAIN CONSERVATION DISTRICT
SARAH BUSMIRE
GMCD@BLACKFOOT.NET

NORTHWESTERN ENERGY
GRANT GRISAK
GRANT.GRISAK@NORTHWESTERN.COM

LARRY LACK
GRIZZLYADAMS_MT@YAHOO.COM

HAGEDORN LAND SURVEYING, INC.
RICK HAGEDORN
HAGEDORNLS@BLACKFOOT.NET

TROUTMAN PEPPER
HALLIE MEUSHAW
HALLIE.MEUSHAW@TROUTMANSANDERS.COM

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
HARVEY CARLSMITH
HCARLSMITH@GMAIL.COM

US FOREST SERVICE
LOLO NATIONAL FOREST
HEATHER BERMAN
HEATHER.BERMAN@USDA.GOV

CHIPPEWA CREE TRIBE OF ROCKY BOYS' INDIAN RESERVATION
TRIBAL BUSINESS COMMITTEE
HARLAN GOPHER BAKER
HIDATSA_CREE@YAHOO.COM

CLARK FORK COALITION
KAREN KNUDSEN
INFO@CLARKFORK.ORG

U.S. DOI
U.S. FISH & WILDLIFE SERVICE
JAMES BOYD
JAMES_BOYD@FWS.GOV

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
JASON BLAKNEY
JBLAKNEY@MT.GOV

ELLIOTT REALTY, INC
JENNA BROWN
JENNA@MONTANAPROPERTY.NET

MONTANA PUBLIC SERVICE COMMISSION
DISTRICT 4
JENNIFER FIELDER
JENNIFER.FIELDER@MT.GOV

KOOTENAI TRIBE OF IDAHO
GARY AIKEN, JR
GARYJR@KOOTENAI.ORG

NORTHWESTERN ENERGY
JEREMY CLOTFELTER
JEREMY.CLOTFELTER@NORTHWESTERN.COM

TROY D. & JODIE L. RASMUSSEN
JODIE.RASMUSSEN@GMAIL.COM

NORTHWESTERN ENERGY
JOHN TABARACCI
JOHN.TABARACCI@NORTHWESTERN.COM

NORTHWESTERN ENERGY
JON HANSON
JON.HANSON@NORTHWESTERN.COM

NORTHWESTERN ENERGY
JORDAN TOLLEFSON
JORDAN.TOLLEFSON@NORTHWESTERN.COM

JOSH SCHULZE
LOLO NATIONAL FOREST
JOSH SCHULZE
JOSHUA.SCHULZE@USDA.GOV

OFFICE OF SENATOR STEVE DAINES
JOSHUA SIZEMORE
JOSHUA_SIZEMORE@DAINES.SENATE.GOV

STATE OF MONTANA
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
JAMES STRAIT
JSTRAIT@MT.GOV

CLARK FORK TITLE, INC
JULIE WATTS
JULIE@CLARKFORKTITLE.COM

US FOREST SERVICE
JUSTIN JIMENEZ
JUSTIN.JIMENEZ@USDA.GOV

GMCD
KENT WILBY
KANDCDUB@GMAIL.COM

JOHNNY & KARLI THOMAS
KARLI.CAVILL22@GMAIL.COM

CONFEDERATED SALISH AND KOOTENAI TRIBES OF THE FLATHEAD RESERVATION
KATIE MCDONALD
KATHRYN.MCDONALD@CSKT.ORG

KANIKSU LAND TRUST
KAYLA MOSHER
KAYLA@KANIKSU.ORG

AMERICAN WHITEWATER ASSOCIATION
KEVIN COLBURN
KCOLBURN@AMWHITEWATER.ORG

STATE OF MONTANA
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
KEENAN STORRAR
KEENAN.STORRAR@MT.GOV

KENT BARBIAN
KENT.BARBIAN2@GMAIL.COM

U.S. DEPARTMENT OF THE INTERIOR
U.S. FISH & WILDLIFE SERVICE
KEVIN ACEITUNO
KEVIN_ACEITUNO@FWS.GOV

KIM A. & SHIRLEY H. HOFLAND
KHOFLAND@BLACKFOOT.NET

PINNACLE RESEARCH AND CONSULTING
KIM MCMAHON
KIM.PINNACLE.RESEARCH@GMAIL.COM

RICHARD B. & KATHRYN C. JACKSON
KJACKSON3152@GMAIL.COM

KURT A. MAART
KMAART1Q@LIVE.COM

SANDERS COUNTY
LAND SERVICES
KATHERINE MAUDRONE
KMAUDRONE@CO.SANDERS.MT.US

NEW WAVE ENVIRONMENTAL CONSULTING, LLC
KRISTI WEBB
KWEBB@NW-ENVIRO.COM

SHPO
LAURA MARSH
LAURA.MARSH@MT.GOV

LEQUITA CAVILL
LCAVILL80@GMAIL.COM

LEN DORSCHER
LDORSCHER@TFALLS.ORG

LEN DORSCHER
LENDORSCHER@GMAIL.COM

FLETCHER FAMILY REVOCABLE TRUST
BOB FLETCHER
LHFLETCHER@HOTMAIL.COM

PINNACLE RESEARCH AND CONSULTING
LIZ STENDER
LIZPINNACLE@BLACKFOOT.NET

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
LADD KNOTEK
LKNOTEK@MT.GOV

MONTANA ASSOCIATION OF CONSERVATION DISTRICTS
JIM SIMPSON
MAIL@MACDNET.ORG

NORTHWESTERN ENERGY
MARY GAIL SULLIVAN
MARYGAIL.SULLIVAN@NORTHWESTERN.COM

GEI CONSULTANTS, INC.
MARK ASHENFELTER
MASHENFELTER@GEICONSULTANTS.COM

WILLIAM & PENNY BECKMAN
MCBECKMAN34@GMAIL.COM

SHEILA VINCENT
MERRMA@ATT.NET

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
MIKE HENSLER
MHENSLER@MT.GOV

CONFEDERATED SALISH AND KOOTENAI TRIBES OF THE FLATHEAD RESERVATION
MICHAEL DURGLO
MICHAEL.DURGLO@CSKT.ORG

FEDERAL ENERGY REGULATORY COMMISSION
MICHAEL TUST
MICHAEL.TUST@FERC.GOV

MITZI ROSSILON, CONSULTING ARCHAEOLOGIST, LLC
MITZI ROSSILLON
MITZI.ROSSILLON@GMAIL.COM

KAILISPEL TRIBE OF INDIANS
MIKE LITHGOW
MLITHGOW@KALISPELTRIBE.COM

THOMPSON FALLS COMMITTEE
TRAILS
KATHY CONLIN
MONTANAGIRL@BLACKFOOT.NET

US FOREST SERVICE
LOLO NATIONAL FOREST
MOLLY PUCHLERZ
MPUCHLERZ@USDA.GOV

APLE
MARK SOMMER
MSOMMER@APLECO.COM

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
NEAL ANDERSON
NANDERSON@MT.GOV

AVISTA CORPORATION
NATE HALL
NATE.HALL@AVISTACORP.COM

U.S. ARMY CORPS OF ENGINEERS
NW DIVISION
NATHAN GREEN
NATHAN.J.GREEN@USACE.ARMY.MI
L

NORTHWESTERN ENERGY
NOEL JACOBSON
NOEL.JACOBSON@NORTHWESTER
N.COM

SANDERS COUNTY
NICHOL SCRIBNER
NSCRIBNER@CO.SANDERS.MT.US

AMERICAN WHITEWATER
THOMAS O'KEEFE, PHD
OKEEFE@AMERICANWHITEWATER.
ORG

RICHARD VINCENT
OMV@ATT.NET

MONTANA STATE REPRESENTATIVE
PAUL FIELDER
PCFIELDER@BLACKFOOT.NET

STATE OF MONTANA
MONTANA STATE HISTORIC
PRESERVATION OFFICE
PETE BROWN
PEBROWN@MT.GOV

U.S. FISH & WILDLIFE SERVICE
PETE GOMBEN
PETER.GOMBEN@USDA.GOV

MT DNRC
PATRICK RENNIE
PRENNIE@MT.GOV

STATE OF MONTANA
MONTANA FISH, WILDLIFE & PARKS
PAT SAFFEL
PSAFFEL@MT.GOV

U.S. EPA, 8WD-CWS
CWA SECTION 401 WATER QUALITY
CERTIFICATION PROGRAM
TONEY OTT
R8CWA401@EPA.GOV

U.S. ENVIRONMENTAL PROTECTION
AGENCY
REGION 8
DEB THOMAS
R8EISC@EPA.GOV

RICK CAVILL
RCAVILL80@GMAIL.COM

REALTY NW
GAIL ENGER
REALTYNORTHWEST@GMAIL.COM

ROSCOE KRONFUSS
ROSCOEKRONFUSS@YAHOO.COM

TROUT UNLIMITED
NATIONAL
ROB ROBERTS
RROBERTS@TU.ORG

NATIONAL PARK SERVICE,
INTERIOR REGIONS 6,7,8
RIVERS, TRAILS, & CONSERV. ASST.
PROGRAM
PATSY MCENTEE
RTCA_APPS_IMR@NPS.GOV

ROSSILLON LLC
KEN DICKERSON
RTIKEN@GMAIL.COM

AMERICAN RIVERS
NORTHERN ROCKIES
SCOTT BOSSE
SBOSSE@AMERICANRIVERS.ORG

SCOTT BOSSEAMERICAN RIVERS
NORTHERN ROCKIES
SCOTT BOSSE
SBOSSE@AMERICANRIVERS.ORG

U.S. DOI
BLM, WESTERN MONTANA DISTRICT
KATIE STEVENS
SHAIGHT@BLM.GOV

AVISTA CORPORATION
SHANA BERNALL
SHANA.BERNALL@AVISTACORP.CO
M

CRAZY WOMAN KAYAKS
SISSEL ROBERTSON
SISSEL@CRAZYWOMANKAYAKS.CO
M

BLACKFEET NATION
SCOTT KIPP
SKIPP@BLACKFEETNATION.COM

SANDERS COUNTY
SANDERS COUNTY
COMMISSIONERS
SANDY MACIEL
SMACIEL@CO.SANDERS.MT.US

U.S. DOI
BIA, PACIFIC NORTHWEST REGION
STEVE LEWIS
STEPHEN.LEWIS@BIA.GOV

U.S. U.S. DOI
NATIONAL PARK SERVICE
SUSAN ROSEBROUGH
SUSAN_ROSEBROUGH@NPS.GOV

MONTANA ASSOCIATION OF
CONSERVATION DISTRICTS
MARK SUTA
SUTAFARM@OUTLOOK.COM

US FOREST SERVICE
LOLO NATIONAL FOREST
ERICKA SCHEURING
SUZANNE.NOVAK@FERC.GOV

SANDERS COUNTY
SANDERS COUNTY
COMMISSIONERS
ANTHONY B. COX
TCOX@CO.SANDERS.MT.US

THOMPSON FALLS CHAMBER OF
COMMERCE
TFCHAMBER@THOMPSONFALLSCH
AMBER.COM

JIMMY LEE & DEBORAH ANN VEACH
TFL4330@BLACKFOOT.NET

LOREN C. & NINA S. HUHTA
TFL9535@YAHOO.COM

THOMPSON FALLS NAPA AUTO
PARTS
BRIAN COLE
TFNAPA@YAHOO.COM

CITY OF THOMPSON FALLS
NEIL HARNETT
TFPWORKS@BLACKFOOT.NET

CHARLES L & DEBBY M FRANCK
THEFRANCKS@BLACKFOOT.NET

SANDERS COUNTY
WEED DISTRICT
MARK LINCOLN
WEEDDEPT@CO.SANDERS.MT.US

NORTHWEST POWER AND
CONSERVATION COUNCIL
MONTANA OFFICE
30 W 14TH ST #207
HELENA, MT 59601