



ESPA Managed Recharge Program Update

Natural Resources Interim Legislative Committee
Boise, Idaho

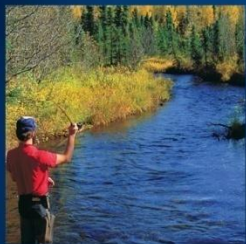
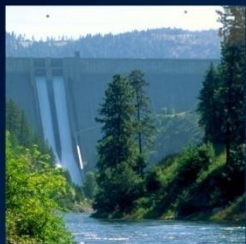
Brian Patton

October 16, 2015



Topics

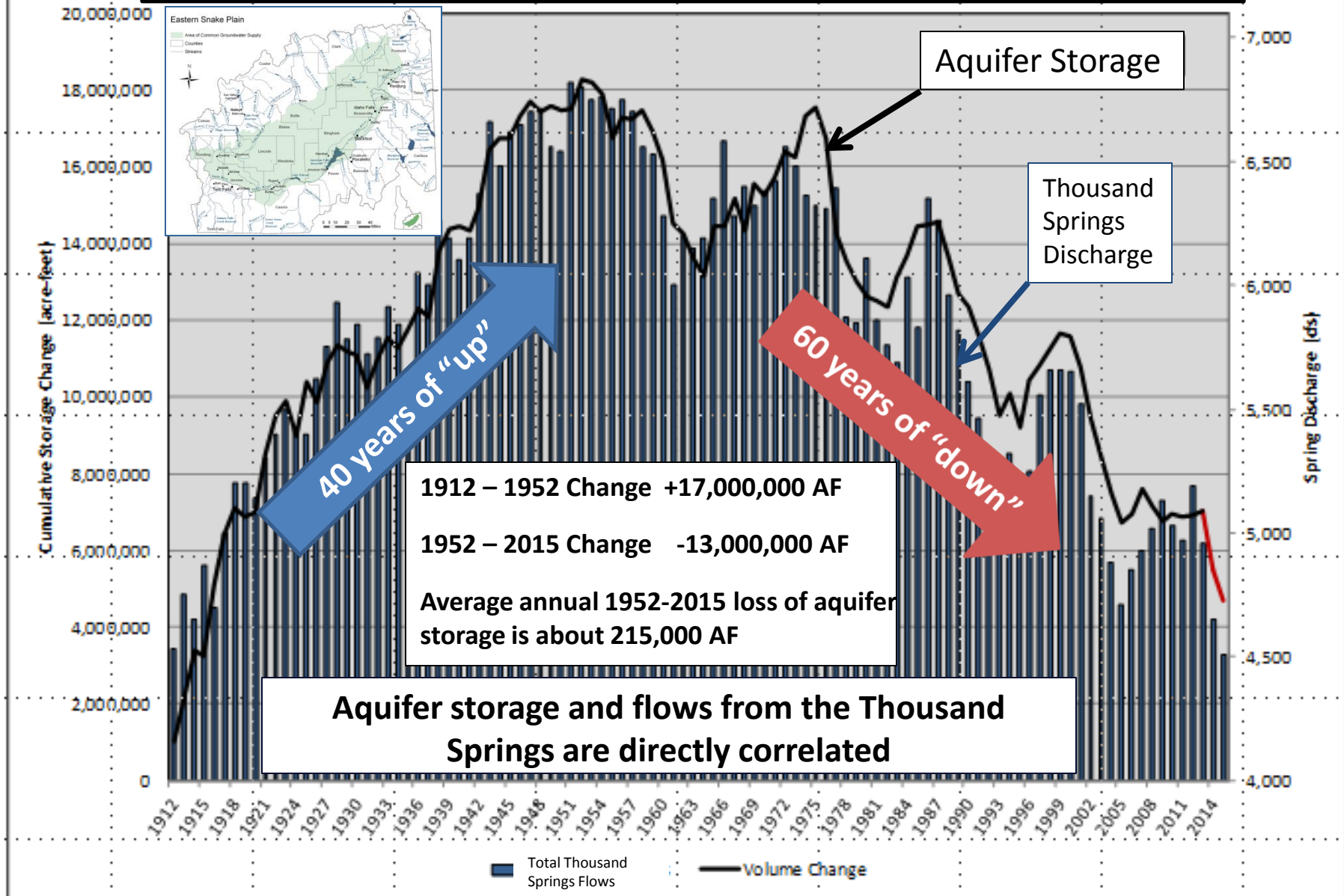
- ✓ State's goals for ESPA recharge
- ✓ Factors that define how ESPA recharge is accomplished
- ✓ 2014-2015 recharge season recap
- ✓ Moving forward



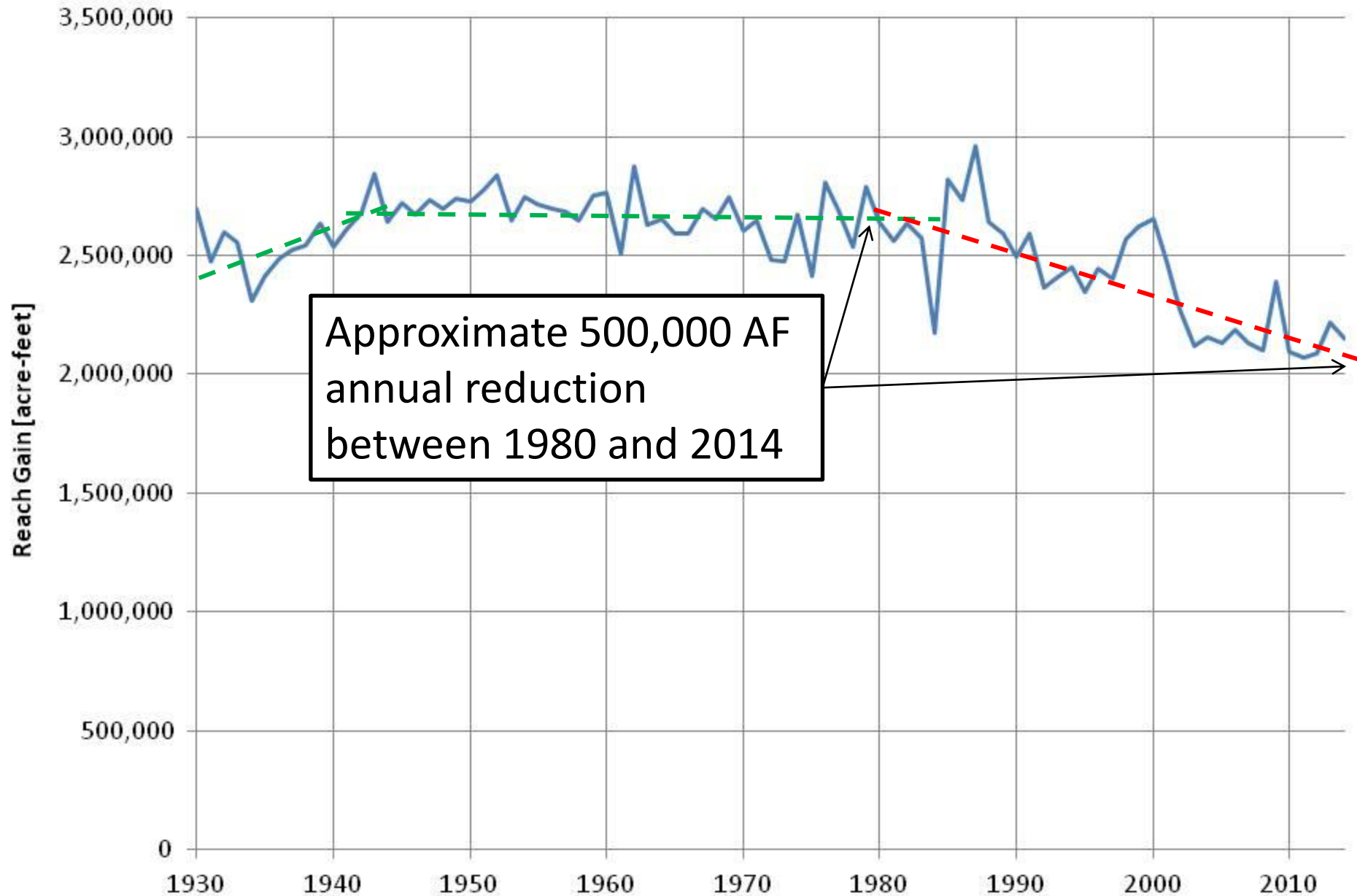
Recharge test – Wilson
Lake on North Side Canal
March 5, 2015



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



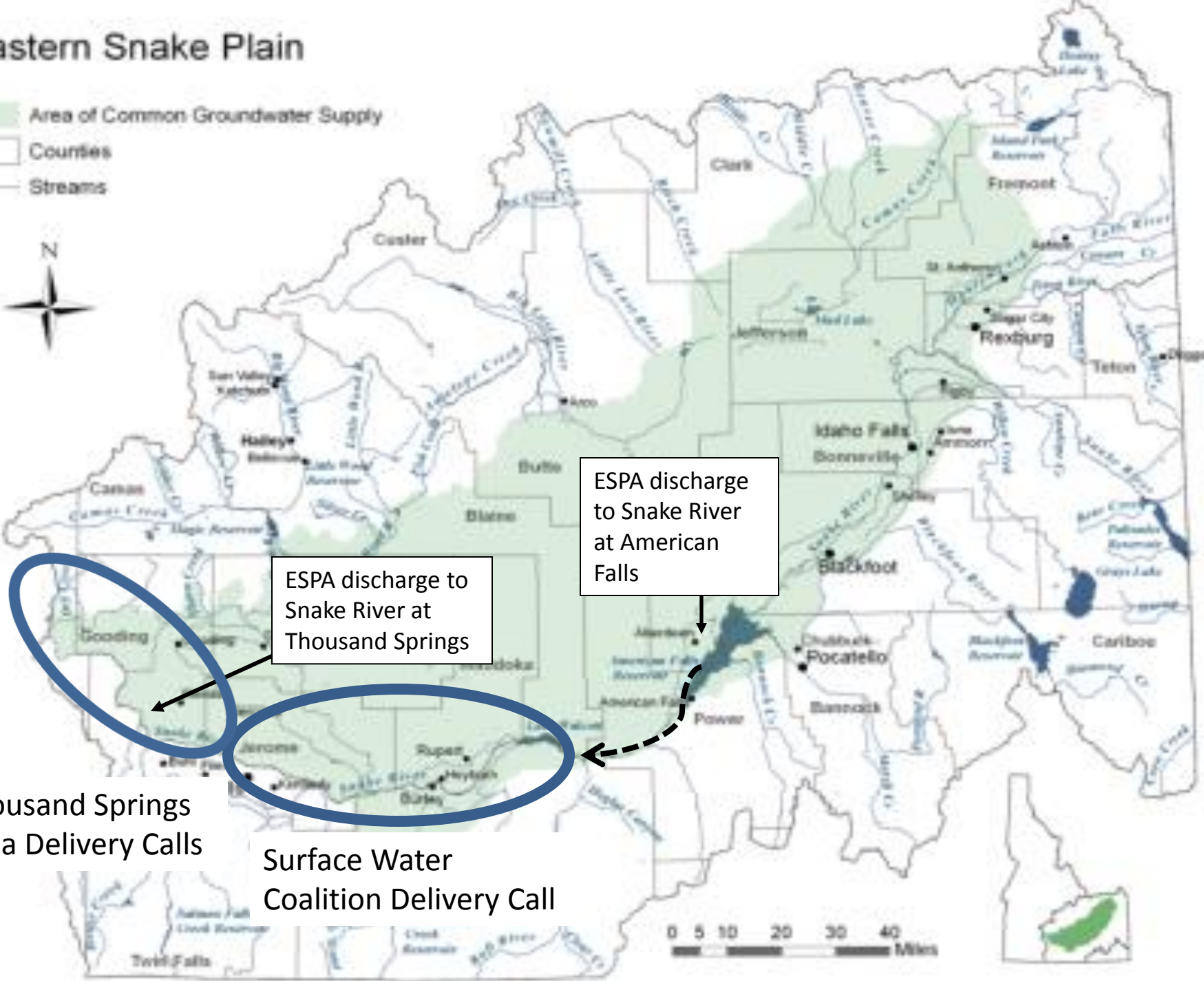
Spring Flows in Blackfoot to Minidoka Reach



Note: 2013 and 2014 data values are preliminary.

Eastern Snake Plain

- Area of Common Groundwater Supply
- Countries
- Streams



EPA discharge
to Snake River
at American
Falls

EPA discharge to
Snake River at
Thousand Springs

Thousand Springs
Area Delivery Calls

Surface Water
Coalition Delivery Call

ESPA Stabilization and Swan Falls Agreement

State responsibility to ensure minimum flows at Murphy Gage just below Swan Falls Dam of:

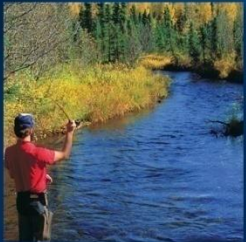
- ✓ 3,900 cfs (4/1 through 10/31) and
- ✓ 5,600 cfs (11/1 through 3/31)

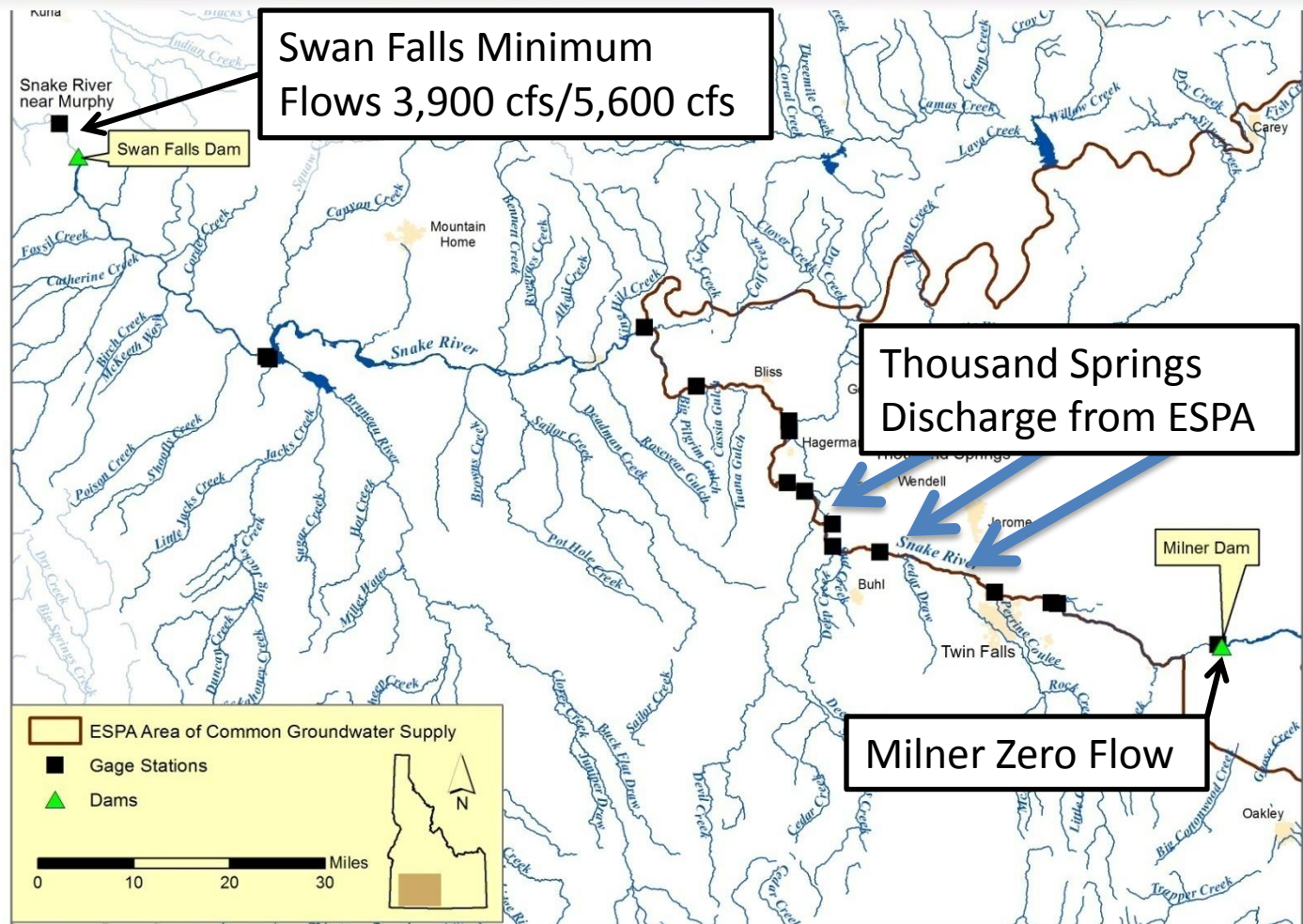
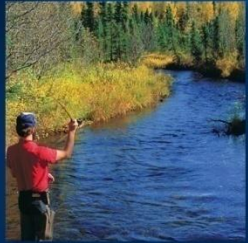


However, 180 miles Upstream at Milner Dam

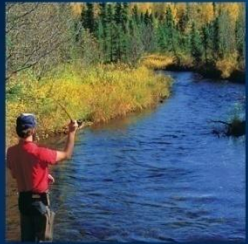


- Water planning, policy, and practice provides for full development of Snake River above Milner Dam
- At times this reduces Snake River flow at Milner Dam to zero

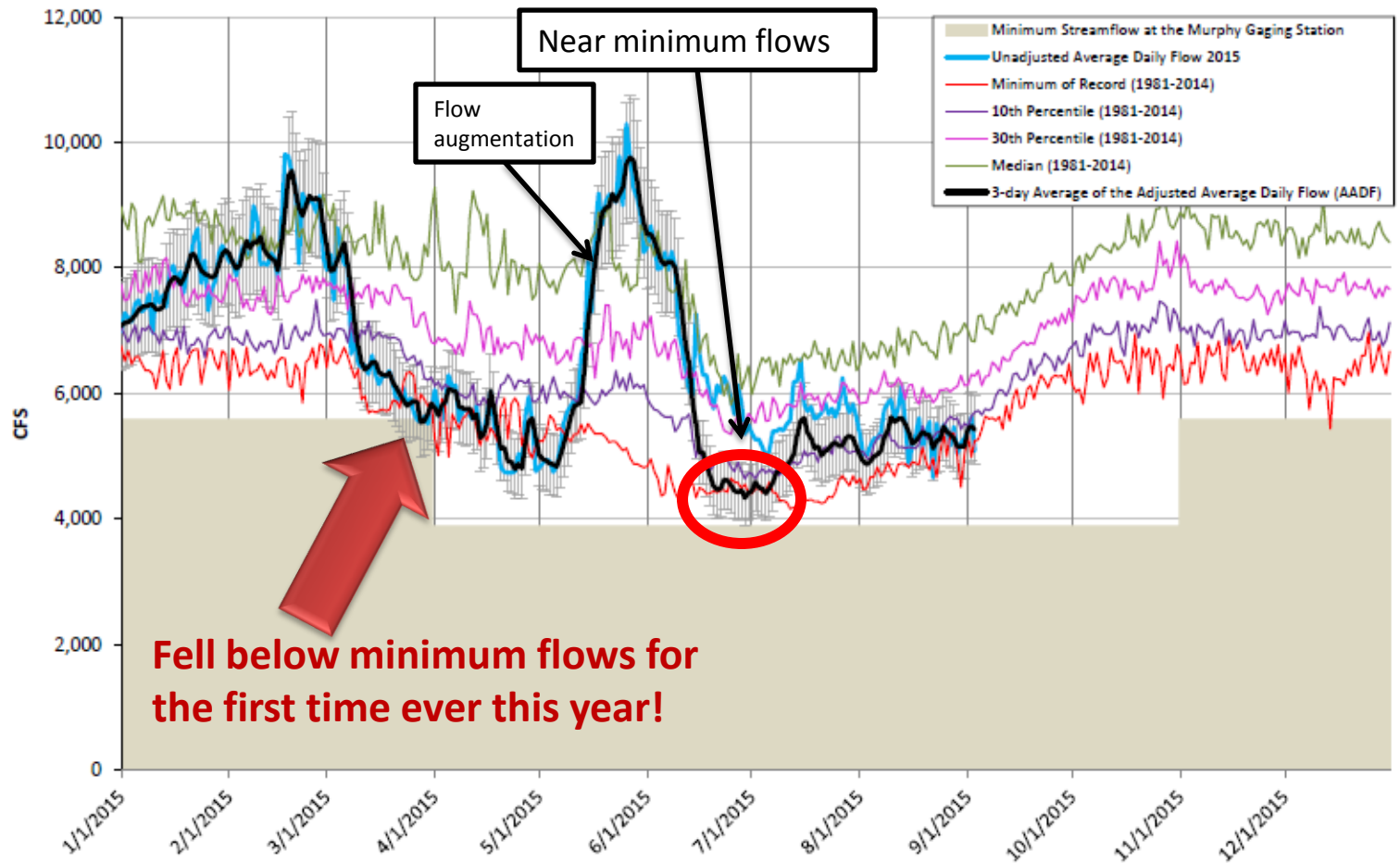




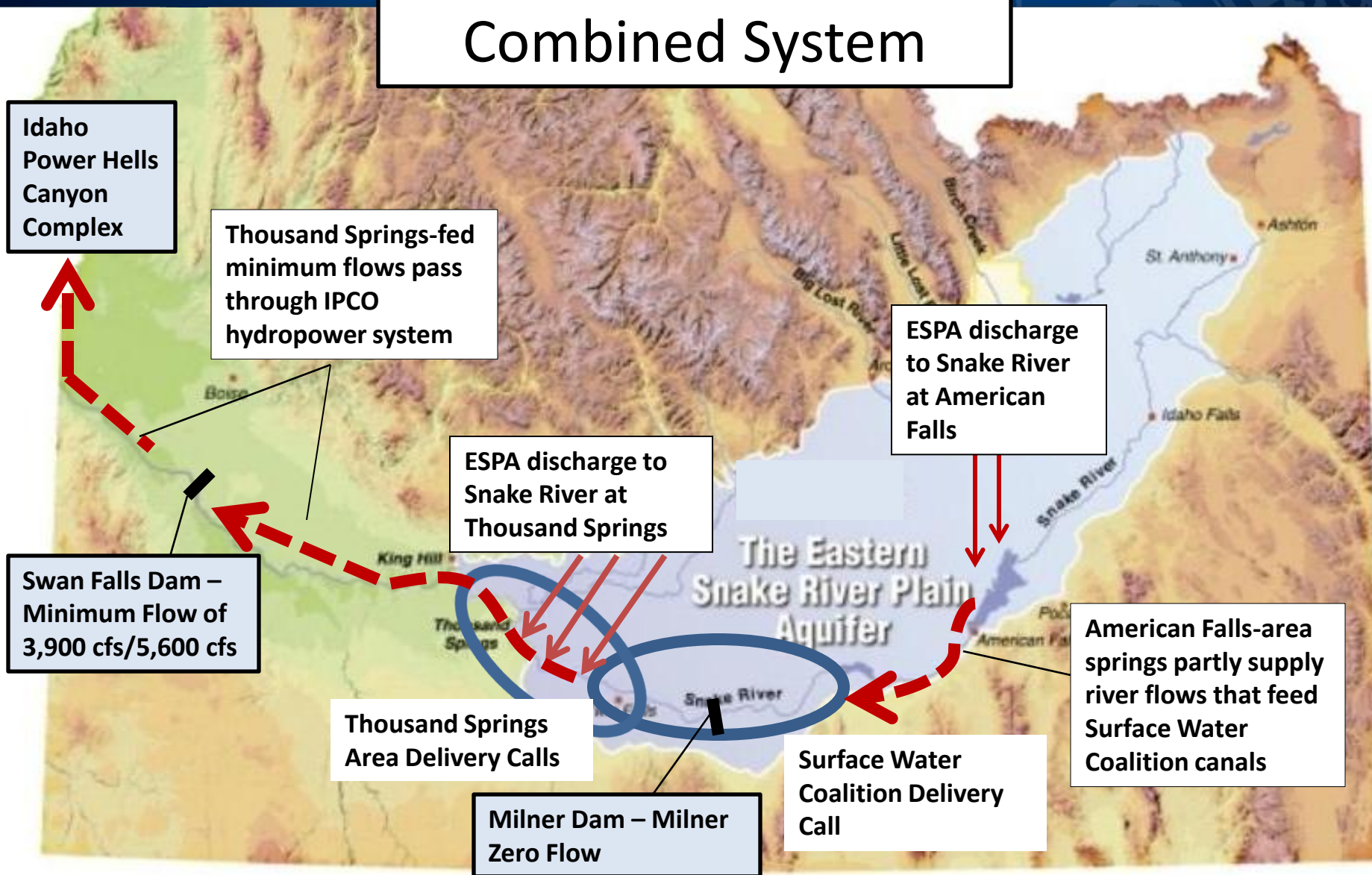
When flow is zero at Milner, flow at Swan Falls Dam is made up almost entirely of spring flows from the ESPA



Snake River Near Murphy Gage - Swan Falls Dam - 2015

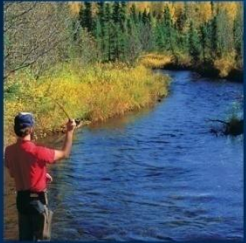


Combined System



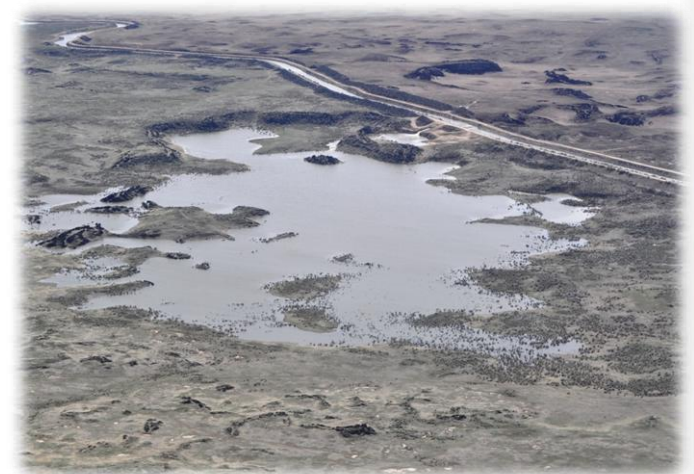
Implications of Aquifer Situation

- ✓ ESPA can no longer meet all the uses that have been assigned to it – delivery calls determine what water uses come off the system
- ✓ ESPA must be managed to sustain spring flows sufficient to meet the Swan Falls minimum flows
- ✓ If economic damage is to be minimized, ESPA must be managed to sustain spring flows sufficient to reduce need for conjunctive water delivery calls
- ✓ Current situation is due partly to “deferred maintenance” of the ESPA
- ✓ Need to “re-build” ESPA

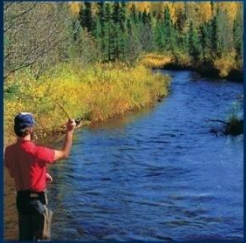


Recharge Goal: Stabilize & Rebuild ESPA

- ✓ HB 547 passed by 2014 Legislature allocates \$5 million annually from cigarette tax to Water Resource Board for “***statewide aquifer stabilization***”
- ✓ ESPA is first priority
- ✓ HB 479 (2014) allocated \$4 million one-time to Water Board for ESPA recharge infrastructure
- ✓ 2015 Legislature allocated additional one-time funds



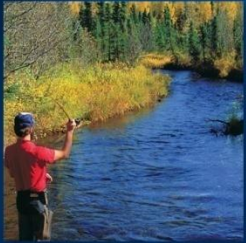
Milepost 31 recharge basin
along Milner-Gooding Canal



Recharge Goal: Stabilize & Rebuild ESPA

- ✓ State Water Plan goal of 250,000 AF/year
- ✓ Component of SWC Settlement Term Sheet
- ✓ Component of draft Hagerman Valley/Thousand Springs Term Sheet
- ✓ Needed to maintain Swan Falls Minimum Flows
- ✓ Needed to maintain Idaho's economic viability

Recharge operations in
Twin Falls Canal
November 12, 2014



Factors That Define ESPA Recharge – two different water supply patterns

✓ Lower Valley at Milner:

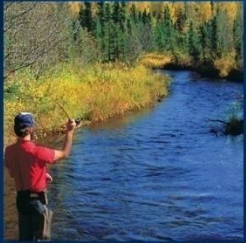
- Downstream of all Upper Snake reservoirs
- Recharge water available all winter (Nov-Mar)
- Even in driest years 500 cfs spills past Milner

✓ Upper Valley upstream of American Falls:

- Recharge water available during flood control releases from reservoirs
- Need to ensure reservoirs fill first
- Senior hydro right at Minidoka



Recharge operations in the
Great Feeder Canal System –
February 2015



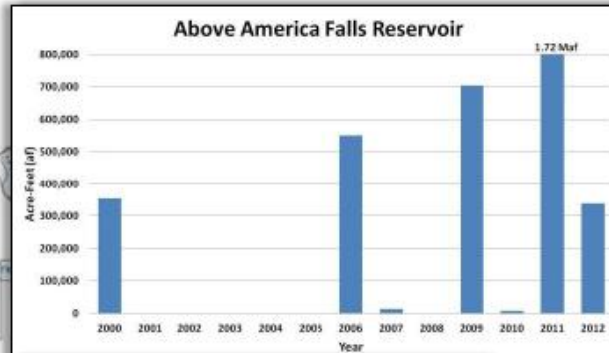
Water Available for Recharge 2000 - 2012

Eastern Snake Plain

Area of Common Groundwater Supply

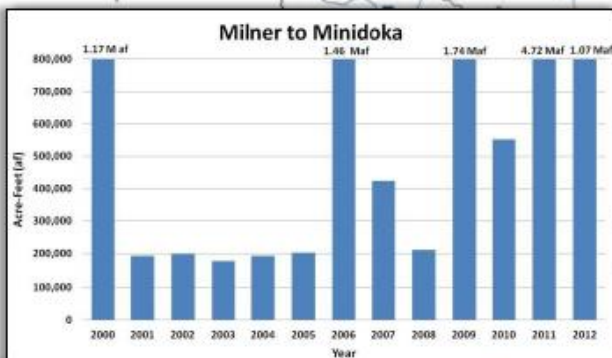
Counties

Streams



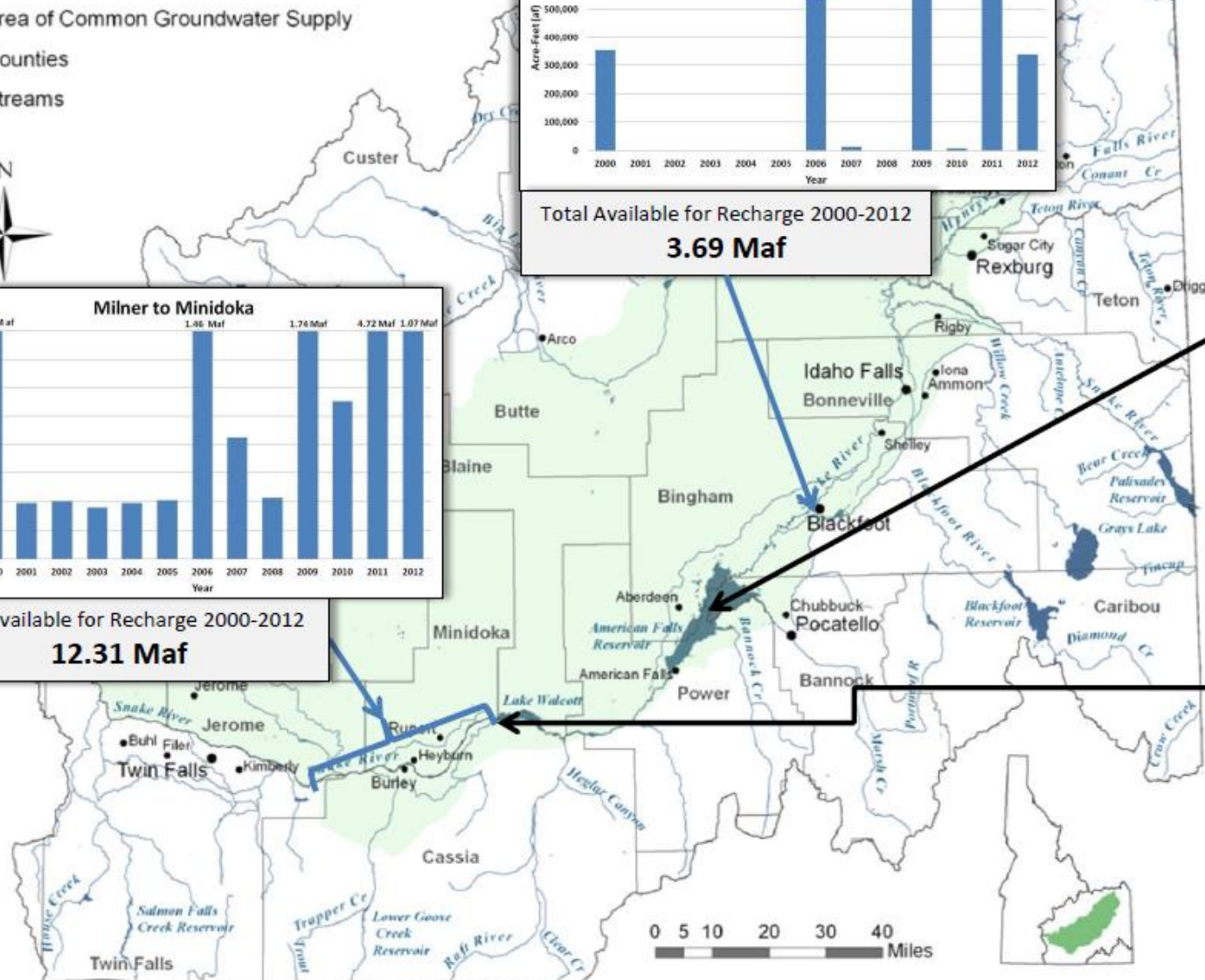
Total Available for Recharge 2000-2012

3.69 Maf



Total Available for Recharge 2000-2012

12.31 Maf



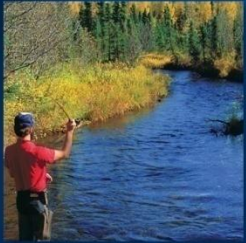
American Falls Reservoir:
1.6 million AF
1921 priority

Unsubordinated
hydropower rights
at Minidoka Dam:
2,700 cfs
1909/1912 priority

Factors That Define ESPA Recharge – Water Rights

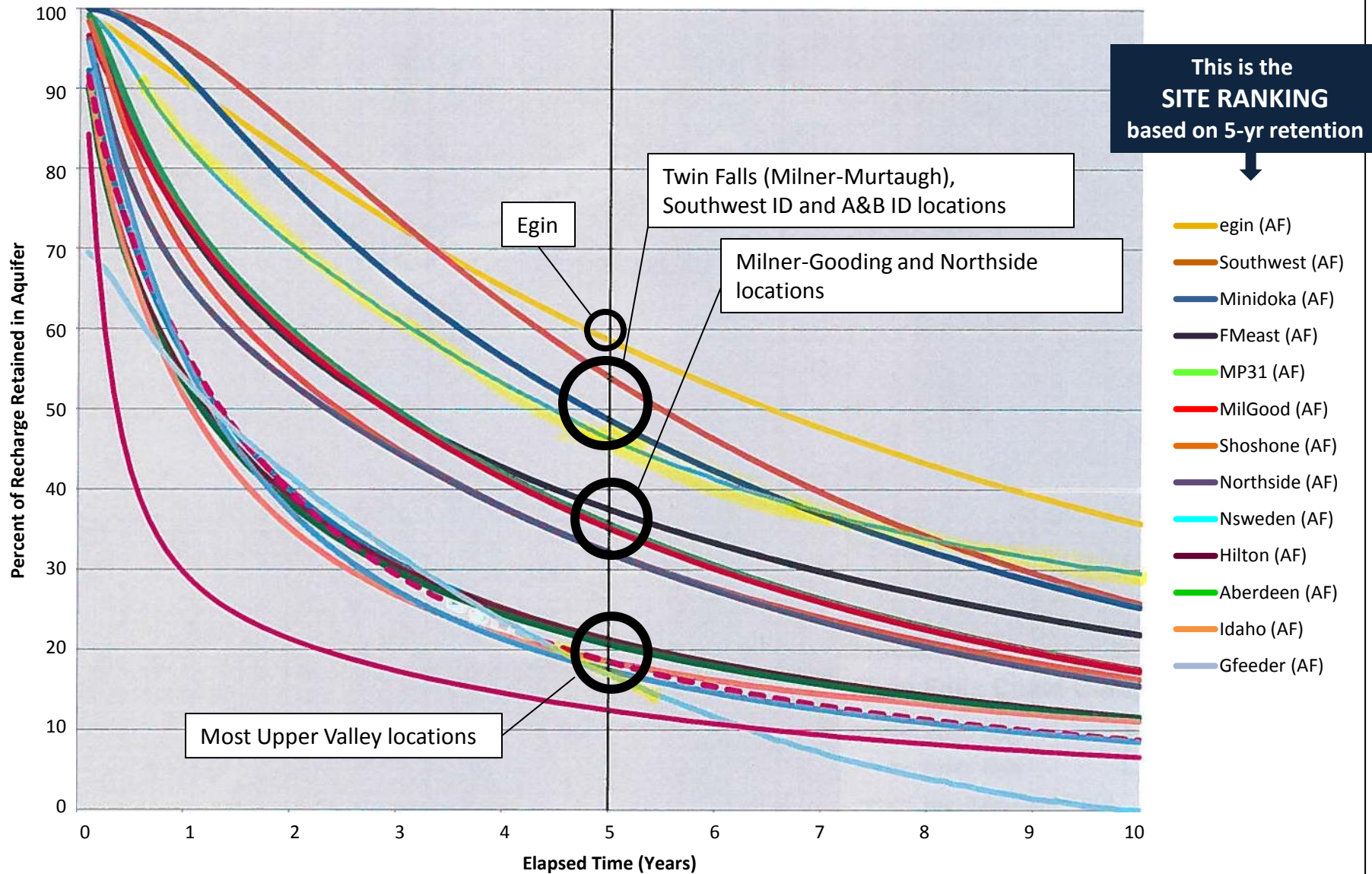
IWRB holds 1980-priority water right for recharge

- 1,200 cfs
- Divert anywhere on Snake River
- Junior to irrigation and existing reservoirs
- Junior to Minidoka Hydropower (2700 cfs)
- Senior to Milner Hydropower
- Senior to other recharge rights
- Additional recharge water right applications in progress by IWRB and others

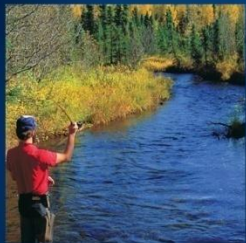
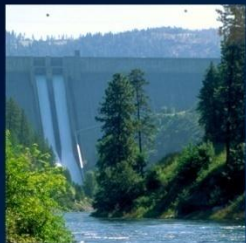


Retention of Recharged Water within the Aquifer

ESPAM 2.1 Ground Water Model



Factors that Define ESPA Recharge Water Rights & Water Supply



Eastern Snake Plain

-  Area of Common Groundwater Supply
-  Counties
-  Streams

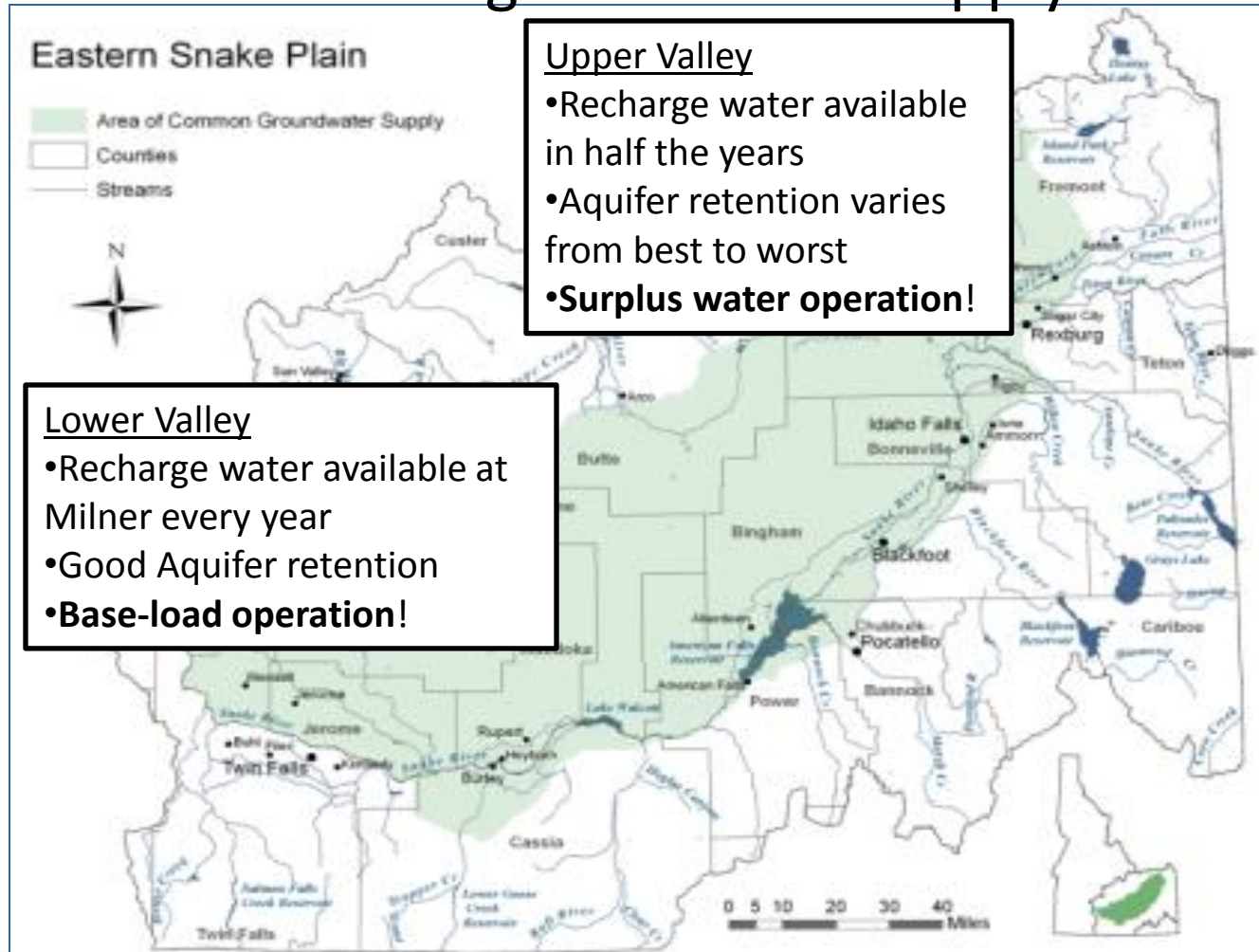


Lower Valley

- Recharge water available at Milner every year
- Good Aquifer retention
- **Base-load operation!**

Upper Valley

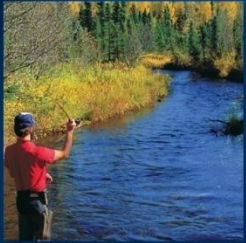
- Recharge water available in half the years
- Aquifer retention varies from best to worst
- **Surplus water operation!**



Factors that Define ESPA Recharge

How to get water in ground?

- Unlined canals that divert from river and cross the plain!
- Most cost effective way to divert & recharge large volumes of water – contract with canal companies & irrigation districts to carry water to recharge
- Supplement with spreading/spill basins
- Injection wells used in a few cases

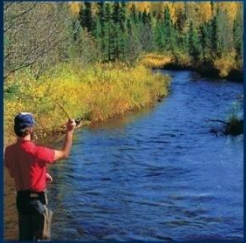


Winter Recharge 2014-2015

- Taking recharge from “pilot scale” to “full scale”
- Use existing canals to extent possible to deliver recharge water
- Water Board adopted incentivized payment schedules for canals –
MAKE RECHARGE A PARTNERSHIP!



Recharge at MP31 recharge basin/Milner-Gooding Canal – Jan 16, 2015

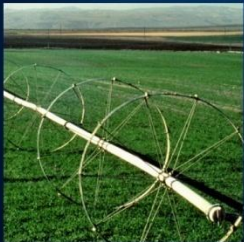
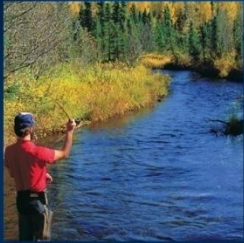


Winter Recharge 2014-2015

October 27 to February 15:

- ✓ Recharge water right “on” at Milner Dam
- ✓ Recharged 37,000 AF in canals diverting from Milner
- ✓ Also spilled 200,000 AF past Milner due to lack of capacity
- ✓ Water Board working with canal company partners to address this capacity issue

Recharge operations in
Twin Falls Canal
November 12, 2014

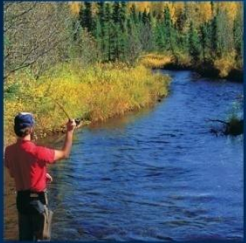


Winter Recharge 2014-2015

February 16 to March 4:

- ✓ Recharge water right “on” both upstream American Falls and at Milner Dam
- ✓ Recharge began in canals upstream of American Falls
- ✓ 500 cfs recharged in canals upstream of American Falls & 700 cfs in canals at Milner (full right is 1,200 cfs)
- ✓ Must maintain 2,700 cfs passing Minidoka Dam for recharge to occur upstream of AMF

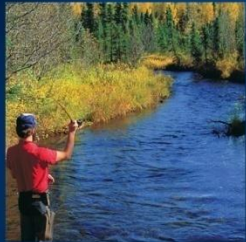
Recharge operations in
the Great Feeder Canal
February 2015



Winter Recharge 2014-2015

March 5 to March 24:

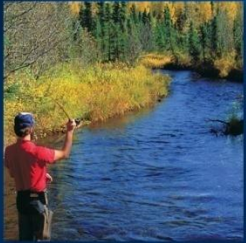
- ✓ Recharge water right turned “off” above American Falls
- ✓ Recharge right still “on” at Milner
- ✓ 12,800 AF recharged, but 17,070 AF spilled past Milner due to lack of diversion capacity
- ✓ Recharge shut down with start of irrigation on Mar. 24th



Shoshone Recharge Basin
Milner-Gooding Canal
March 5, 2015

Winter Recharge 2014-2015

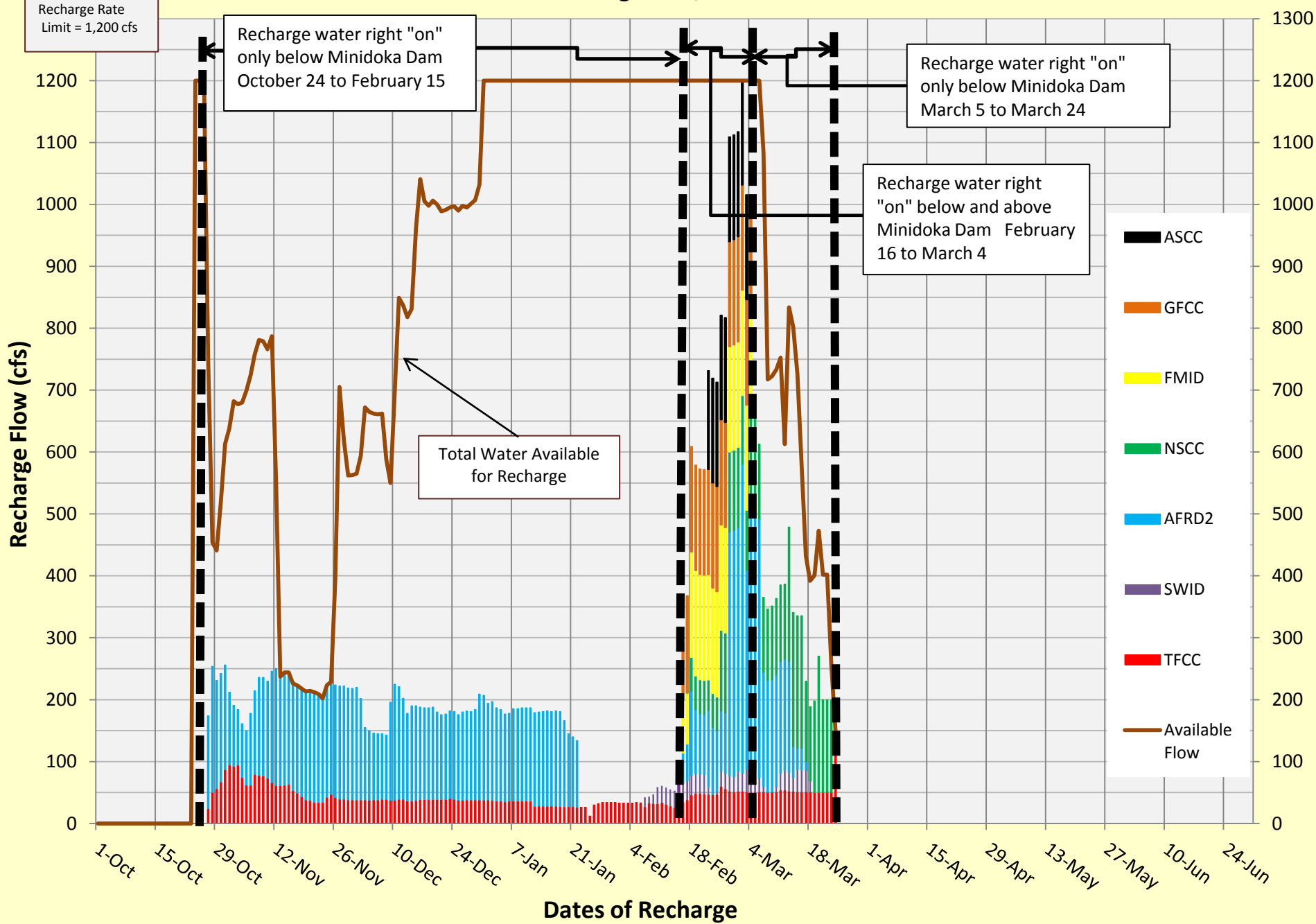
- Total ESPA recharge: 75,234 AF
- Amount below Minidoka: 61,068 AF
- Amount above American Falls: 14,166 AF
- Total spill past Milner Oct - Mar: ~ 300,000 AF



Recharge operations in
Aberdeen-Springfield
Canal & Hilton Spill
February 26, 2015

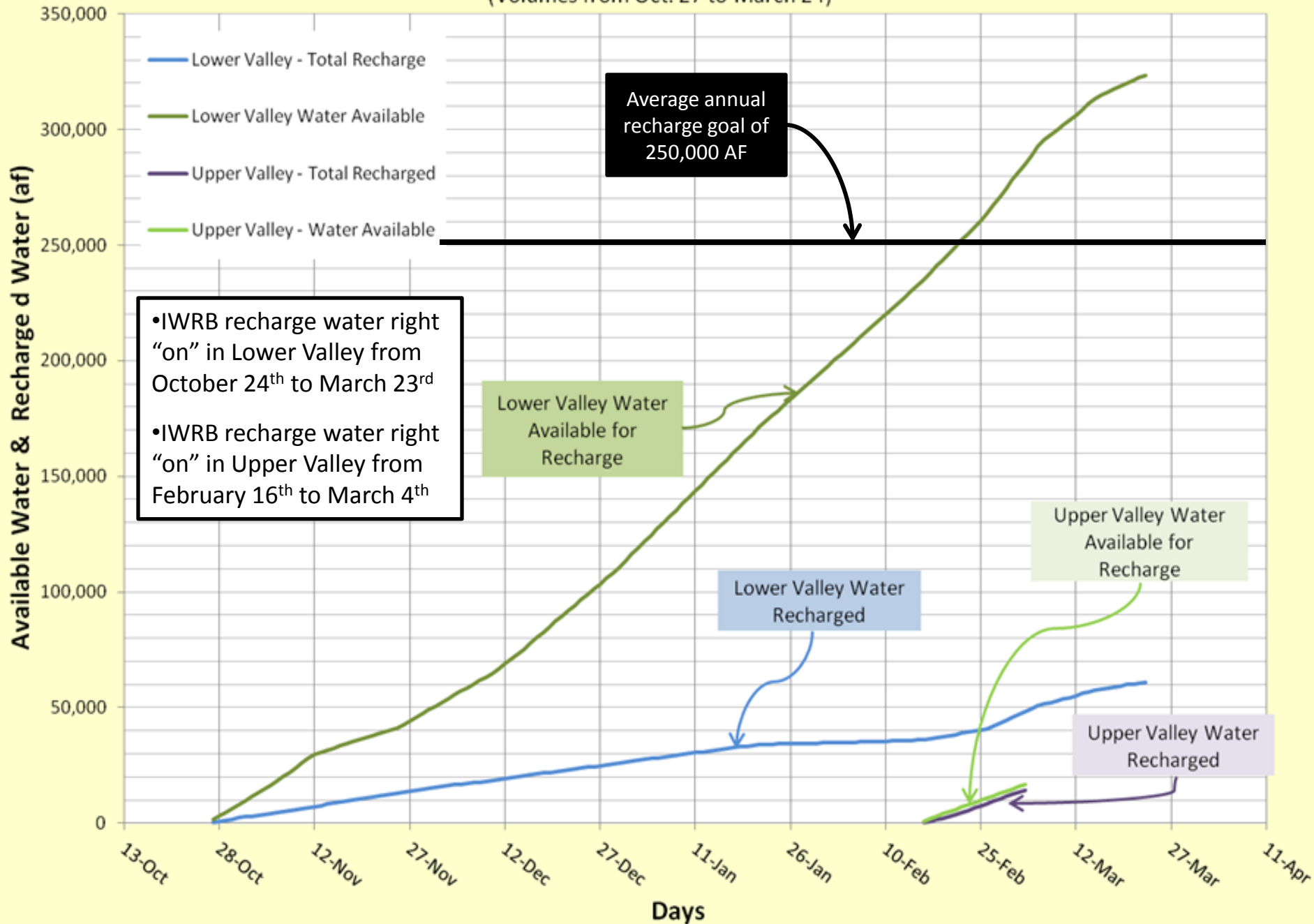
Total Water Board Recharge Rates During 2014 - 2015 Season

Total Volume of Recharge = 75,234 ac-ft as Oct. 27 to Mar. 23



ESPA Managed Recharge - 2014 - 2015 Season

(Volumes from Oct. 27 to March 24)

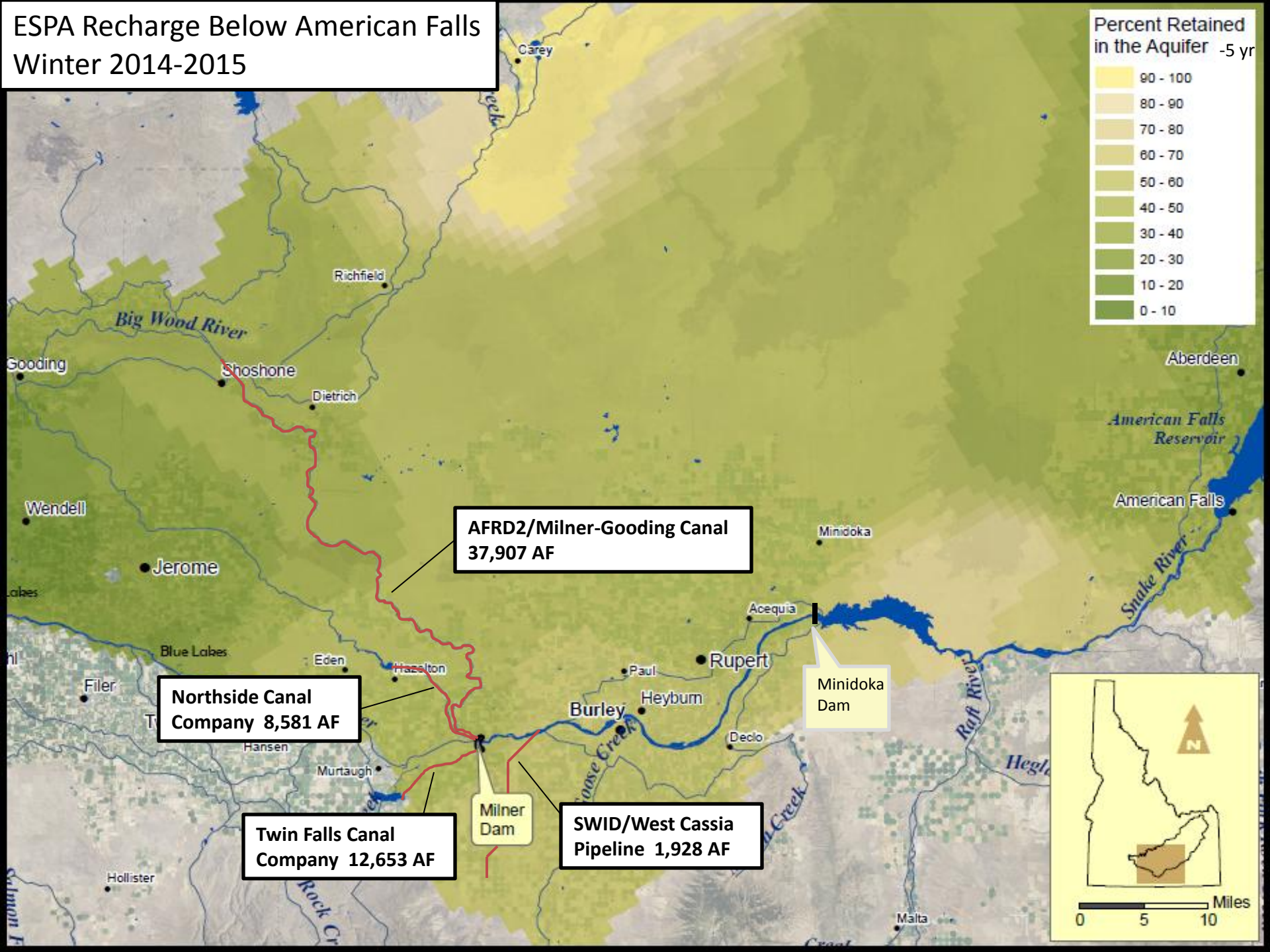


ESPA Managed Recharge Summary

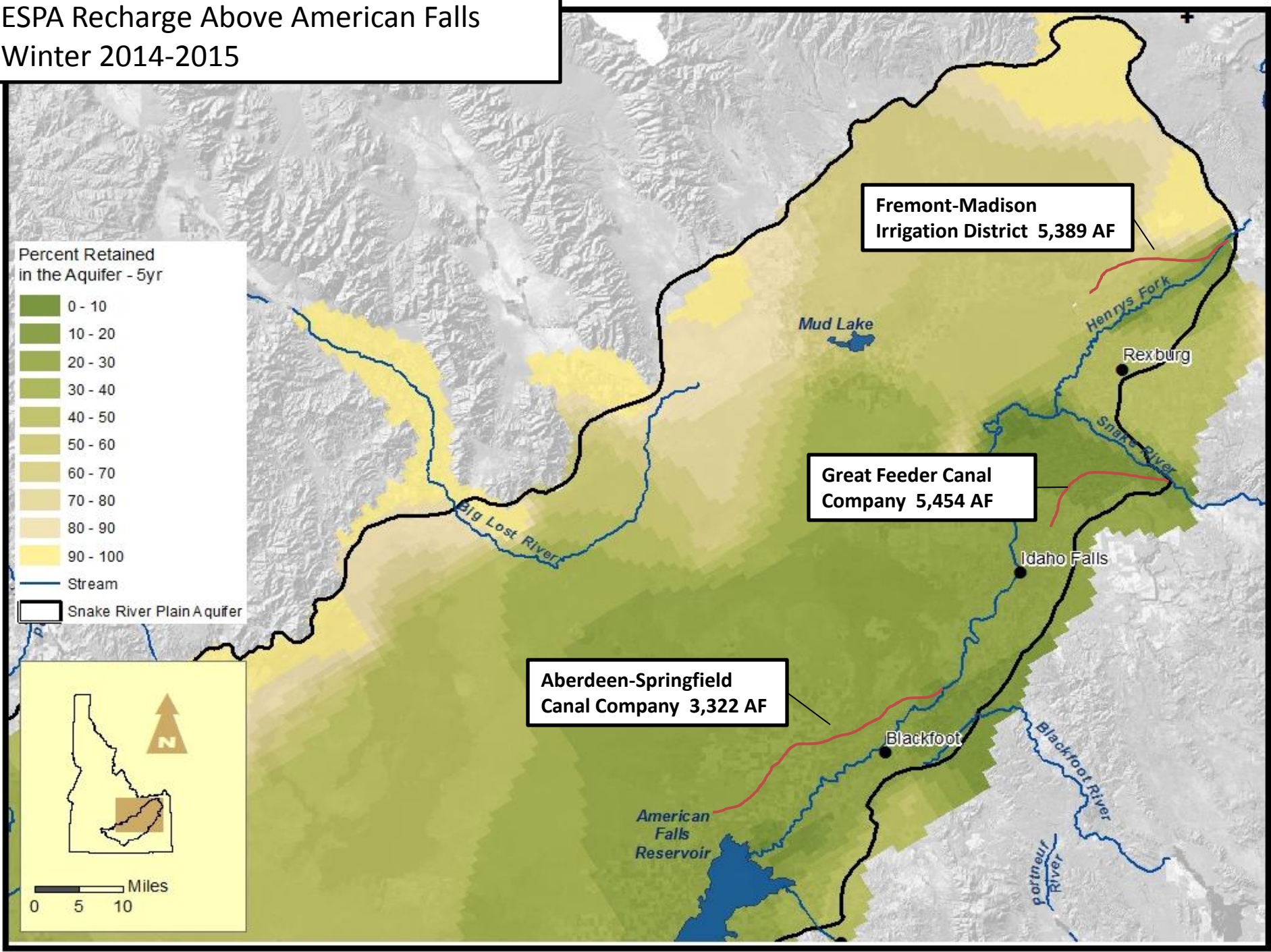
Oct 27th, 2014 to March 23rd, 2015

ESPA Area	Canal System	5-Year Retention Time (%)	Median Recharge Rate (cfs)	Days Recharged	Volume Recharged (Acre-feet)
Upper Valley	Aberdeen-Springfield Canal Company	~26	169	10	3,322
	Great Feeder Canal Company	~18	170	17	5,454
	Fremont Madison Irrigation District	~44	170	17	5,389
	Upper Valley Total				14,165
Lower Valley	American Falls Reservoir District No. 2 (Milner-Gooding Canal)	~40	153	118	37,907
	Northside Canal Company	~40	127	34	8,581
	Southwest Irrigation District	~55	25	47	1,928
	Twin Falls Canal Company	~50	39	148	12,653
	Lower Valley Total				61,069
TOTAL					75,234

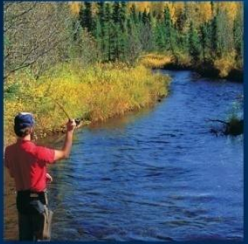
ESPA Recharge Below American Falls
Winter 2014-2015



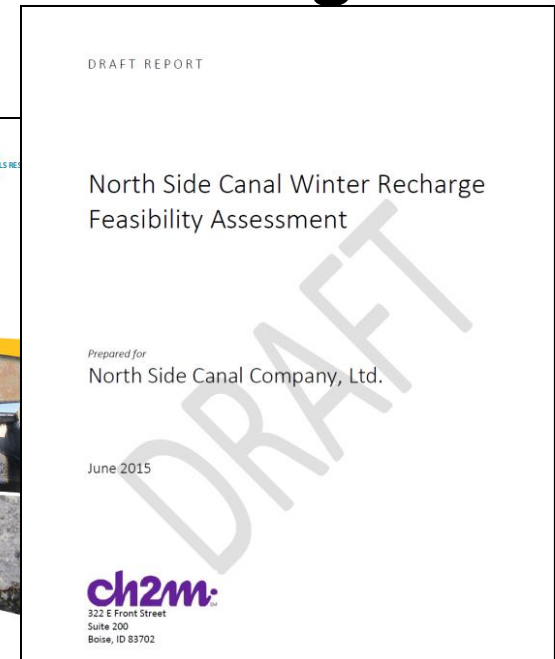
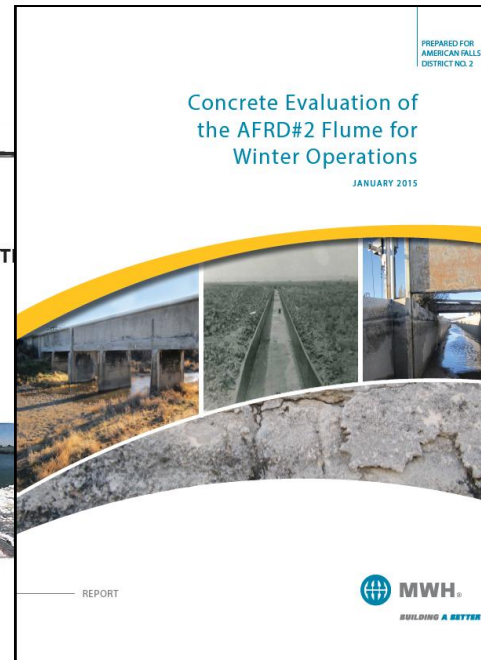
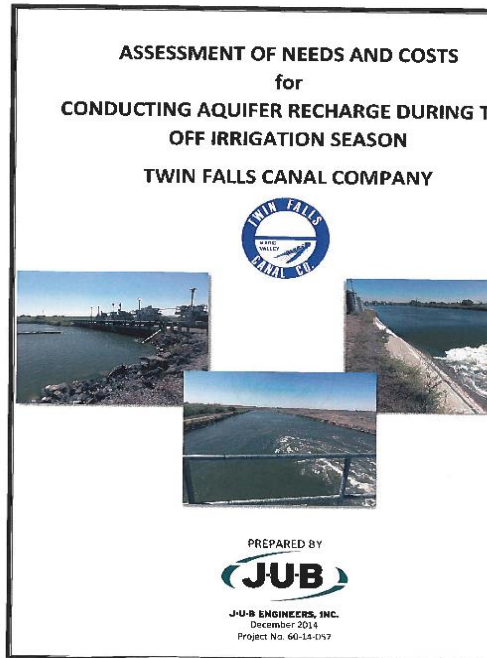
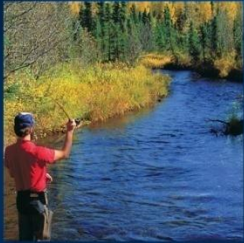
ESPA Recharge Above American Falls
Winter 2014-2015

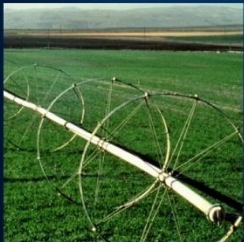
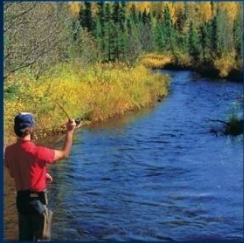


Working with Canal Company Partners to Improve Systems for Recharge



Working with Canal Company Partners to Improve Systems for Recharge





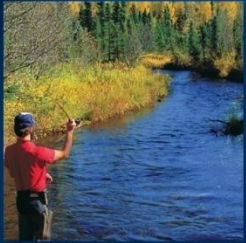
IWRB FY 2016 Budget for Aquifer Stabilization

ESPA Managed Recharge Operations & GW level monitoring	1,200,000
ESPA Managed Recharge Infrastructure	
Milner-Gooding Recharge Capacity Projects (Flume, MP31, Road, 28 hydro)	1,110,000
Twin Falls Canal recharge improvements	500,000
Northside canal hydro plant bypasses	2,000,000
Great Feeder Canal recharge improvements	500,000
Milner Pool Development and other Projects	2,000,000
Egin Recharge Enlargement	500,000
Investigation/engineering for further ESPA recharge capacity improvements	300,000
Administrative expenses	50,000
Ground water conservation grants in priority aquifers (Roger's proposal)	200,000
Amount reserved for projects in other priority aquifers	<u>1,000,000</u>
TOTAL FY2016 BUDGETED FUNDS	9,360,000

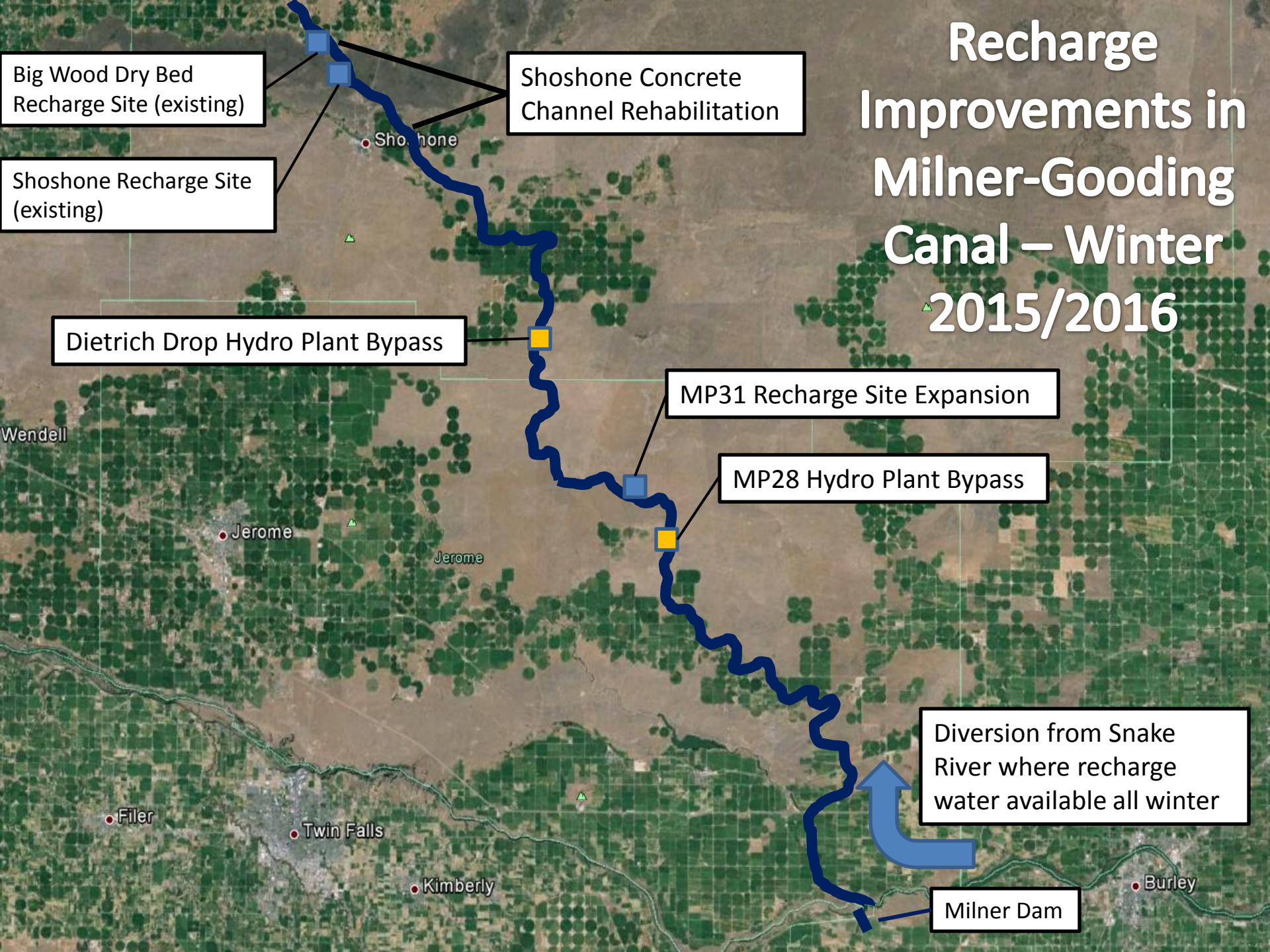
Recharge Improvements in Milner-Gooding Canal – Winter 2015/2016

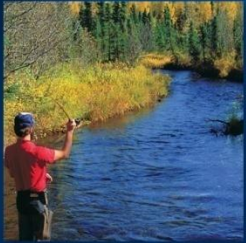
- Recharge water is available all winter
- Existing recharge sites along canal include MP31, Shoshone, and Big Wood Dry Bed – Shoshone and Big Wood cant be used in winter because of conveyance limitations
- Projects this coming winter will increase recharge capacity from:
 - ✓ 200 cfs (40,000 AF over 100 winter days) to
 - ✓ 600 cfs (120,000 AF over 100 winter days)
- Projects:

✓ MP31 expansion	\$200,000
✓ Concrete channel rehab at Shoshone	\$700,000 (state share)
✓ Access road improvements	\$150,000
✓ MP28 Hydro Plant bypass	\$60,000
✓ Dietrich Drop Hydro Plant bypass	TBD



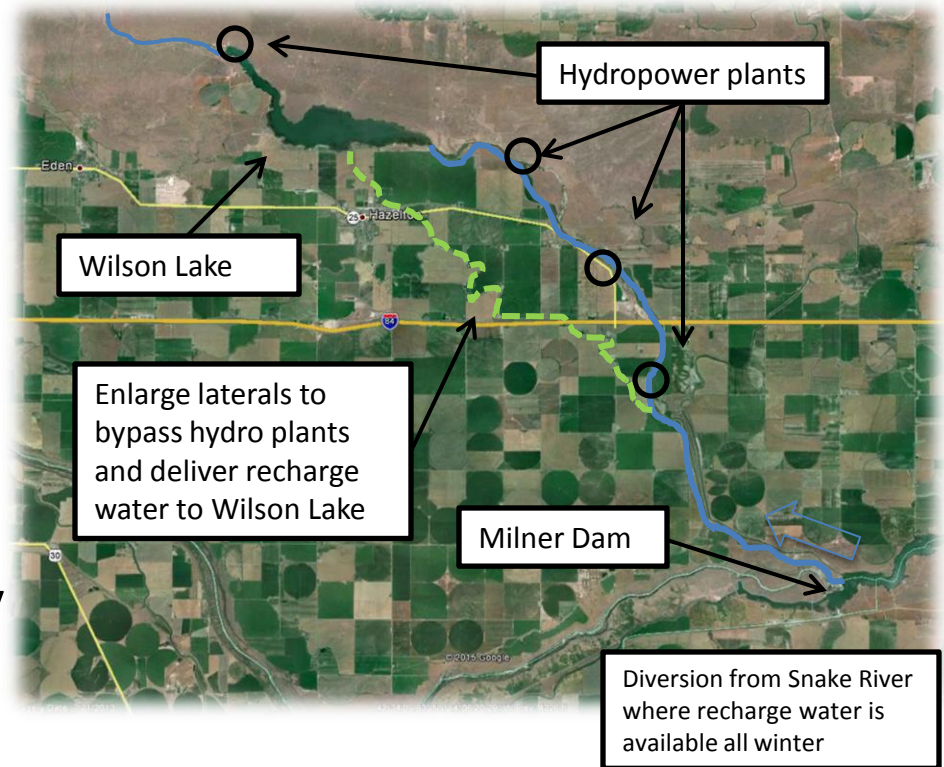
Recharge Improvements in Milner-Gooding Canal – Winter 2015/2016





North Side Canal Recharge Improvements – Winter 2016/2017

- Northside Canal – Milner to Wilson Lake
- 125 cfs recharge rate in Wilson Lake (25,000 AF over 100 days in winter)
- Recharge water all winter long
- Four hydropower plants
- Engineering underway by CH2M-Hill



Working with Canal Company Partners to Improve Systems for Recharge

Twin Falls Canal – improvements
for every-year recharge deliveries

- De-icing systems, spill structures
- Winter 2015/2016



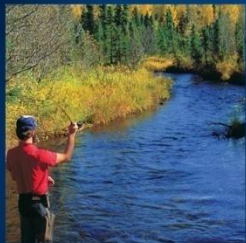
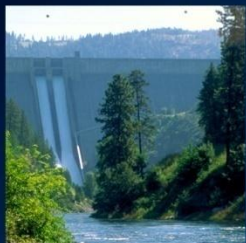
Icing on Murtaugh Lake outlet gates,
Nov. 2014

Southwest Irrigation District –
retrofit West Cassia Pipeline for
winter deliveries

- Future Years

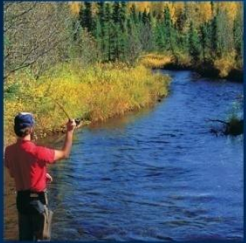
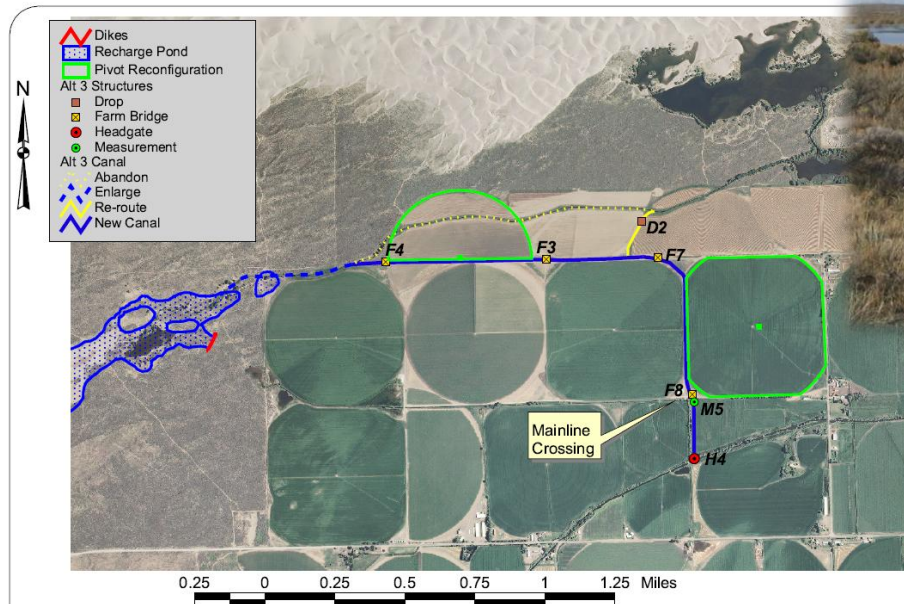


SWID Injection Well, 10 cfs, Feb 18th,
2015



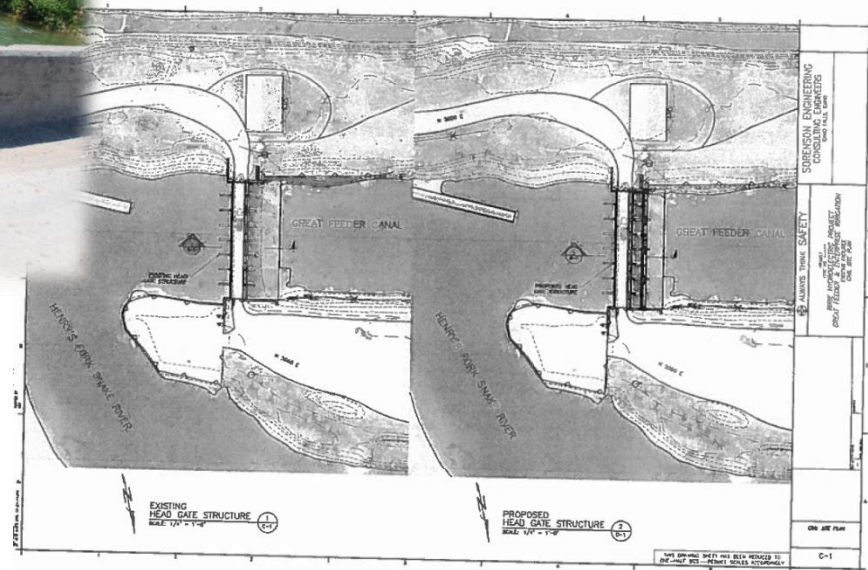
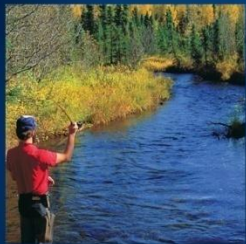
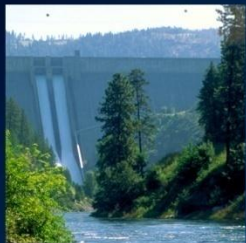
Upper Valley Recharge Infrastructure Projects

- Fremont-Madison Irrigation District – expand delivery capacity to Egin Bench Recharge areas
- Winter 2015/2016



Upper Valley Recharge Infrastructure Projects

- Great Feeder Canal Company – recharge conveyance project
- Winter 2015/2016



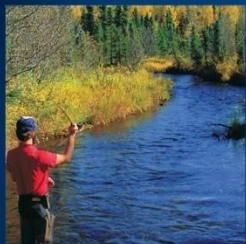
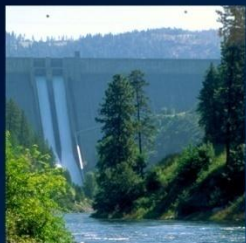
Upper Valley Recharge Infrastructure Projects

- Aberdeen-Springfield Canal Company – Hilton Spill Enlargement

•Winter 2015/2016



- Others – Peoples Canal?
Idaho Irrigation District?
Other canals?



ESPA Recharge – Monitoring Program

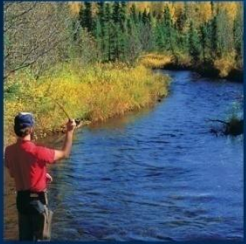
- **QA/QC Program**

- Recharge Flow Measurements
 - Cooperative Effort with:
 - Water District 01
 - Canal Companies
 - Idaho Power
 - IDWR Staff

- **Water Level Monitoring**

- **Dye Testing**

- **Water Quality Monitoring**



IDWR and NSCC staff measuring flows at the inlet to Wilson Lake on March 11th



LSRARD and Idaho Power assisting IDWR staff with borehole camera Milner Reservoir test well.

Winter 2015-2016 Recharge Operations Projection

- Downstream of Minidoka Dam (Lower Valley)**

	1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr
TFCC	50 cfs	50 cfs	50 cfs	50 cfs	50 cfs	
NSCC	125 cfs	canal/hydro maintenance	canal/hydro maintenance	125 cfs	125 cfs	
AFRD2	construction/maint.	200 cfs	200 cfs	200 cfs	200 cfs	
SWID				30 cfs	30 cfs	

✓ Projected total recharge ~ 100,000 AF

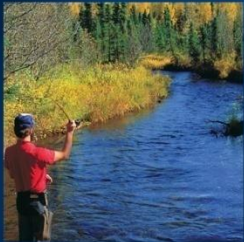
✓ Projected delivery costs ~ \$700,000

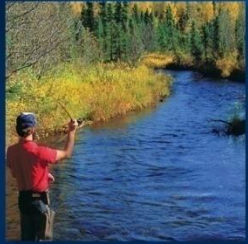
- Upstream of American Falls Reservoir (Upper Valley)**

✓ Projected total recharge = ?

✓ Projected delivery costs = ?

✓ Depends on water supply conditions!





ESPA Recharge for Aquifer Stabilization and Recovery – Costs & Timeline

- 200,000 AF/year average in 2019 (+/-)
- 250,000 AF/year average full build-out in 2025 (+/-)
- \$30M capital cost
- \$2-to-3M/year ongoing, for operations, maintenance, and replacements
- Schedule contingent on adequate resources (Cigarette Tax funds)

We need your help & support to get this done!



Measuring recharge
flow in Milner-
Gooding Canal
January 16, 2015

