Eastern Snake Plain Aquifer Management Update

Natural Resources Interim Legislative Committee

Roger Chase

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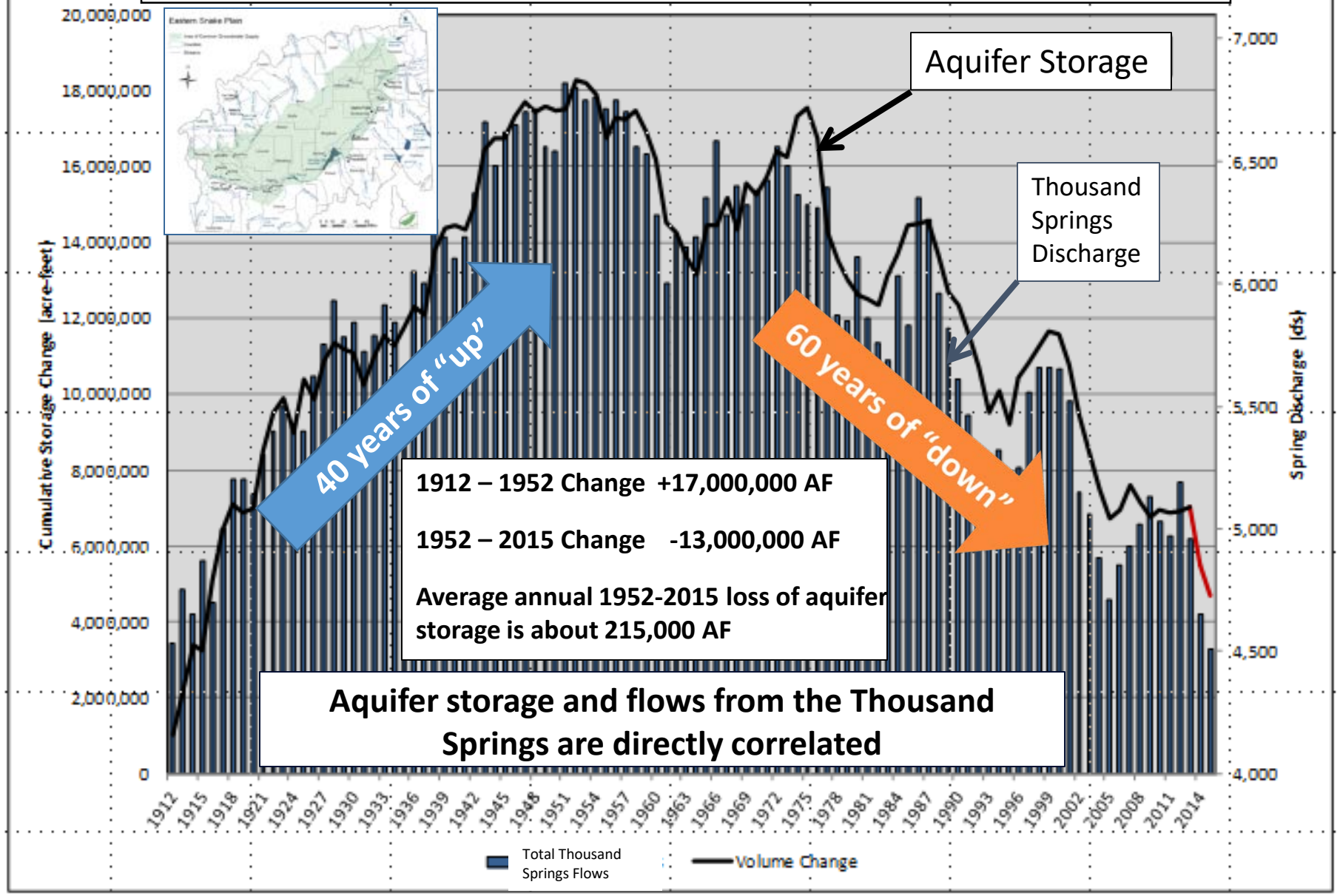
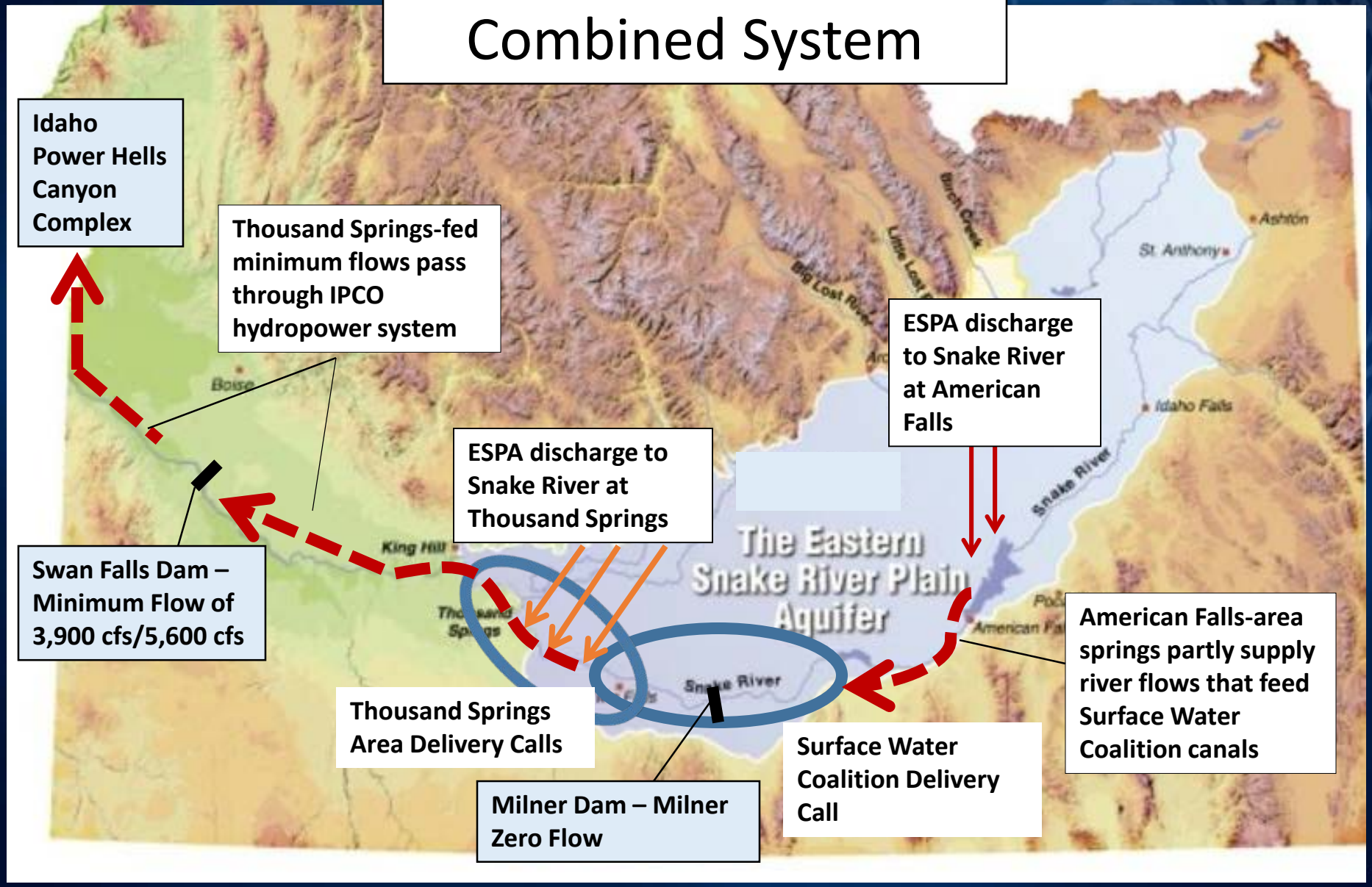
October 15, 2020

Volume Change of Water Stored Within the Eastern Snake Plain Aquifer and Thousand Springs Total Discharge



IDAHO
Water Resource Board

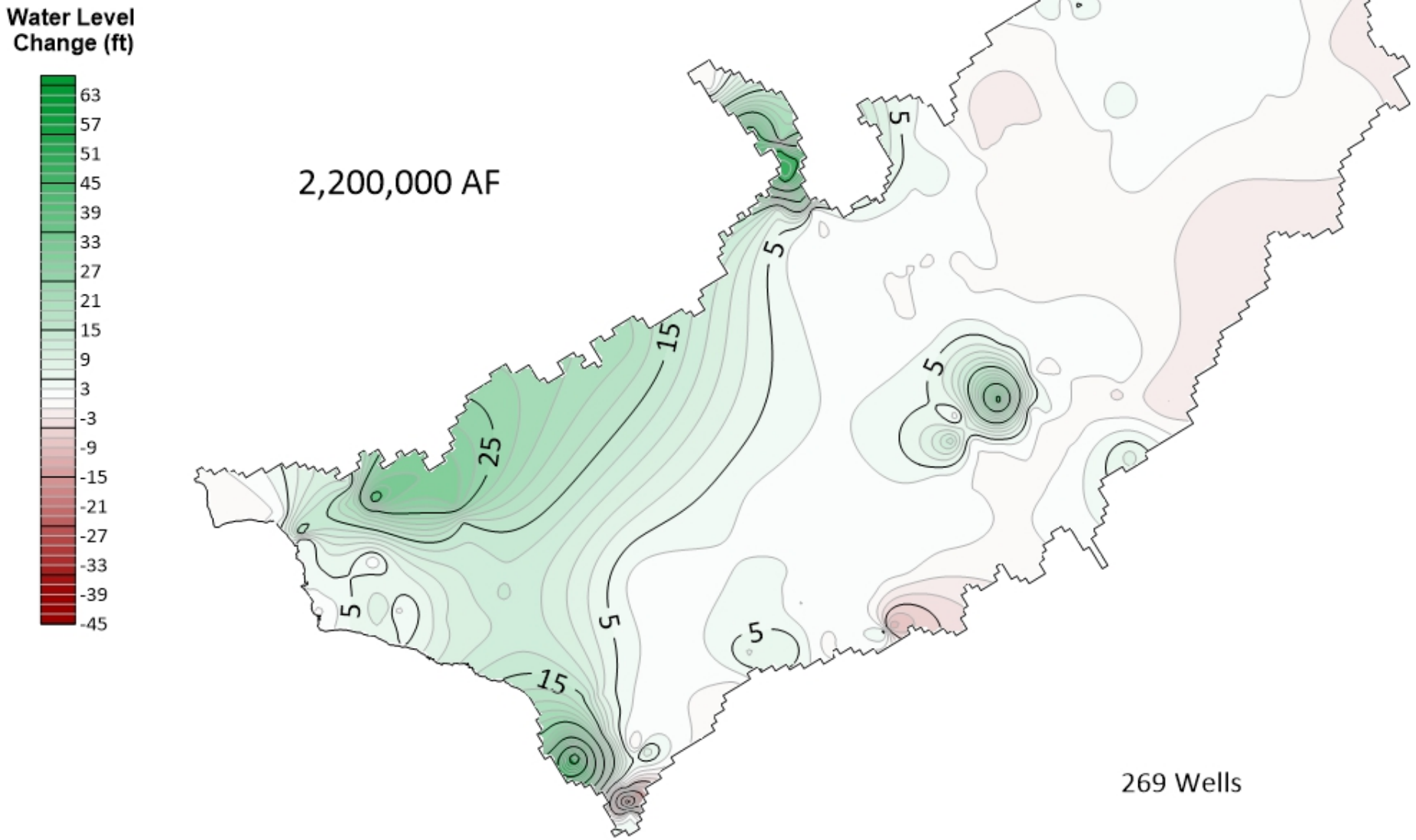
Combined System

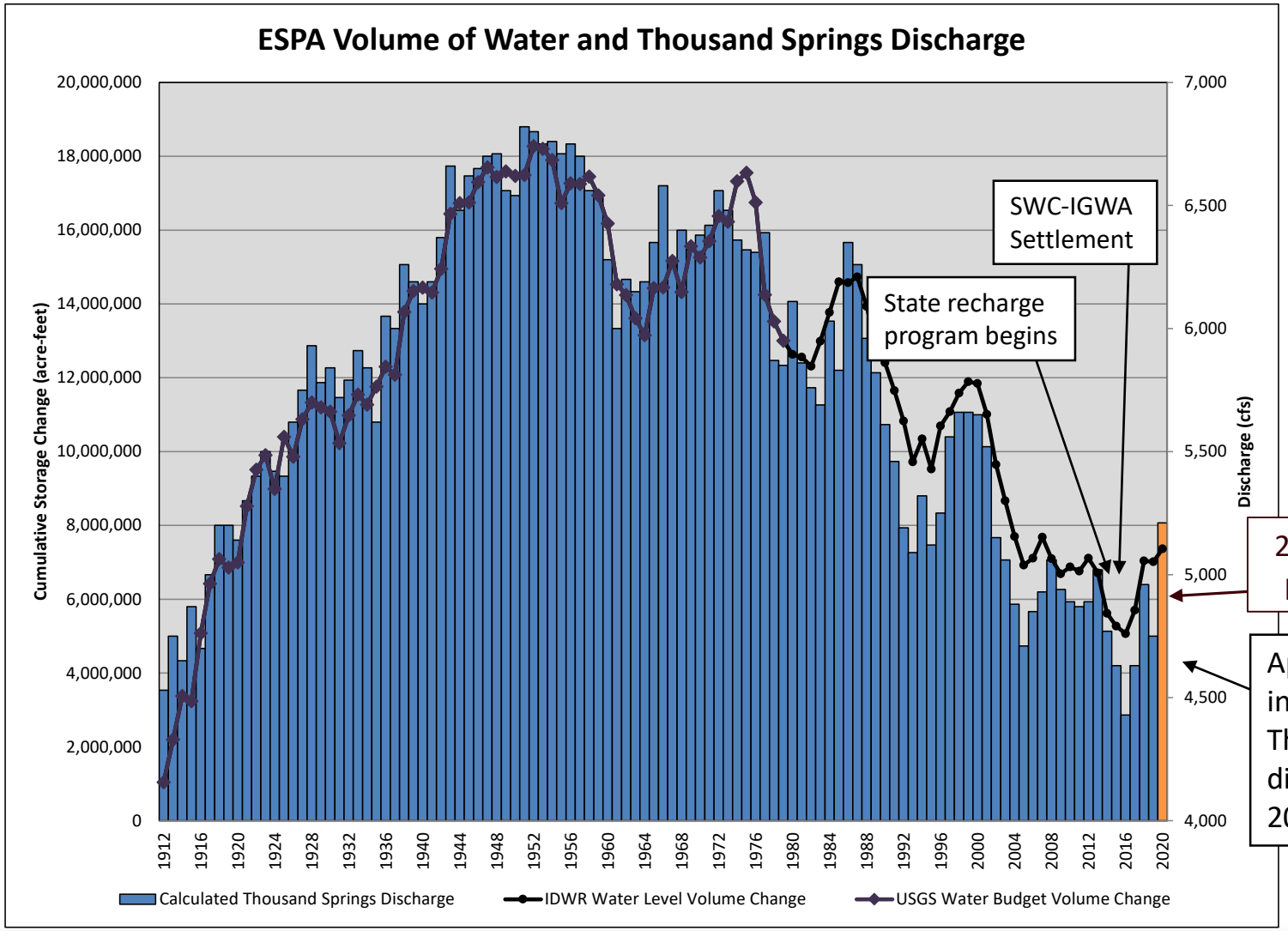


ESPA Management Strategy

- 250,000 AF annual average natural flow managed recharge program by state (IWRB)
- 240,000 AF annual use reductions by ground water pumpers under Settlement Agreement (may be offset or enhanced by their own recharge efforts)
- 50,000 AF storage water provided annually by ground water pumpers to SWC under Settlement Agreement - if not needed by SWC it is recharged by IWRB
- Food processors provide 8,500 AF of storage water to SWC – if not needed by SWC it is recharged by IWRB
- 7,650 AF annual average storage water contributed by ESPA Cities for aquifer management under their Settlement Agreement - recharged by IWRB
- SWID & ABID actions contribute about 25,655 AF
- Cooperative cloud seeding program (Idaho Power, State, water users) provides more water into system
- Follows on the CAMP: 600,000 AF water budget change from recharge (250,000 AF), demand reduction (250,000), GW-SW conversions (100,000 AF) and a cloud seeding program

Water Level Change - Spring 2015 To Spring 2020

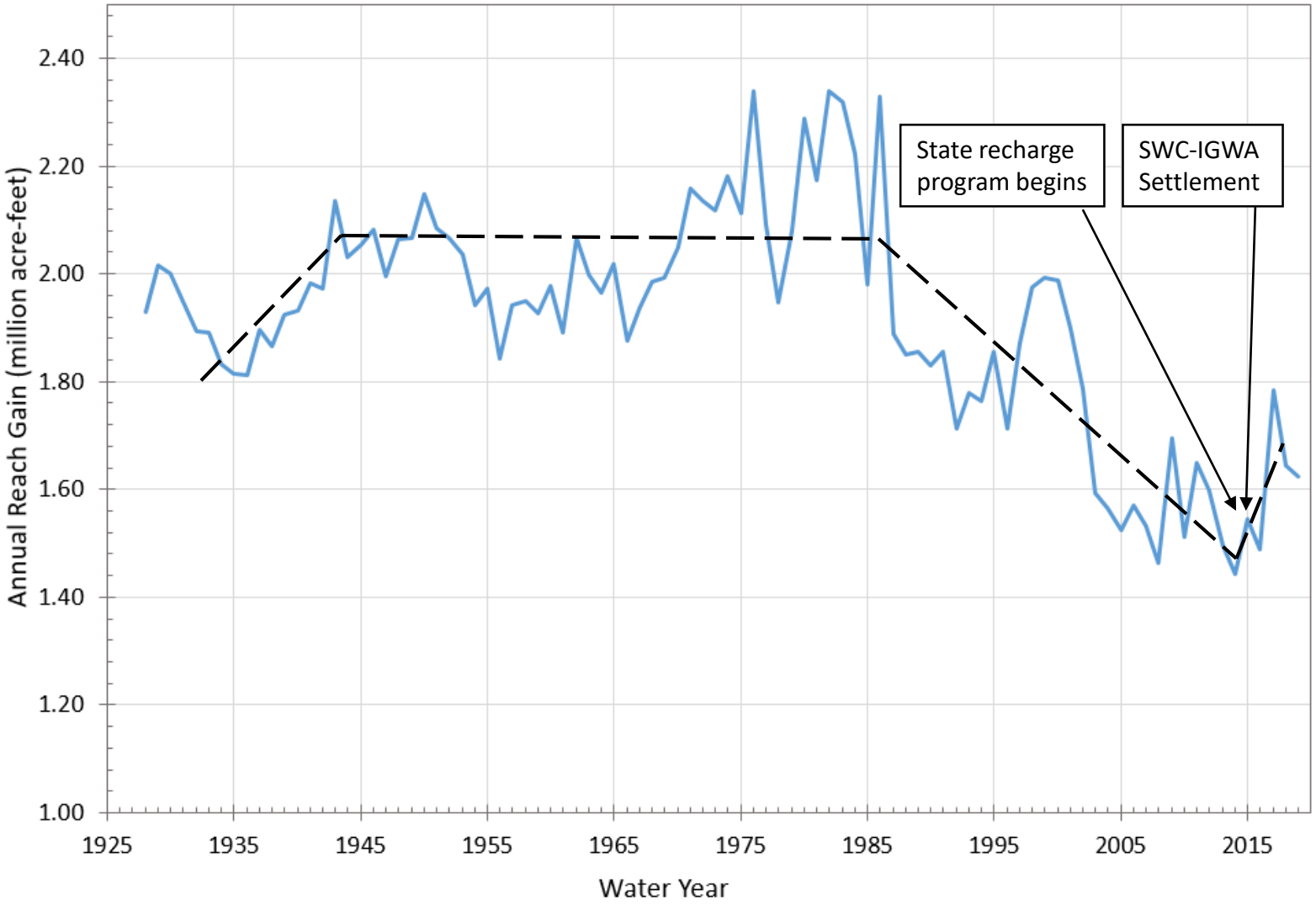


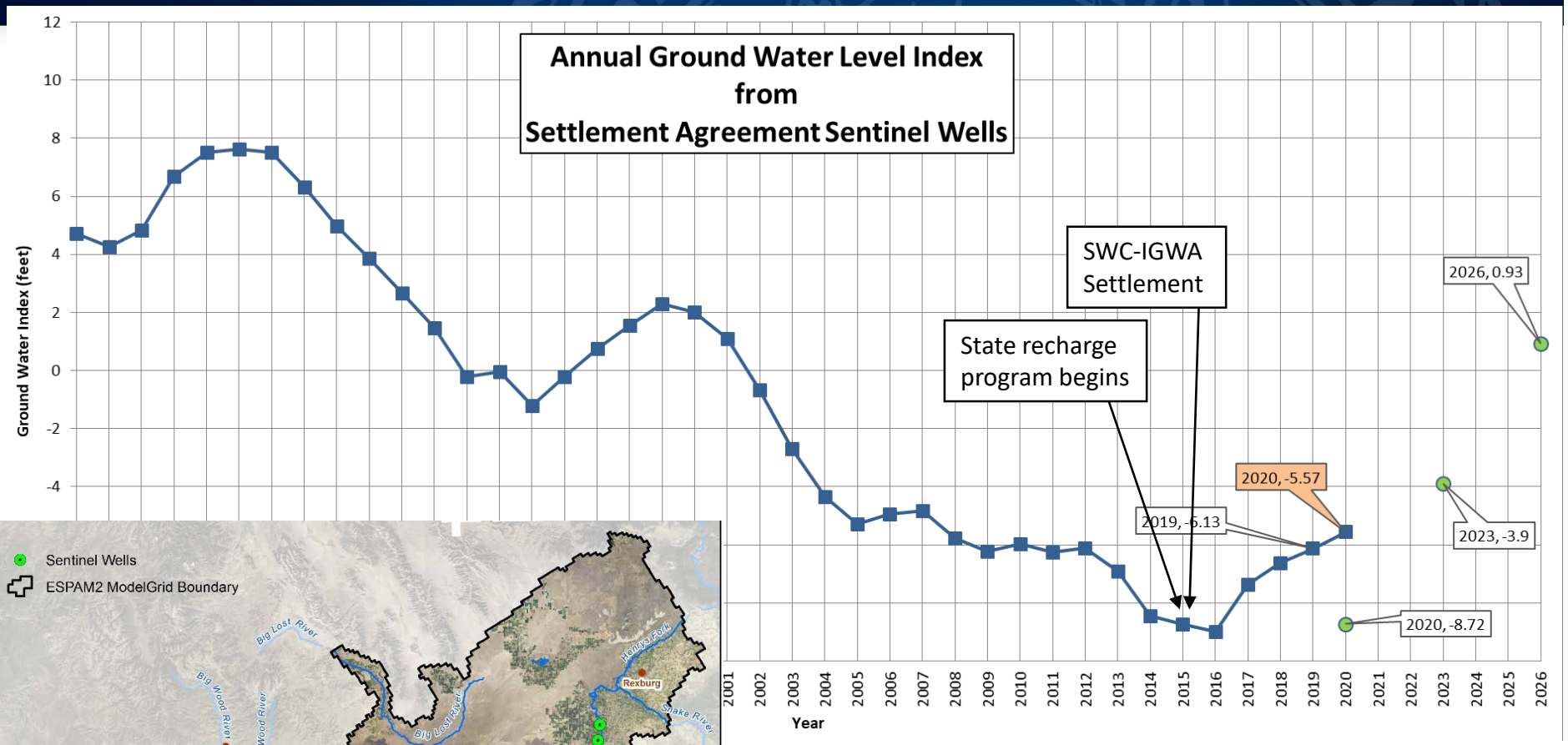


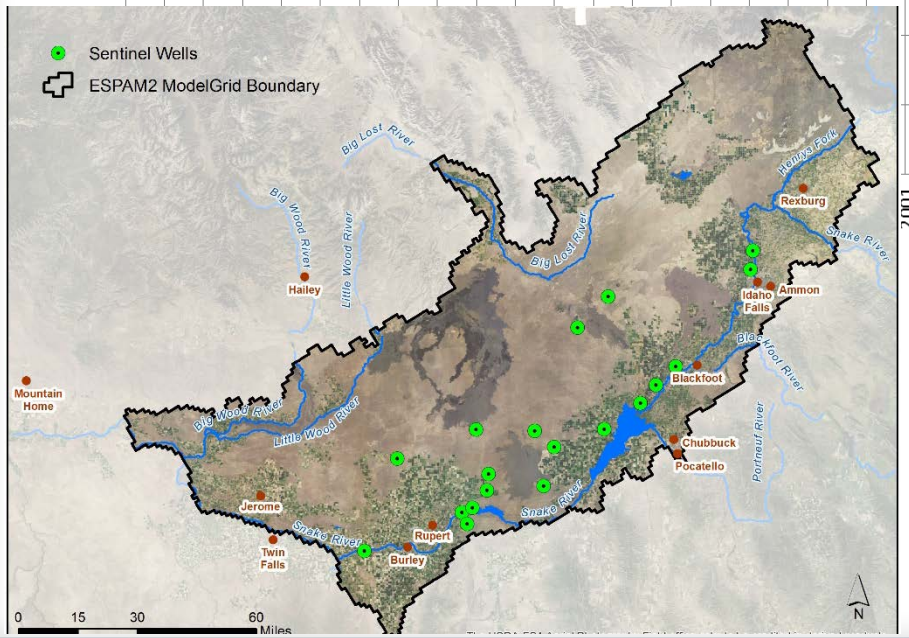
2020 value is preliminary

Approx. 850 cfs increase in total Thousand Springs discharge since 2015

Near Blackfoot to Minidoka Reach Gains – 1928 to 2019




Annual Ground Water Level Index from Settlement Agreement Sentinel Wells
Ground Water Index (feet)
12
10
8
6
4
2
0
-2
-4
Year
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
SWC-IGWA Settlement
State recharge program begins
2026, 0.93
2020, -5.57
2019, -5.13
2023, -3.9
2020, -8.72


Sentinel Wells
ESPAM2 ModelGrid Boundary
Big Lost River
Big Wood River
Little Wood River
Hailey
Mountain Home
Jerome
Twin Falls
Burley
Rupert
Snake River
Big Lost River
Henrys Fork
Rexburg
Idaho Falls
Ammon
Blackfoot
Bear River
Chubbuck
Pocatello
Portneuf River
0
15
30
60
Miles
N

Natural Flow Recharge By State

Year	Volume (Acre-Feet)
2014-2015	75,475
2015-2016	66,897
2016-2017	317,714
2017-2018	474,001
2018-2019	310,132
2019-2020	447,956
AVERAGE	**271,041**

Recharge Program Costs

- Paid through IWRB's Secondary Aquifer Fund
  - $5M annually from General Fund
  - $5M annually from Cigarette Tax (will decline in future)

- Average program costs (2017-2020)

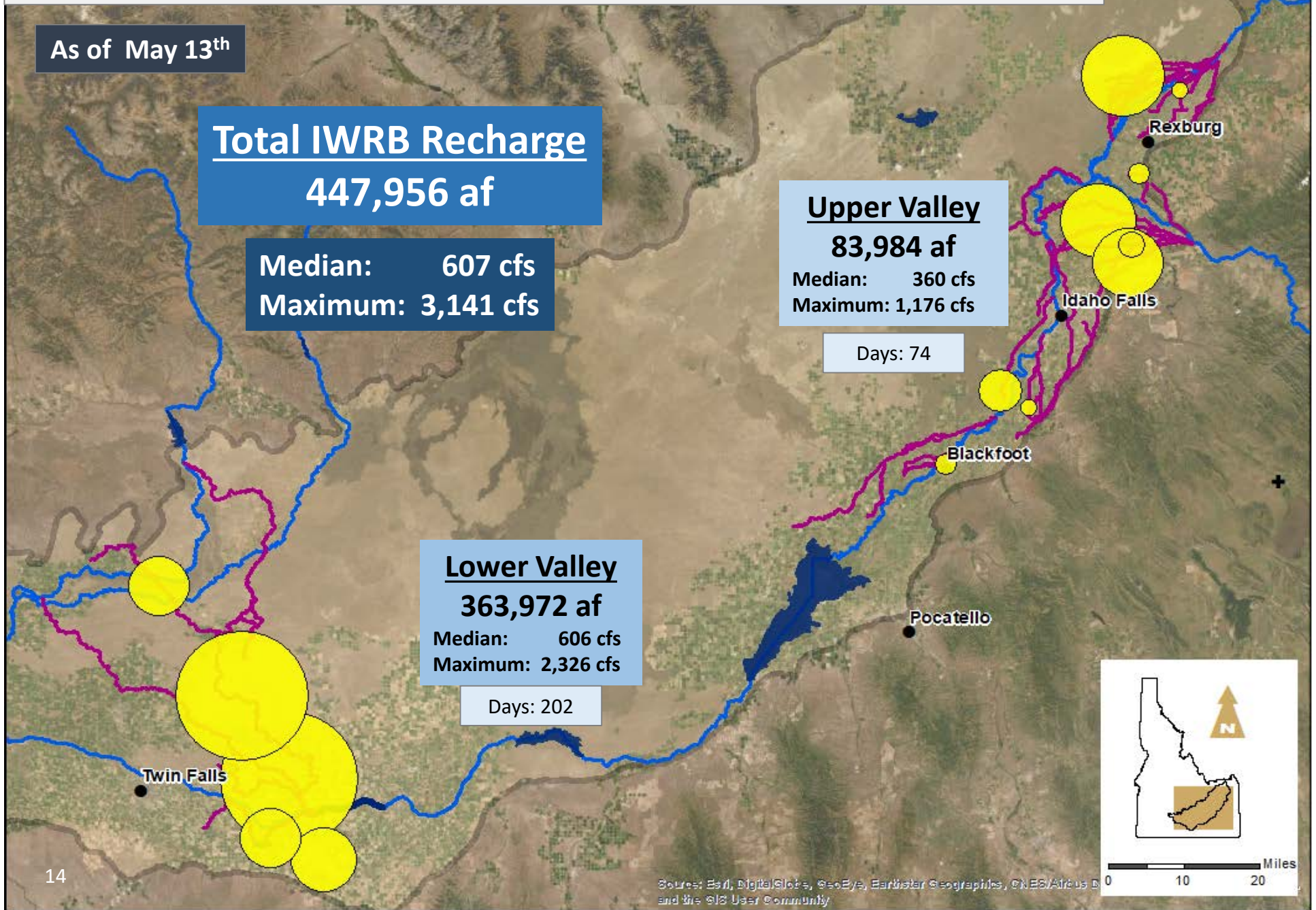
• Conveyance Payments to Canals	$3.22M
• Program Operations	$0.51M
• Capital Expenses	$2.76M
TOTAL	**$6.49M**

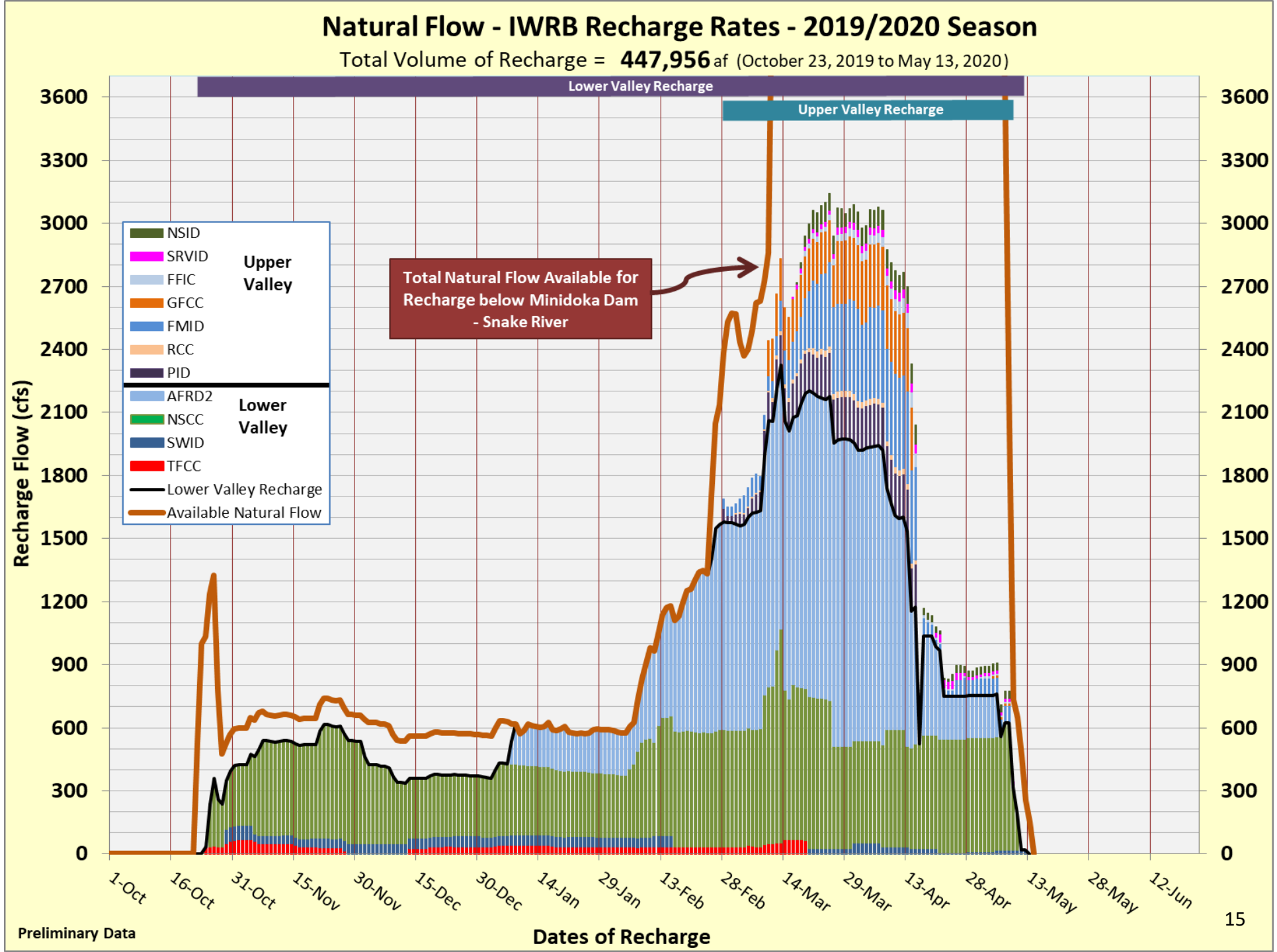
- Capital expenses (infrastructure) to date: $20.42M

- Recharge infrastructure now sufficient to average 250,000 AF annually if flows are taken to zero at Milner all winter

- Secondary Fund also pays for state's part of cloud seeding program (about $2M annually) and work in other aquifers

IWRB Natural Flow Managed Recharge – 2019/2020

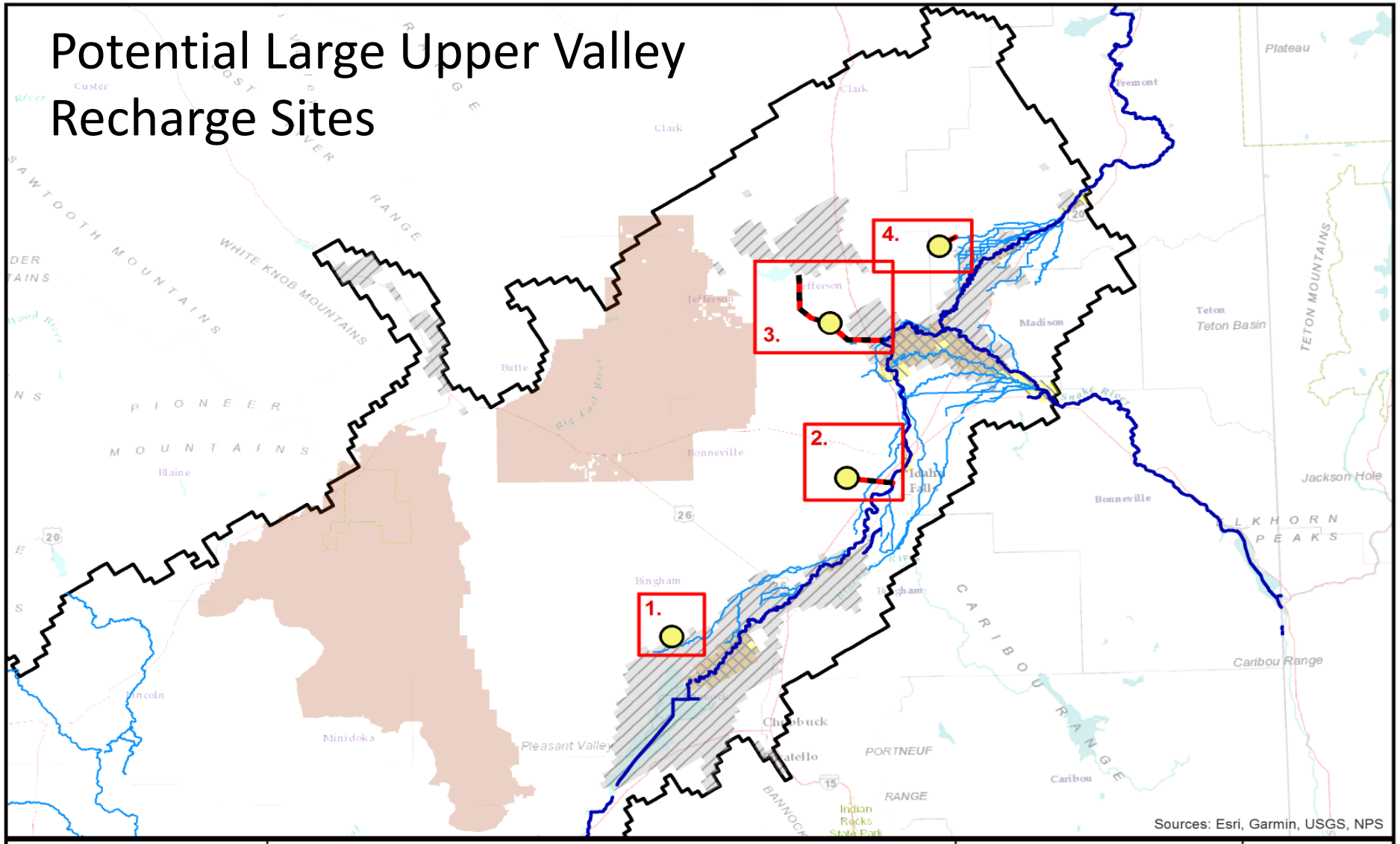



Natural Flow - IWRB Recharge Rates - 2019/2020 Season
Total Volume of Recharge = 447,956 af (October 23, 2019 to May 13, 2020)
Lower Valley Recharge
Upper Valley Recharge
Total Natural Flow Available for Recharge below Minidoka Dam - Snake River
NSID
SRVID
FFIC
GFCC
FMID
RCC
PID
Upper Valley
AFRD2
NSCC
SWID
TFCC
Lower Valley
Lower Valley Recharge
Available Natural Flow
Recharge Flow (cfs)
3600
3300
3000
2700
2400
2100
1800
1500
1200
900
600
300
0
1-Oct
16-Oct
31-Oct
15-Nov
30-Nov
15-Dec
30-Dec
14-Jan
29-Jan
13-Feb
28-Feb
14-Mar
29-Mar
13-Apr
28-Apr
13-May
28-May
12-Jun
Dates of Recharge
Preliminary Data

Managed Recharge Program

- Ongoing discussions about how best to manage winter flows
- Push to let some winter flows pass Milner Dam for hydropower generation
  - Compensate by recharging more of the high spring runoff flows
  - Would require more and larger facilities
- Others believe strongly that all available water should be recharged

Potential Large Upper Valley Recharge Sites



IDAHO WATER RESOURCE BOARD

Miles
0 12.5 25

Legend

- Potential Recharge Site
- Recharge Investigation Area
- River
- Existing Irrigation Canals
- ESPAM Boundary

Project Selection Criteria

- Depth to Water less than 50'
- Retention less than 15%
- Combined DTW & Retention Limitations
- Restricted Access

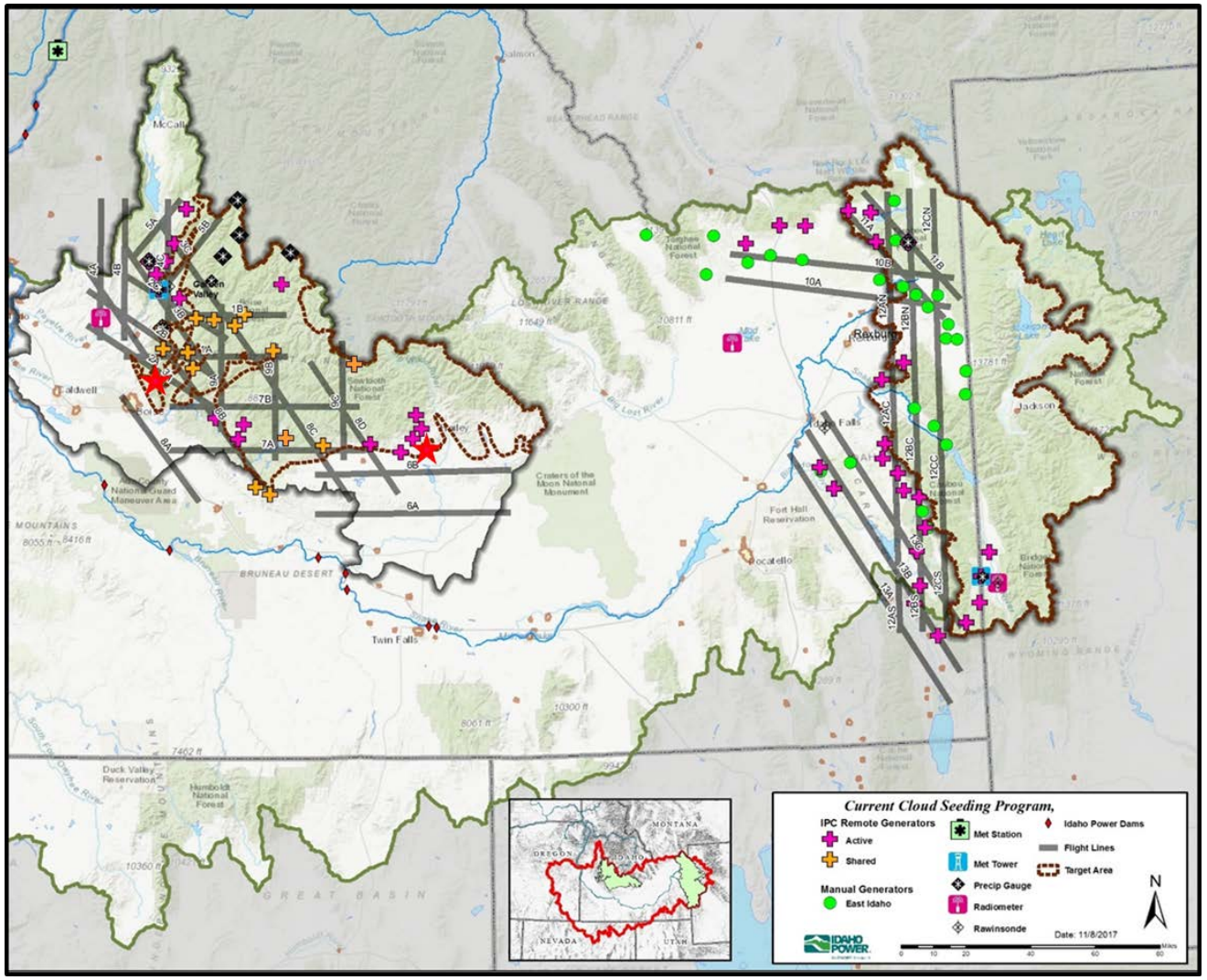
Figure 1.

Large Upper ESPA Potential Recharge Projects Map

Potential Large Upper Valley Recharge Sites

Potential Managed Recharge Projects	Potential Length (miles)	Conveyance System	Potential Recharge Capacity (cfs)	Total Project Capital Cost ($)	5-Year Retention %
Aberdeen-Springfield Area	1	Gravity/ Pump	100 - 150	$22 M - $36 M	15 - 24
New Sweden Area	6	Pump	100 - 200	$30 M - $50 M	20 - 29
Snake to Mud Lake Area	18	Pump	250 - 500	$36 M - $60 M	34 - 55
Egin Phase III	2	Gravity	150 - 250	$12 M - $20 M	50 - 60

Cooperative Cloud Seeding Program



Cooperative Cloud Seeding Program

Estimated Runoff Benefits (from Idaho Power)

Average Additional Runoff (unregulated)

CURRENT PROGRAM		PROGRAM AT FULL BUILD-OUT
Boise – 229 KAF	51 KAF →	**Boise – 280 KAF**
Wood – 113 KAF	50 KAF →	**Wood – 163 KAF**
Upper Snake – 424 KAF	190 KAF →	**Upper Snake – 614 KAF**
Above Palisades – 280 KAF	144 KAF →	Above Palisades – 424 KAF
Henry's Fork – 144 KAF	46 KAF →	Henry's Fork – 190 KAF
	291 KAF	
TOTAL – **766 KAF**	→	TOTAL – **1057 KAF**

ESPA Region: 537 KAF

ESPA Region: 777 KAF

Cloud Seeding Expenses

	FY2015 2014-2015	FY2016 2015-2016	FY2017 2016-2017	FY2018 2017-2018	FY2019 2018-2019	FY2020 2019-2020	FY2021 2020-2021	TOTAL 2015-2020
Total Program	**$1,709,364**	**$2,846,939**	**$2,857,850**	**$3,728,801**	**$3,313,646**	**$4,348,776**	**$4,269,622**	**$23,074,997**
IWRB	$0	$182,007	$906,372	$1,442,539	$1,212,053	$1,777,383	$2,312,755	**$7,833,109**
IPC	$1,610,477	$2,227,820	$1,507,669	$1,811,262	$1,571,594	$2,041,393	$1,582,755	**$12,352,970**
Water Users	$98,887	$437,112	$443,809	$475,000	$530,000	$530,000	$374,111	**$2,888,919**

- IWRB (state) portion is paid through the IWRB's Secondary Aquifer Fund
    - $5M annually from General Fund
    - $5M annually from Cigarette Tax (will decline in future)
    - ESPA Recharge expenses average $6.5M annually
    - Fund also pays for work in other aquifers such as Treasure Valley Aquifer Model
- Water users in Snake, Wood, and Boise River basins contribute to Cloud Seeding Program

Estimated Distribution of Water Generated Through Cloud Seeding – Upper Snake River

Snake River	In-Basin Natural Flow Use	Reservoir Carryover	IWRB Recharge	Hydro-power downstream of Milner	Spill in excess of downstream hydro plant capacity
Wet Year (1996)	11,504	9,911	132,038	162,647	652,092
Dry Year (2002)	384,040	23,936	431	0	0
Average Percentage (1994-2007)	32%	10%	12%	13%	33%

Note: preliminary numbers – subject to revision

Estimated Distribution of Water Generated Through Cloud Seeding – Wood and Boise

Wood River	In-Basin Natural Flow Use	Reservoir Carryover	IWRB Recharge	Hydro-power downstream of confluence with Snake	Spill in Excess of downstream hydro plant capacity
Wet Year (1996)	0	9,982	747	17,946	24,872
Dry Year (2002)	48,351	0	0	0	0
Average Percentage (1994-2007)	29%	22%	1%	20%	28%

Boise River	In-Basin natural flow use	Reservoir Carryover	IWRB Recharge	Hydro-power downstream of confluence with Snake	Spill in Excess of downstream hydro plant capacity
Wet Year (1996)	0	1,119	N/A	137,370	140,755
Dry Year (2002)	116,786	177	N/A	176	0
Average Percentage (1994-2007)	18%	7%	0%	45%	30%

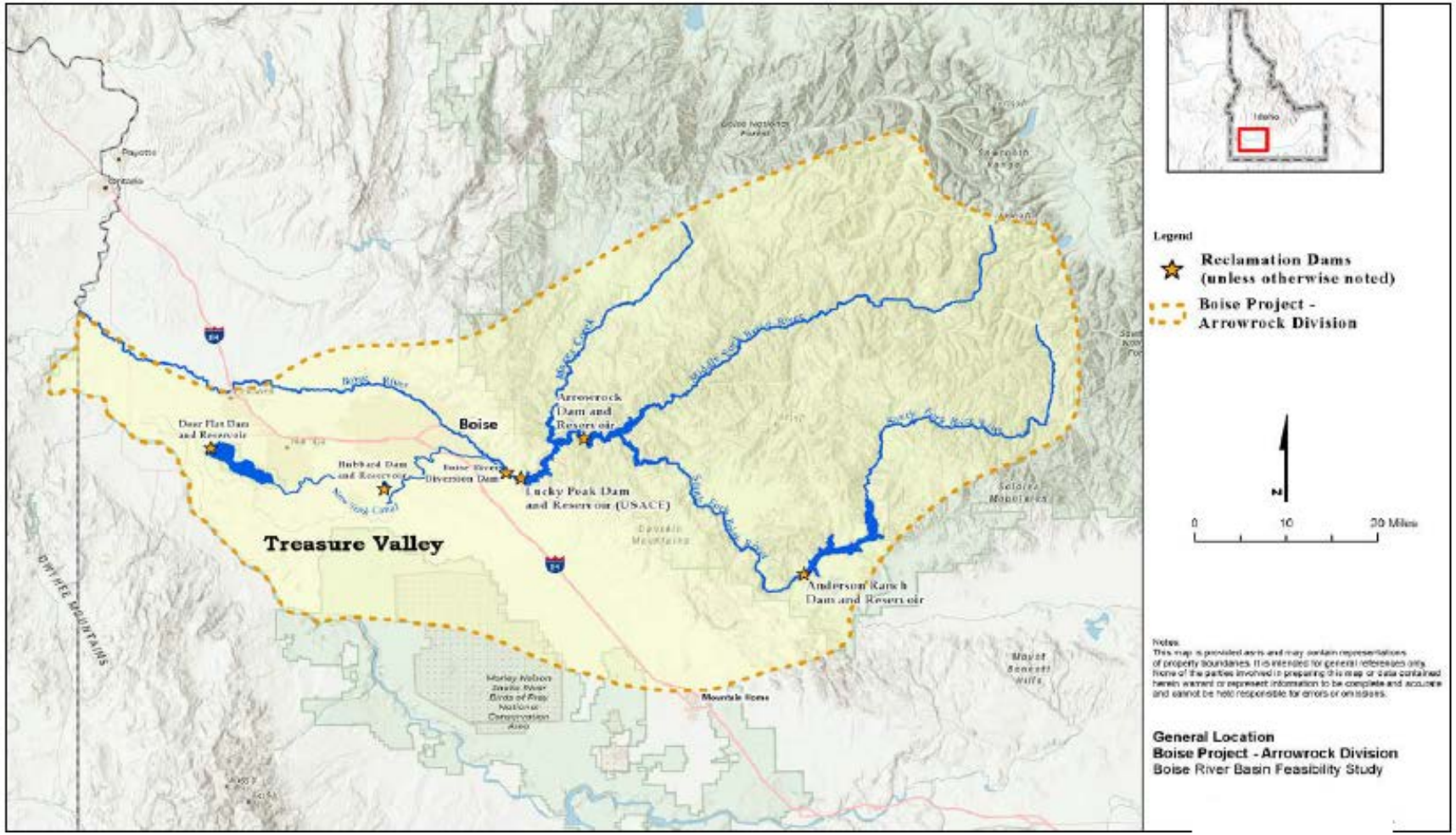
Note: preliminary numbers – subject to revision

Anderson Ranch Reservoir Enlargement Project

Anderson Ranch Dam

- Located on South Fork Boise River in Elmore County, Idaho
- Authorized purposes: water supply, flood control, power, fish and wildlife, and recreation
- Active storage capacity ~413,000 acre-feet
- Full pool elevation 4196.0
- Structural height 456 feet; hydraulic height 330 feet
- 40 megawatt powerplant

Anderson Ranch Reservoir Enlargement Project

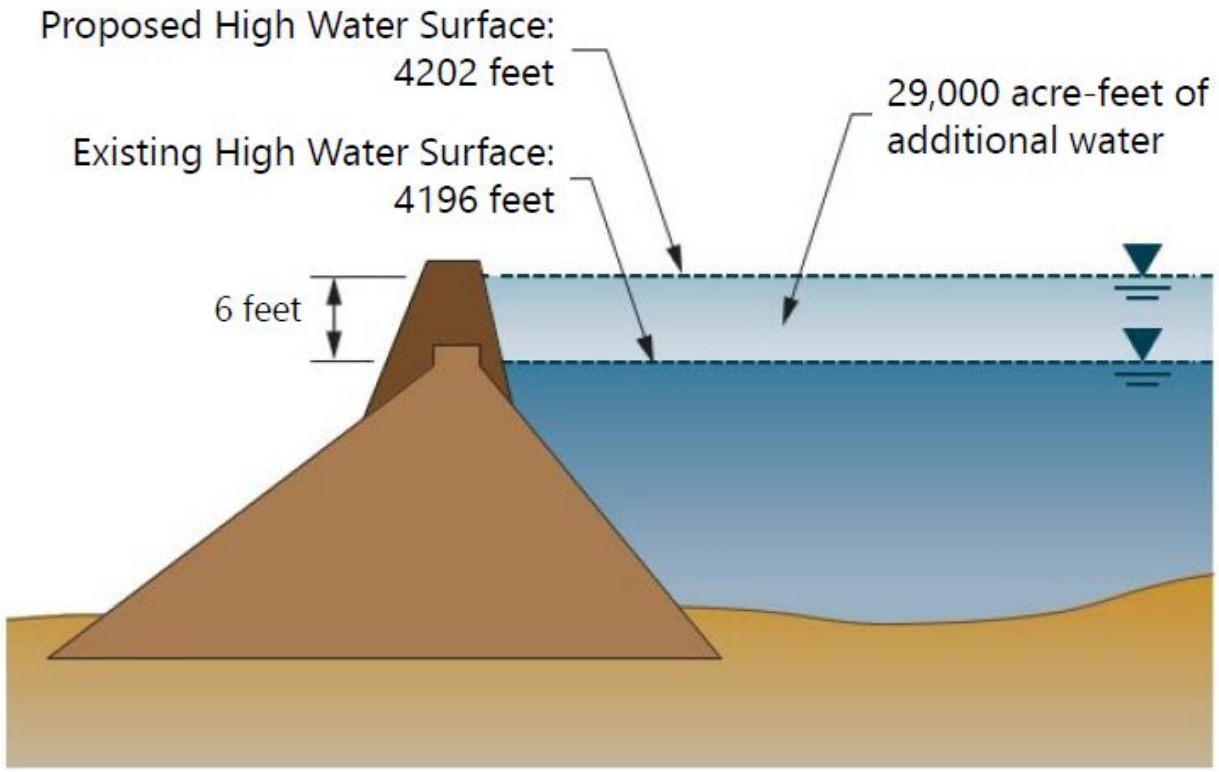


Anderson Ranch Reservoir Enlargement Project

- Water Infrastructure Investments for the Nation Act
  - Allows for federal cost share
  - Must have finding of feasibility by Secretary of Interior by January 1, 2021
- HJM4 (2019 Legislature) – supports project
- HB285 (2019 legislature) – appropriated $20M for this project OR the Mountain Home Air Force Base Pipeline – none of these funds have been used to date

Anderson Ranch Reservoir Enlargement Project

Proposed Plan – 6-foot Dam Raise



Proposed Plan (from US Bureau of Reclamation)

Raise Anderson Ranch Dam to capture and store additional water in a partnership with the Idaho Water Resource Board (IWRB)

- Potential spaceholders - Reclamation contractors and IWRB
- IWRB would contract space to existing Water District 63 water users and/or offer water through the Idaho water supply bank
- Dam modifications
  - Demolish and construct new spillway and crest structure
  - Remove, rehabilitate, and re-install existing radial gates
  - Restore two-lane road across the dam crest
  - Widen right abutment to improve turning radius for traffic
- Reservoir perimeter modifications
  - Modify recreation sites and roadway sections
  - Realign unpaved airstrip and a portion of the detour route (dam crest closed during construction)

Anderson Ranch Reservoir Enlargement Project

- Total project cost: $83.3M (from U.S. Bureau of Reclamation)

- Benefit/Cost ratio: 1.74

  (10% of water to fish & wildlife; 45% to irrigation; 45% to DCMI)

- Construction Cost Assignment (from U.S. Bureau of Reclamation)

Purpose	Total Construction Cost	Federal Cost Share	Non-Federal Cost Share
DCMI	$60,484,000	$0	$60,484,000
Irrigation	$13,615,000	$0	$13,615,000
Fish and Wildlife	$2,187,000	$2,187,000	$0
Hydropower	$2,888,000	$2,888,000	$0
Recreation	$4,126,000	$4,126,000	$0
Total	**$83,300,000**	**$9,201,000**	**$74,099,000**

Anderson Ranch Reservoir Enlargement Project

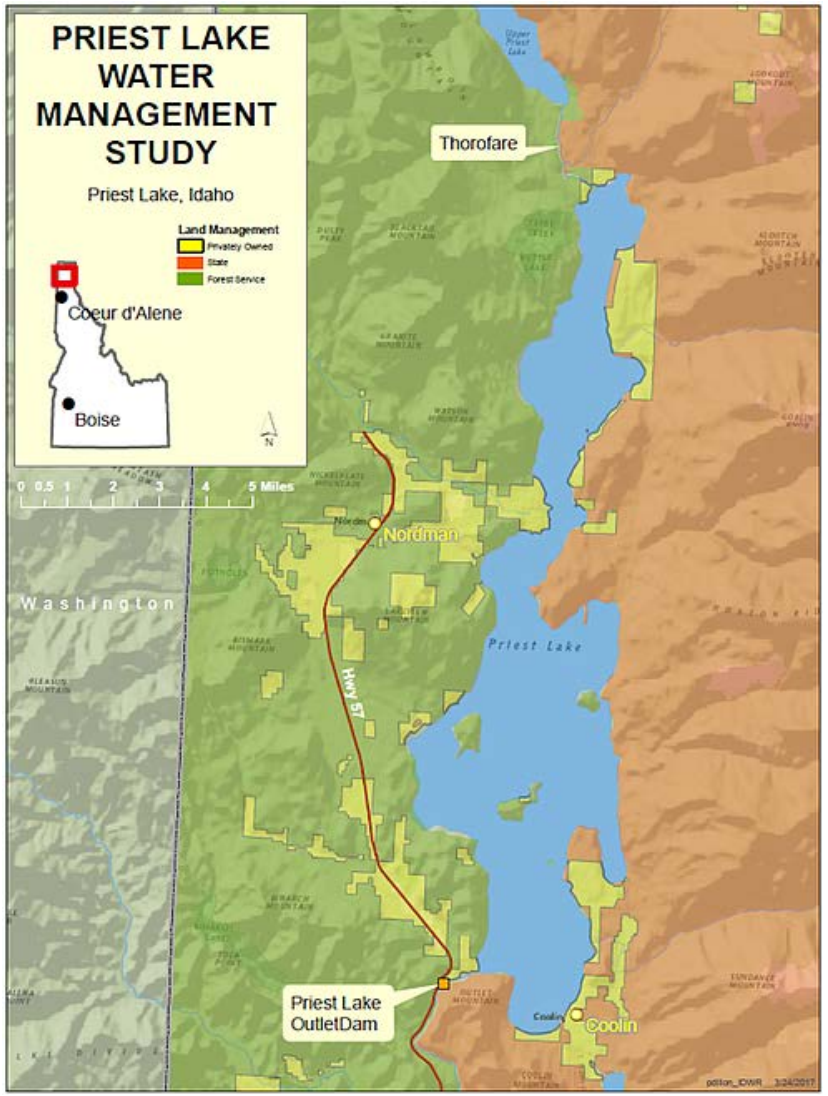
- IWRB's plan is for it to be the "spaceholder" and contract with U.S. Bureau of Reclamation
- IWRB would be to issue revenue bonds to finance project costs
- IWRB would "sub-contact" parts of the new reservoir space to those that want it
- The "sub-contractors" would pay over time – these funds would be used to pay debt service on the bonds

Anderson Ranch Reservoir Enlargement Project

- Draft Environmental Impact Statement was published in August
- Draft Feasibility Study was published in August
- Next Steps:

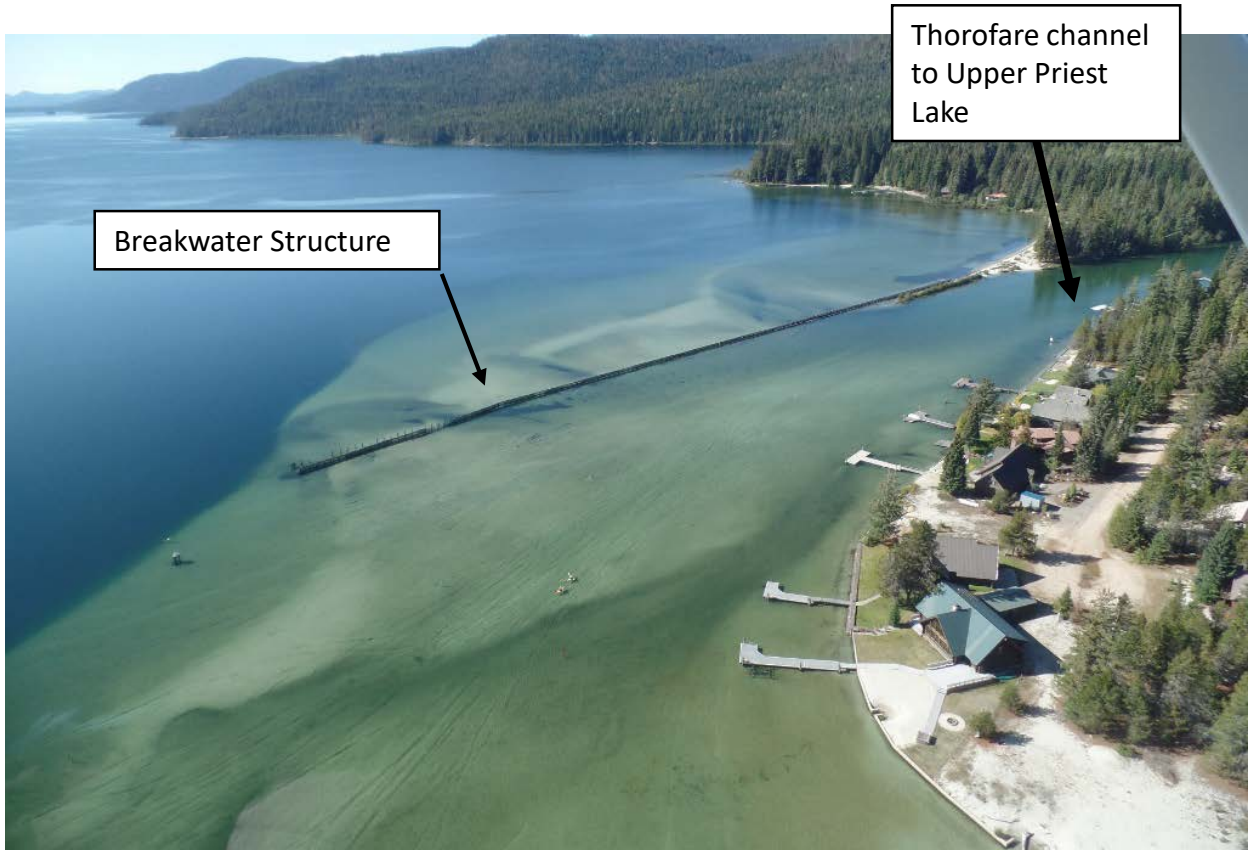
Milestone	Date
WIIN Act feasibility determination deadline	January 1, 2021
Final Environmental Impact Statement	February 2021
Record of Decision	May 2021
Secure non-Federal Funding Agreement	FY 2021
Design and early construction	FY 2021-2023
Award primary construction contract	FY 2024
Complete construction	FY 2030

Priest Lake Water Management Project



- Better manage Priest Lake to maintain lake levels, maintain downstream flows in Priest River, and maintain navigation in the Thorofare between Priest Lake and Upper Priest Lake
- Includes modification of outlet dam and breakwater structure at the Thorofare
- HB677 passed by 2018 Legislature appropriated $2.4M and redirected $2.419M for project
- Bonner County contributed $240,000 and lake interests contributed $135,000
- Project has been bid
- Pre-construction work is underway
- Construction will begin on November 1st after the lake drawdown and should be done by spring

Priest Lake Water Management Project



Priest Lake Water Management Project

Contractor stockpiling materials for Breakwater construction