NRCS Snotel site at Mores Creek
Courtesy Rick Raymondi

Marsh Creek, tributary of the Middle Fork of the Salmon River near Stanley, Idaho
Courtesy Rick Raymondi

Idaho Water Resource Board

Meeting No. 3-14
March 21, 2014
Boise, Idaho

MEDIA

WORK SESSION IN PREPARATION FOR
IWRB MEETING NO. 3-14

March 20, 2014 at 8:30 am
Idaho Water Center
Conference Rooms 602 B,C,D
322 East Front Street, Boise, ID 83702

WORK SESSION AGENDA

1. Water Supply Update
2. Lemhi River Ground Water-Surface Water Interaction Study
3. Water Supply Bank (See Tab 9 under IWRB meeting)
   a. Annual Report
   b. Proposed Guidance
4. Storage Studies Update
5. Henrys Fork Basin Study Results
6. Curtailment Issues
   a. Surface Water Coalition
   b. Rangen
7. US Army Corps of Engineers Surplus Water Issue
8. ESPA Management
   a. Recharge
   b. 2014 Farm Bill Implications

----*The Board will break for lunch at approximately 12:00 pm*----

---

FINANCIAL PROGRAMS COMMITTEE
MEETING NO. 1-14

Idaho Water Center
Conference Rooms 602 B,C,D
322 East Front Street, Boise, ID 83702
March 20, 2014 upon adjournment of Work Session

1. Introductions
2. Loan Interest Rates
3. Adjournment

Americans with Disabilities

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email Mandi.Pearson@idwr.idaho.gov or by phone at (208) 287-4800.

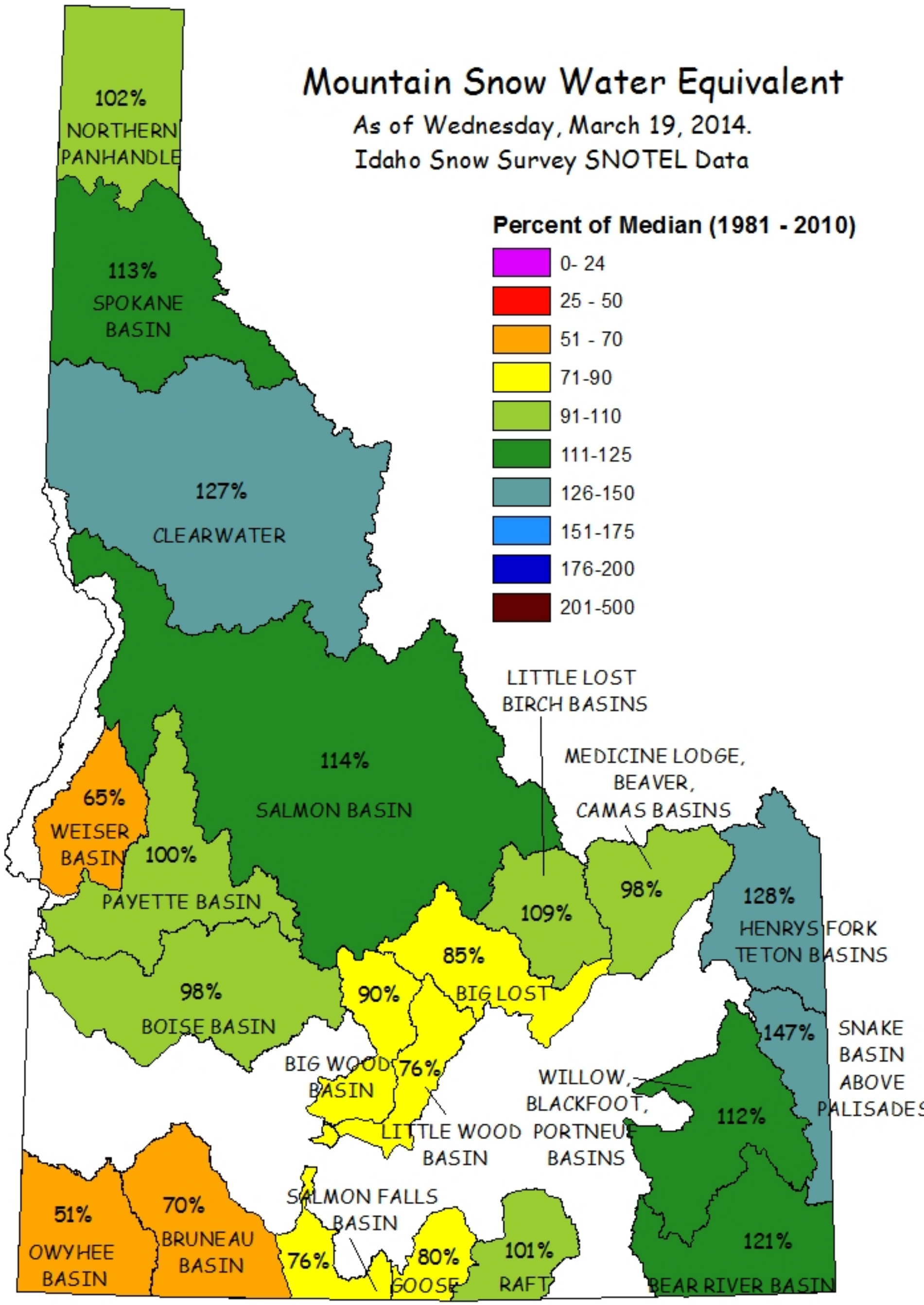
Idaho Water Supply

Presented by Liz Cresto

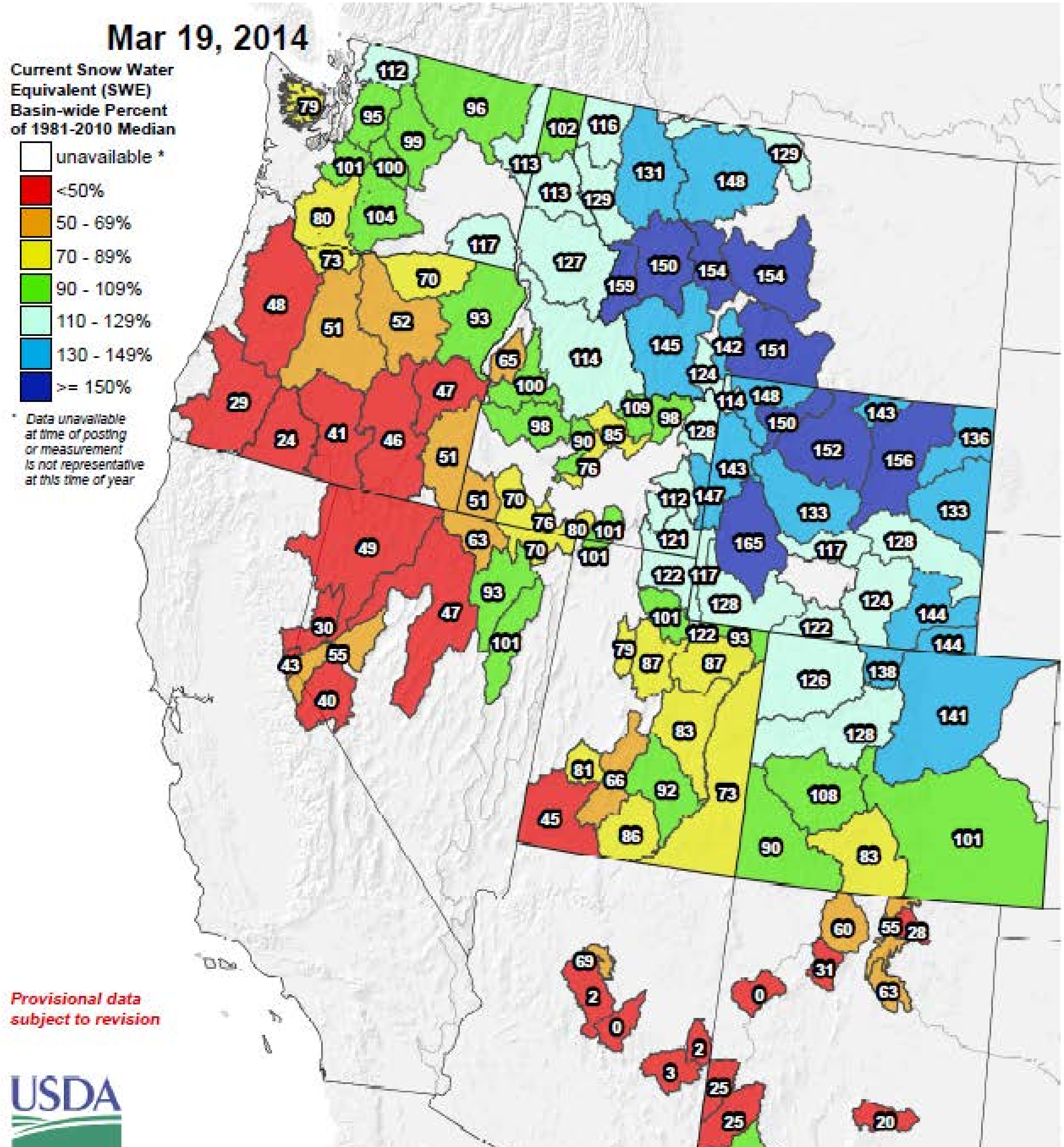
March 20, 2014

IDAHO Department of Water Resources

Current Snowpack
51% - 147% of median.



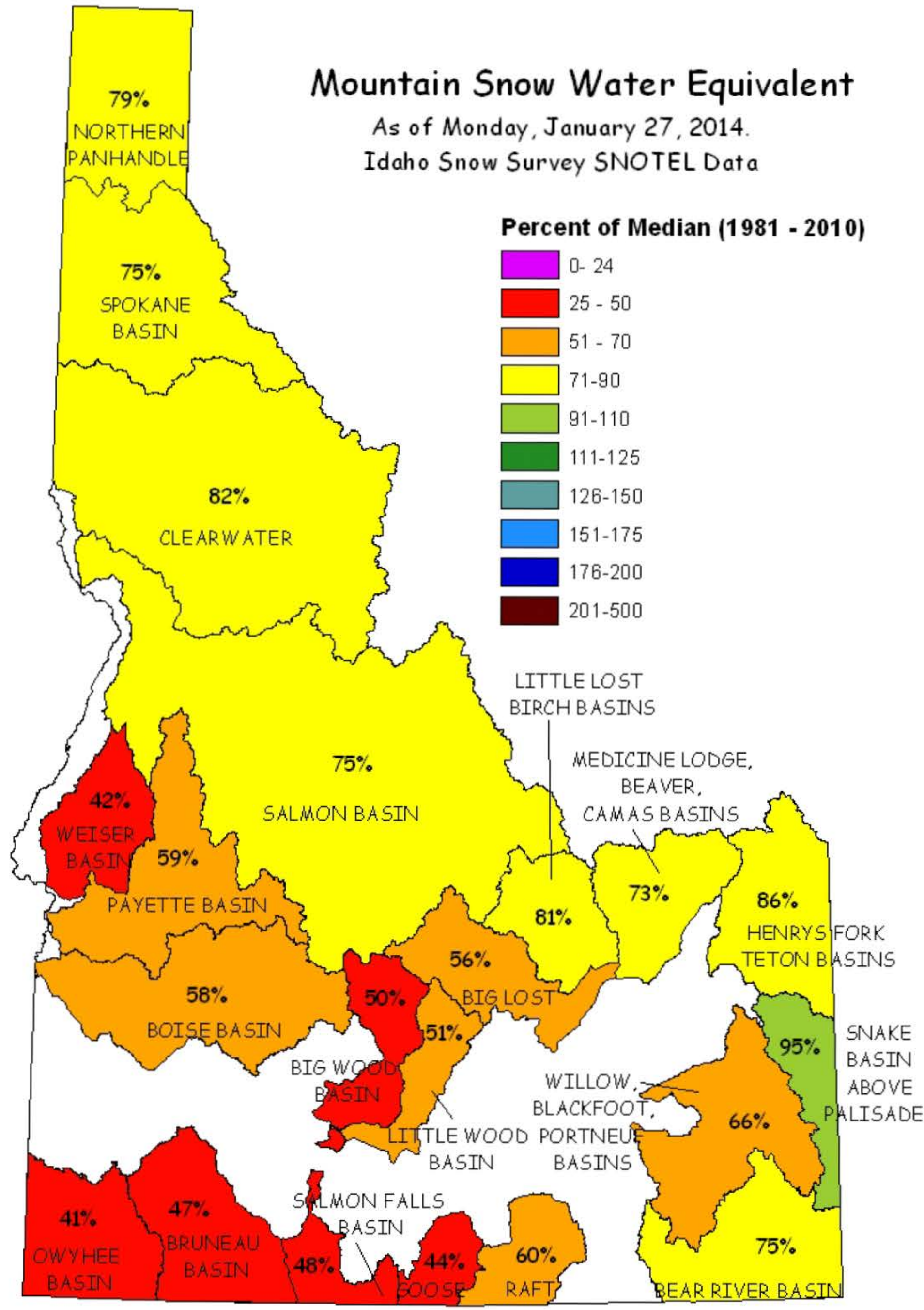
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal



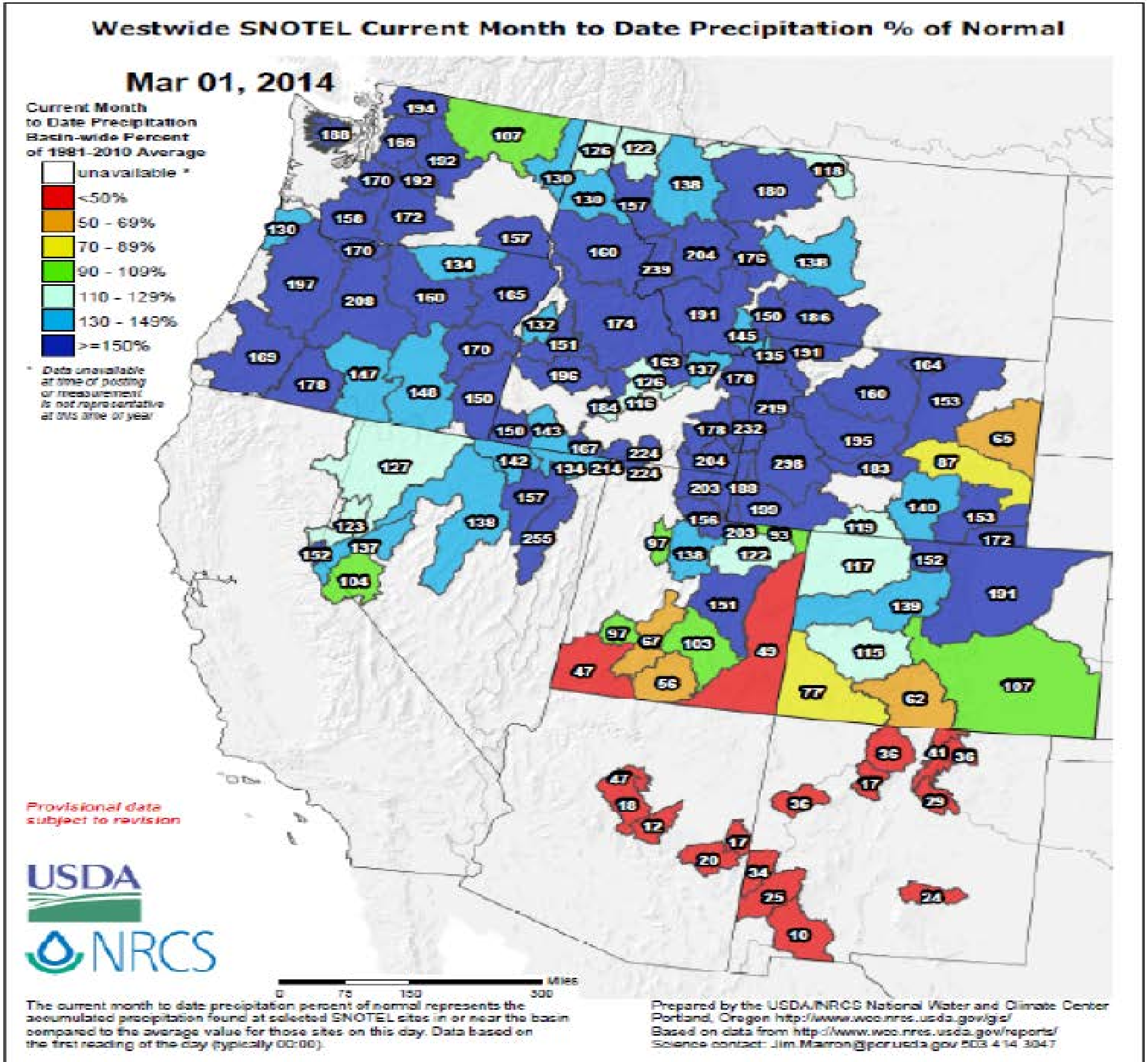
IDAHO Department of Water Resources

A Slow Start

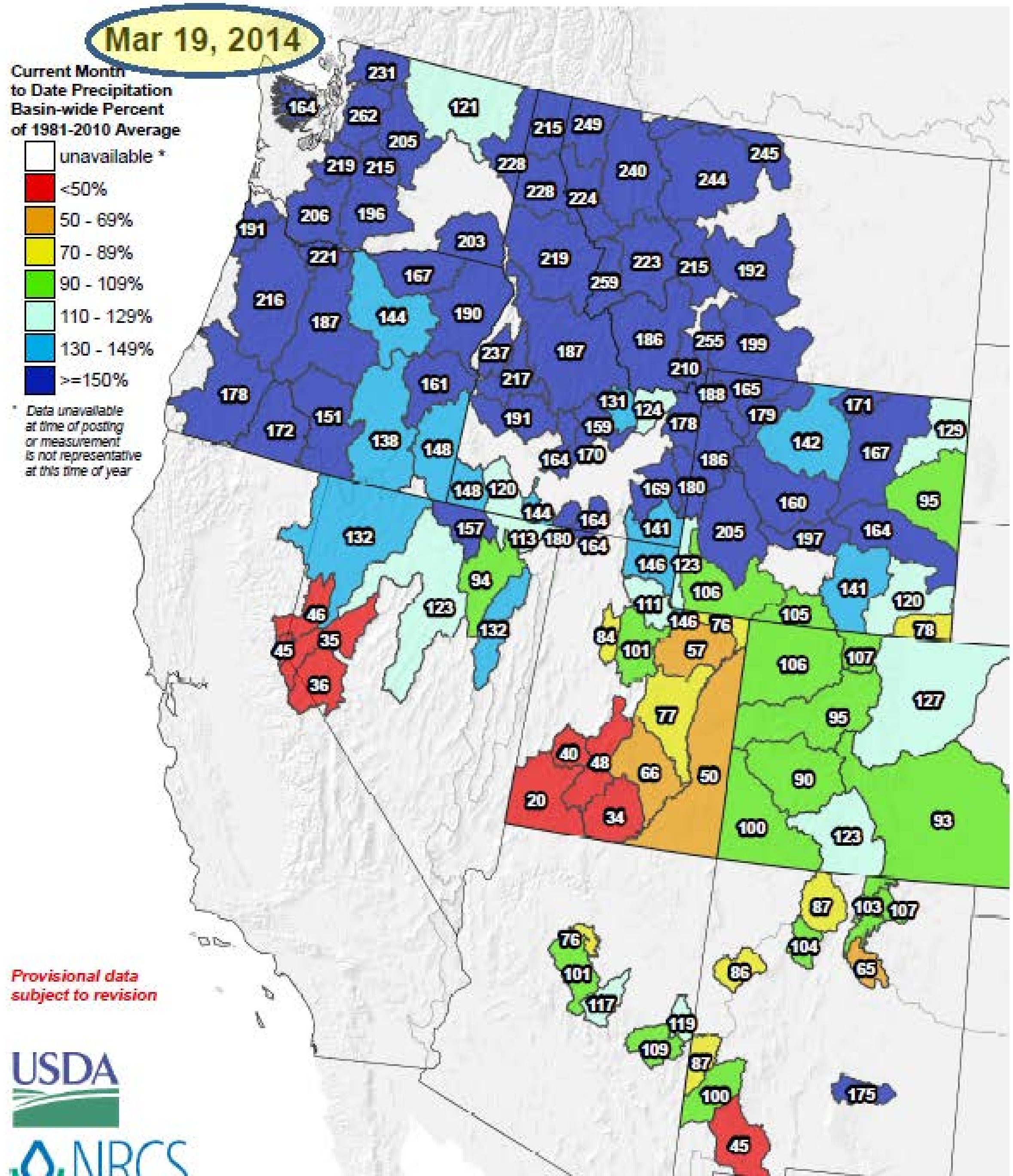
January 27, 2014

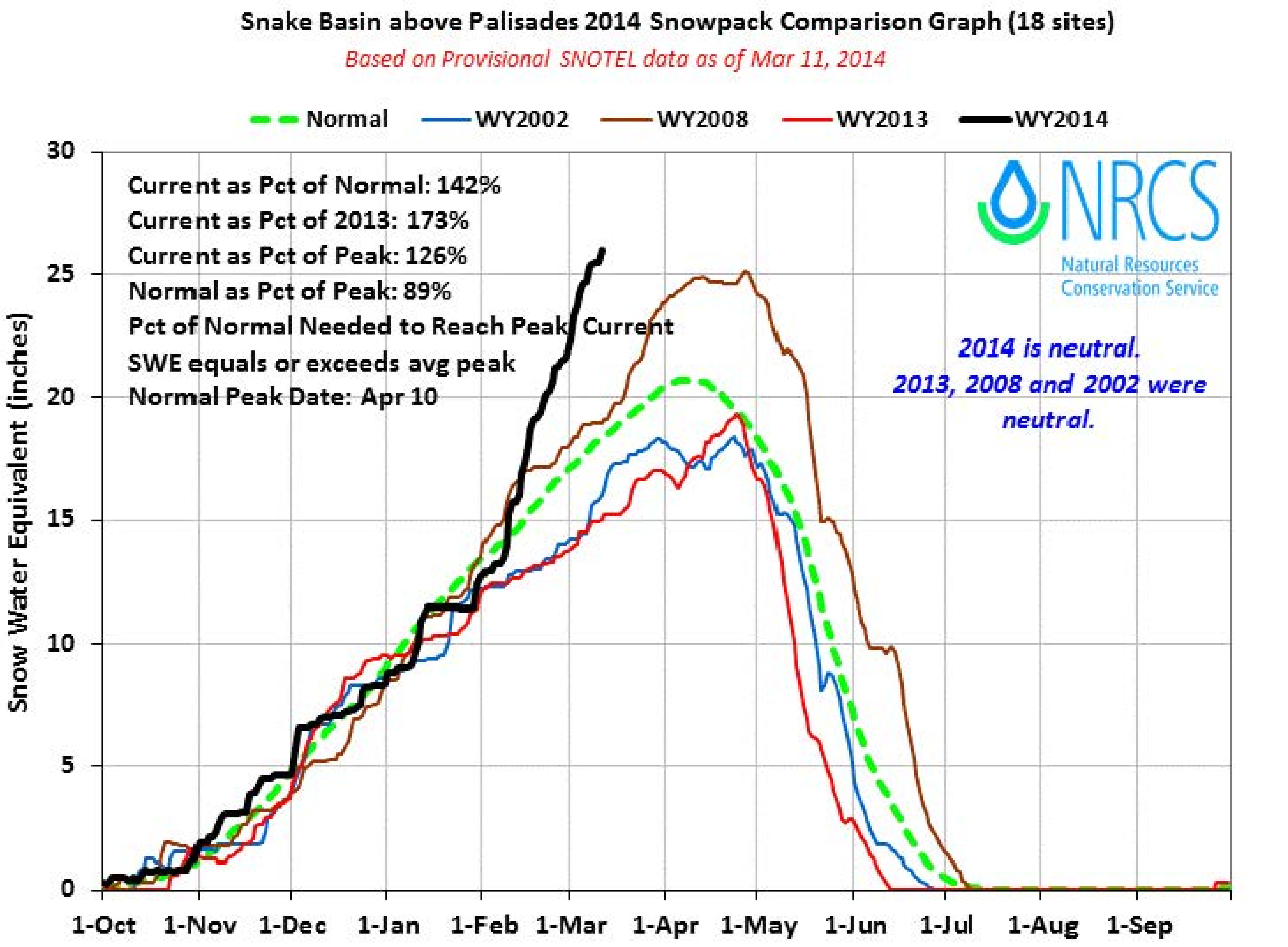


February SNOTEL Precipitation as % of Normal



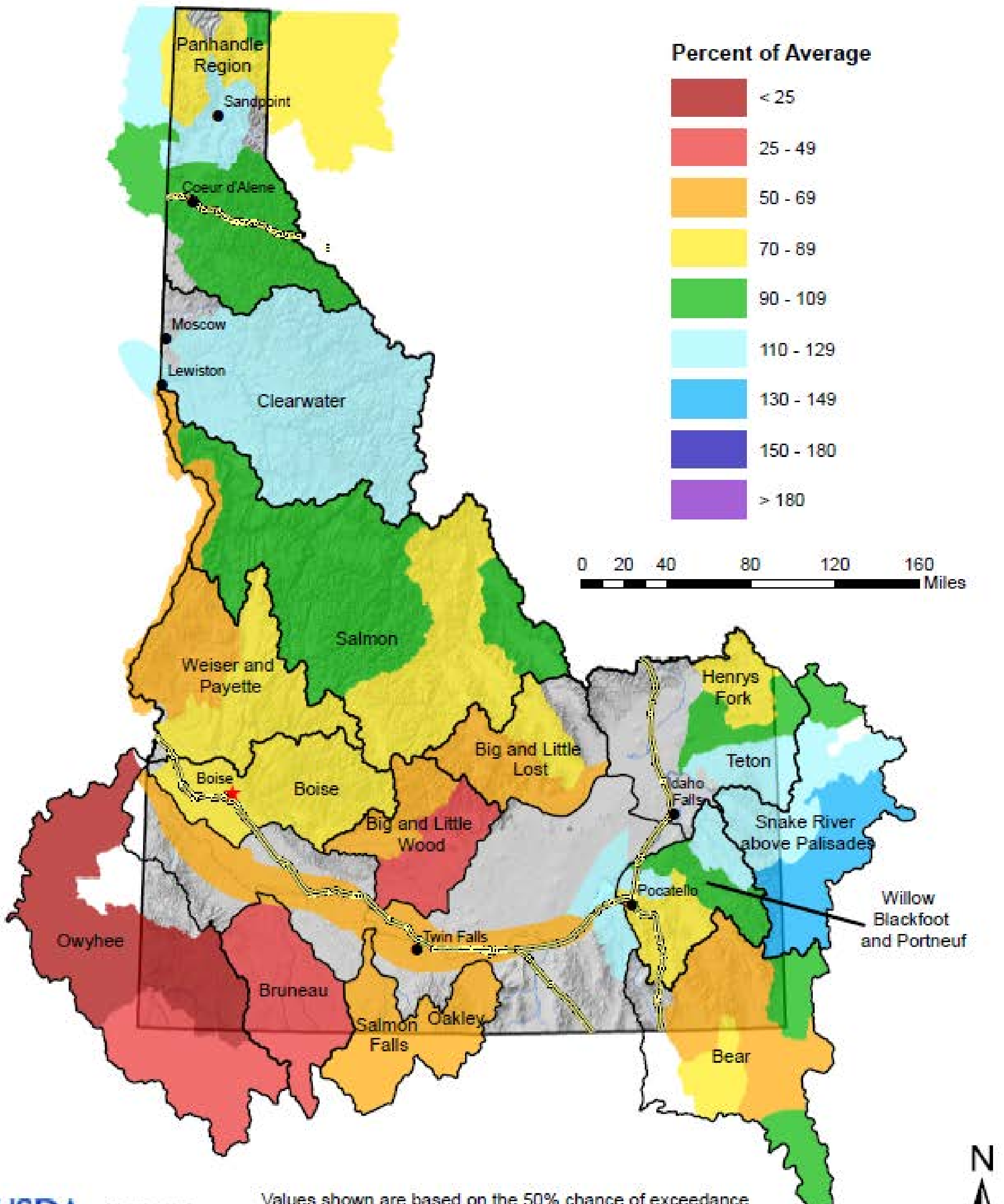
Westwide SNOTEL Current Month to Date Precipitation % of Normal





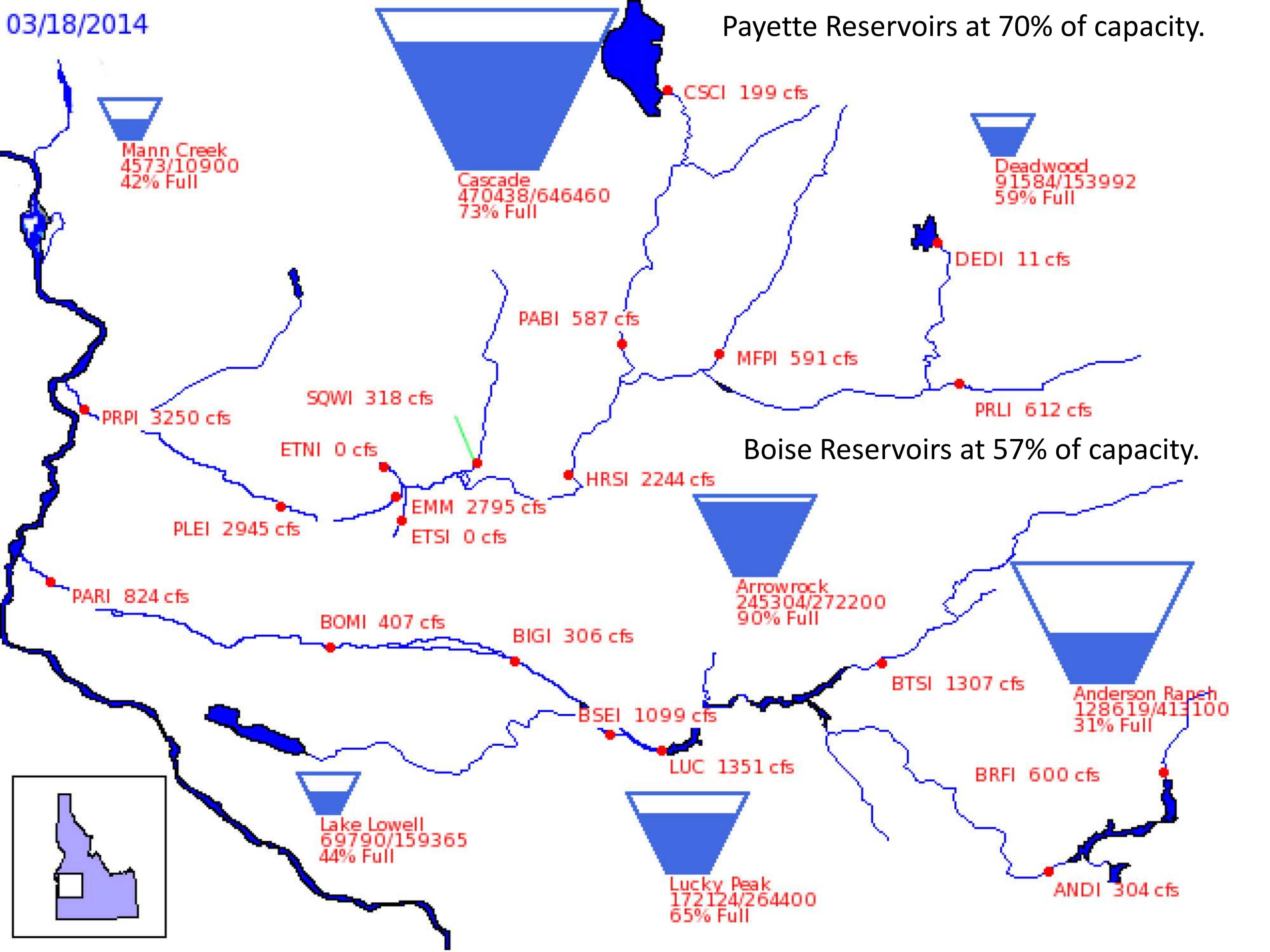
Snake Basin above Palisades 2014 Snowpack Comparison Graph (18 sites)
Based on Provisional SNOTEL data as of Mar 11, 2014
Normal
WY2002
WY2008
WY2013
WY2014
Current as Pct of Normal: 142%
Current as Pct of 2013: 173%
Current as Pct of Peak: 126%
Normal as Pct of Peak: 89%
Pct of Normal Needed to Reach Peak: Current
SWE equals or exceeds avg peak
Normal Peak Date: Apr 10
NRCS
Natural Resources
Conservation Service
2014 is neutral.
2013, 2008 and 2002 were
neutral.
Snow Water Equivalent (inches)
0
5
10
15
20
25
30
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep

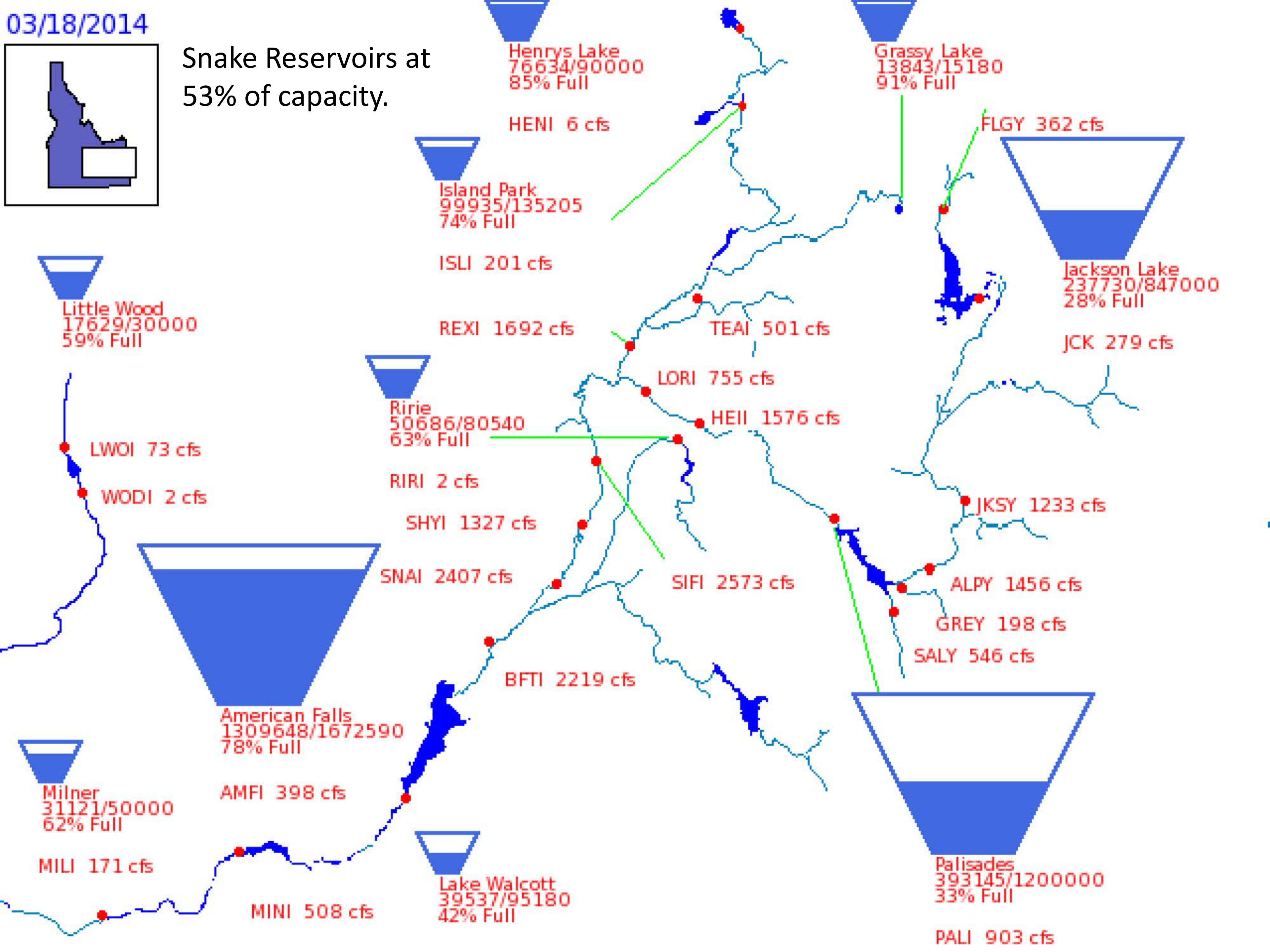
NRCS Streamflow April - July Streamflow Forecasts
March 1, 2014



USDA United States Department of Agriculture

Values shown are based on the 50% chance of exceedance forecasts. Forecast period varies for some basins. Please refer to the Water Supply Outlook Report for more details regarding these forecasts.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/


03/18/2014
Payette Reservoirs at 70% of capacity.
Boise Reservoirs at 57% of capacity.
Mann Creek
4573/10900
42% Full
Cascade
470438/646460
73% Full
CSCI 199 cfs
Deadwood
91584/153992
59% Full
DEDI 11 cfs
PABI 587 cfs
MFPI 591 cfs
PRLI 612 cfs
SQWI 318 cfs
PRPI 3250 cfs
ETNI 0 cfs
HRSI 2244 cfs
EMM 2795 cfs
PLEI 2945 cfs
ETSI 0 cfs
Arrowrock
245304/272200
90% Full
PARI 824 cfs
BOMI 407 cfs
BIGI 306 cfs
BTSI 1307 cfs
Anderson Ranch
128619/413100
31% Full
BSEI 1099 cfs
LUC 1351 cfs
BRFI 600 cfs
Lake Lowell
69790/159365
44% Full
Lucky Peak
172124/264400
65% Full
ANDI 304 cfs

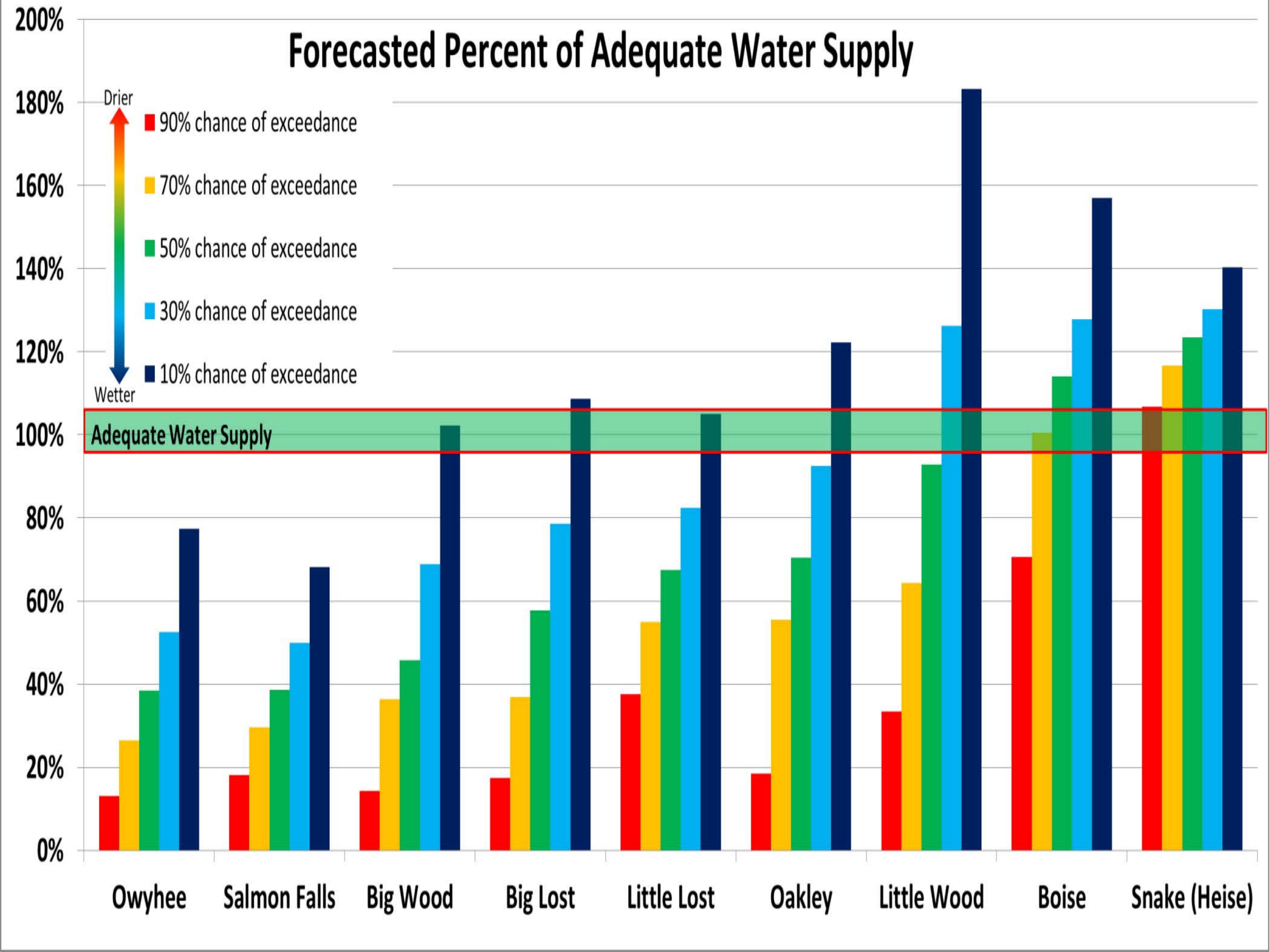

03/18/2014
Snake Reservoirs at 53% of capacity.
Henrys Lake
76634/90000
85% Full
HENI 6 cfs
Grassy Lake
13843/15180
91% Full
FLGY 362 cfs
Island Park
99935/135205
74% Full
ISLI 201 cfs
Jackson Lake
237730/847000
28% Full
JCK 279 cfs
Little Wood
17629/30000
59% Full
REXI 1692 cfs
TEAI 501 cfs
LORI 755 cfs
Ririe
50686/80540
63% Full
HEII 1576 cfs
LWOI 73 cfs
RIRI 2 cfs
WODI 2 cfs
SHYI 1327 cfs
JKSY 1233 cfs
SNAI 2407 cfs
SIFI 2573 cfs
ALPY 1456 cfs
GREY 198 cfs
SALY 546 cfs
BFTI 2219 cfs
American Falls
1309648/1672590
78% Full
AMFI 398 cfs
Milner
31121/50000
62% Full
MILI 171 cfs
MINI 508 cfs
Lake Walcott
39537/95180
42% Full
Palisades
393145/1200000
33% Full
PALI 903 cfs

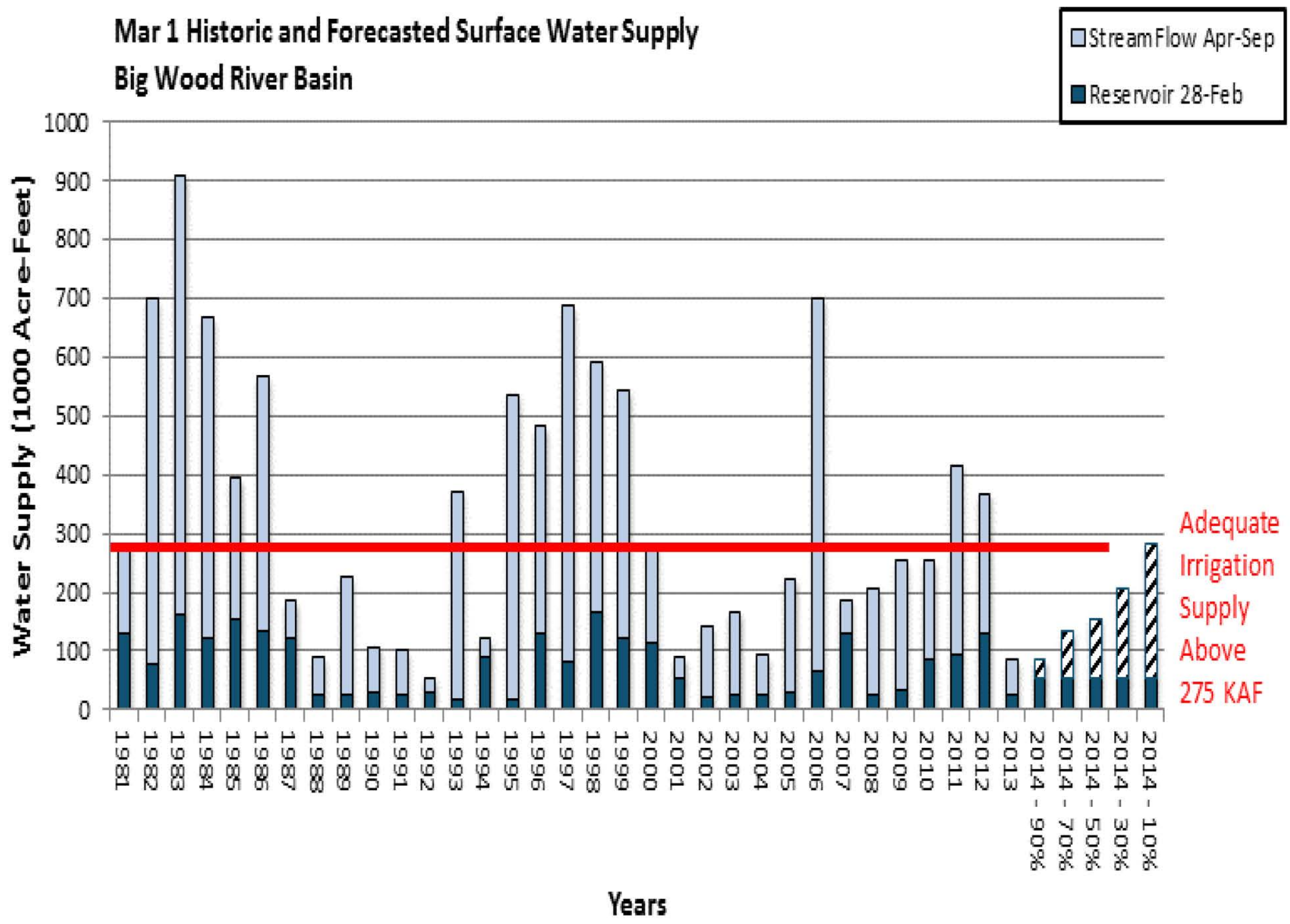
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) March 1, 2014

BASIN or REGION	*SWSI Value*	*Most Recent Year With Similar SWSI Value*	*Agricultural Water Supply Shortage May Occur When SWSI is Less Than*
Northern Panhandle	-0.4	2000/2007	NA
Spokane	-0.1	2006	NA
Clearwater	2.1	2009/2012	NA
Salmon	0.1	2010	NA
Weiser	-2.1	2004/2013	NA
Payette	-1.8	2002/2005	NA
Boise	-1.1	2002/2003	-1.5
Big Wood	-1.8	2002/2003	0.0
Little Wood	-2.8	2002/2013	-1.7
Big Lost	-1.6	2000/2007	0.5
Little Lost	-1.3	2000/2008	1.2
Teton	0.9	2006/2009	-3.9
Henrys Fork	-0.1	2000/2012	-3.4
Snake (Heise)	1.1	2006/2012	-1.5
Oakley	-2.3	2002/2004	-0.2
Salmon Falls	-3.3	2003	-1.0
Bruneau	-2.6	2007/2013	NA
Owyhee	-3.8	1992/2003	-3.4
Bear River	0.4	2001/2013	-2.7

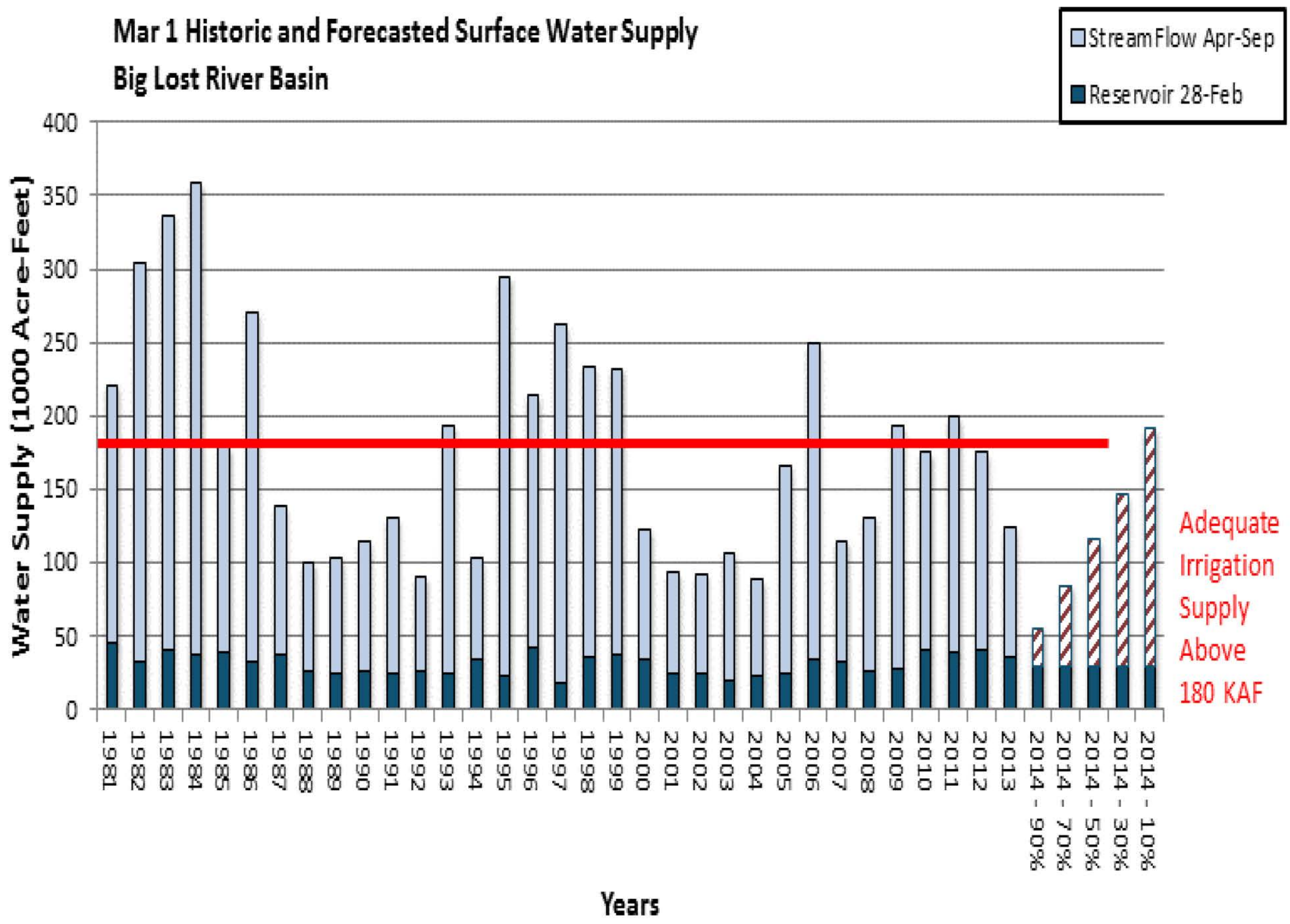
SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION

```
 -4      -3      -2      -1       0       1       2       3       4
  |-------|-------|-------|-------|-------|-------|-------|-------|
 99%     87%     75%     63%     50%     37%     25%     13%     1%
-------------------------------------------------------------------
|Much    | Below      |        Near Normal        | Above    | Much  |
|Below   | Normal     |        Water Supply       | Normal   | Above |
-------------------------------------------------------------------
```


Forecasted Percent of Adequate Water Supply
Drier
Wetter
90% chance of exceedance
70% chance of exceedance
50% chance of exceedance
30% chance of exceedance
10% chance of exceedance
Adequate Water Supply
200%
180%
160%
140%
120%
100%
80%
60%
40%
20%
0%
Owyhee
Salmon Falls
Big Wood
Big Lost
Little Lost
Oakley
Little Wood
Boise
Snake (Heise)

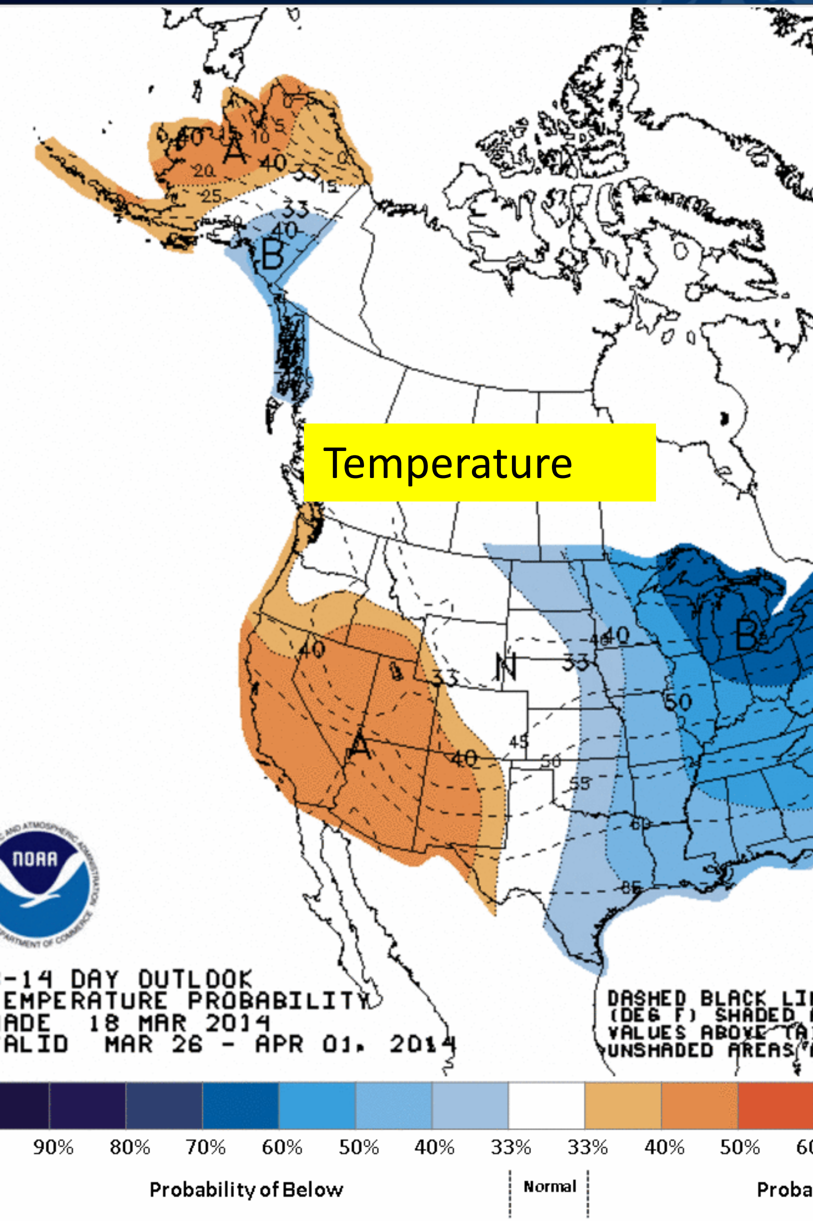


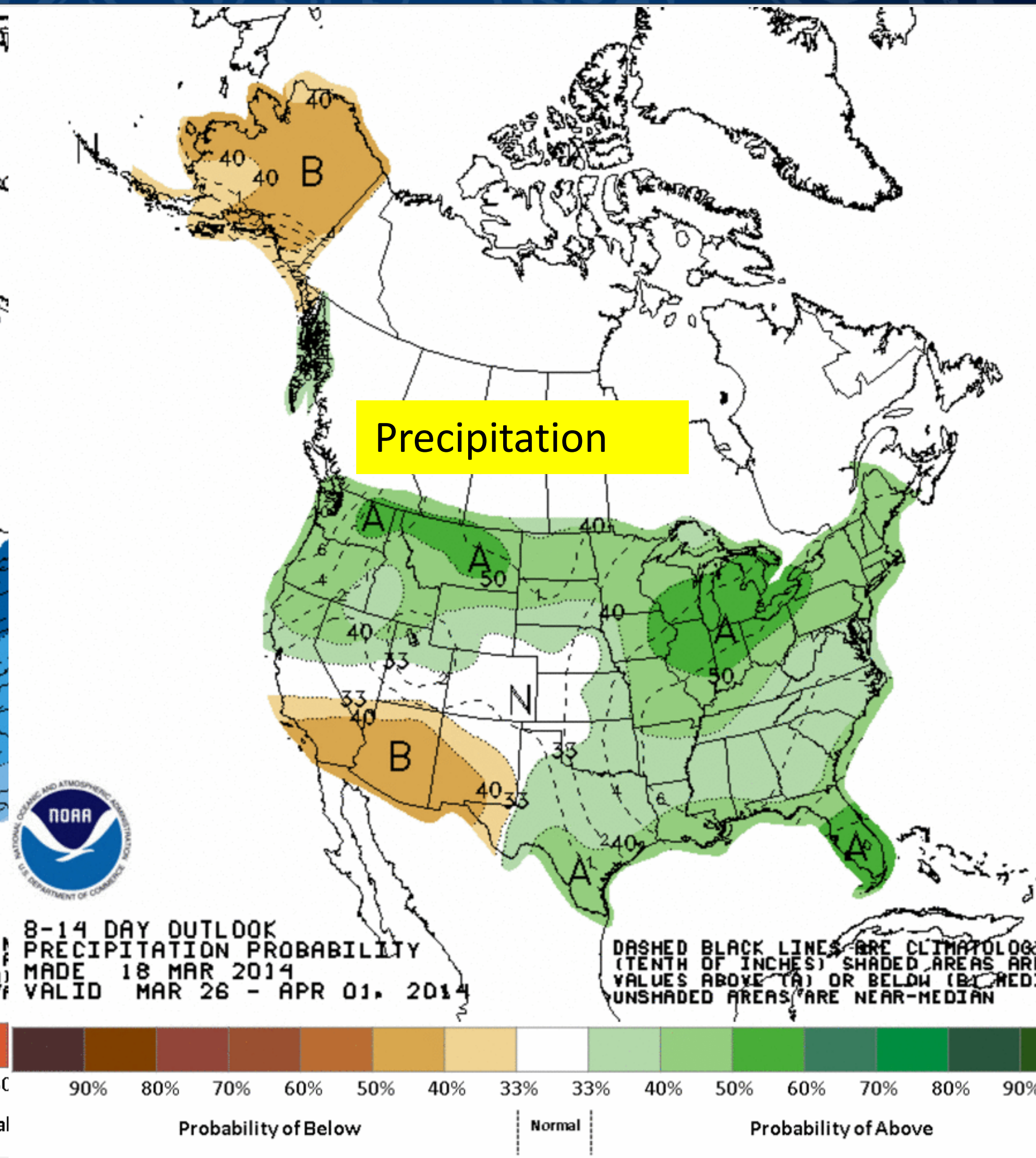
Mar 1 Historic and Forecasted Surface Water Supply
Big Wood River Basin
StreamFlow Apr-Sep
Reservoir 28-Feb
Water Supply (1000 Acre-Feet)
0
100
200
300
400
500
600
700
800
900
1000
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014 - 90%
2014 - 70%
2014 - 50%
2014 - 30%
2014 - 10%
Years
Adequate Irrigation Supply Above 275 KAF


Mar 1 Historic and Forecasted Surface Water Supply
Big Lost River Basin
StreamFlow Apr-Sep
Reservoir 28-Feb
Water Supply (1000 Acre-Feet)
400
350
300
250
200
150
100
50
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014 - 90%
2014 - 70%
2014 - 50%
2014 - 30%
2014 - 10%
Adequate
Irrigation
Supply
Above
180 KAF
Years

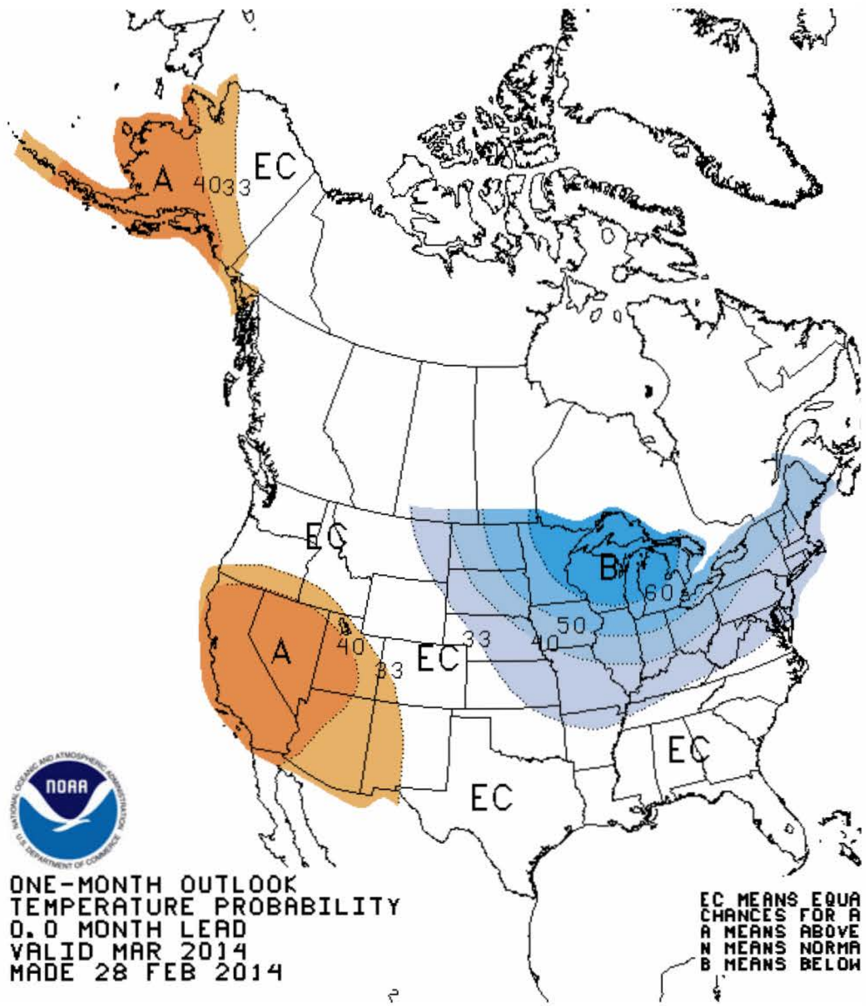
IDAHO Department of Water Resources

8-14 Day Outlook

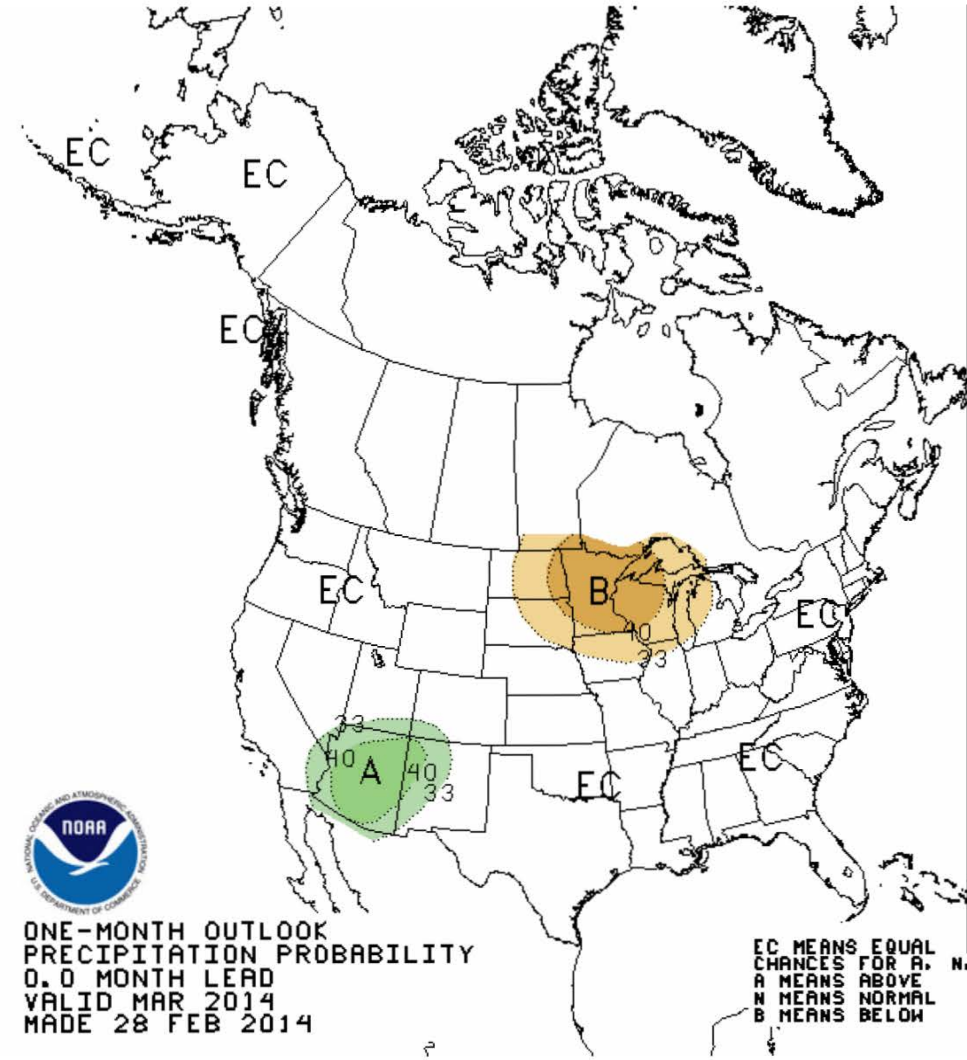




One Month Outlook



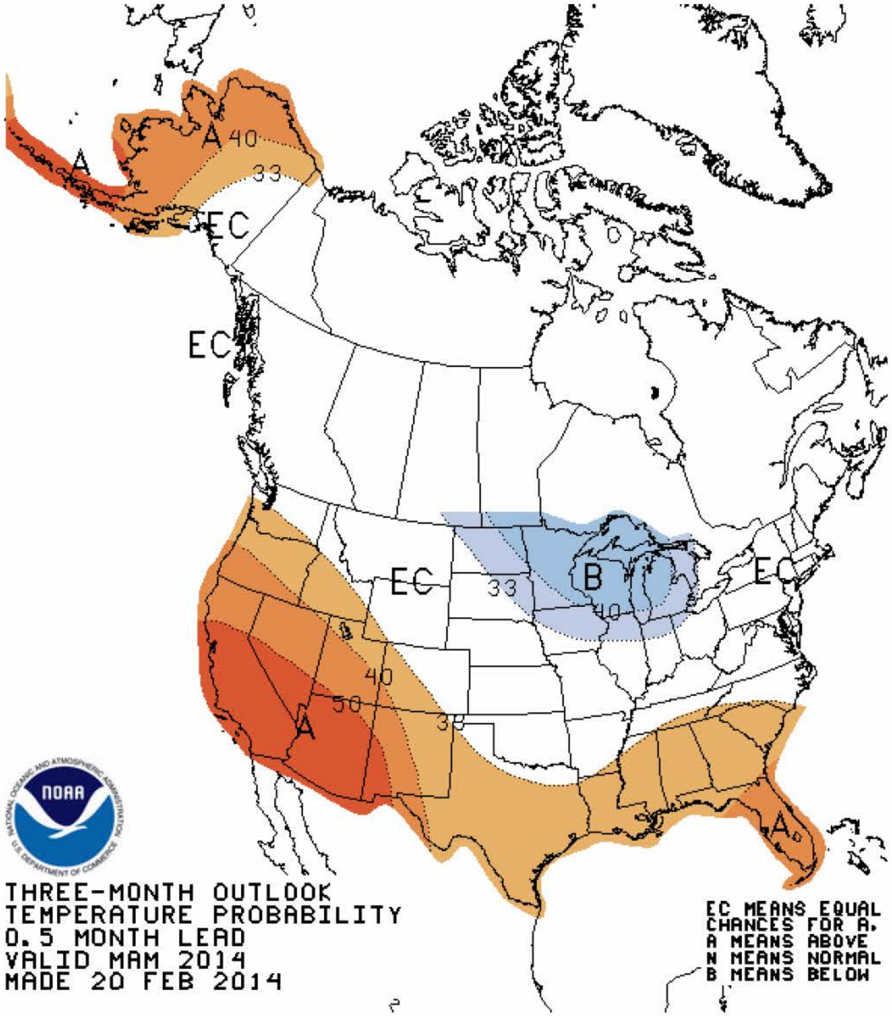
Temperature



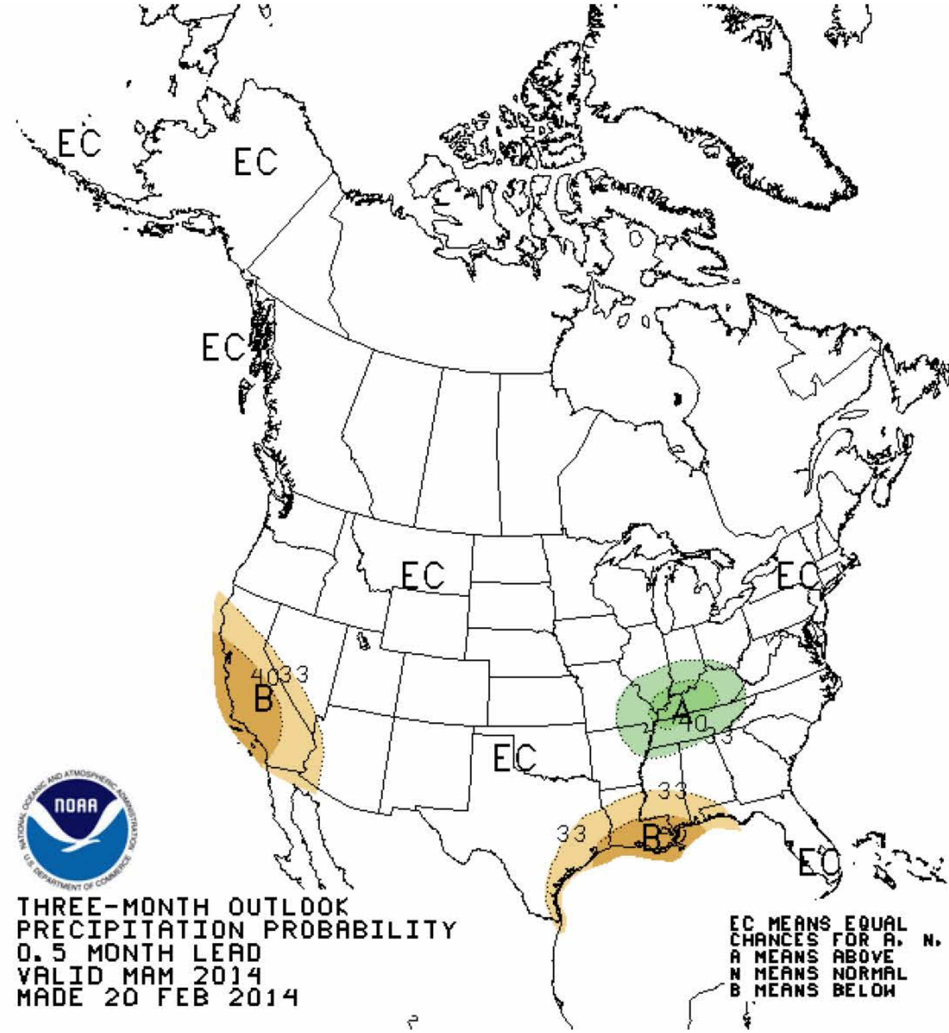
Precipitation

IDAHO Department of Water Resources

Three Month Outlook



Temperature



Precipitation

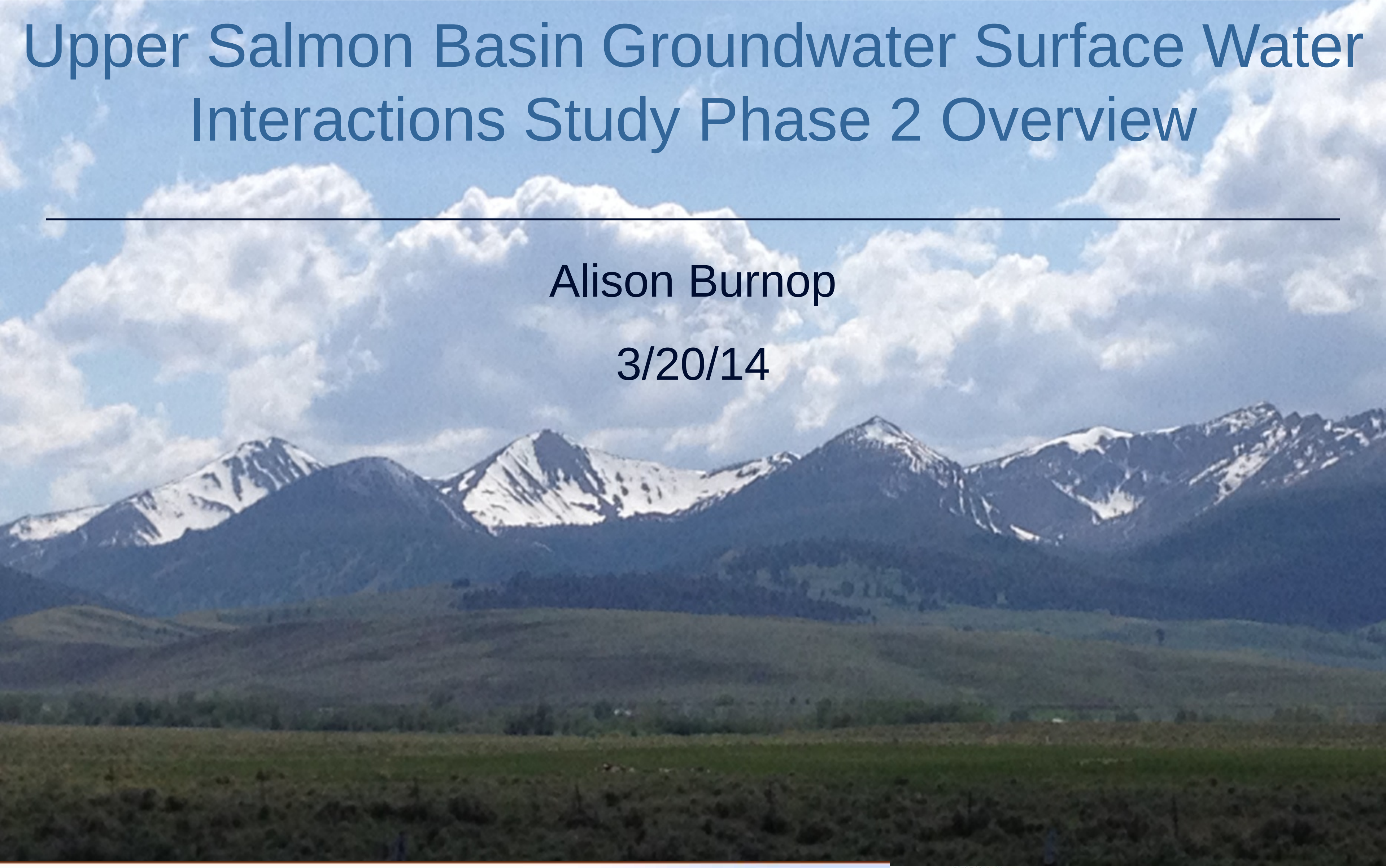
Western Owyhee County, Oregon, January, 2014

Questions?

More Information:
Liz.cresto@idwr.idaho.gov
208-287-4833
http://www.idwr.idaho.gov/WaterInformation/WaterSupply/supply.htm

Photo: Courtesy of Brian Sauer, USBR

Upper Salmon Basin Groundwater Surface Water Interactions Study Phase 2 Overview



Alison Burnop

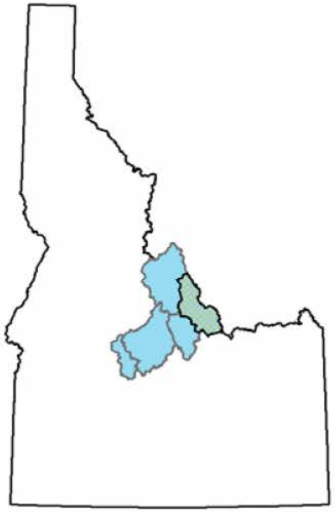
3/20/14

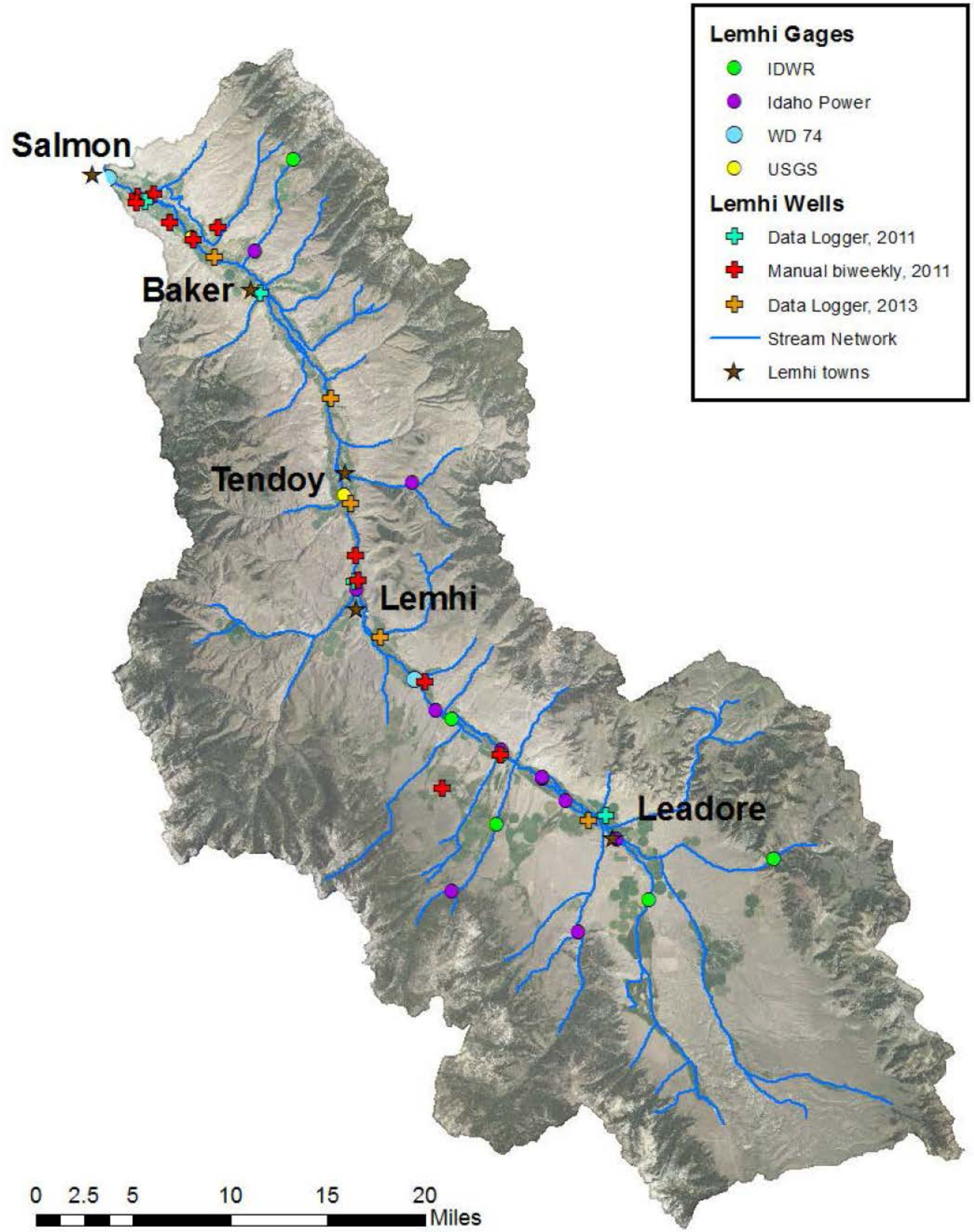
IDAHO Department of Water Resources

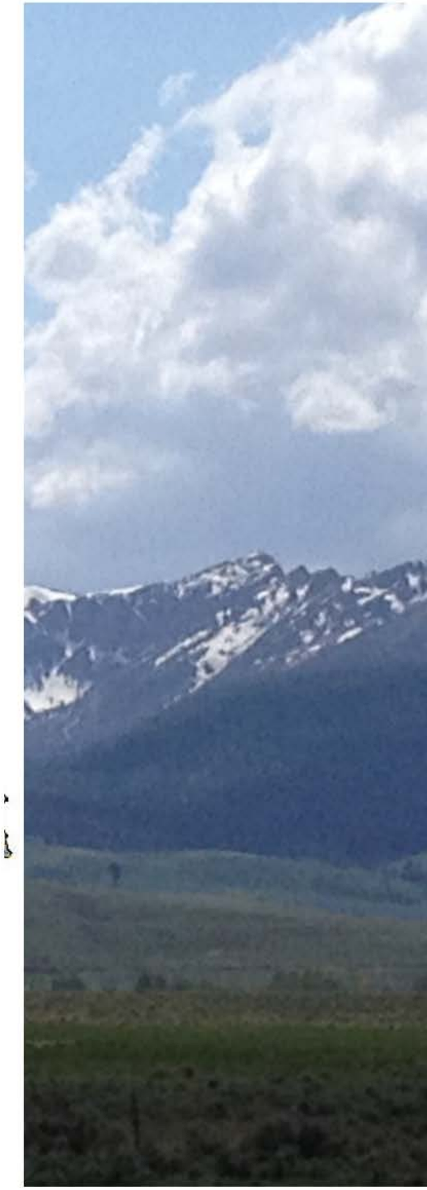
IDWR

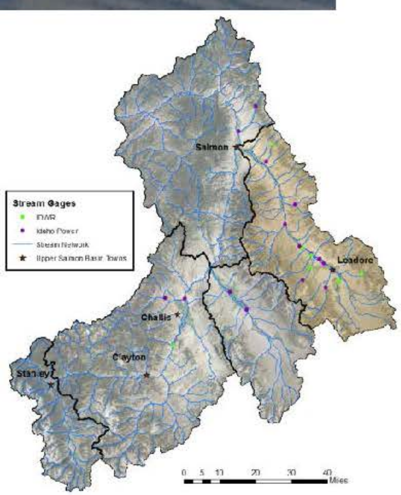
NOAA FISHERIES

PACIFIC COASTAL SALMON RECOVERY FUND




Lemhi Gages
IDWR
Idaho Power
WD 74
USGS
Lemhi Wells
Data Logger, 2011
Manual biweekly, 2011
Data Logger, 2013
Stream Network
Lemhi towns
Salmon
Baker
Tendoy
Lemhi
Leadore
0 2.5 5 10 15 20
Miles

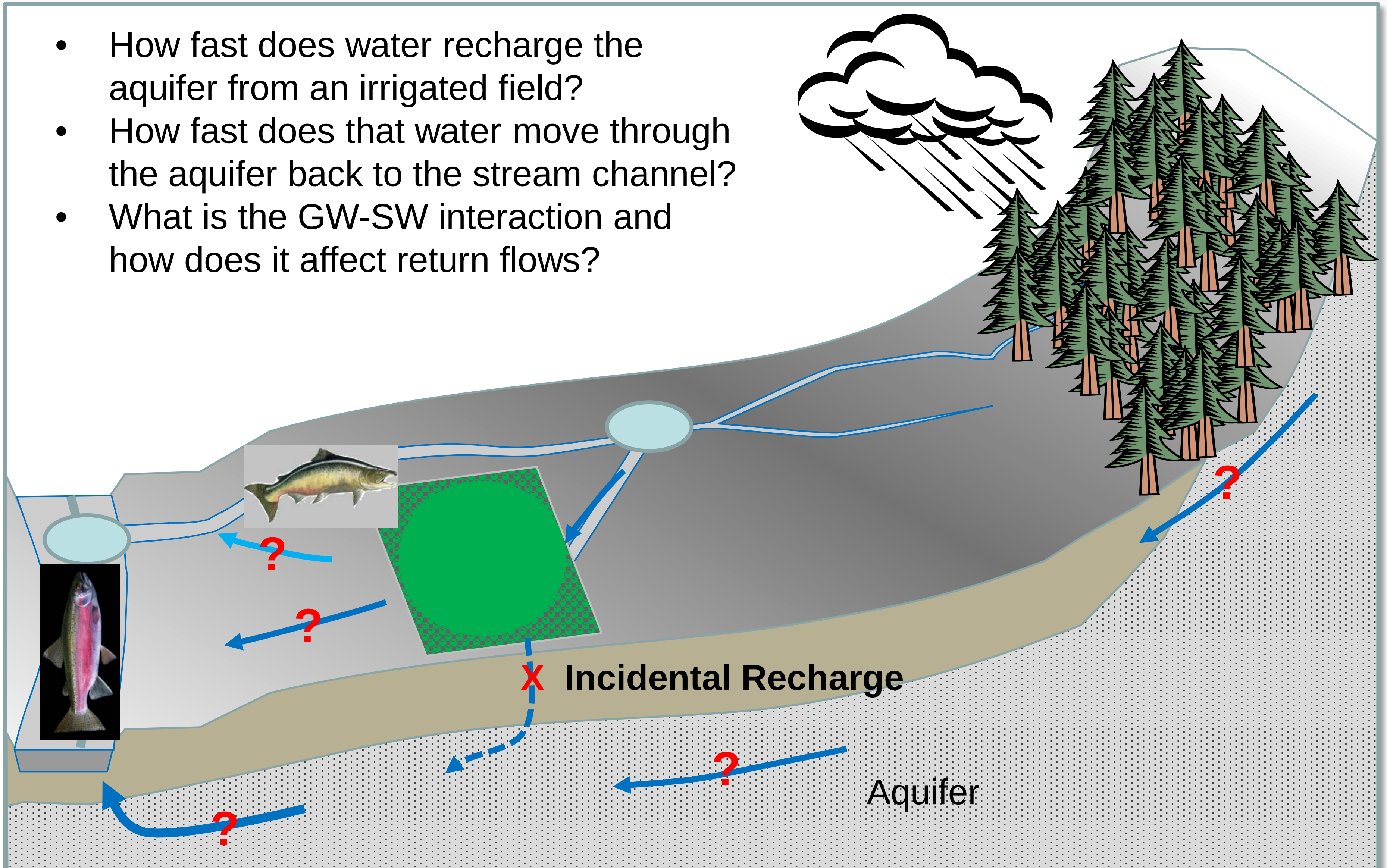



Stream Gages
IDWR
Idaho Power
Stream Network
Salmon
Leadore
Challis
Clayton
Stanley

IDAHO Department of Water Resources

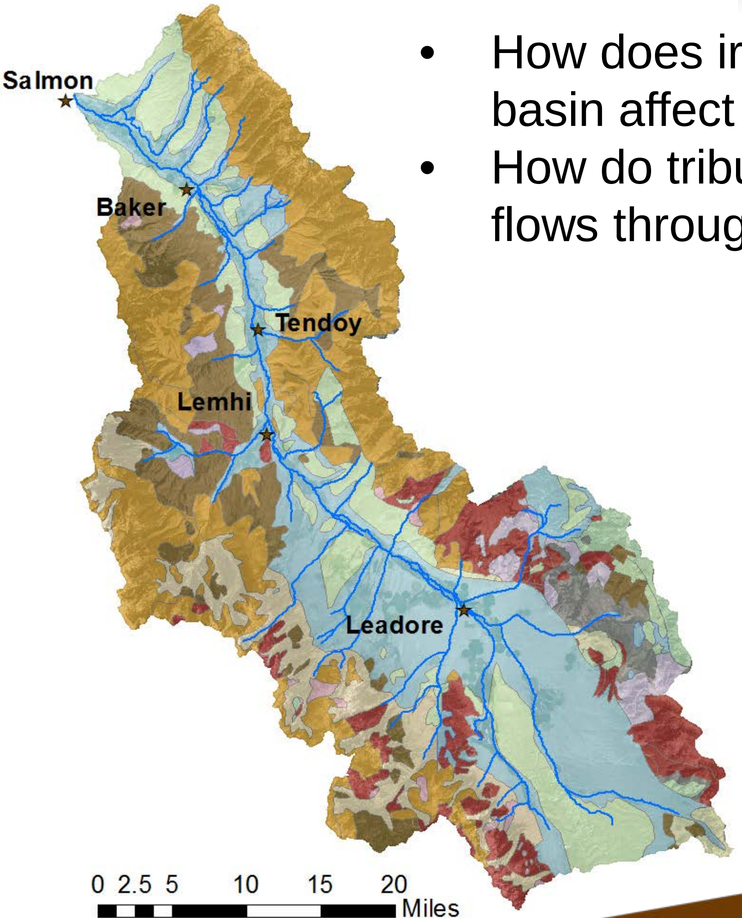
Overall Purpose

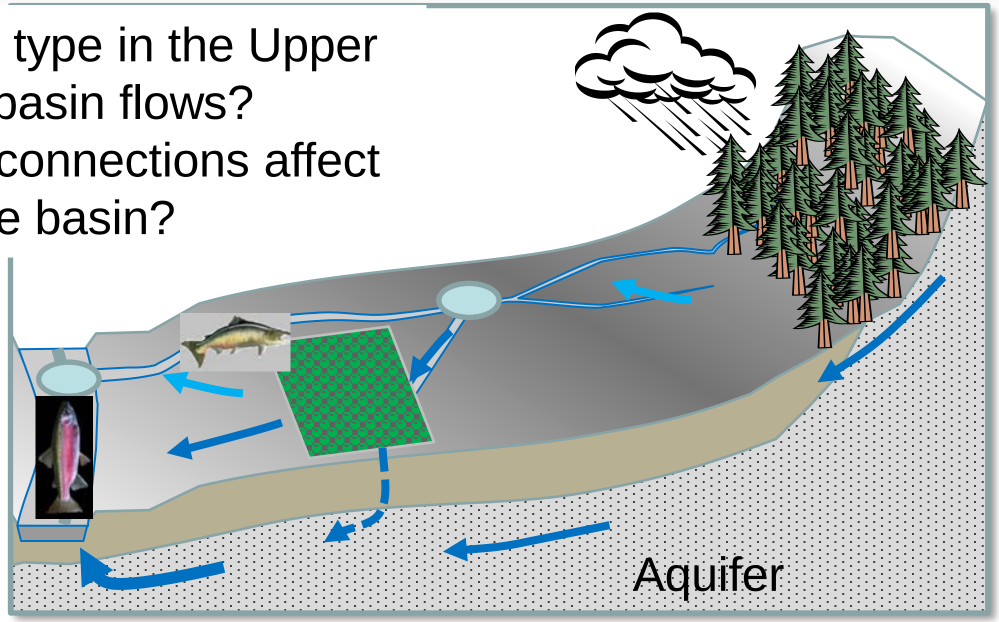
- How fast does water recharge the aquifer from an irrigated field?
- How fast does that water move through the aquifer back to the stream channel?
- What is the GW-SW interaction and how does it affect return flows?

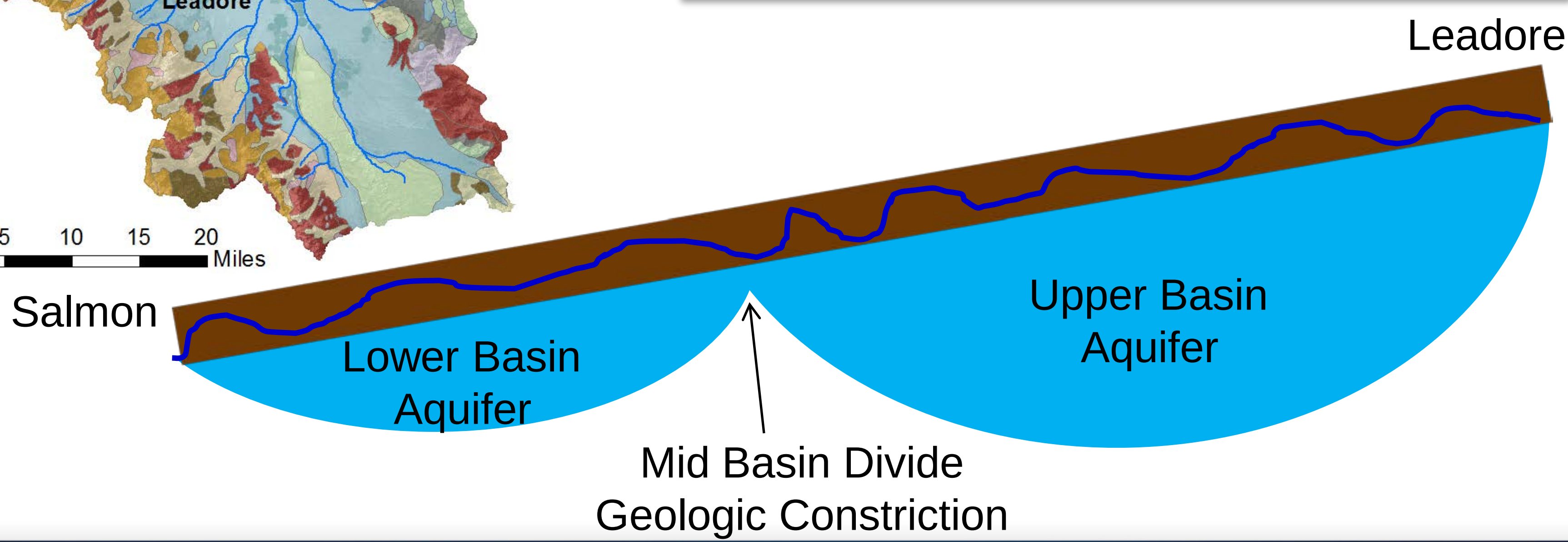


Overall Purpose

- How does irrigation type in the Upper basin affect Lower basin flows?
- How do tributary reconnections affect flows throughout the basin?







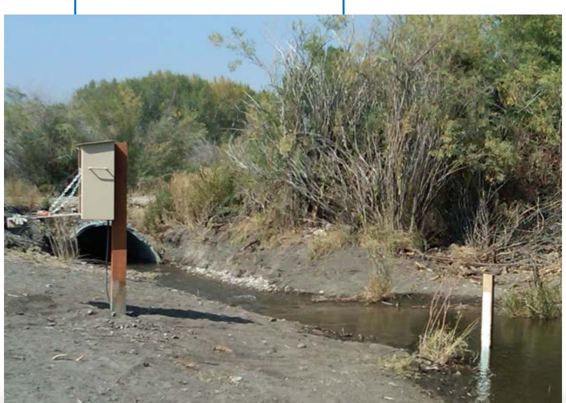
Overall Purpose

- Assess Contributions to Stream Flows from Natural Runoff, Irrigation Practices, and Groundwater
  - Ensure salmonid recovery efforts are effectively planned and implemented
- How does the GW/SW interaction, and changes to it, affect flows?
  - Downstream?
  - Through mid-basin divide?
  - In the aquifer?
  - Timing and Magnitude!!
- How vulnerable is the system to changes?
  - What are the seasonal implications?
  - Ensure we are not negatively impacting the system with these projects

IDAHO Department of Water Resources

Project History

	2004	2006	2008	2010	2012	2013
Stream Gages	17		22		24	
Seepage Runs	2	13	17	18	19	20



IDAHO Department of Water Resources

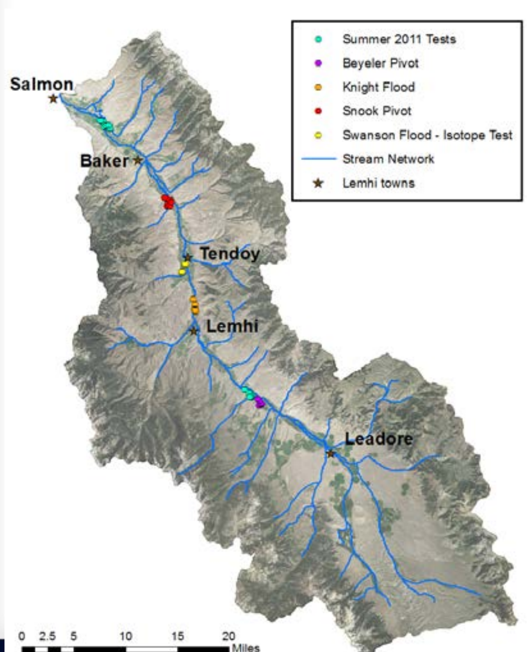
Project History

2004 2006 2008 2010 2012 2013

GW Depth Monitoring

16 21

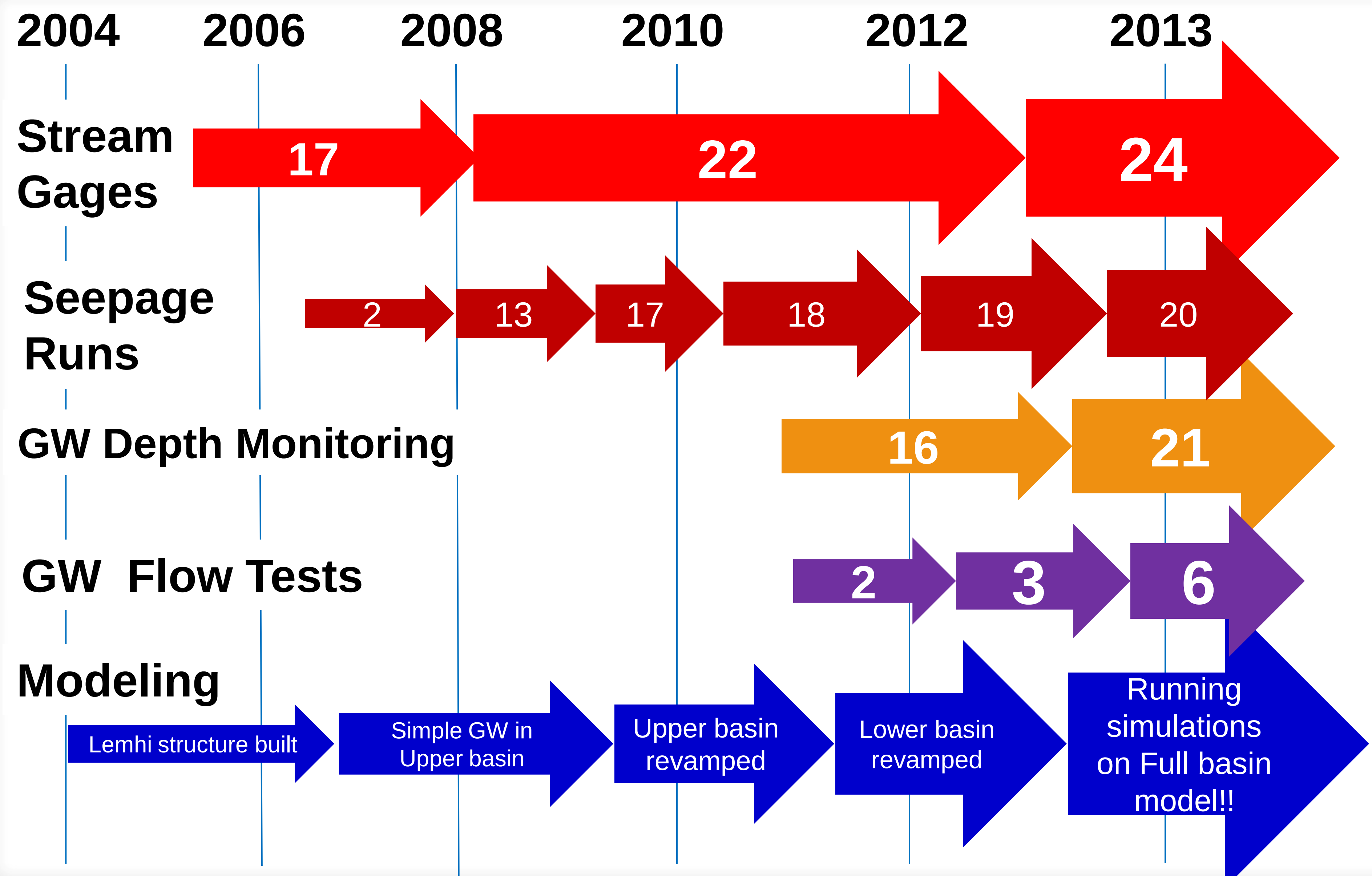
GW Flow Tests



2 3 6

IDAHO Department of Water Resources

Project History



FOCUS OF PHASE 2
2014+

IDAHO Department of Water Resources

Budget

- 2 year time period (Jan 2014 – Dec 2015)
- PCSRF funds:
  - 1 Hydrologist
  - Gaging contract **(39% of budget)**
  - Field and Lab supplies

  - $458K PCSRF
  - $159K match
  - $617K total

IDAHO Department of Water Resources

Deliverables

1. Streamflow data from 24 gages in USB
   - 17 by Idaho Power, 7 by IDWR
   - Used by all collaborators for project planning
   - Model input
   - Baseline data
   - Gives timing and magnitude of SW

2. Aquifer Characterization Report
   - Aquifer extent
   - Aquifer properties
   - Understanding of GW system

Deliverables

3. Water Budget of Lemhi basin
   - Quantify all inflows and outflows
     - Seasonally and irrigation induced
   - Understanding of GW/SW interactions
     - Including their timing and magnitude

4. Identification and documentation of data and uncertainty gaps
   - Including execution plan to fill the gaps

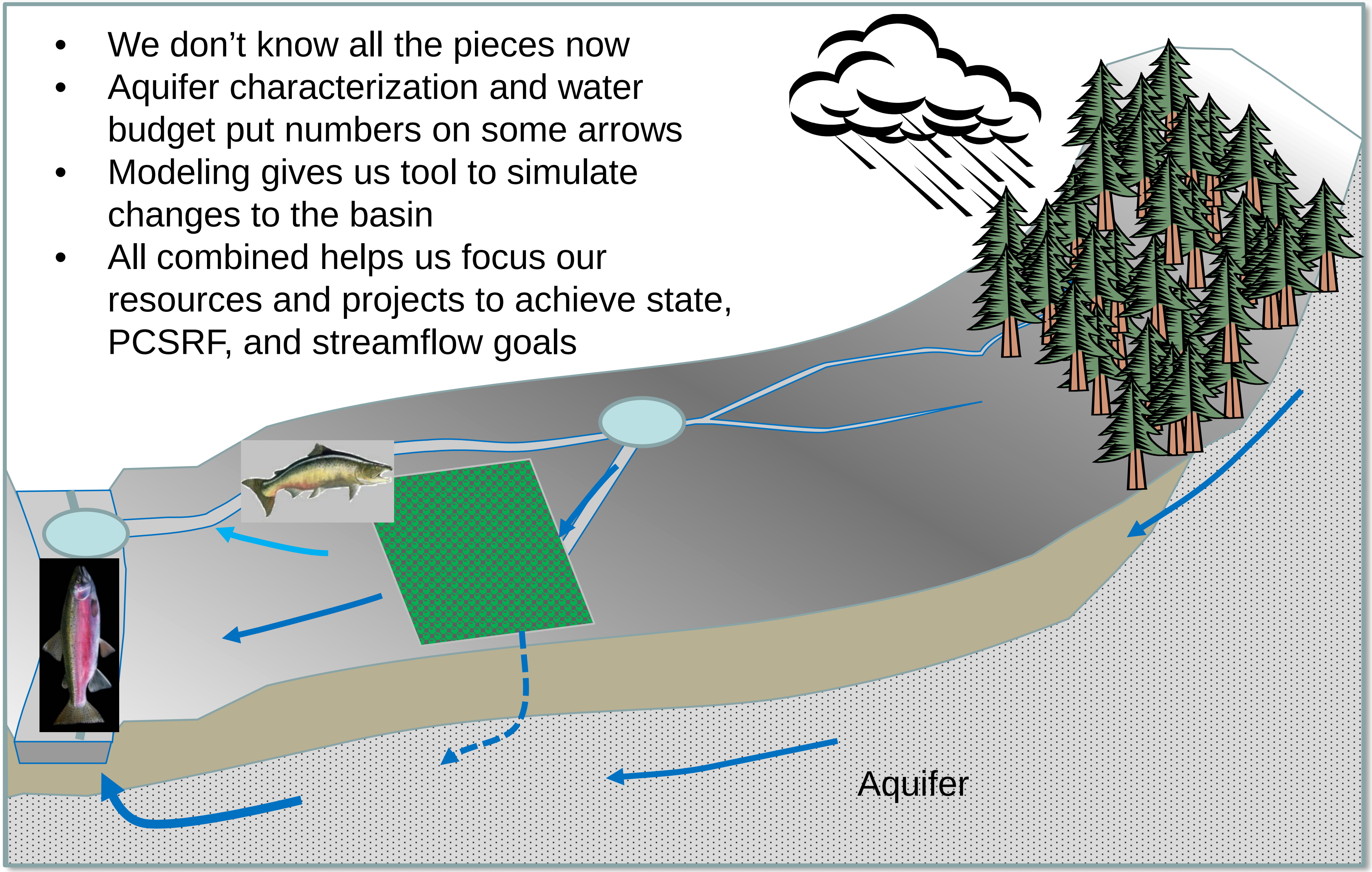
Deliverables

5. Maintenance and application of MIKE BASIN model
   - Update with basin changes and GW data
   - Run scenarios for project planning
   - See potential implications of projects and transactions
   - See effects of multiple projects on whole system

6. Assessment report of tools/models to characterize GW flow and movement
   - To accurately represent the GW system and its interaction with the SW system

Summary

- We don't know all the pieces now
- Aquifer characterization and water budget put numbers on some arrows
- Modeling gives us tool to simulate changes to the basin
- All combined helps us focus our resources and projects to achieve state, PCSRF, and streamflow goals



Questions?

Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark

Date: March 10, 2014

Re: Status of Storage Water Studies

The following is a status report on the surface water storage studies initiated by the Idaho Water Resource Board (IWRB). This memorandum describes progress since the last IWRB meeting in January 2014.

Weiser-Galloway Project

Snake River Operational Analysis Project (Operational Analysis):

- The Corps is running a series of operating scenarios using the reservoir model developed for the Galloway project, and is coordinating results with IDWR and Idaho Power Company (IPC) to model the Snake River System using the Snake River Planning Model. The operating scenarios were developed with consultation from IDWR, IPC and the US Bureau of Reclamation (BOR) to address specific areas of interest and methodology questions.
- The Corps is completing the hydraulic, economic and cost analyses for the project. It has also developed a temperature model to assess potential changes in water temperature in the Weiser River between the dam site and the Snake River. It is reviewing model assumptions and methodology with IPC.
- IPC has agreed to evaluate impacts to the Hells Canyon Complex and mid-Snake River hydropower projects based results of the modeling efforts.
- Completion of the Operational Analysis is scheduled for spring 2014. Results will be presented to the IWRB for review and comment prior to completion of the study.

Additional Activities:

- As a result of the IWRB's request to the Idaho Legislature for additional funding for the Galloway Project, there has been significant interest in the project by the media and several inquiries from the general public for project details. A summary of the general response will be provided during the water storage update at the IWRB's work session on March 20, 2014.
- Pending the results of the Operations Analysis, staff is reviewing potential options for continued study of the project including funding/cost-share opportunities. Additional Planning Assistance for States funding is currently under consideration by the Corps to pursue an analysis of the relocation of the Weiser River Recreational Trail and to evaluate of potential integration of hydropower from the project with the Northwest power grid.

REQUIRED ACTIONS: No action is required by the IWRB at this time.

Boise River Feasibility Study

- Modification of the federal cost share agreement (FCSA) between the IWRB and the Corps is currently under review by Corps Headquarters. The FCSA will clarify the IWRB's cost share commitment including the projected in-kind contributions. The associated project management plan (PMP) will document the general issues and basis for the feasibility study, outline the general tasks, schedule, and process for study execution.
- Since the January IWRB meeting, the Corps secured an additional $50,000 to continue preliminary hydraulic, economic and other technical analyses. This information will be used to refine the specific flood risk reduction and water supply measures to be studied.
- In mid-February, the Corps and IDWR met with a number flood plain managers, and city and county officials from around the Treasure Valley to discuss the feasibility study and identify additional areas of critical concern to the respective communities. The information gathered will be considered in finalizing the scope of work for the study.
- An Environmental Impact Statement (EIS) will be completed through the feasibility study process. The Corps is currently planning public scoping meetings in preparation for the EIS.
- On February 27, IWRB members and IDWR staff met with the Walla Walla District Commander and other key staff from the district to discuss the Galloway studies and the Boise River Feasibility study. The Commander indicated there is significant support within the Corps to prioritize and secure funding for the Boise study.

REQUIRED ACTIONS: No official action is required by the IWRB at this time. Staff will provide an update on the combination of measures identified for study and summarize public feedback following the public scoping meetings.

Henrys Fork Basin Study

- A Draft Henrys Fork Basin Study Final Report was released for public comment in early February 2014. The report is scheduled to be finalized in April 2014. BOR will present results of the study to the IWRB at the March 20, 2014 work session. A copy of the Draft report is included in the IWRB work books for reference. Comments submitted by IDWR staff and the public are not reflected in the attached draft.
- IDWR staff will also discuss development of recommendations for the implementation of projects based on the findings of the basin study.
- The issuance of the draft final report and the IWRB's request to the Idaho Legislature for additional funding to pursue further study of an enlargement of the Island Park Reservoir has generated significant interest from the media and constituents within the basin. Media articles have been provided to the IWRB over the last several weeks.

REQUESTED ACTIONS: No action is required by the IWRB at this time. However, staff will request feedback from the IWRB on the results and the conclusion of the basin study.

RECLAMATION
Managing Water in the West

Henrys Fork Basin Study
January 14, 2014

Idaho Water Resource Board

and

Henrys Fork Watershed Council

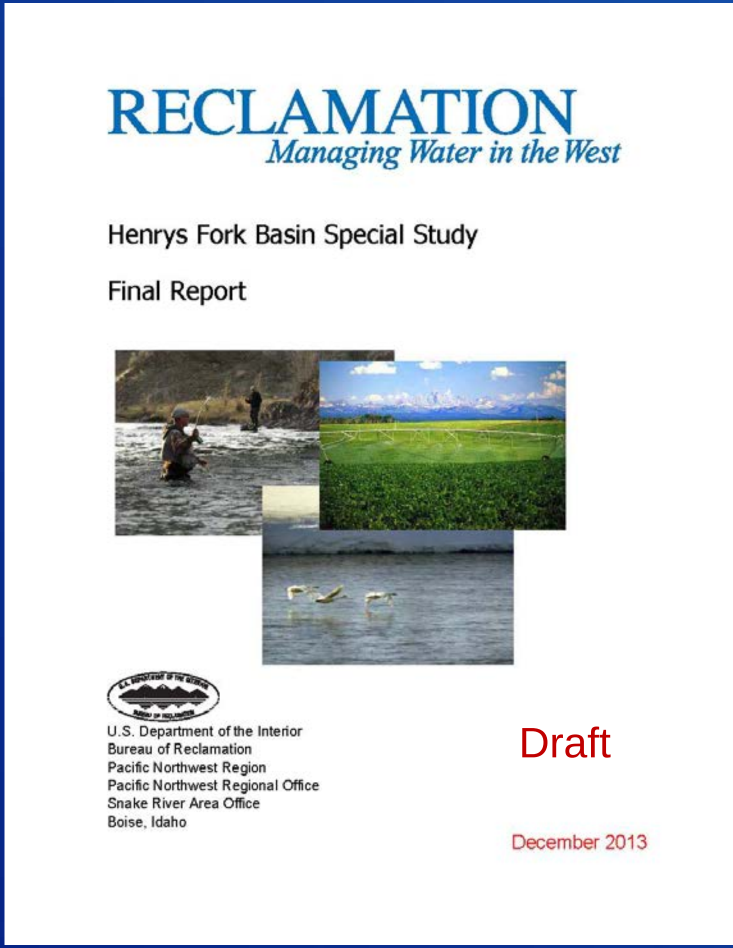
U.S. Department of the Interior
Bureau of Reclamation

Final Report – Menu of Alternatives

Storage Alternatives	Water Mgmt . Alternatives
New Reservoirs Lane Lake Dam Spring Creek Dam Moody Creek Dam Upper Badger Creek Dam Teton Dam	Managed Groundwater Recharge
Raise Existing Reservoirs Island Park Dam (Raise WS) Ashton Dam Raise	Water Marketing common to all alternatives water transfers
	Water Conservation canal automation canal piping demand reduction

RECLAMATION

Path Forward


RECLAMATION
Managing Water in the West

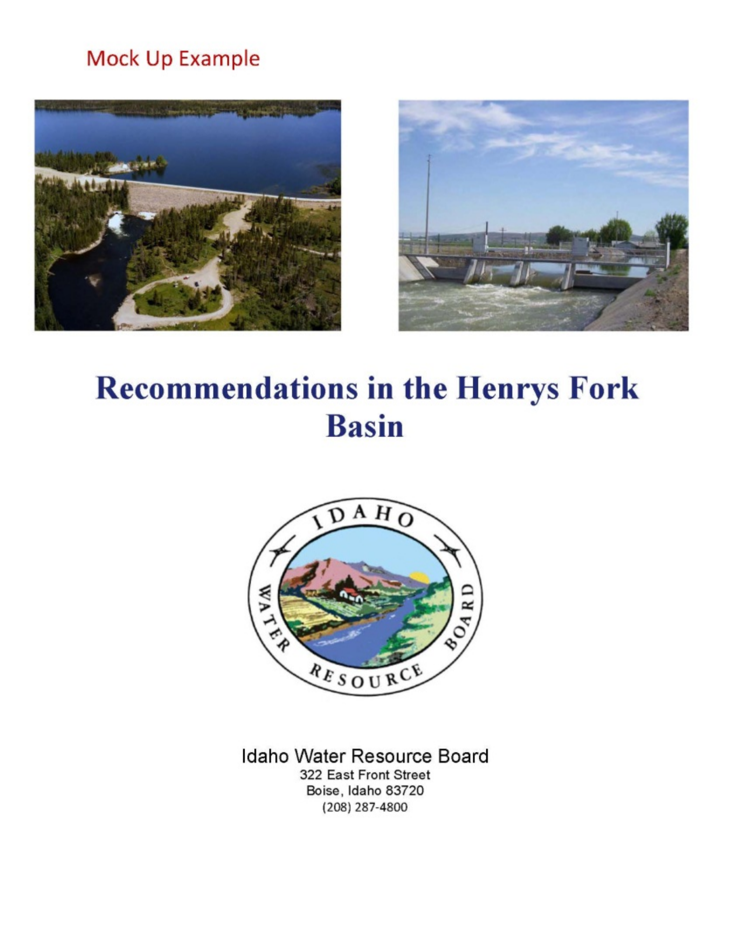
Henrys Fork Basin Special Study

Final Report

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Pacific Northwest Regional Office
Snake River Area Office
Boise, Idaho

Draft

December 2013


Mock Up Example

Recommendations in the Henrys Fork Basin

IDAHO WATER RESOURCE BOARD

Idaho Water Resource Board
322 East Front Street
Boise, Idaho 83720
(208) 287-4800

Basin Study

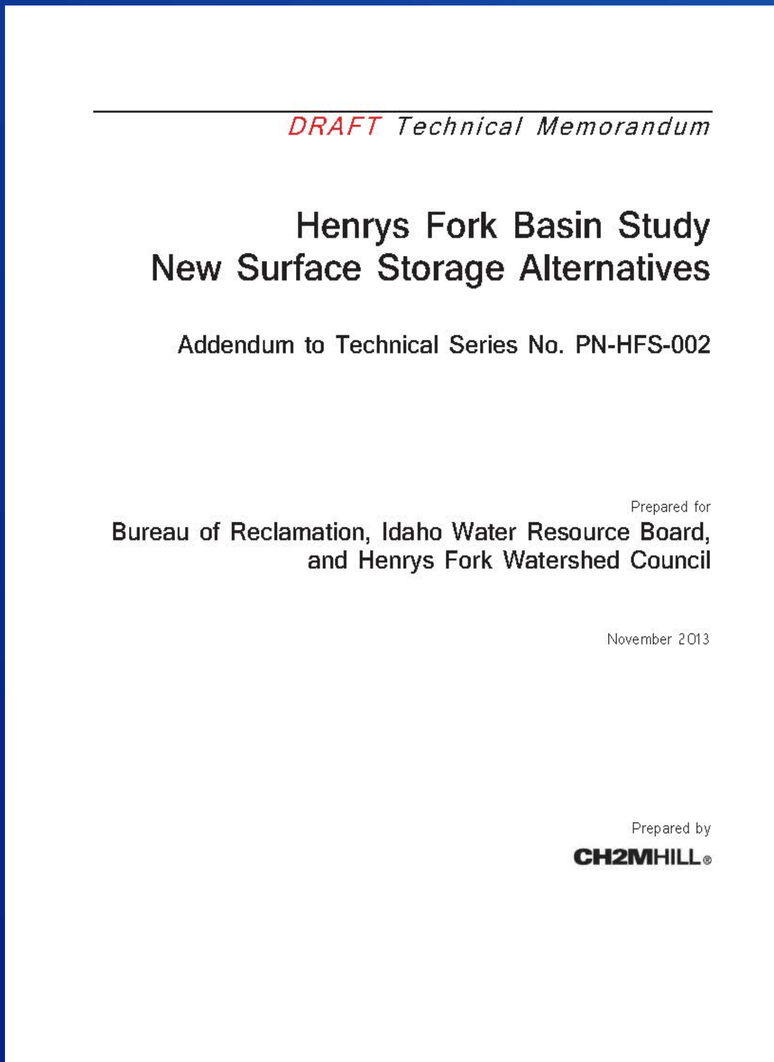
- ✓Developed by Reclamation & IWRB in collaboration with the workgroup participants and the HFWC
- ✓Submitted to Reclamation’s Basin Study program for final approval
- ✓Fact based and technically sound
- ✓Document water management and water supply alternatives
- ✓Will not include recommendations

RECLAMATION

Technical Update on Alternatives

- ✓ Tech memo update – Teton Dam/Lane Lake (CH2M HILL)
- ✓ Flood routing Island Park Reservoir (Rec. TSC)
- ✓ MODSIM – Hydrologic Analysis w/ Climate Change Scenarios (Rec. RO)
- ✓ Deficit Irrigation Analysis (Rec. RO)
- ✓ Canal Automation Prioritization (Rec. RO)

Teton Dam / Lane Lake Addendum



DRAFT Technical Memorandum

Henrys Fork Basin Study
New Surface Storage Alternatives

Addendum to Technical Series No. PN-HFS-002

Prepared for
Bureau of Reclamation, Idaho Water Resource Board, and Henrys Fork Watershed Council

November 2013

Prepared by
CH2MHILL®

	Lane Lake	Teton Dam
Maximum Volume (ac-ft)	101,000	265,000
Median (50% exceedance) Volume (ac-ft)	98,000	202,000
Field Construction Cost ($)	$466 mil.	$492 mil.
Cost ($) per Acre Feet (ac-ft)	$4,600	$1,900

RECLAMATION

Island Park Reservoir – Flood Routing

Raise water surface but not dam raise

1. Base Condition – 30,000 ac-ft flood surcharge
2. Reservoir Outflow Constricted
3. Eight Flood Routing Alternatives

RECLAMATION

Island Park Reservoir – Flood Routing

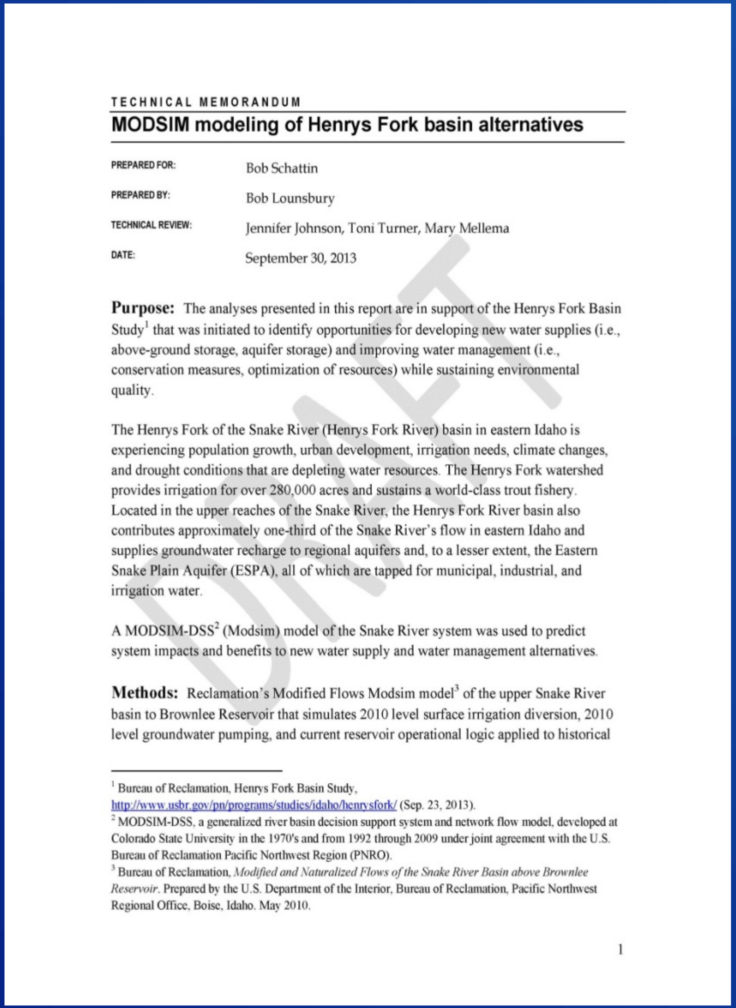
5’ Bladder Raise
w/ 1,130 foot emergency spillway – Normal Pool at 6307 feet – raise normal pool 4’

	Island Park Bladder Raise
[1]Maximum Volume (ac-ft)	26,700
[1]Median (50% exceedance) Volume (ac-ft)	26,700
[2]Field Construction Cost ($)	$6.4 mil.
Cost ($) per Acre Feet (ac-ft)	$240
Structures Impact @ Normal Pool (est #)	2

[1]Volumes are incremental change due to WS raise

[2]Very preliminary cost estimate

MODSIM modeling



TECHNICAL MEMORANDUM

MODSIM modeling of Henrys Fork basin alternatives

PREPARED FOR: Bob Schattin

PREPARED BY: Bob Lounsbury

TECHNICAL REVIEW: Jennifer Johnson, Toni Turner, Mary Mellema

DATE: September 30, 2013

Purpose: The analyses presented in this report are in support of the Henrys Fork Basin Study[1] that was initiated to identify opportunities for developing new water supplies (i.e., above-ground storage, aquifer storage) and improving water management (i.e., conservation measures, optimization of resources) while sustaining environmental quality.

The Henrys Fork of the Snake River (Henrys Fork River) basin in eastern Idaho is experiencing population growth, urban development, irrigation needs, climate changes, and drought conditions that are depleting water resources. The Henrys Fork watershed provides irrigation for over 280,000 acres and sustains a world-class trout fishery. Located in the upper reaches of the Snake River, the Henrys Fork River basin also contributes approximately one-third of the Snake River's flow in eastern Idaho and supplies groundwater recharge to regional aquifers and, to a lesser extent, the Eastern Snake Plain Aquifer (ESPA), all of which are tapped for municipal, industrial, and irrigation water.

A MODSIM-DSS[2] (Modsim) model of the Snake River system was used to predict system impacts and benefits to new water supply and water management alternatives.

Methods: Reclamation's Modified Flows Modsim model[3] of the upper Snake River basin to Brownlee Reservoir that simulates 2010 level surface irrigation diversion, 2010 level groundwater pumping, and current reservoir operational logic applied to historical

[1] Bureau of Reclamation, Henrys Fork Basin Study, http://www.usbr.gov/pn/programs/studies/idaho/henrysfork/ (Sep. 23, 2013).

[2] MODSIM-DSS, a generalized river basin decision support system and network flow model, developed at Colorado State University in the 1970's and from 1992 through 2009 under joint agreement with the U.S. Bureau of Reclamation Pacific Northwest Region (PNRO).

[3] Bureau of Reclamation, *Modified and Naturalized Flows of the Snake River Basin above Brownlee Reservoir*. Prepared by the U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. May 2010.

1

Alternatives analyzed:

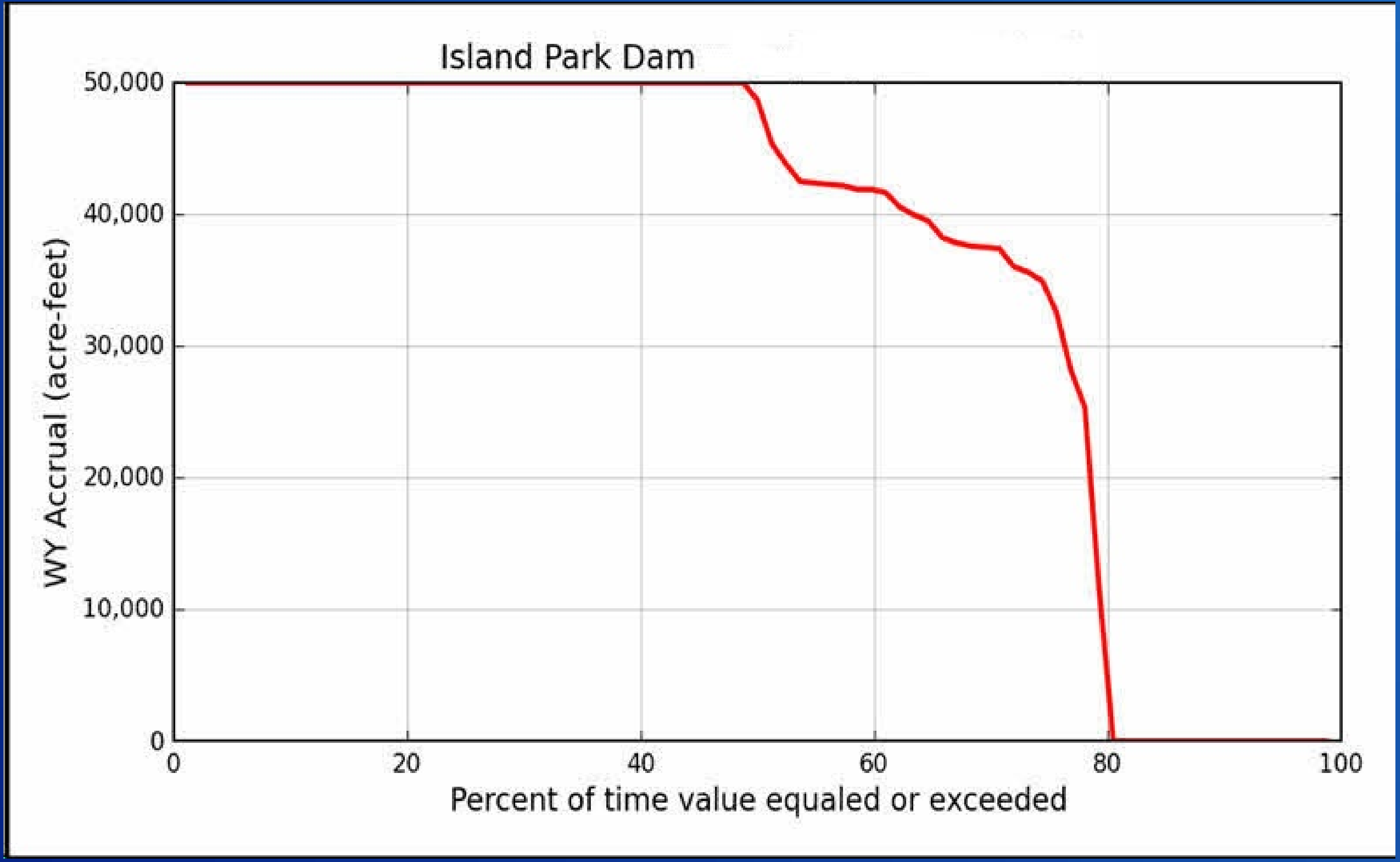
1. Lane Lake
2. Island Park
3. Teton Dam
4. Automated Canals

w/Consideration to

1. Water rights
2. Suggested environmental flows
3. Water delivery ***
4. Climate change

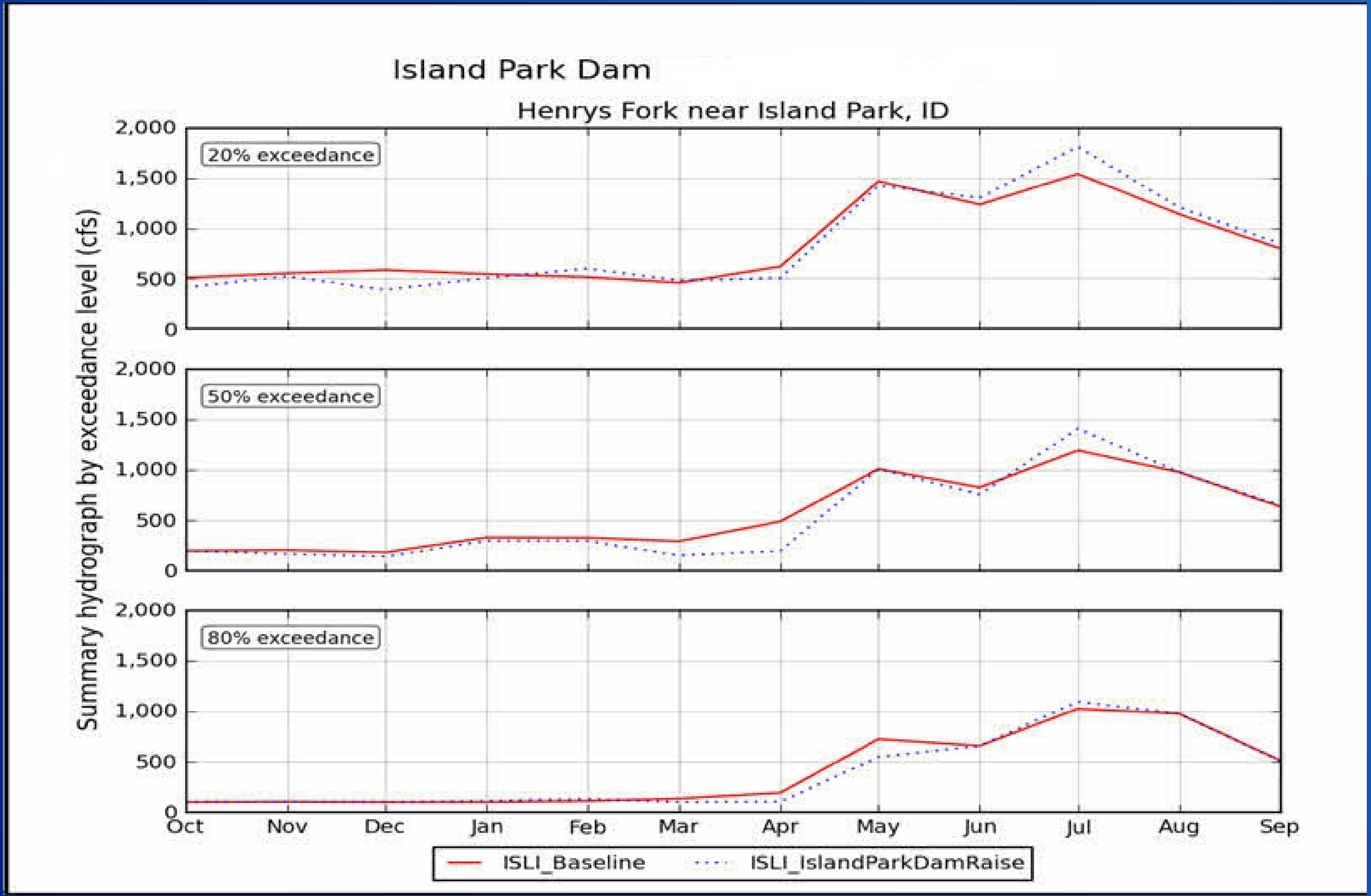
RECLAMATION

MODSIM – Island Park Reservoir Example
Reservoir Filling



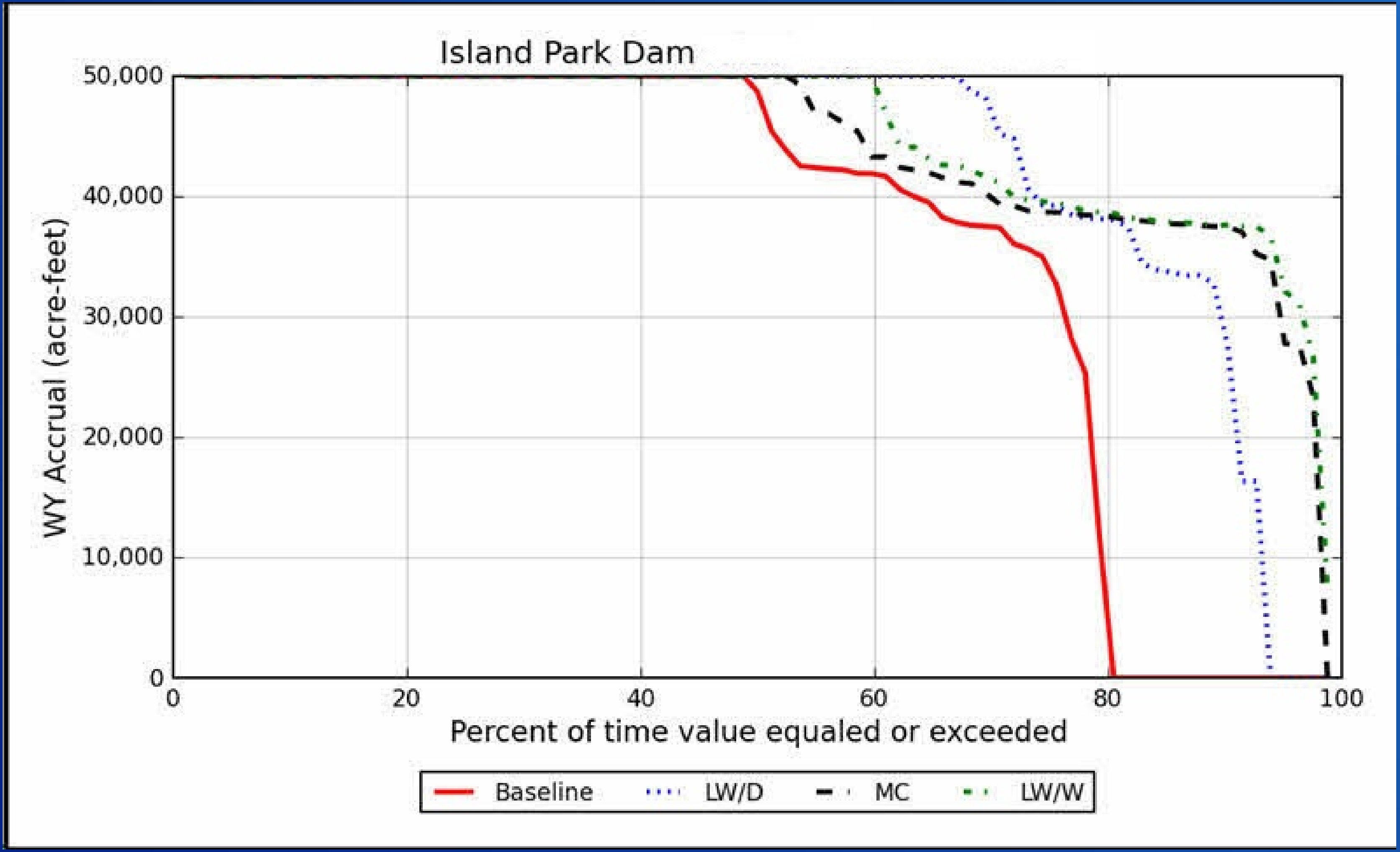
RECLAMATION

MODSIM – Island Park Reservoir Example
Change in River Flows



RECLAMATION

MODSIM – Island Park Reservoir Example
Climate Change Response



RECLAMATION

Deficit Irrigation

Deficit Irrigation Calculation

Example Alfalfa Hay - Klamath Basin

Step #1 - Determine Value of Water ($/acft) Based on Water Savings, Yield Reduction & Crop Price

$WaterSavings := 11\ in$

Source - Implications of Deficit Irrigation Management of Alfalfa (Orloff et.al. 2005) - Table 1. Malin Sand Loam - Stop Irrigation after 1st cutting

$PracticalYieldReduction := 0.82\ \frac{ton}{acre}$

Source - Implications of Deficit Irrigation Management of Alfalfa (Orloff et.al. 2005) - Table 2. Stop Irrigation after 1st cutting

$HayPrice := 180\ \frac{\$}{ton}$

Source - Internet Hay Exchange 2012 - average value

$$WaterValue := \frac{(HayPrice \cdot PracticalYieldReduction)}{WaterSavings} = 161\ \frac{\$}{acft}$$

Step #2 - Determine Present Value of Farm Gate and Total Agricultural Economic Impact

$InterestRate := .0375 \qquad Life := 50$

Source - Assumed Project Life & Interest Rate

$$PresentValueFarmGate := \frac{-pv(InterestRate, Life, WaterValue \cdot acft)}{acft} = 3612\ \frac{\$}{acre \cdot ft}$$

Better suited to areas with chronic water shortage ?

Key input ***Crop Price*** increases significantly in water short years

Automated Canals

Canals Divert –

1. natural flows early in irrigation season (don’t want to change)

1. flows from stored water later in irrigation season (high priority)

RECLAMATION

Automated Canals - Priority

Canal Name	Island Park Storage ac-ft	Henrys Lake Storage ac-ft	American Falls Storage ac-ft	Total Storage ac-ft	[1]Peak Diversion cfs	[2]Est. Annual Water Saved ac-ft	[2]Cost Per Installation	Cost Per ac-ft Water Saved
INDEPENDENT	9,147	24,120	0	33,267	522	333	$219,624	$660
SALEM UNION	7,752	22,374	0	30,126	339	301	$147,888	$491
CONSOLIDATED FARMERS	4,857	18,459	0	23,316	612	233	$254,904	$1,093
ENTERPRISE	10,233	0	10,024	20,257	168	203	$80,856	$399
MARYSVILLE(9A)	19,554	0	0	19,554	240	196	$109,080	$558
LAST CHANCE	1,824	10,047	0	11,871	136	119	$68,312	$575
ST ANTH U(17A)	3,680	7,500	0	11,180	620	112	$258,040	$2,308
EGIN	2,308	7,500	0	9,808	439	98	$187,088	$1,908
TETON ISL FDR	9,229	0	0	9,229	631	92	$262,352	$2,843

[1]Reclamation 2012 PN-HFS-006

[2]Estimated Percent of Water Stored Saved 1.00%

RECLAMATION

Final Report – Development of Alternatives

- ✓ Description of Alternative
- ✓ Cost Estimate
- ✓ Impact to Water Budget (needs)
- ✓ Potential Climate Change Impacts
- ✓ Benefits and Impacts
- ✓ Key Points from Evaluation and Feedback
- ✓ Additional Limitations of Analysis
- ✓ Potential Implementation

RECLAMATION

RECLAMATION
Managing Water in the West

DRAFT Henrys Fork Basin Study

Final Report

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Pacific Northwest Regional Office
Snake River Area Office
Boise, Idaho

February 2014

Version 3

Mission of the U.S. Department of the Interior

Protecting America's Great Outdoors and Powering Our Future

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

Mission of the Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Photograph on front cover: Fly fishing, irrigated agriculture, and wildlife habitat are important activities in the Henrys Fork River basin

RECLAMATION
Managing Water in the West

DRAFT Henrys Fork Basin Study
Final Report

Produced in partnership with the
State of Idaho Water Resource Board

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Pacific Northwest Regional Office
Snake River Area Office
Boise, Idaho

February 2014

Abbreviations and Acronyms

AWEP	Agricultural Water Enhancement Program
Basin Study	Henrys Fork Basin Study
CBWTP	Columbia Basin Water Transaction Program
cfs	Cubic feet per second
CIG	Conservation Innovation Grant Program
CRP	Conservation Reserve Program
ESA	Endangered Species Act
ESPA	Eastern Snake Plain Aquifer
ESPA CAMP	Eastern Snake Plain Aquifer Comprehensive Aquifer Management Plan
ESPAM	Eastern Snake Plain Aquifer Model
FERC	Federal Energy Regulatory Commission
FMID	Fremont-Madison Irrigation District
GCMs	Global Circulation Models
Henrys Fork River	Henrys Fork of the Snake River
Idaho CREP	Idaho Conservation Reserve Enhancement Program
IDFG	Idaho Department of Fish and Game
IDWR	Idaho Department of Water Resources
IWRB	Idaho Water Resource Board
IWTP	Idaho Water Transactions Program
LRP	Local rental pools
LW/D	Less warming and drier climate scenario

LW/W	Less warming and wetter climate scenario
MC	Minor change climate scenario
NEPA	National Environmental Policy Act
NFRC	North Fork Reservoir Company
NRCS	U.S. Department of Agriculture, Natural Resources Conservation Service
NWSRS	National Wild and Scenic River System
Plan	Comprehensive State Water Plan
Recharge Program	Managed Aquifer Recharge Program
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RMP	Teton River Canyon Resource Management Plan
State	State of Idaho
USGS	U.S. Geological Survey
Watershed Council	Henry's Fork Watershed Council

EXECUTIVE SUMMARY

Introduction

The Bureau of Reclamation (Reclamation), in cooperation with the Idaho Water Resource Board (IWRB), developed this *Final Report of the Henrys Fork Basin Study* (*Final Report*). Reclamation and IWRB entered into a partnership under the auspices of Reclamation's WaterSMART Basin Study program to identify opportunities for developing water supplies, improving water management, and sustaining environmental quality in the Henrys Fork River basin. Because the Henrys Fork River basin overlies part of the Eastern Snake Plain Aquifer (ESPA), opportunities for managed recharge within the basin were explored for the benefit of the ESPA Comprehensive Aquifer Management Plan (CAMP). A stakeholders working group (Workgroup) comprised of organization and agency personnel that worked through the Henry's Fork Watershed Council collaborated with Reclamation and the IWRB to develop alternatives that would potentially improve the water supply reliability in the Henrys Fork River basin and the ESPA.

The Workgroup, Reclamation, and IWRB initially identified 51 alternatives to address the Henrys Fork River basin water needs. From these 51 alternatives, a screened group of about 18 alternatives were evaluated and the results were documented in the *Final Henrys Fork Basin Special Study Interim Report* dated July 2013 (Reclamation 2013a). Those alternatives were assessed so that only the most viable alternatives were passed on for more scrutiny and detail for viability. The results of these assessments were presented to the Workgroup for input and the proposed alternatives were further filtered down to a group of 11 that were carried forward for additional analyses under in this Basin Study.

The final analyses refined and revised the alternatives to a group of 12 alternatives which included the addition of one new alternative (canal piping and lining) and the recognition that the water marketing alternative would essentially become a potential element with all of the final alternatives. The 12 alternatives were grouped into three major categories: surface storage alternatives, managed groundwater alternative, and conservation, water management, and demand reduction alternatives. While not universally agreed upon, these alternatives provide a cross-section of structural and management alternatives that have a reasonable path forward and have met multiple assessments for viability (i.e., acceptability, effectiveness, efficiency, and completeness).

This *Final Report* provides the summation of the final evaluations of the 12 alternatives that were the most viable, but does not provide a decision on the best alternatives for implementation. All of the alternatives can potentially benefit one or more of the water needs, but each alternative or group of alternatives has different requirements and issues for implementation. IWRB will follow the release of this *Final Report* with a companion document providing the best paths forward. The data and evaluations contained in these two documents will allow future decision makers to have the best available information in order to determine what future actions to take and when to take them.

Evaluations of Alternatives

The group of 12 alternatives formulated by Reclamation, IWRB, and the Workgroup during the Basin Study were in response to the region's needs as described in the *Water Needs Assessment* (Reclamation 2012, Appendix A) (Table 1). Of these 12 alternatives, the 3 storage alternatives of Lane Lake Dam, Island Park storage increase, and Ashton Dam raise appear to have broad support by all interested stakeholders. That broad support also extends to the alternatives of canal automation, Egin Lake recharge site expansion, water markets, irrigation canal piping, and demand reduction.

The four storage alternatives that involve dams located on a river or creek (Spring Creek Dam, Moody Creek Dam, Upper Badger Creek Dam, and Teton Dam) do not have broad stakeholder support. Conservation groups have clearly articulated their objection to these alternatives because of potential impacts to Yellowstone cutthroat trout, scenic beauty, and free-flowing rivers. While considerable storage potential exists with these alternatives, the current social, cultural, and environmental issues would be significant.

Table 1. Summary of alternatives from the Henrys Fork Basin Study.

Alternative	Cost	Effect to Water Budget	Effects to Environment
Lane Lake Dam	$462, 000,000 ($4,600 per acre-foot)	101,000 acre-feet additional stored water	Increased flows during low flow season; impacts to fisheries and hydrology
Spring Creek Dam	$41,760,000 ($3,900 per acre-foot)	10,800 acre-feet additional stored water	Increased flows during low flow season; impacts to fisheries and hydrology
Moody Creek Dam	$123,920,000 ($3,600 per acre-foot)	10,800 acre-feet additional stored water	Increased flows during low flow season; impacts to fisheries and hydrology
Upper Badger Creek Dam	$128,940,000 ($2,700 per acre-foot)	47,000 acre-feet additional stored water	Increased flows during low flow season; impacts to fisheries
Teton Dam	$492,210,000 ($1,900 per acre-foot)	202,000 acre-feet additional stored water	Increased flows during low flow season; impacts to fisheries and hydrology
Island Park Storage Increase	$6,400,000 ($240 per acre-foot)	26,700 acre-feet additional stored water	Increased flows during low flow season
Ashton Dam Raise	$28,210,000 ($1,382 per acre-foot)	20,400 acre-feet additional stored water	Impacts to river hydrology
Managed Groundwater Recharge	$10,064,000 ($,000 per acre-foot)*	2,500 acre-feet additional recharge	Increased flow in Henrys Fork River and in ESPA
Water Market	Varies with the program*	No increase in supply; better management of existing supply	None
Canal Automation	estimated average of $941 per acre-foot*	No increase in supply; better management of existing supply	Positive impacts overall; negative impacts during low flows
Piping and Lining of Irrigation Canals	$8.5 million with North Fremont Gravity Pipeline Project*	Reduction of groundwater and stream flows	Negative impacts except in the North Fremont irrigated region
Demand Reduction	$161 per acre-foot of water saved (one time savings); $3,612 per acre-foot saved amortized over 50-year period*	Increase in flows except for Teton Valley and Lower Watershed irrigated regions during low flows	Potential fisheries impacts during low flows

*Costs for the non-structural alternatives are difficult to calculate because State and Federal programs may be involved and participation is voluntary. Costs in the table are based on averages. See Section 5.0 for more details on how these costs were derived.

While each of the alternatives discussed in Section 5.0 has the potential to decrease the gap between demand and supply for water in the Henrys Fork River basin, no single alternative would likely solve all of the challenges. The degree of complexity varies among the alternatives and significant obstacles remain for implementation, particularly for some of the alternatives. Public acceptability, funding, legal ramifications, and regulatory compliance issues would need to be resolved before moving any of these alternatives toward implementation.

Findings

Surface Storage Alternatives

Five of the seven surface storage alternatives proposed building new dams and reservoirs of various configurations. These alternatives, except for the Teton Dam alternative, proposed off-stream structures that would be fed by pressurized pipelines and pumps from water sources away from the reservoir site. Only the Teton Dam alternative would involve building a new structure instream. The Island Park and Ashton dam raise alternatives proposed altering existing dams to increase the volume of water stored in their reservoirs. All of the alternatives would capture stored water during seasonal peak flows and redistributing that water during periods of higher demand. Withdrawals may impact conservation populations of Yellowstone cutthroat trout in Conant Creek, Fall River, and Teton River. The stored water would satisfy unmet irrigation demands and enhance downstream flows during seasonal low flow periods which would benefit some environmental needs as well. These alternatives may have significant impacts to big game winter range, and moderate impact to lands designated as eligible for Federal wilderness status and Endangered Species Act (ESA)-listed terrestrial species (grizzly bear [designated as threatened] and wolverine [designated as a candidate for listing]).

Of the seven surface storage alternatives, three alternatives, Lane Lake, Teton Dam, and Island Park Dam raise, were selected for in-depth hydrology and climate change analyses at the request of IWRB and the Workgroup (Reclamation 2013b). These three alternatives represented an off-stream storage alternative, an on-stream storage alternative, and an existing facility alternative and the results were used to extrapolate information about the other alternatives. The analyses were conducted knowing that reservoir diversions and storage cannot negatively affect instream flows. In general, water may be available for storage high or average water years (approximately 80 percent of the time), but may not be available during dry years. These projections also hold even with forecasted climate changes.

After considering all the evaluation factors for each alternative, study participants were able to determine those storage alternatives they can support for further study and evaluation. Conversely, clear indications have been provided regarding alternatives that either do not have broad support (including agency support) or would be actively opposed by participating stakeholder groups. Figure 1 illustrates a ranking of the alternatives based on the input received.

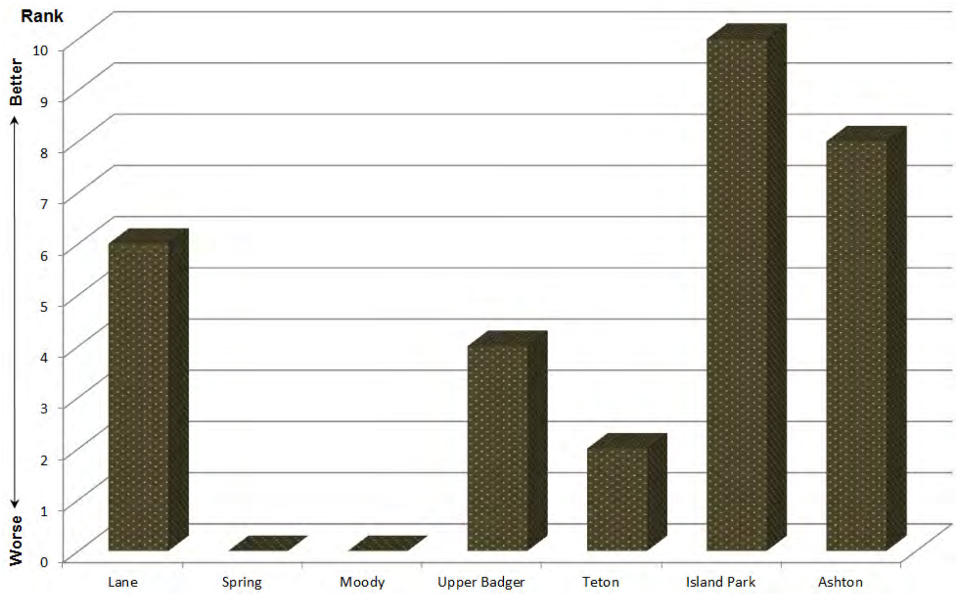


Figure 1. Relative ranking of storage alternatives based on the viewpoints of agencies and stakeholders.

Groundwater Recharge Alternative

Three locations in the Henrys Fork River basin were considered as part of this Basin Study: 1) Egin Lake recharge site expansion, 2) lower Teton River, and 3) Teton Valley tributaries. Of these, only the expansion of the existing Egin Lake recharge operation was assessed; however, the other two sites may hold potential for future assessment and action.

Expansion of the Egin Lakes recharge program would provide additional water storage for the Henrys Fork River basin, effectively enhancing water supply by improving aquifer storage and increasing ecological flows in the river. Expansion of the Egin Lakes recharge program would enhance the in-basin water budget by annually recharging an additional 2,500 to 5,000 acre-feet (7,500 to 10,000 acre-foot total). The increase in recharge at the Egin Lakes site would not involve a substantial increase in the size of the recharge site itself nor the route of the canal delivering water to the site; however, the capacity of the canal would need to be expanded.

Expanding recharge volume at the Egin Lake site would have few, if any significant adverse environmental impact and may have beneficial impacts on streamflow (especially temperature) below the St. Anthony gage. The only potentially adverse consequence would be in direct effects on a priority rainbow trout fishery in the Henrys Fork River.

Water Marketing Alternative

Water markets do not increase the water supply, but they provide a means of managing water supplies. The economic and/or environmental value of water can be maximized by exchanging water rights that might otherwise be unused or forfeited and minimizing the consequences of water shortages. IWRB has an advanced water market system and coordinates efforts to enhance existing programs. This alternative should be considered in conjunction with all of the other alternatives.

Conservation Alternatives

Automated Canals Alterative

Automated canals allow irrigators to match diversions with irrigation requirements and reduce the demand for water, especially with late-season withdrawals. Installation of automated gates at nine principal stream diversions points would cost approximately $1.6 million and conserve approximately 1,687 acre-feet annually. Both total annual and peak flows would increase in all of the irrigated regions with this alternative, but has mixed results during low flow periods. Nonpeak flows would increase in the North Fremont irrigated region, but decrease in the other irrigated regions which would have negative environmental impacts. Potential climate change impacts were analyzed and indicated that there may be a shift in timing of high flows to earlier in the year. A decrease in water delivery may occur in the latter part of the irrigation season or warmer months.

Canal Lining Alterative

The lining of canals was shown to be beneficial only in the North Fremont irrigated region. Irrigators in this region have installed several gravity pressurized pipeline systems which have reduced demand for Fall River flows and increased total annual, peak, and nonpeak flows. In the other irrigated regions, late summer flows would decrease because of the interconnection between groundwater and recharge by irrigation water. This would have a negative environmental impact to the Henrys Fork and Teton rivers.

Demand Reduction Alternative

Agricultural demand reduction means reducing the number of irrigated acres or changes farming practices to use less water. The cost of converting irrigated cropland to dryland farming or simply ceasing irrigation is estimated to be $1,860 per acre. Deficit irrigation, meaning the acre would be partially irrigated, is approximately $3,600 per acre. This alternative would generally have positive environmental impacts in the North Fremont, Egin Bench, and upper Teton Valley irrigated regions, but have negative environmental impacts in the lower Teton Valley and Lower Watershed irrigated regions with a decrease in nonpeak flows.

Potential Implementation of Alternatives

A single alternative cannot meet all of the water demands in the Henrys Fork River basin; however, grouping of alternatives may be necessary to facilitate decisions regarding implementation of one or more of the alternatives and meet the broadest set of needs in the Henrys Fork River basin. Groups of projects would involve discussions of the likelihood and risk of funding and developing the facilities; the viability of the combination; and the irrigation, environmental, fisheries, and ESPA components to assure that all four needs are addressed. Even when implementation details are finalized, more rigorous analyses would be necessary before progressing with the project or group of projects. In the end, IWRB will decide what actions it can take to address the challenges and how it will move forward to resolve the remaining issues of funding and implementation.

In completing the efforts of the Basin Study, Reclamation and IWRB agreed to utilize a two-document approach. This *Final Report* contains the technical information and the discussions of the Basin Study. A companion document will be produced by the IWRB in collaboration with the Workgroup and Reclamation to document IWRB's decisions regarding the path forward in future actions in the Henrys Fork River basin; the recommendations and prioritization for which alternatives to pursue; and the sequence of steps for the recommended alternatives or group of alternatives. The Path Forward document will be submitted to the Governor and the Legislature to comply with the State Senate Bill 1511 and inform those officials of the recommendations and prioritization of alternatives, the investments in water management infrastructure most advantageous to the State, and seek further financial support to help implement alternatives.

A Path Forward document does not preclude any member of the Workgroup from independently developing its own vision for a path forward. Since the Basin Study presents an array of alternatives, any person or group, private or public, may seek to move an alternative(s) forward as they deem appropriate.

Table of Contents

List of Figures

List of Tables

This page intentionally left blank.

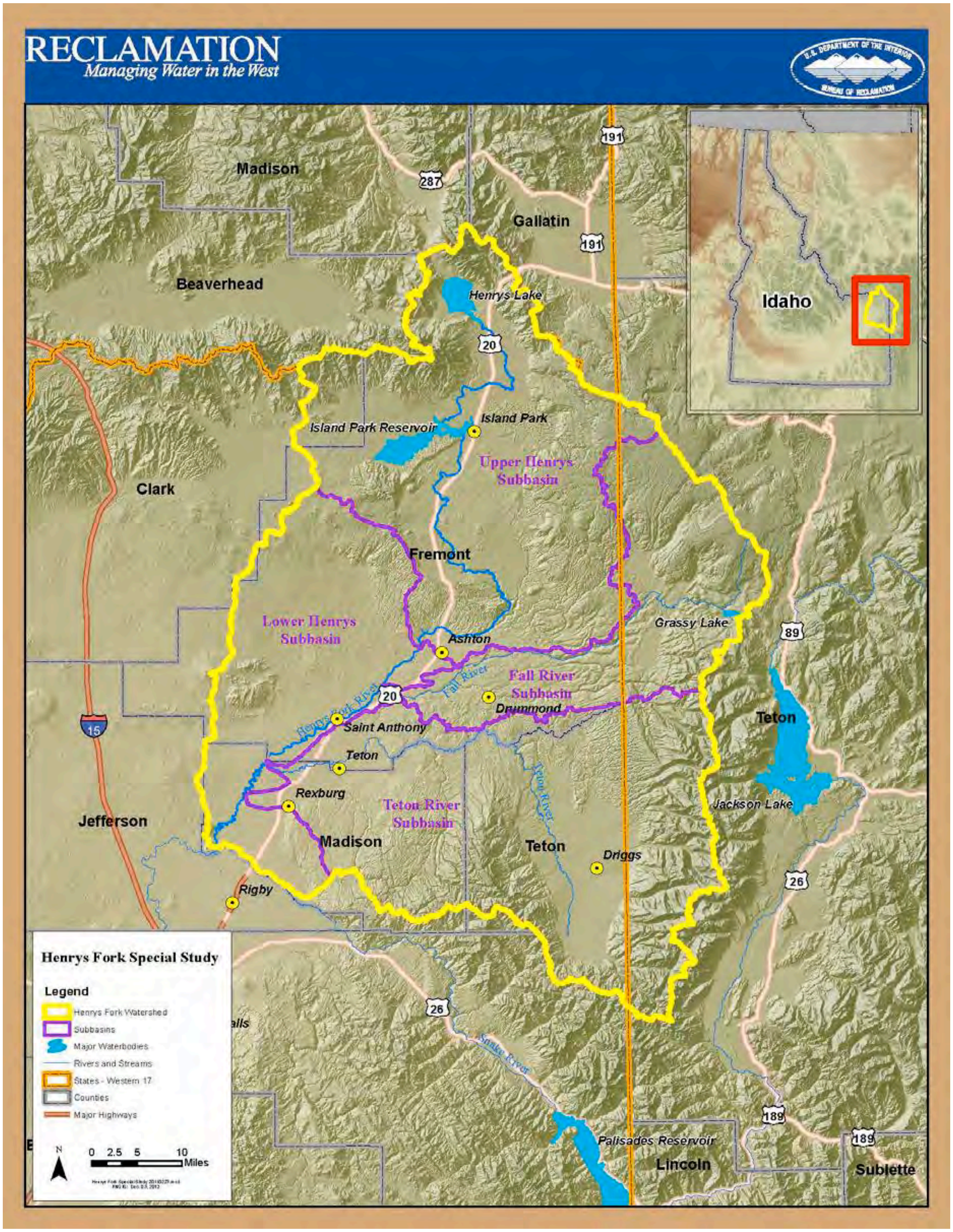
1.0 INTRODUCTION

1.1 Purpose and Objectives

The Henrys Fork Basin Study (Basin Study) is sponsored and led by the Bureau of Reclamation (Reclamation) in cooperation with State of Idaho Water Resource Board (IWRB). The purpose of the Basin Study is to assist State and local planning efforts by exploring potential action alternatives for both (1) meeting the complex water supply and management challenges in the basin and (2) implementing the Eastern Snake Plain Aquifer (ESPA) Comprehensive Aquifer Management Plan (CAMP) and Idaho State Water Plan. Figure 2 and Figure 3 show the location of the Henrys Fork of the Snake River (Henrys Fork River) basin in context with the watershed and the ESPA.

The Henrys Fork River basin provides irrigation water for over 280,000 acres and sustains a world-class trout fishery. Agricultural changes; population growth and its consequent urban development; drought conditions; and climate changes are impacting water resources. These factors are increasing the need to identify adaptation and mitigation strategies to resolve water supply imbalances and preserve ecological resiliency in the basin.

In a broader context, the western portion of the Henrys Fork River basin overlies the ESPA so opportunities in the basin could support the objectives of the ESPA CAMP for stabilizing the ESPA (Figure 3). One-third of the upper Snake River flow in eastern Idaho comes from the Henrys Fork basin, supplying groundwater recharge to local aquifers and the ESPA downstream. These aquifers are tapped for municipal, industrial, and agricultural water. The upper Snake River region, including the Henrys Fork River basin, produces approximately 21 percent of all goods and services in the State of Idaho, resulting in an estimated value of $10 billion annually (IDWR 2009). Water is the critical element for this productivity. This Basin Study complements the objectives of ESPA CAMP and policies of the State Water Plan by identifying specific alternatives to improve water supplies and water management in the upper Snake River basin.



1

2 **Figure 2. Map of Henrys Fork River basin and its subbasins, major tributaries, and reservoirs.**

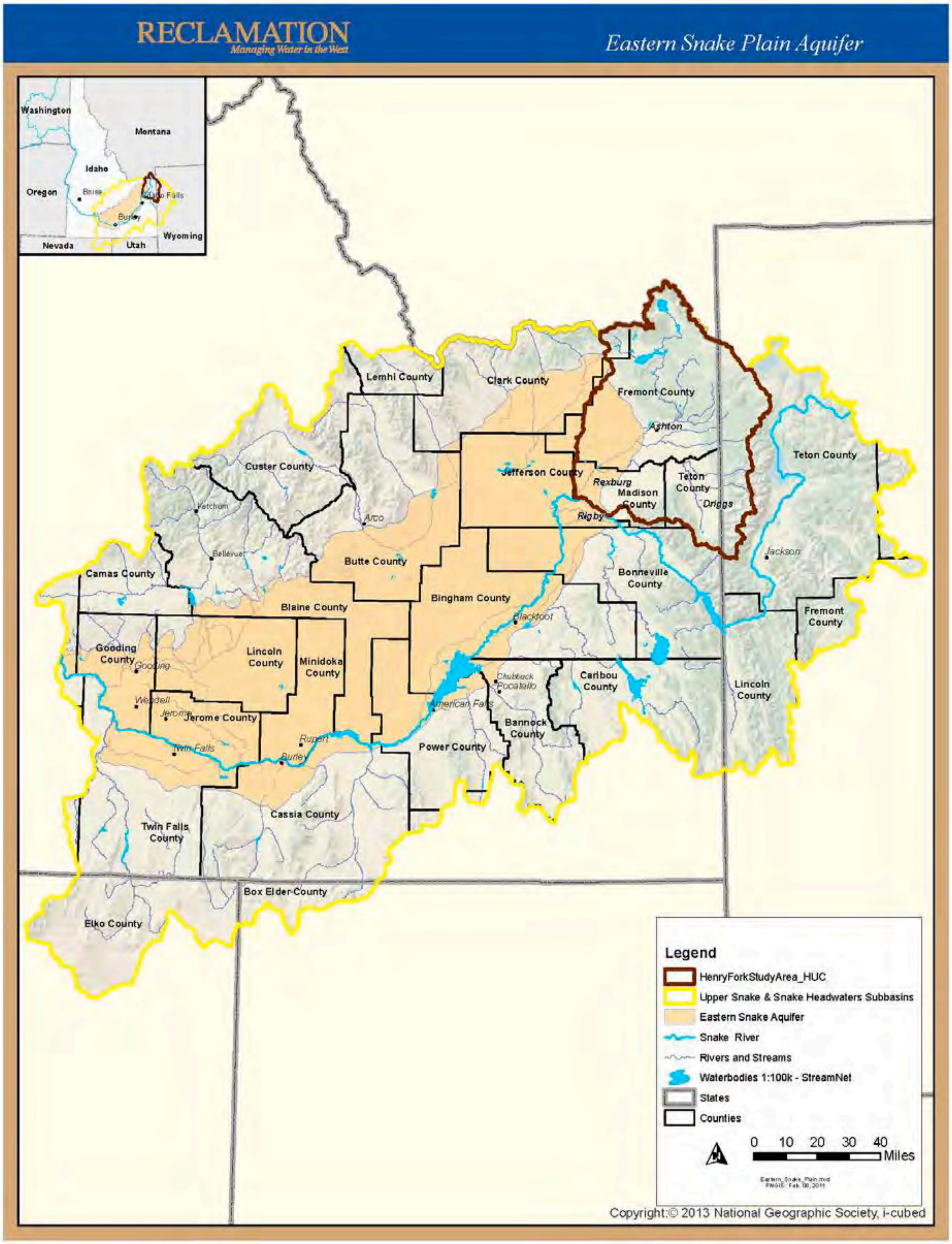


Figure 3. Map showing the spatial relation of the Henrys Fork River basin to the Eastern Snake Plain Aquifer.

This Basin Study focused on identifying opportunities for developing water supplies, improving water management, and sustaining environmental quality in the Henrys Fork River basin. Opportunities for improved or expanded groundwater management were also assessed. The objectives of the Basin Study were to analyze projected water supplies and demands, including the possible effects of climate changes; utilize a collaborative workgroup in formulating possible strategies that would address supply and management challenges and improve water supply reliability in the future; analyze the alternatives; and present them back to the State, with feedback from the a workgroup made up of Federal, State, regional, and local stakeholders (Workgroup), to assist with decision-making processes at the State and local levels. The most potentially viable alternatives were found to be for surface storage, managed recharge, water marketing, and water conservation.

The discussions and process used during the Basin Study is reflected in the table of contents presented below:

- **Section 1.0 - Introduction**: summary of Federal and State study authorities; collaboration and outreach; relevant previous and current studies; and interrelated programs and activities.
- **Section 2.0 - Overview of the Henrys Fork Basin**: summary description of the study area and its resources.
- **Section 3.0 - Water Supplies and Demands**: current and projected water supplies and demands and the potential effects of climate change.
- **Section 4.0 - Screening & Selection of Alternatives**: determination of which alternatives for surface storage, groundwater recharge, water markets, and conservation, water management, and demand reduction warranted more detailed investigation.
- **Section 5.0 - Evaluation of Alternatives**: evaluation of alternatives that emerged from the screening process.
- **Section 6.0 – Comparisons of Alternatives**: comparative assessment of the alternatives in terms of water supply, cost, environmental effects, and the perspectives of involved agencies, organizations and stakeholders.
- **Section 7.0 - Conclusions and Next Steps**: summary of basic study conclusions and steps to pursue the alternatives described in the evaluation and comparison sections.

1.2 Federal and State Study Authorities

The Basin Study Program, part of the U.S. Department of the Interior's WaterSMART Program, addresses 21st century water supply challenges such as increased competition for limited water supplies and climate change. The Federal SECURE Water Act of 2009 and Secretarial Order 3297 established the WaterSMART Program that authorizes Federal water and science agencies to work with State and local water managers to pursue and protect sustainable water supplies and plan for future climate change by providing leadership and technical assistance on the efficient use of water.

The 2008 Idaho State Legislature recognized that the need for additional water supplies and found that it was in the interest of the State to invest in short-term and long-term water projects that provide a balance between water use and water supply for both surface water and groundwater. State Senate Bill 1511, passed and approved by the 2008 Idaho State Legislature, authorized appropriation the of $400,000 for IWRB to study replacing Teton Dam and $1.4 million to determine the feasibility of enlarging the Minidoka Dam.

Reclamation and IWRB entered into a partnership under the auspices of Reclamation's WaterSMART Basin Study program. The $400,000 appropriation was used as the State's contribution to the Basin Study which included the replacement of Teton Dam as an alternative. Under this partnership, the Henrys Fork Basin Study was conducted. The results of the Basin Study are presented in this Final Report.

1.3 Collaboration and Outreach

Reclamation and IWRB collaborated with the Henry's Fork Watershed Council (Watershed Council) to form a Workgroup that included members of the Watershed Council and other interested stakeholders. The Workgroup helped develop and provide input and feedback on a set of alternatives for developing new water supplies and improving water supply reliability for instream flows, irrigation water, municipal and industrial water supplies, groundwater recharge, and fish habitat. In June 2010, the Watershed Council hosted the first session for the Basin Study. For more than 3 years, Reclamation and representatives from the IWRB met with the Watershed Council, Workgroup, and other stakeholder groups collectively and individually to develop alternatives and discuss the analyses and evaluation processes. Interests represented through this process included conservation groups, irrigators, other interested organizations, and Federal, State, and local agencies.

Reclamation created a Basin Study website[1] containing the meeting notes, presentations, research materials, and reports generated during the Basin Study. Input and comments were

[1] See http://www.usbr.gov/pn/programs/studies/idaho/henrysfork/index.html.

solicited from the Workgroup, the Watershed Council, and the general public before reports were finalized and published. Comments and responses to the comments were also included on the Basin Study website.

1.4 Relevant Previous and Current Studies

At the start of the Basin Study, an extensive literature search was conducted for previous studies in the Basin Study area, many of which are posted on Reclamation's website.[2] A list of documents produced during the course of this Basin Study can be found in Section 8.0. The following studies and programs were not part of the Basin Study, but were crucial in the analyses conducted during the study.

ESPA Managed Aquifer Recharge Program

As mandated by the Idaho Legislature, the IWRB operates a managed aquifer recharge program consistent with the goals set forth in the ESPA CAMP and State Water Plan. Several criteria are used to prioritize the location of the IWRB's recharge activities on the ESPA:

- Stabilization of the ESPA through long-term aquifer storage.
- In compliance with the Swan Falls Agreement, maintain minimum flows in the Snake River at the Murphy gage in a reach of the river largely fed by spring discharge from the ESPA through the Thousand Springs.
- Surface water availability for recharge within the water administration system (i.e., spill over Milner Dam, senior water rights at American Falls Reservoir, and senior water rights of 2,700 cubic feet per second (cfs) for hydropower at Minidoka Dam; all limit availability of water for recharge at specific locations in the system).
- Noninterference with optimal capture of water in the surface water reservoirs (ensure no impacts to reservoir fill due to managed recharge operations up-basin).
- Availability of willing partners with water delivery systems in priority areas.
- Avoidance of significant environmental impacts.

The ESPA CAMP, approved by the State Legislature in 2009, identifies an annual average target of 100,000 acre-feet in Phase 1 (through 2017) and 250,000 acre-feet in Phase 2. The IWRB has invested over $1 million since 2009 in recharge activities which include recharge water delivery contracts and development of additional capacity and new recharge

[2] See http://www.usbr.gov/pn/programs/studies/idaho/henrysfork/index.html.

infrastructure. From 2009 through 2012, an average of 117,111 acre-feet per year was recharged across the ESPA by the IWRB. The Fremont-Madison Irrigation District (FMID) has participated in this effort, delivering water under the IWRB's recharge water right to the aquifer through various unlined canals and making use of the existing recharge facilities at the Egin Bench.

Managed aquifer recharge is accomplished both through unlined irrigation canals and in dedicated constructed recharge sites. Recharge in existing unlined canals takes place both before and after the irrigation season. Constructed recharge sites further increase recharge capacity and provide a delivery location if recharge water is available after the irrigation season begins. Several dedicated recharge sites have been constructed on the ESPA, including the Egin Bench site inside the Basin Study area. Additional sites are being evaluated and prioritized based on the State's goals. The IWRB and FMID have a cost-sharing agreement in place to conduct an investigation of expansion of the Egin Bench site.

IWRB and the Idaho Department of Water Resources (IDWR) are continuing to refine IWRB's managed recharge program with cooperation from key leadership, stakeholders, water users, and the public throughout the ESPA and with participation from the State Legislature and Governor's Office. A fundamental component of the program is the continual evaluation, revision, and application of the ESPA groundwater model (ESPAM 2.1) to ensure that the IWRB's recharge activities are implemented in a manner that maximizes stabilization of the ESPA while minimizing water use conflict

Humboldt University Water Budget Study

Humboldt State University developed a computer model to estimate the water budget for the Henrys Fork watershed's surface irrigation system. Field research was conducted by graduate students supervised by university faculty and additional data were compiled from existing water resources and land use databases under a grant from the U.S. Department of Agriculture, Cooperative State Research, Education and Extension Service. Groundwater and surface water flows were modeled under historic, current, and future land and water use scenarios. The study resulted in a water budget and analysis of water supplies and use in the watershed which was shared with decision makers and stakeholders via University masters theses so that they could develop strategies to increase water availability while enhancing ecological benefits in key stream reaches. Reclamation used the modeling and study results during this Basin Study to evaluate potential water management alternatives.

1.5 Interrelated Programs and Activities

Federal, State, and local entities are currently overseeing a number of programs and ongoing activities related to water management in the in the Henrys Fork River basin. Most of these programs are expected to continue into the foreseeable future with the exception of the Agricultural Water Enhancement Program (AWEP) which expires in 2014. In this section, Federal, State, and local activities and programs being utilized in the basin are discussed.

1.5.1 Federal

Minidoka Project

The U.S. Geological Survey investigated the irrigation possibilities of the Minidoka Project in the early 1890s and the project was already under consideration when the Reclamation Act of 1902 was passed. One of Reclamation's earliest projects, the Minidoka Project provides irrigation water across the upper Snake River basin, including the Henrys Fork River basin. The project is discussed in more detail in Section 3.1.1.

Cooperative Watershed Management Program (CWMP)

A U.S. Department of the Interior program, CWMP was implemented in 2009 as part of the SECURE Water Act. The program supports local watershed groups and facilitates multi-stakeholder watershed management projects. Through WaterSMART grants, Reclamation provides 50/50 cost-share funding to water or power delivery entities for programs or actions that seek to conserve and use water more efficiently, increase the use of renewable energy, protect endangered species, or facilitate water markets.

Conservation Innovation Grant Program (CIG)

Natural Resources Conservation Service (NRCS) administers this voluntary program which is intended to stimulate the development and adoption of innovative conservation practices and natural resource protection approaches and technologies for agriculture.

Conservation Reserve Program (CRP)

The goal of CRP, administered by the Farm Service Agency, is to re-establish valuable land cover, and thereby help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. In exchange for yearly payments over 10- to 15-year contracts, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and sow species that will improve environmental health and quality.

Targhee National Forest Plan

Parts of the Basin Study area are included in the Caribou-Targhee National Forest which is managed by the U.S. Forest Service. The Forest Service developed a Forest Plan for the conservation, protection, management, and utilization of the lands and resources in the Caribou-Targhee National Forest. During the course of the Basin Study, the Moose Creek Dam alternative was eliminated from consideration based in part on that Forest Plan which designated the site as a Research Natural Area and suitable for a National Wild and Scenic Rivers System designation.

National Wild and Scenic River System (NWSRS)

The NWSRS, instituted under the Wild and Scenic Rivers Act, protects rivers based upon three classifications: wild, scenic, or recreational. The Bureau of Land Management has determined that four streams in the Henrys Fork River basin meet the eligibility criteria for designation as a wild and scenic river: Teton River (split into four segments), Badger Creek, Bitch Creek, and Canyon Creek. The river segments determined to be eligible are granted interim protective management until a suitability study can be completed (BLM 2009).

Teton River Canyon Resource Management Plan (RMP)

Reclamation released the Teton River Canyon RMP in 2006. This plan guides the future use and management of Reclamation lands along 22 miles of the Teton River above the original Teton Dam site. The RMP provides balance between public demand for multiple uses of the river and natural resource protection and enhancement.

1.5.2 State

Eastern Snake Plain Aquifer Comprehensive Aquifer Management Plan (ESPA CAMP)

ESPA CAMP was developed to address water use conflicts that were threatening to severely disrupt the economy of the ESPA. The plan identifies actions to stabilize spring flows, aquifer levels, and river flows across the ESPA. The long-term objective of the ESPA CAMP is to incrementally achieve a net ESPA water budget change of 600,000 acre-feet annually by implementing a mix of management strategies over a 20-year period. The plan approaches the 600,000-acre-foot target in phases. The hydrologic target for Phase I (years 1 to 10) is a water budget change of between 200,000 and 300,000 acre-feet through groundwater-to-surface-water conversion projects, managed aquifer recharge, demand reductions, and a pilot weather modification program. The hydrologic target for aquifer recharge during Phase I is 100,000 acre-feet on an average annual basis. The long-term target at the end of Phase II (years 11 to 20) for aquifer recharge is 150,000-250,000 acre-feet on an average annual basis.

Agricultural Water Enhancement Program (AWEP)

AWEP is a voluntary conservation initiative administered by NRCS. It provides financial and technical assistance to agricultural producers to implement agricultural water enhancement activities on agricultural land for the purposes of conserving surface water and groundwater and improving water quality.

IWRB's AWEP Project to support stabilization of the ESPA was first approved in 2009. Projects eligible for consideration include 1) ground water to surface water conversions which allow for the delivery of additional surface water in order to reduce groundwater pumping; 2) improvements to water delivery systems in the Thousand Springs area; 3) regulating reservoirs; and 4) demand reduction projects such as end gun removal and conversion to dryland farming.

Idaho Conservation Reserve Enhancement Program (Idaho CREP)

Since 2006, the Idaho CREP agreement between the State, U.S. Department of Agriculture, and Commodity Credit Corporation has promoted the improvement of water quantity and quality in Idaho by enhancing wildlife habitat through establishment of vegetative cover to reduce irrigation water consumptive use and reducing agricultural chemical and sediment runoff to surface water and groundwater. The Idaho CREP is a part of the CRP operated by the Farm Service Agency (see Section 1.5.1). Other agencies involved with this program include Idaho Soil and Water Conservation Commission, IDWR, Idaho Department of Fish and Game (IDFG), local Soil and Water Conservation Districts, Pheasants Forever, and the Idaho Ground Water Appropriators.

The Idaho CREP was established with the goal of retiring up to 100,000 acres of groundwater-irrigated land which is expected to provide water savings of up to 200,000 acre-feet annually to assist in stabilizing the ESPA (ISWCC 2013). The Idaho CREP also addresses issues related to water shortages in the ESPA due to increased use of groundwater, drought, and changing irrigation practices that have resulted in decreased spring flows of tributaries to the Snake River.

Water Supply Bank (Water Bank) and Water District 01 Rental Pool

The Idaho Water Supply Bank (Water Bank), administered by IWRB, provides a centralized mechanism to promote trading and leasing of valid, but temporarily unused water rights. The Water Bank encourages the highest beneficial use of water and provides a source of adequate water supplies to benefit new and supplemental water uses. It also provides a source of funding for infrastructure, improvements to water user facilities and efficiencies across the state.

There are two types of exchange markets: 1) the Water Bank which generally refers to transactions executed across the state using natural flow groundwater and surface water rights and 2) local rental pools which manage exchanges of reservoir storage water primarily within a specific water district. Both the Water Bank and the local rental pools allow water exchanges for all beneficial uses recognized under State law. Any valid water right can be leased to the Water Bank during which time the right is protected from forfeiture. IDWR administers transactions through the Water Bank while local rental pools are administered by individual rental pool committees approved by the IWRB. Six rental pools are currently operated in Idaho, four of which are authorized by the IWRB. The upper Snake River rental pool is represented by the Upper Snake/Water District 01 (upstream of Milner Dam) and the Shoshone-Bannock rental pool is operated independently by the Tribes. The Upper Snake rental pool includes the Henrys Fork River basin area.

The Water District 01 Rental Pool is the largest in the state, exchanging 311,430 acre-feet of water and providing over $290,000 of revenue to the IWRB in 2012. Rental prices range from $6 to $22 per acre-foot depending on annual water availability. Participation in the IWRB's bank has increased in the last decade particularly in areas of limited supply, such as the ESPA. As a result of increased transaction activity and application fees approved by the State Legislature in 2011, the Water Bank rented a total volume of 57,306.9 acre-feet of water in 2012, an increase from 28,816 acre-feet in 2011. The total revenue generated from rental applications was over $540,000, of which approximately $95,000 was retained by the IWRB for administrative costs. The total rental revenue increased from over $190,000 in 2011 (IDWR 2012a).

Idaho Water Transactions Program (IWTP)

In 2003, IWRB became a Qualified Local Entity of the Columbia Basin Water Transaction Program and initiated activities through the IWTP. The purpose of this program is to help restore water to streams and rivers and improve habitat for imperiled fish species and populations while maintaining the agricultural economic base of the area. Mechanisms used include water right leases (partial or full-season), minimum flow agreements, negotiated changes in points of diversion, and water right acquisitions and conservation easements. All of these actions are accomplished using existing administrative programs or processes.

This program has been focused in the upper Salmon River basin. Based on program success in the Salmon River basin, the Friends of the Teton River entered into a partnership with IWRB in 2011 to expand the IWTP to the Teton River basin to enhance flows and improve resident fish habitat. Efforts in the Teton Valley are focused on the Yellowstone cutthroat trout, currently listed as a Species of Greatest Conservation Need by IDFG.

Comprehensive State Water Plan (Plan)

This Comprehensive State Water Plan (Plan), approved by the State Legislature, represents the State's position on water development, management, conservation, and optimum use of all unappropriated water resources and waterways (IDWR 2012b). The Plan seeks to ensure that through cooperation, conservation, and good management, future conflicts will be minimized and the optimum use of the State's water resources will benefit the citizens of Idaho.

In 1992, the IWRB prepared the Plan for the Henrys Fork River basin, including the Fall River and Teton River drainage basins. Each resource element is addressed in the Plan with seventeen recommendations that cover a wide range of water resource issues, including promotion of water conservation, groundwater recharge, and minimum streamflows for aquatic life. Approximately 200 miles of the basin's 3,000 miles of streams were designated for State recreational or natural river protection (IDWR 1992 and IDWR 2014).

Managed Recharge Program

The interaction between surface water and groundwater in the Basin Study area and the ESPA are discussed in Section 3.2 and demands on ESPA water supply resulting from declining aquifer levels is discussed in Section 3.3.2. The Recharge Program provides for development of managed recharge as part of the program to stabilize the ESPA, consistent with in the ESPA CAMP. While the focus of the IWRB's recharge activities is currently being prioritized based on available funding, water supplies, hydrogeologic characteristics, and technical information regarding the most effective locations for long-term aquifer storage, significant amount of managed recharge has occurred in the eastern part of the aquifer. From 2009 through 2012, a total of nearly 150,000 acre-feet of water has been delivered by FMID to the Egin Lakes as part of IWRB's ESPA recharge program.

Relationship to State Law

State government agencies with authority over water resource related activities generally include the Idaho Water Resource Board and the Idaho Departments of Water Resources, Environmental Quality, Parks and Recreation, Fish and Game, Lands, and Agriculture. Title 42, Idaho Code, vests authority over the appropriation and use of public surface water and groundwater of the state is vested in the IDWR. IDWR programs include water rights administration, dam safety, water distribution (measurement and enforcement), ground water protection (including well drilling licensing and permitting), stream channel protection, flood plain management, planning and technical services.

The IWRB is responsible for formulating and implementing the State Water Plan and basin-specific plans, including comprehensive aquifer management plans, subject to legislative approval (Title 42-1732 through 42-1734, Idaho Code; Idaho Constitution Article XV, Section 7). All state agencies must exercise their duties in a manner consistent with these plans (Idaho Code § 42-1734B [4]). Additional programs operated by the IWRB include the Water Bank, water project development and funding, minimum stream flows, natural and recreational designations, as well as objective specific programs such as the managed aquifer recharge program on the ESPA, the Idaho Water Transactions program, Idaho AWEP, and Idaho CREP.

1.5.3 Local

Henrys Fork Drought Management Plan

In 2003, the Fremont-Madison Conveyance Act (P.L. 108-85) transferred title of the Cross Cut Diversion Dam, Cross Cut Canal, and Teton Exchange Wells to FMID. This legislation also established an advisory board to initiate a drought management plan to address all water uses in the Henrys Fork River basin. The purpose of the Henrys Fork Drought Management Plan is to maintain or enhance watershed health and ecology in below-average water years and to balance agricultural and environmental needs through flexible and adaptive water management within the context of State water law. Advisory members represent FMID, Reclamation, IDFG, Henry's Fork Foundation, The Nature Conservancy, Trout Unlimited, and the North Fork Reservoir Company, with technical support from Idaho State University. Meetings with the advisory members occur at regular intervals to determine the best management actions.

2.0 OVERVIEW OF STUDY AREA

2.1 Setting

The Henrys Fork River flows for 120 miles in the eastern part of Idaho, joining the upper Snake River from the north near Rexburg, Idaho (Figure 4). The Basin Study area encompasses the watershed, approximately 3,300 square miles bound by high desert areas of the Eastern Snake River Plain on the west and by the Continental Divide along the Centennial and Henry's Lake mountains on the north. The Yellowstone Plateau and Teton Mountains form the eastern boundary and the southern boundary is marked by the Snake River. Elevations in the Basin Study area range from over 10,000 feet along the Centennial Mountains on the north side of the basin to approximately 4800 feet near the Henrys Fork River's confluence with the Snake River on the south.

The Basin Study area includes most of Fremont, Madison, and Teton counties. Cities and towns within the basin include Rexburg, St. Anthony, Teton, Ashton, Island Park, Drummond, and Driggs (Figure 2 and Figure 7).

Figure 4. Aerial photo of the landscape and geologic features of the Henrys Fork River basin.

2.2 Climate

The climate in the Basin Study area varies with elevation and proximity to the mountain ranges on the north and east. Historically, the minimum annual average temperatures have ranged from 22° F near the headwaters of the Henrys Fork River to 30° F at its confluence with the Snake River. The maximum annual average temperatures have ranged from 52° F in the headwaters area to 57° F at the confluence. Precipitation varies with elevation, with an average of over 43 inches of precipitation in the headwaters area and about 14 inches near the confluence. Over 70 percent of the precipitation occurs between November and May, mainly in the form of snow (Reclamation 1980).

The effects of climate change in the upper Snake River basin have been studied by Reclamation, Bonneville Power Administration, and U.S. Army Corps of Engineers. In general, results of these studies suggest a shift in the annual precipitation to earlier in the year, with more falling as rain. This shift reflects the probability of a longer warm/growing season with less precipitation in the latter part of the season. More detailed discussion of climate change parameters and effects is provided in Section 3.5. Climate change studies by Federal agencies, universities, and researchers are ongoing and when new science and results become available, they will likely be incorporated into future analyses.

2.3 Geology

The geology in the Basin Study area was formed by volcanic cycles and flows that left the northern portion of the area, namely the Island Park basin, layered with primarily rhyolitic magma which fractured and allowed basaltic magma to erupt and flood the floor of the basin. The rhyolite formations are highly permeable, particularly in the upper 100 feet or in highly fractured zones. Rainfall and snowmelt appear to rapidly infiltrate the formation so that little runoff or evapotranspiration occurs (IDWR 1978).

Outwash from glaciers during the Pleistocene Epoch scoured the highlands at the same time as basalt flows from vents south and west of the caldera covered some of the rhyolite flows. Flows from vents on the north and east of the caldera covered much of the eastern part of the study area (Figure 4). The alluvium fill that covers most of the basin is derived from volcanic and sedimentary rocks in the adjacent highlands. In general, the alluvium fill is thickest in the area of Henrys Lake and thins toward the south (Bayrd 2006).

2.4 Hydrology

Originating at Big Springs in the northern part of the basin, the mainstem of the Henrys Fork River flows generally southward, supplemented by water from tributaries flowing from the mountains to the east. The Henrys Fork watershed has four major subbasins: upper Henrys Fork, lower Henrys Fork, Fall River, and Teton River. The United States Geological Survey (USGS) identifies the upper Henrys Fork River watershed as hydrologic unit code (HUC) 17040202; the lower Henrys Fork River watershed as HUC 17040203; and the Teton River watershed as HUC 17040204.

Flows in the basin are influenced by snowmelt and groundwater. The predominately permeable geology of the basin generates a strong connection between surface water and groundwater, especially in the northern parts of the basin. Consequently, much of the lower Henrys Fork River and many of its tributaries are dominated by groundwater flows. The upper Henrys Fork River and Teton River are dominated more by snowmelt, while the lower Teton River has a strong connection to groundwater.

Streamflows are altered by the operation of Henrys Lake Dam, Grassy Lake, Island Park Dam, and Ashton Dam. In general, the dams are operated so that high flows during the spring are captured. Dam operations lower the annual peak flows and increase the low flows of summer and early fall to be increased. Winter flows may be lower than under natural conditions. Under the Drought Management Plan, winter flows are set to serve the best interest of the agricultural community while giving consideration to downstream fisheries and aquatic habitat.

The water supply of the Henrys Fork River basin is discussed in more detail in Section 3.0 and in the baseline conditions of some of the alternatives discussed in Section 5.0.

2.5 Fish and Wildlife

The Henrys Fork River basin is part of the Greater Yellowstone Ecosystem. This ecosystem is one of the largest intact temperate zone ecosystems on earth, covering 28,000 square miles in Idaho, Montana, and Wyoming. It has become an important sanctuary of the largest concentration of wildlife in the lower 48 states (NPS 2014).

The Henrys Fork River basin supports wild populations of native Yellowstone cutthroat trout (Figure 5) and nonnative rainbow trout and brown trout. IDFG operated the Henrys Lake Hatchery near the town of Island Park part of the year for egg collections from Yellowstone cutthroat trout for later release into Henrys Lake. The hatchery was closed in 2013.

Figure 5. Yellowstone cutthroat trout.[3]

Migratory Yellowstone cutthroat trout can be found in Henrys Lake, the Teton River, and the lower Henrys Fork River (DeRito 2012). Rainbow trout have largely displaced cutthroat trout throughout most of the mainstem Henrys Fork River and the Fall River drainages, but have not displaced cutthroat trout in the Teton River drainage. The reason for the difference is likely due to hydrology. The Henrys Fork River hydrograph is representative of groundwater-dominated streams in the Henrys Fork River basin, while the Teton River at South Leigh Creek and Snake River at Heise (just outside the Henrys Fork River basin) hydrographs are representative of snowmelt-dominated streams in the Henrys Fork River basin.

Nonnative rainbow trout have difficulty reproducing in streams that have a high peak flow immediately before and during fry emergence in the spring months because the peak flow displaces eggs and fry. The Yellowstone cutthroat trout fry generally emerge in late summer and early fall when they are not displaced by high flows. In the Henrys Fork River drainage, peak flows are low during rainbow trout egg incubation and fry emergence; consequently, rainbow trout have displaced cutthroat trout throughout most of the Henrys Fork watershed (Van Kirk and Jenkins 2005). In the Teton River drainage, peak flows are high during rainbow trout egg incubation and fry emergence in the spring which may be one reason why rainbow trout have been less successful in the Teton River basin.

As a result of the Yellowstone cutthroat trout population status, IDFG has designated the Yellowstone cutthroat trout as a Species of Greatest Conservation Need (IDFG 2005). IDFG's *Management Plan for Conservation of Yellowstone Cutthroat Trout in Idaho* provides

[3] Photo catalog of yellowstone cutthroat trout can be found at http://www.nps.gov/yell/naturescience/fishid_yct.htm, accessed on September 27, 2013.

details on Yellowstone cutthroat trout population status, distribution, habitat, history of ESA actions, threats, and management actions (IDFG 2007).

As part of the Greater Yellowstone Ecosystem, the Basin Study area provides habitat for a variety of large and small mammals and birds. Over 50 IDFG Species of Greatest Conservation Need are found throughout the watershed. Grizzly bears and lynx, both listed under ESA, are found in the Henrys Fork River basin. Black bears, deer, moose, elk, and pronghorn also inhabit the forested uplands, grassland steppe, and canyons. Small mammals such as beaver, river otters, raccoons, marmots, bats, and a large variety of rodents are year-round residents across the entire Study Basin area. Species such as fisher, wolverine, and lynx use the watershed as transitional habitat. Low elevation areas of the Henrys Fork River basin that are located in the Sand Creek desert provide wintering grounds for thousands of mule deer, elk, and moose.

Fish in the rivers and creeks draw hawks, osprey, owls, kestrels, and eagles to nest in the area during the summers. Columbian sharp-tailed grouse are found throughout the watershed in suitable grassland steppe and agricultural habitats and are considered a Species of Concern by the U.S. Fish and Wildlife Service and a Sensitive Species by the U.S. Forest Service and Bureau of Land Management. Sage grouse are found in intact sagebrush habitats of the watershed and are a candidate species for ESA listing by the U.S Fish and Wildlife Service. Northern goshawks have been seen in the Basin Study area and are considered a Sensitive Species by the U.S. Forest Service (Reclamation 2006).

Figure 6. Sage grouse.[4]

[4] See http://fishandgame.idaho.gov/public/wildlife/sageGrouse/ for Sage-grouse Conservation and Management information.

The Henrys Fork River basin is located along a portion of the Pacific waterfowl flyway. Over a million waterfowl migrate through the area in spring and in fall, with large concentrations of ducks and geese found around Island Park Reservoir and Henrys Lake and along most of the river systems. Trumpeter swans utilize the open waters of the Henrys Fork River basin, which is the primary wintering area for most of Canada's trumpeter swan population (IWRB 1992). Open waters of the Henrys Fork River basin provide wintering habitat for the nearly 5,000 trumpeter swans of the Rocky Mountain population that nest in Canada and the Greater Yellowstone ecosystem area.

2.6 Land Use

Land use in the Henrys Fork River basin is comprised of forestland, rangeland, irrigated cropland, dryland agriculture, and other uses such as urban and housing development areas. The forest land and much of the rangeland are located mostly in the mountainous northern and eastern parts of the basin. Most of the forested lands are owned by the United States and managed by the Forest Service or the National Park Service. The majority of the agricultural land is concentrated in the western, central, and southern areas of the basin, especially on both sides of the lower Henrys Fork River and the lower Teton River (Figure 7).

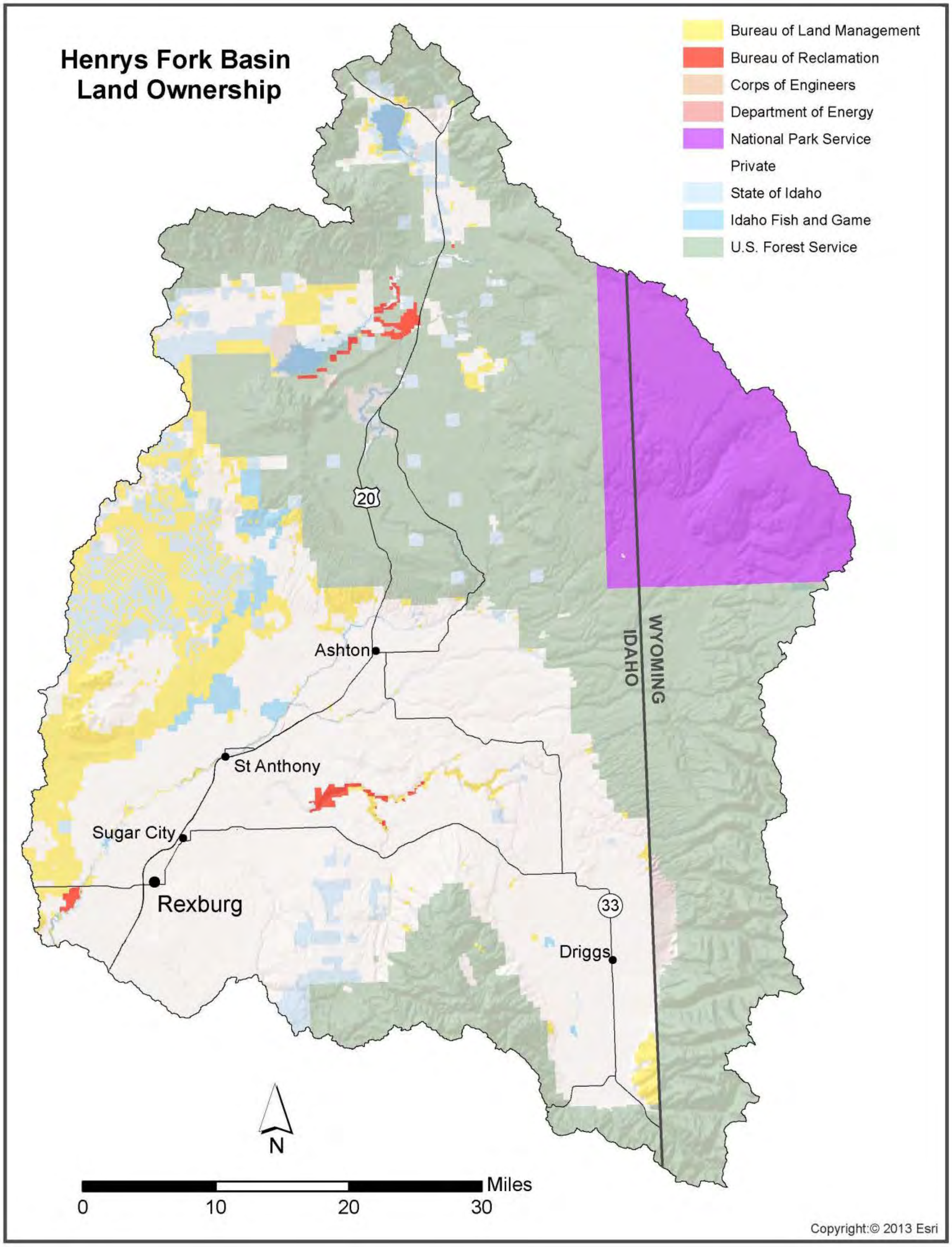


Figure 7. Map showing land ownership in the Henrys Fork River basin.

2.7 Socioeconomics

The 2010 Census recorded 13,242 people in Fremont County, 37,536 people in Madison County, and 10,170 people in Teton County (IDOL 2012). The average county population of the Basin Study area has increased by about 34 percent since 2000, with Fremont County population increasing 7.4 percent, Madison County increasing 39.9 percent, and Teton County increasing 55.7 percent (Census 2011). To meet the needs of the growing population, farms and ranches have been subdivided into housing developments, many of which were platted on lands formerly irrigated for agriculture.

Irrigated agriculture and its related food processing are the main economic activities in the Henrys Fork River basin (IWRB 1992), with the FMID lands generating over $100 million annually in crop sales (Reclamation 2004). Water for the majority of irrigated lands comes from Reclamation's Minidoka Project (see Section 3.1.1). The irrigated lands consist of highly productive soils which primarily produce grain, alfalfa, and potato crops and support dairy and beef operations (Table 2 and Table 3). Livestock water supplies come from irrigation canals or from livestock access to streams and springs.

Table 2. Estimated acreages of major crops in 2010 (NASS 2012).

Crop	Fremont County (acres)	Madison County (acres)	Teton County (acres)	Total Acres
Alfalfa	25,900	20,100	16,800	62,800
Barley	42,800	38,100	28,300	109,200
Potatoes	22,500	28,000	5,300	55,800
Winter Wheat	0	2,600	2,000	4,600

Table 3. Estimated number of cattle during 2010 (NASS 2012).

	Fremont County	Madison County	Teton County
Head of Cattle	13,100	11,100	8,200

Tourists come to the upper Henrys Fork River basin area to visit the nearby Yellowstone and Grand Teton National Parks and to participate in a variety of outdoor recreational activities on National Forest system lands. The Henrys Fork River's world-class fly fishing and the National Forest system lands provide summer and winter outdoor recreational opportunities, drawing tourists from all over the world, and sustaining the tourism/recreation businesses in the area. On the Henrys Fork River alone (Fremont and Madison Counties), angling contributed $29 million and 851 jobs to eastern Idaho's economy. Improved stream conditions could lead to higher catch rates and larger fish, resulting in larger benefits to the rural communities of perhaps as much as $49 million annually (Loomis 2005).

2.8 Hydropower Facilities

Hydropower generation facilities in the basin are located on the Henrys Fork River (Island Park Dam, Chester Dam, and Ashton Dam), the Teton River (Felt Hydro [Figure 8]), the Fall River (Marysville Hydro), and the Buffalo River (Buffalo River Dam).

Figure 8. Felt hydro powerplant on the Teton River.

3.0 WATER SUPPLY AND DEMAND

The hydrology and associated water supplies and demands in the Henrys Fork River basin are complex. Water supply and demand involves a variety of activities and users. In the *Henrys Fork Watershed Basin Study Water Needs Assessment* (Appendix A of Reclamation 2012), the Basin Study area's water needs were discussed in detail for agriculture; hydropower; domestic, commercial, municipal, and industrial water; fish and wildlife habitat; and stabilization of the ESPA. While all water needs are acknowledged as important to the Basin Study area, IWRB, Reclamation, and the Workgroup prioritized three water needs above the others for study: agriculture; fish and wildlife habitat; and groundwater supply for the ESPA.

The following sections describe the current surface water and groundwater supplies and water demands as related to the three prioritized needs in the basin as they currently exist. The climate change projections that may come about in the next 40 years are discussed, as well as how climate change may affect future water supplies and demands.

3.1 Surface Water Supplies

The Henrys Fork River is the largest tributary of the Snake River which in turn, is the largest tributary to the Columbia River. Under natural, unregulated conditions, the total watershed discharge would be around 2.5 million acre-feet per year, with the largest tributaries, Fall River and Teton River, collectively contributing about 1.3 million acre-feet per year (Table 4; Van Kirk 2011).

Table 4. Mean annual natural flows for Henrys Fork River basin (Van Kirk 2011).

Source	Segment	30-Year Mean Annual Natural Flow (acre-feet)	30-Year Mean Annual Flow (acre-feet)	Percent of Total
Upper Henrys Fork River			1,225,356	48.2%
	Henrys Lake	41,768		1.6%
	Henrys Lake to Island Park	439,072		17.3%
	Island Park to Ashton	744,516		29.3%
Fall River			699,914	27.5%
Teton River			618,863	24.3%
	Teton Above S. Leigh	304,084		12.0%
	Teton S. Leigh to St. Anthony	314,779		12.4%
Total Henrys Fork watershed			**2,544,133**	**100.0%**

The natural flow regime of the Henrys Fork River has been altered by irrigation diversions, increased evapotranspiration of irrigation, water storage, and canal conveyances. This alteration is highest during low water years and in the upper portion of the basin (Reclamation 2004).

The mean annual basin outflow over the past 30 years is about 1.6 million acre-feet (Figure 9; Van Kirk 2012a). Much of the water lost to reservoir, stream, and conveyance system seepage and irrigation is recaptured as recharge to the aquifers (Appendix A of Reclamation 2013a). Computer modeling has shown that the lower Henrys Fork River would be a losing reach in the absence of irrigation return flow so that under natural conditions, the basin outflow would still be somewhat less than the supply of 2.5 million acre-feet, due to river seepage to the ESPA (Van Kirk 2012a).

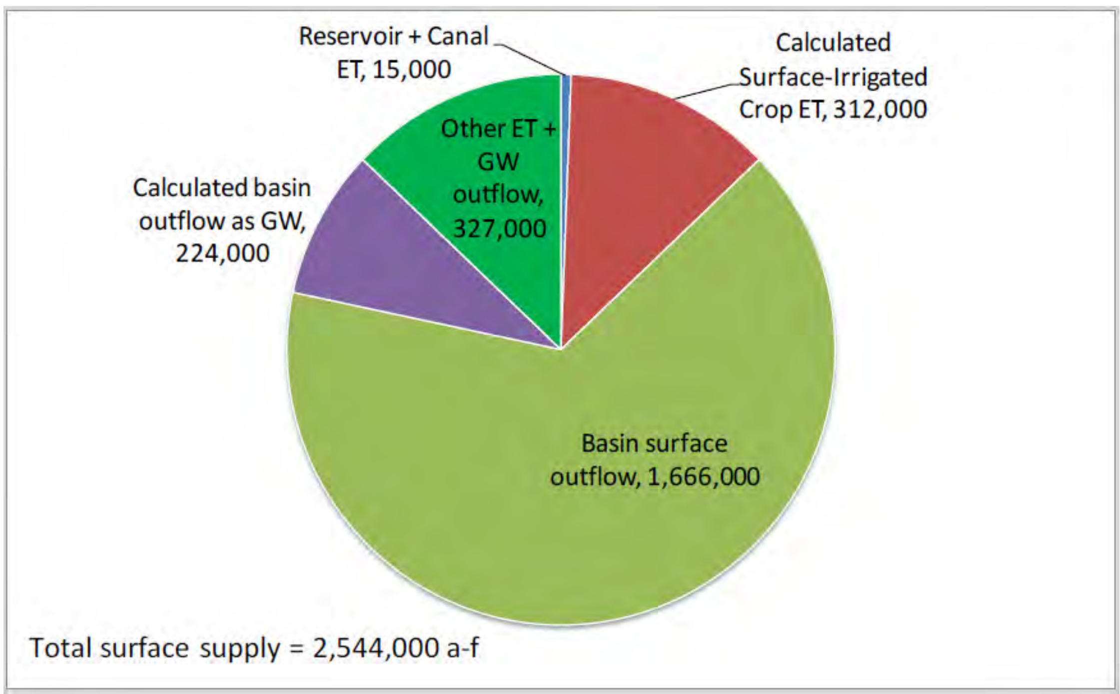


Figure 9. Water budget for Henrys Fork River basin surface supply (Van Kirk 2011). ET denotes evapotranspiration and GW denotes groundwater.

Much of the surface water is tapped for agricultural uses. Water in the Henrys Fork River basin is stored in Henrys Lake, Grassy Lake, and Island Park Reservoir for delivery to irrigated lands across the basin. Private interests developed Henrys Lake Dam and many canals and laterals serving the irrigation lands in the basin were privately developed prior to Reclamation's Minidoka Project. Reclamation's Minidoka Project extends into parts of the Henrys Fork River basin and includes Island Park Reservoir and Grassy Lake and some of the irrigation systems.

3.1.1 Minidoka Project

Reclamation's Minidoka Project is comprised of many dams, reservoirs, hydroelectric facilities, and associated irrigation systems throughout the upper Snake River system (Figure 10). Facilities of the Project include the Minidoka Dam and Reservoir, Jackson Lake Dam and Reservoir, American Dam and Reservoir, Island Park Dam and Reservoir, Grassy Lake Dam and Reservoir, and the Cross Cut, North Side, South Side, and Milner-Gooding canals. The Project provides a full or supplemental irrigation water supply to about 1.1 million acres. Project lands extend discontinuously from the town of Ashton on the Henrys Fork River, to the confluence of the Henrys Fork River with the Snake River and then continue for a total of about 300 miles downstream to the town of Bliss in south-central Idaho. Island Park Dam and Reservoir, Grassy Lake Dam and Reservoir, and the Cross Cut Canal are the only Project facilities present in the Basin Study area.

Most of the water in the Henrys Fork River basin is appropriated; however, new junior water rights may possibly be stored in reservoirs during high flows for short durations of time. Much of the water stored in Island Park Reservoir must be passed through the basin to out-of-basin senior water rights holders. In accordance with spaceholder contracts for reservoir storage, water is stored in a manner that will maximize reservoir storage by keeping storage in the most upstream reservoirs. Water may be passed downstream from Island Park Reservoir to American Falls Reservoir to increase late winter flows below the Island Park Dam; consequently, water physically stored in one reservoir may actually belong to another reservoir.

In 1935, FMID was formed to unite the many irrigation and canal companies spread across Fremont, Madison, and Teton Counties in eastern Idaho. FMID distributes a supplemental water supply to about 1,500 water users irrigating over 285,000 acres associated with the original Upper Snake River Storage Division of the Minidoka Project and the Lower Teton Division of the Teton Project (Reclamation 2004). Irrigated acreage and irrigation methods have changed through the years, increasing the efficiency of water use. FMID estimates that over 70 percent of the acreage is sprinkler irrigated; the remaining lands are flood or subirrigated.

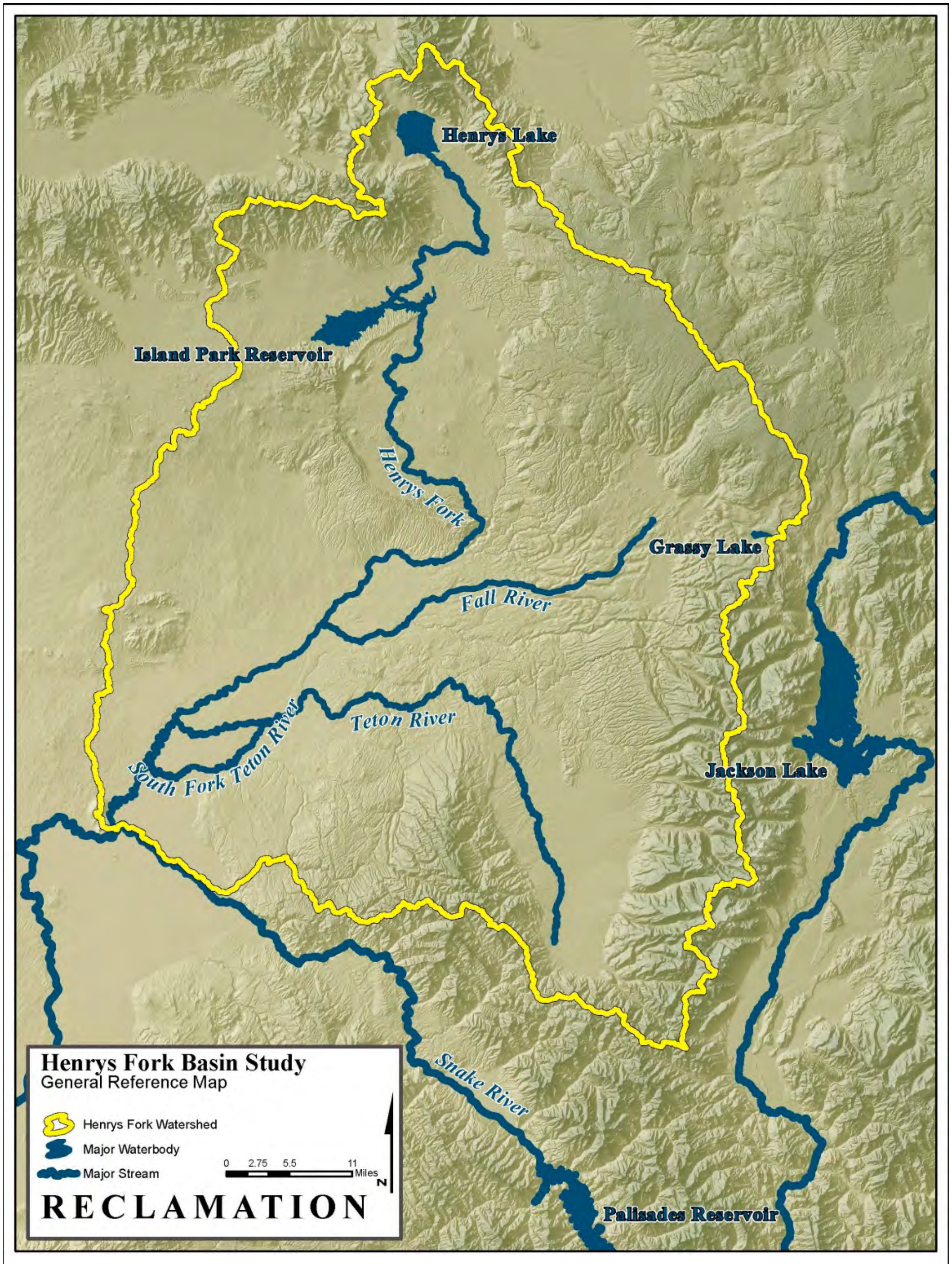


Figure 10. Map of the Minidoka Project facilities in or adjacent to the Henrys Fork Basin Study area. Only Island Park Dam and Reservoir and Grassy Lake are inside the Basin Study area. Henrys Lake is privately owned.

Island Park Dam and Reservoir

Island Park Reservoir, operated by Reclamation, has a total storage capacity of 135,500 acre-feet (Figure 11). The water surface elevation in the reservoir reaches its highest level in late spring and its lowest level in October. Releases from the reservoir are made in consultation with FMID based on water supply, reservoir carryover, and irrigation demand. Releases during irrigation season are generally maintained at 1,200 cfs at the St. Anthony gage, but during years of low runoff, an operating target of 1,000 cfs is maintained downstream at the Rexburg gage.

Figure 11. Island Park Dam and Reservoir on the Henrys Fork River, Idaho.

In the winters, Island Park Dam and Reservoir are owned by Reclamation and operated by FMID. In coordination with Reclamation and other State and Federal agencies, FMID sets the timing and quantity of winter flows in the Henrys Fork River below the dam, based on reservoir carryover and current and projected precipitation. Winter flows may be passed out of Island Park Dam and stored in American Falls Dam without shorting irrigation needs for the next irrigation season, allowing higher late winter flows below the dam which are critical to juvenile fish survival. Ramping rates and schedules are in accordance with the project's Federal Energy Regulatory Commission (FERC) license.

Hydropower is generated at Island Park Dam. The Fall River Rural Electric Cooperative owns the Island Park Hydroelectric Project.

Grassy Lake Dam and Reservoir

Constructed and operated by Reclamation, Grassy Lake Dam is located on Grassy Creek in Wyoming near the southern edge of Yellowstone National Park on Reclamation-withdrawn National Forest system lands (Figure 12). Its storage capacity of 15,500 acre-feet provides supplemental water for FMID. No releases are made during the winter, and summer releases are based on demand, usually in July and August. Additional releases may be made in late summer, if needed, to draft Grassy Lake to its winter operation level of 12,200 acre-feet.

Figure 12. Grassy Lake Dam and Reservoir, Grassy Creek, Wyoming.

Cross Cut Diversion Dam and Canal

Reclamation built the Cross Cut Diversion Dam and Cross Cut Canal in 1938 as part of the Minidoka Project. The Cross Cut Diversion Dam, later renamed Chester Dam, diverts water from the Henrys Fork River between Ashton and St. Anthony, immediately below the confluence with the Fall River. The dam is a concrete weir that raises the water level 10 feet above the streambed (Figure 13). The Cross Cut Canal travels approximately 6.6 miles in a south-southwesterly direction before flowing into the Teton River near Newdale, Idaho. It has a capacity of 591 cfs at the headworks and 759 cfs where the Fall River discharge water enters the canal. The canal conveys irrigation water to 112,000 acres in Fremont and Madison counties, in part via the Teton River.

Under the Fremont-Madison Conveyance Act (P.L. 108-85), Reclamation transferred all right, title, and interest of the United States in and to the Cross Cut Diversion Dam and Reservoir, the Cross Cut Canal, and the canals, laterals, drains, and other components of the water distribution system to FMID.

Figure 13. Cross Cut Diversion Dam and radial headgate on the Henrys Fork River.

3.1.2 Teton Exchange Wells

In the early 1970s, Reclamation drilled five wells to serve the Lower Teton Division of the Teton Basin Project. In 1977, FMID and Reclamation entered into a contract to allow use of the wells as a supplemental water supply in exchange for the water that would have been stored behind the failed Teton Dam. During low water years, FMID pumps up to 30,000 acre-feet of water from the wells into the lower Henrys Fork River, the lower Teton River, and the North Branch Independent Canal to increase the water supply. Although the well permit allows for additional well developments, FMID has agreed to limit well expansion to supply a maximum of 80,000 acre-feet per year during low water years. Although the well water is discharged directly into the Henrys Fork River, it does not provide a net benefit to the instream flows, but instead replaces storage water released from Island Park Reservoir for irrigators downstream of FMID. Exchange well pumping and additional exchange well development may impact the Henrys Fork River and Snake River by slightly decreasing river flows.

3.1.3 Henrys Lake and Dam

In the early 1920s, the North Fork Reservoir Company (NFRC) constructed a dam across the outlet of the natural Henrys Lake to increase the storage capacity of the lake and supply irrigation water to the St. Anthony area (Figure 14). NFRC owns the dam and reservoir, and operates the 90,000 acre-feet of storage in conjunction with the Minidoka Project.

Figure 14. Henrys Lake.[5]

3.2 Groundwater Supplies

Aquifer recharge from irrigation system seepage is a major component of the Henrys Fork River watershed hydrology. The Henrys Fork River watershed exhibits a high degree of surface water and groundwater interaction, both spatially and temporally. Almost 25 percent of the flows diverted from rivers in the Basin Study area enter the aquifers as seepage from reservoirs, rivers, conveyance systems, and irrigation. (Van Kirk 2011). Using the large aquifers of the region as underground reservoirs has been extensively studied, but mostly in regard to recharging of the ESPA (IDWR 1999). Increased irrigation efficiencies, increased groundwater pumping, and a series of drought years have lowered groundwater levels in the Basin Study area and in the ESPA. The total diversions in the basin have decreased about 20 percent since 1978 and recharge has decreased by approximately the same amount (Van Kirk 2011).

There are three main aquifers in the Basin Study area which influence the flows in the Henrys Fork watershed, as well as a localized shallow aquifer. The Yellowstone Plateau Aquifer, formed of rhyolite, covers hundreds of square miles and is recharged by snowmelt. It discharges hundreds of thousands of acre-feet annually to the headwaters of the Henrys Fork River. The Teton Valley Aquifer covers 90 square miles and is recharged by stream channel,

[5] From Idaho Parks and Recreation website at http://parksandrecreation.idaho.gov/parks/henrys-lake.

irrigation canal, and irrigation seepages (Bayrd 2006). The southwestern portion of the Basin Study area lies above the highest point of the ESPA, upstream of most points of ESPA use. The Henrys Fork River basin is an important source of recharge to the ESPA. FMID participates in IWRB's Recharge Program and since 2008, has provided nearly 150,000 acre-feet of water for recharge to the ESPA.

The ESPA covers more than 10,800 square miles of southern Idaho, extending from the town of Ashton in the Basin Study area for 170 miles to the southwest and 60 miles across at its greatest width (Figure 15). The capacity of the ESPA is estimated to be as much as a billion acre-feet of water. It discharges about 8 million acre-feet of flow each year past King Hill at the western-most point of the aquifer (IDEQ 2005). Recharge to the ESPA comes from stream channel and irrigation seepage, and discharge is primarily at Thousand Springs on the Snake River. Its discharge is higher now than it was before irrigation due to the increased seepage from irrigation systems above it; however, the total recharge to the ESPA has decreased since the mid-1900s due to more efficient irrigation delivery systems (Bayrd 2006). More than 10 percent of the ESPA is recharged from irrigation activity in the Basin Study area (Reclamation 1991).

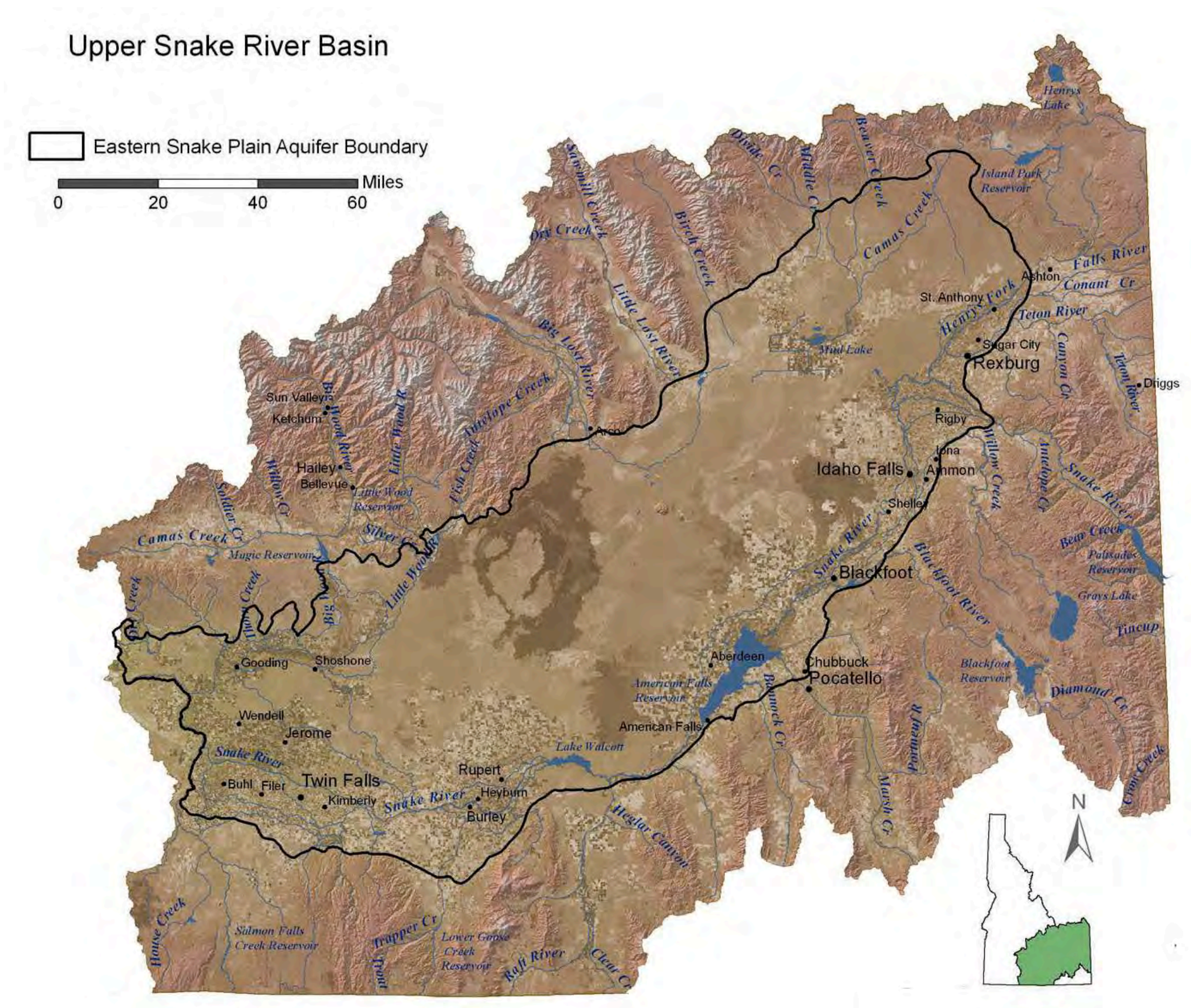


Figure 15. Map of the Eastern Snake River Plain (ESPA). The northeastern-most part of the ESPA stretches into the western side of the Basin Study area.

The IWRB operates a Managed Recharge Program in the ESPA, together with other measures as laid out in the ESPA CAMP (see Section 1.5.2). From 2009 through 2012, IWRB-sponsored managed recharge in the ESPA totaled almost 468,444 acre-feet, or 117,111 acre-feet per year on average. FMID and its member canals participate in the Recharge Program by delivering recharge water prior to and after the irrigation season. FMID's recharge occurs as a result of canal seepage and by direct delivery to the Egin Lake recharge site. In both situations, water passively infiltrates into the ESPA; however, the proportion of water from the Egin Bench canals that goes into the ESPA is still unknown. Since 2008, FMID has delivered an estimated 148,831 acre-feet for recharge (IWRB 2010, IWRB 2012b).

3.3 Water Demands

From the beginning of the Basin Study in 2010, the Workgroup, Reclamation, and IWRB collaborated to identify alternatives that addressed the Henrys Fork River basin water needs. As a result of input from meetings and from public comments received on Basin Study documents, the three water needs of agriculture, fisheries, and ESPA were determined to be the priorities in the Basin Study area and became the focus of the Basin Study.

Existing water demands vary from year to year with varying annual precipitation amounts; future water needs will vary with climate change impacts, population growth, changes in farming methods, water conservation, and other factors that may not be fully understood at this point in time. Table 5 summarizes the current demands and projected future water demands in the basin without consideration of climate change impacts. These totals may vary as climate change impacts become more evident in the future.

Table 5. Summary of average annual water demands in the Henrys Fork River basin (Appendix A of Reclamation 2012).

Water Needs	Current Water Use (acre-feet)	Projected Future Use (acre-feet)	Future Unmet Water Demands (acre-feet)
Agriculture (based on the four canal-irrigated regions)[1]	282,905 in average years 234,421 in drought years	366,235 in average years 366,235 in drought years	83,331 in average years 131,814 in drought years
Fisheries			200,000
ESPA (long-term target to be met through a mix of regional strategies)			600,000
Domestic, commercial, municipal, and industrial needs[2]	18,361	36,722	18,361
Environmental needs	Various Recommendations	Various Recommendations	Various Recommendations

[1] Agricultural current and future use refers to crop consumptive requirements. To meet these crop requirements, additional water must be diverted to account for canal and on-farm inefficiencies.

[2] 2 percent annual increase over 40 years based past population growth and current water use.

3.3.1 Surface Water Demand

Agriculture

Reclamation defines a water shortage as a maximum of 50 percent of a full water supply in a single year or a 10 percent average shortage in any 10 consecutive years. Based on these criteria, three of the four irrigated regions in the Basin Study area have varying degrees of water shortages that range from 20 to 80 percent for individual canal companies (Figure 16):

- Lower Watershed – adequate supply in average water years; deficit in a drought year following a drought year.
- North Fremont – always significantly deficit.
- Teton Valley – always significantly deficit.
- Egin Bench – has a surplus in average water years and a balance in drought year following a drought year.

The average annual irrigation water supply shortage in all four canal-irrigated regions is 83,331 acre-feet (Appendix A of Reclamation 2012). The Teton Exchange wells are located at the lower end of the basin; consequently, supplemental water from the wells cannot be directly delivered to the Fremont and Teton areas that have the greatest unmet irrigation needs. Local irrigators indicate that several management strategies are used during drought periods, particularly in regions like the Fremont and Teton irrigated regions where water shortages are greatest, to minimize the economic consequences of agricultural water shortages.

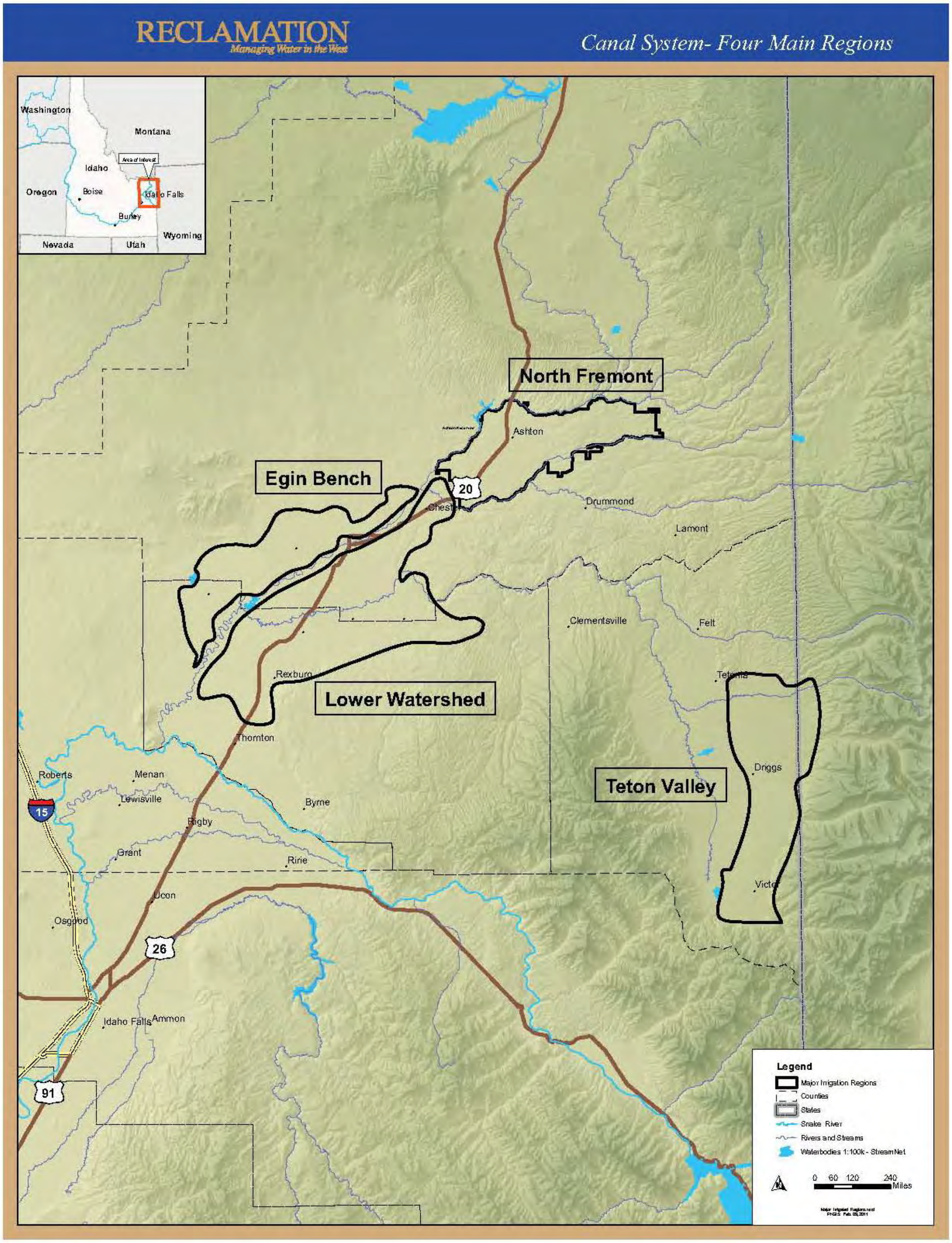


Figure 16. The four irrigated regions in the Henrys Fork Basin Study area.

Fish and Wildlife

The minimum streamflow is defined as the minimum flow necessary to protect desired stream values such as fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, navigation, transportation, or water quality (Idaho Code § 42-1502(f)). Various recommended minimum flow targets to preserve stream values have been planned by the IDFG (IDFG 1999 and IDFG 1978), the Snake River Resources Review panel (SR3 2001), and other entities. Under the Henrys Fork River Drought Management Plan, Reclamation cooperates with IDFG and FMID to minimize impacts from reservoir drawdowns and meet fish habitat needs while still considering irrigation needs.

Current water management practices allow Teton Valley irrigators to purchase water from storage facilities outside of the Teton River basin (most commonly out of Island Park Reservoir) to provide water for downstream senior users when IWRB curtails surface water usage. This practice results in out-of-basin water exchanges and tends to exacerbate tributary dewatering issues. While groundwater recharge from irrigation activities helps replenish downstream flows, diversions often have a negative impact on fish and fish habitat.

The timing and magnitude of peak and seasonal flows in the Henrys Fork River and its tributaries are important to sustain its fisheries (see Section 2.5). The current alteration of flows below storage and power facilities on the rivers in the basin is offset to a small extent by inflows from the tributaries and groundwater recharge from irrigation activities. Additional water to reduce the impacts to fisheries is most needed in the tributary basins where there is less inflow and recharge and the water shortages are the greatest (Van Kirk et al. 2011).

3.3.2 Groundwater Demand

The ESPA was designated as a sole source aquifer by the U.S. Environmental Protection Agency because it supplies at least 50 percent of the drinking water to the population living above the aquifer and there is no other source of drinking water that can be physically, legally, or economically used to supply that population (IDEQ 2005). A large part of Idaho's agricultural product, valued at approximately $10 billion annually, is dependent on water from the ESPA (IDWR 2009). Fish farms fed by the ESPA provide about three-fourths of the nation's farm-raised trout (IDEQ 2005).

In the ESPA, more water is being used than is being recharged. Declining aquifer levels and spring discharges (e.g., Thousand Springs area), changing flows in the Snake River, and other actions (e.g., flow augmentation for anadromous fish survival) have resulted in insufficient supplies to satisfy existing beneficial uses across the upper Snake River basin. As described in Section 1.5.2, the ESPA CAMP outlines a long-term objective of incrementally achieving a net ESPA water budget increase of 600,000 acre-feet annually through implementation of a mix of management actions including, but not limited to, aquifer recharge, groundwater-to-surface water conversions, and demand reduction strategies (IWRB 2009).

3.4 Characterization of Future Conditions

Looking 40 years into the future, economic issues relating to irrigation, recreation, and associated businesses will continue to require dependable water supplies. Future water needs may fluctuate with varying annual precipitation amounts, climate change impacts, population growth, changes in farming methods, water conservation, and other factors that may not be fully understood at this point in time. While the quantity of available water is not expected to change in the future, the timing of peak flows and an extended warm-weather season could increase future demands across all areas and needs (see Section 3.5).

For the Basin Study, no increase in the number of irrigated acres is expected; however, fewer acres may be irrigated as farms and ranches are subdivided into housing developments to meet the growing population needs. Future irrigation water demands could be affected by the continued conversion of agriculture lands to urban areas; changes in crop types in response to the market or climate conditions; and the employment of new conservation measures in agricultural practices or irrigation delivery systems. Whether these impacts will increase or decrease future demands is unclear at this time.

The Henrys Fork River is expected to maintain its reputation for world-class fly fishing and the adjacent National Forest system and National Park lands will likely continue to draw tourists from all over the world.

The river is expected to continue to support wild populations of native Yellowstone cutthroat trout and nonnative rainbow trout and brown trout. The Basin Study area is expected to continue to provide habitat for a variety of large and small mammals and birds; however, recharge from irrigation has decreased with the installation of more efficient irrigation systems, which in turn has decreased groundwater inflows to the rivers. Over time, this could potentially impact wildlife and fisheries and their habitats (Van Kirk 2011).

IWRB expects to continue the managed recharge program and manage and improve the ESPA water supply consistent with the ESPA CAMP and State Water Plan.

3.5 Potential Effects of Climate Change on Supply and Demand

The impacts of climate change in the Henrys Fork River basin are uncertain. Ongoing research indicates that the basin may experience warmer air temperatures and varied precipitation amounts. There may be a shift in the timing of peak flows to earlier in the year and a decrease of summer flows during the warmer months. The projected warmer air temperatures could extend the irrigation season to later in the year than is currently experienced.

Reclamation, the Bonneville Power Administration, and the U.S. Army Corps of Engineers collaborated to adopt climate change and hydrologic datasets to better understand how potential changes in water supply due to climate change may affect reservoir operations in the Columbia River Basin. Output (e.g., temperatures, precipitation) from Global Circulation Models (GCMs) was spatially downscaled and bias corrected, then used in a hydrologic model that generated supply or flow values at various locations in the Columbia River Basin. Two future time periods called Hybrid-Delta were defined as the 30-year period surrounding the 2020s (2010 to 2039) and the 30-year period surrounding the 2040s (2030 to 2059). Those supply data were provided to stakeholders for use in their long-term planning models for several basins, including the upper Snake River basin which included the Henrys Fork watershed. For the analyses of the Basin Study alternatives, the 2040s period was used in the computer modeling activities.

3.5.1 Potential Effects on Agricultural Water

Using hydrologic models, Reclamation generated projected inflows influenced by climate change. Those data were used in existing water management models for the upper Snake River above Brownlee Reservoir. The modeling results indicated a shift in the timing of the peak flow to a month earlier. Flow volume increased above historical flows earlier in the cool season (October or November to April) and decreased in the summer and fall seasons (May through September or October).

This shift in peak flow timing and increased cool season inflow occurred when reservoirs would be at or near capacity or constrained by a flood control rule curve that may increase the probability of passing floodwaters downstream. The lower flows that are projected in future summer months may result in less water in the rivers and creeks to fulfill natural flow water rights, subsequent increased use of stored water by those that hold contracted storage space, and potential impacts to reservoir carryover during particularly long-term drier periods.

Given the modeled warming global temperatures and changes in precipitation, the growing season for agriculture is expected to begin earlier in the season and end later in the season than it currently does, depending on geography. While the shift of peak flow timing to earlier in the year may be counterbalanced by the shift in the volume of flow, the extension of the growing season will likely exacerbate any drought conditions currently experienced by instream flow users and create a greater reliance on storage water rights.

These shifts may also affect the operations of dams and management of irrigation systems, increasing the need to release more water from the reservoirs and divert more water for irrigation later in the summer months (Reclamation 2011). A decrease in natural streamflow in the late summer to early fall months could result in less water available for natural flow diversions thus increasing stored water usage.

3.5.2 Potential Effects on Fish and Wildlife Habitat

Environmental objectives for both anadromous and resident fish species were evaluated in the climate change study. Climate-induced changes in the hydrologic regime of the Henrys Fork River could impact early life stages of fish (i.e., Yellowstone cutthroat trout and rainbow trout). Earlier peak flows due to climate changes in the Basin Study area could potentially impact the timing of spawning and fry emergence (see Section 2.1). Warmer air temperatures may increase water temperatures enough that fish will move to higher elevations in search of cold water (Gresswell 2011).

Since 1992, consultations between Reclamation and NOAA Fisheries Service under Section 7(a)(2) of the ESA have included the consideration of flow augmentation from Reclamation's upper Snake Projects (including Island Park Reservoir) to augment flows in the lower Snake and Columbia rivers through acquisitions from willing sellers. In the reservoirs that require minimum pools or flows, it was found that in some cases, it may be more difficult to meet these augmentation objectives in some of the reservoirs in the driest conditions (Reclamation 2011).

3.5.3 Potential Effects on Groundwater and the ESPA

Climate change in the Henrys Fork River basin has the potential to impact the quantity of groundwater recharge and the quantity of water pumped from the shallow aquifer. Three climate change scenarios were used to evaluate potential impacts to streamflow in the Henrys Fork River basin (see Section 5.1.2). The modeling results indicated an increase in precipitation from historical norms in the winter months and a decrease in the summer months (Reclamation 2013b). These changes in precipitation patterns would result in increased base streamflows in the winter months and a decrease in the summer months.

Based on the climate change projections, recharge that occurs directly from precipitation has the potential to increase during the winter months and decrease during the summer months. Since a large portion of the groundwater recharge in the Henrys Fork River basin occurs due to canal losses and on-farm inefficiencies, changes in farming practices and methods in response to climate change have the potential to impact the aquifer more than climate change alone. Irrigators may be more likely to implement conservation measures, such as converting to sprinkler irrigation or lining/piping canals, to improve the efficiencies of their systems if late summer flows are limited. These activities could result in decreased recharge to the aquifers.

The Teton exchange wells are operated by FMID in years when FMID's full water allotment from Island Park Reservoir storage is not available. This type of operation may occur less often under the projections evaluated. Island Park Reservoir fills more often under the climate change projections that were used in this study. Because these projected future climates increase inflow to the reservoir during the winter and thereby increases the reliability of filling the reservoir, the operation of the exchange wells would be required less often, resulting in less water pumped from the aquifer.

The changes to aquifer storage as a result of changes in recharge would impact groundwater returns to streams, though the extent of the impact would depend on the quantity of increased or decreased recharge.

3.6 Future Challenges and Considerations

The Henrys Fork River basin and ESPA are in a non-trust water area as designated by the IDWR. The trust/non-trust areas were established as a result of 1984 Swan Falls Agreement between the State and Idaho Power Company which defined minimum streamflows in the Snake River for Idaho Power Company's water rights at Swan Falls above Milner. Water rights from the Snake River in the non-trust area are not fully satisfied at certain times.

In general, for any new consumptive use of water, applicants must demonstrate to the State that their new diversion and consumptive use of water will not injure senior water rights or that mitigation can be done during times in which injury would otherwise occur. The interconnection between surface and groundwater in the area must be considered and addressed in any new proposal. Meeting these criteria may limit new water uses in the future for municipalities and industries.

4.0 Screening and Selection of Alternatives

As a first step in the planning process, Reclamation, IDWR, and the Workgroup met to discuss the issues, opportunities, and constraints to be considered in formulating alternatives for the Basin Study. Through these discussions, the following process was defined to both identify the full range of alternatives and determine which ones held the most promise and warranted more detailed investigations as the focus of this study:

1. Identify a full range of potentially viable alternatives for augmenting water storage and for optimizing and conserving water supply in the Henrys Fork River basin. In the case of storage, alternatives needed to provide additional water supply for both the Henrys Fork Basin and the ESPA. For water supply optimization and conservation, the focus would be on in-basin needs.

2. Conduct initial opportunities and constraints screening of the full list of potential alternatives by using available information and a straightforward scoring system to determine which alternatives warranted more detailed consideration or should be eliminated early due to a high level of constraint ("fatal flaws") or fundamental absence of meaningful opportunities.

3. Review results of initial screening to verify accuracy and credibility; refine results based on (Step A) professional judgment of the study team and (Step B) preliminary analysis, including field reconnaissance, to define the final short list of the most promising alternatives that would become the focus of this Basin Study.

4.1 Identification of Potential Alternatives

The full range of potential alternatives to provide additional water storage and to optimize and conserve water resources in the Henrys Fork River basin was identified through a review of existing sources[6] and through discussions with the Workgroup. Four general categories emerged from the 51 alternatives put forward by the Workgroup: 1) surface storage; 2) groundwater recharge; 3) water markets; and 4) conservation water management and demand reduction in agricultural and municipal uses.

4.1.1 Combination of Alternatives

Reclamation, IDWR, and the Workgroup recognized that the potential to combine alternatives aimed at increasing storage and improving management of water resources held significant promise for meeting local and regional/State needs. At this early stage of planning, too little

[6] Many of these published sources may be found at http://www.usbr.gov/pn/programs/studies/idaho/henrysfork/reference/index.html.

was known about the characteristics of the individual elements, how viable they would be, and how they may synchronize with each other. Consequently, the study of potential combination options or water supply and management programs was deferred until sufficient study of individual categories of action was completed.

4.2 Preliminary Screening – Opportunities and Constraints Assessment

All of the alternatives put forward by the Workgroup were assigned scores based on the evaluation categories and factors listed in Table 6. The scores provided a ranking of the alternatives that emphasized constraints and impacts of each alternative for comparative purposes.

Table 6. Evaluation categories, factors, and scoring (rating) system.

	Score of 1	Score of 2	Score of 3
Water Supply			
Hydrologic potential (average annual in acre-feet)	High potential: greater than 100,000 acre-feet	Moderate potential: 30,000-100,000 acre-feet	Low to no potential: less than 30,000 acre-feet
Restrictions on hydropower development (i.e., IWRB or Northeast Power Coordinating Council (NPCC) designation)	No restrictions	Moderate: NPCC restrictions	IWRB or both IWRB & NPCC restrictions
Flood control potential	High potential	Moderate potential	Low to no potential
Natural Environment			
Wildlife habitat (i.e., big game winter range and big game migration corridors)	Low to no constraints	Moderate constraints: e.g., adverse but not significant or significant but mitigable adverse impact	High constraints: e.g., significant impact not subject to mitigation
ESA-listed species, including At-Risk (U.S. Forest Service and Bureau of Land Management Sensitive Species and Idaho Species of Greatest Conservation Need), and threatened, endangered, candidate and experimental nonessential species			
Wetland/habitat values, including National Wetlands Inventory (NWI) wetlands			
State aquatic species of special concern (i.e., Yellowstone cutthroat trout, presence and conservation/management tier)			
Special designation (i.e., Bureau of Land Management/U.S. Forest Service eligible stream, State natural river, State recreational river, and designated wilderness)			
Socioeconomic Environment			
Land management (i.e., private, Federal or State landownership and presence of conservation easements)	Low to no constraints	Moderate constraints: e.g., adverse but not significant or significant but mitigable adverse impact	High constraints; e.g., significant impact not subject to mitigation
Recreation/economic value (i.e., boating, fishing, hunting, Yellowstone National Park, guiding/outfitting, scenic/natural features, cultural/historic resources, and developed recreation facilities such as campgrounds and trails)			
Infrastructure (i.e., roads, utility lines, structures, habitation)			

From the screening results, the following top-rated alternatives were carried forward into the next level of assessment:

- Surface Storage Site Alternatives
    - Lane Lake
    - Moody Creek (Webster Dam)
    - Teton Creek (Alta Project)
    - Ashton Dam enlargement
    - Horseshoe Creek
    - Island Park Enlargement
    - Grassy Lake
    - Squirrel Meadows (Wyoming)
    - Conant Creek
    - Moose Creek
    - Squirrel Creek (Idaho)
    - Driggs
    - Spring Creek (Canyon Creek)
    - Teton (rebuild or new site)
    - Upper Badger Creek
- Managed Groundwater Recharge Alternatives
    - Egin Lake enlargement
    - FMID Recharge Program (Egin Bench)
    - FMID Recharge Program (other)
    - Teton Valley Recharge Program
- Water Market
    - Credit system
    - Utilize and/or expand existing banking program
    - Economic valuation of water

- Conservation, Water Management, and Demand Reduction Alternatives
  - Teton Valley water conservation
  - North Fremont water conservation
  - Lower Bench water conservation
  - Egin Bench water conservation
  - Increase capacity of Cross Cut Canal
  - General demand reduction alternatives
  - Weather modification
  - Consolidation (e.g., Lemhi)
  - Domestic, commercial, municipal, and industrial supply and conservation
  - FMID system optimization

At this preliminary stage of the Basin Study, no analyses were done to estimate the volumes or locations of water; however, these options offered the potential for meeting at least part of local needs and generally did not have the potential for adverse environmental impacts. For these reasons, all identified options were carried forward for further discussion and analysis.

4.3 Final Screening of Alternatives

The results of the preliminary screening were reviewed by Reclamation, IDWR, and the Workgroup. For the candidate surface storage sites, the review focused on the relative severity of potential environmental impacts and the potential to mitigate those impacts. For the remaining alternatives (managed recharge; water markets; and conservation, water management, and demand reduction), the review centered on determining whether the most viable and productive options had been identified.

As a first step (Step A) in this final screening, Reclamation, IDWR, and the Workgroup checked the preliminary screening results based on available information and revised the results, where warranted, based on more in-depth review. In cases where substantial uncertainty still remained, a second step (Step B) of final inquiry was carried out. This step featured preliminary field work and/or more in-depth research.

The results of this final screening are summarized in the following subsections.

4.3.1 Surface Storage Site Alternatives

Fifteen candidate surface storage sites received a score of 1 through 6 in the preliminary screening process described in Table 6. A more in-depth review found that eight of these storage site alternatives had other constraints that were both significant and not subject to mitigation. Seven of these constrained sites were identified during Step A of the final review; the eighth, Moose Creek, was identified as a result of a more in-depth Step B assessment. As shown in Table 7, these eight sites were removed from further consideration and the remaining seven sites were carried forward into the full study.

Table 7. Final screening results (Steps A and B) for the surface storage alternatives

Preliminary Alternatives	Carried Forward for Further Study	Remove from Consideration	Rationale for Removal
Ashton Dam Enlargement	X		
Conant Creek		X	Impact on Yellowstone cutthroat trout
Driggs		X	Impact on community (infrastructure inundation)
Grassy Lake		X	Limited additional capacity; within National Park boundary
Horseshoe Creek		X	Undefined; Horseshoe Creek is on the west side of a bifurcation of Teton River near Bates Road. This would be a partial alternative of Driggs.
Island Park Enlargement	X		
Lane Lake	X		
Moody Creek (Webster Dam)	X		
Moose Creek		X	Further investigation revealed that this alternative would have severe impacts on wildlife habitat and protected landmark features.
Spring Creek (Canyon Creek)	X		
Squirrel Creek (Idaho)		X	Significant Endangered Species Act concerns; grizzly bear habitat; contiguous with National Forest and National Park boundaries.

Preliminary Alternatives	Carried Forward for Further Study	Remove from Consideration	Rationale for Removal
Squirrel Meadows (Wyoming)		X	Significant Endangered Species Act concerns; grizzly bear habitat; contiguous with National Forest and National Park boundaries.
Teton (rebuild or new site)	X		
Teton Creek (Alta Project)		X	Geologic fatal flaw
Upper Badger Creek	X		

4.3.2 Managed Groundwater Recharge Site Alternatives

A more in-depth review by Reclamation, IDWR, and the Workgroup resulted in (Step A) restating the alternatives to provide better focus on the most promising actions or sets of actions related to groundwater recharge, and (Step B) the elimination of all but the Egin Lake alternative based on more in-depth study. The overall review and selection process is shown in Table 8.

Table 8. Final screening results for the managed groundwater recharge alternatives.

Preliminary Alternatives	Step A Shortlist	Step B
Egin Lake enlargement	Expansion of managed recharge in Egin basin	Retain for further study by IWRB (see Section 5.3)
FMID Recharge Program (Egin Bench)		
FMID Recharge Program (all other FMID)	Evaluate recharge in the Lower Teton through development of new facilities	Retain for further study by IWRB (see Section 5.3)
Teton Valley Recharge Program		
Evaluation of the benefits of expanding Egin Lake groundwater recharge	Recharge using existing irrigation canals (moved to the agricultural water conservation category)	Eliminated due to low viability due to significant challenges in obtaining water rights, limited benefits, and potential environmental impact conflicts

4.3.3 Water Market Alternatives

The three alternatives related to water markets identified in the preliminary screening process represented different aspects of or approaches to a water marketing program. During the final screening, discussion of the potential for water markets resulted in the decision to consolidate these aspects and further consider the broad concept of water markets as a whole (Table 9).

Table 9. Final screening results for the water market alternatives.

Preliminary Alternatives	Final Screening (Steps A and B)
Credit system	
Utilize and/or expand existing banking program	Evaluate existing and potential market-based mechanisms
Economic valuation of water	

4.3.4 Conservation, Water Management and Demand Reduction Alternatives

As with the managed groundwater recharge and water market alternatives, Reclamation, IDWR, and the Workgroup discussions during Step A of the final screening process resulted in substantial restatements of candidate alternatives related to conservation, water management, and demand reduction. Some alternatives were grouped or restated; others were eliminated due to being too general or speculative. This restatement of the alternatives is shown in Table 10. Overall, the restatement was intended to more clearly describe potentially feasible options as more detailed analyses were initiated. Step B of the final screening process for conservation, water management, and demand reduction alternatives involved further assessment by Reclamation, IDWR, and the Workgroup. The results of this assessment are shown in Table 10.

It should also be noted that assessment of on-farm conservation practices was also originally considered as part of this study. This analysis would have evaluated the conversion of surface irrigation systems to sprinkler irrigation systems. However, due to the lack of extensive surface irrigation systems and the complexity of estimating the reduction in irrigation seepage, canal discharge, and increased crop consumptive use, this alternative was not evaluated.

Table 10. Step 1 final screening results for the conservation, water management, and demand reduction alternatives.

Preliminary Alternatives	Final Screening – Step 1 Restatement of Shortlist	Step B Final Screening Results
Teton Valley water conservation	Piping and lining	Carry forward into more detailed study
North Fremont water conservation		
Lower Bench water conservation	Demand reduction	Carry forward into more detailed study
Egin Bench water conservation		
Increase capacity of Cross Cut Canal (CCC)	Recharge using existing irrigation canals	Eliminated due to significant challenges related to obtaining additional water rights and the limited and/or conflicting benefits/impacts
General demand reduction alternatives		
Weather modification	Municipal and industrial conservation	This option is considered viable to help basin cities meet their population growth needs, but would not be a benefit to the Henrys Fork River basin water budget or the ESPA. The municipalities would be able to implement conservation on their own to meet their needs; therefore, this alternative was dropped from consideration.
Consolidation (e.g., Lemhi)		
Domestic, commercial, municipal, and industrial supply & conservation	Canal automation	Carry forward into more detailed study
FMID system optimization		

5.0 EVALUATION OF ALTERNATIVES

The screening process described in Section 4 resulted in 12 alternatives being carried forward for more detailed analysis. Care was taken to provide for the array of alternatives selected for further study to include the most promising actions in the four main categories: surface storage, managed recharge, water marketing, and conservation, management and demand reduction. The selected alternatives were:

- Surface Storage Alternatives
  - Lane Lake Dam
  - Spring Creek Dam
  - Moody Creek Dam
  - Upper Badger Creek Dam
  - Teton Dam
  - Island Park Dam storage increase
  - Ashton Dam raise
- Managed Recharge Alternative
- Water Marketing (common to all alternatives)
- Conservation Alternatives
  - Canal automation
  - Canal piping
  - Demand reduction

The reporting of study results begins in Section 5.1 with a discussion of characteristics and/or findings that are common to all or a significant subset of the alternatives. Study results for each alternative are organized according to the following general outline:

- Description
- Impact to Water Budget
- Benefits and Impacts
- Key Points from Evaluation and Feedback
- Additional Limitations of Analysis

Three alternatives, Lane Lake, Teton Dam, and Island Park Dam storage increase, were selected for in-depth hydrology and climate change analyses at the request of IWRB and the Workgroup (Reclamation 2013b). These three alternatives represented a storage alternative with pumped water as a source, a storage alternative with impoundment of a major river, and an alternative that would alter an existing facility. The results could be used to extrapolate information about the other alternatives. For the hydrologic analyses, ecological flow targets for the hydrologic modeling were determined after discussions with the Native Trout Subcommittee of the Henrys Fork Watershed Council. The ecological flow targets were modeled as 200 cfs from September to November, 400 cfs from December to February, and 300 cfs the rest of the year (Reclamation 2013b).

5.1 Findings Common to Majority of Alternatives

5.1.1 Capability of Alternatives to Meet Henrys Fork River Basin and/or ESPA Needs

A review of existing and projected water needs in the Henrys Fork River basin revealed that any of the candidate actions, either individually or in combination, would only represent a partial solution to meeting the basin's needs. Given these conditions, future actions in the basin would need to be defined and pursued based on the needs of specific areas and/or uses. Some combinations of the alternatives may provide significant progress toward meeting the needs.

Available in-basin storage is only a partial solution for changing the water budget in the ESPA. IWRB would need to develop delivery strategies downstream on the Eastern Snake River Plain to deliver the storage water into areas served by groundwater pumpers such as the A&B Irrigation District. With respect to the Egin Lakes recharge alternative, IWRB would continue to work with stakeholders to determine whether recharge activities at this site would stabilize the ESPA and meet recovery goals and objectives set out in the ESPA CAMP and State Water Plan.

5.1.2 Potential Climate Change Impacts

As noted in Section 3.4, climate change scenarios indicate a shift in the timing of peak precipitation and runoff and an increase in volume in most locations. The timing of peak runoff is generally projected to shift to a month earlier, with volumes increasing above historical levels earlier in the cool season (October or November to April) and decreasing in the summer and fall seasons (May through September or October). This shift in timing and increase in runoff volume to earlier in the year would mean an increase in reservoir storage earlier in the year and a greater need to provide irrigation water later in the summer months

(Reclamation 2011). A decrease in surface water delivery would be anticipated in the latter part of the irrigation season or warmer months (Reclamation 2011).

The baseline conditions in the Henrys Fork River basin were compared to these climate change scenarios:

- Less Warming and Drier (LW/D).
- Minor Change (MC).
- Less Warming and Wetter (LW/W).

Another probable effect of climate change was observed through the more in-depth studies of the Lane Lake, Teton Dam, and Island Park storage increase alternatives. Studies performed for these three potential reservoir actions all suggested an increase in precipitation in the spring, allowing increased reservoir accrual (see individual sections for more details). The percentage of years during which little or no precipitation would be available to fill the new reservoir space would be reduced from 15 to 20 percent of years to approximately 5 percent or less; however, all climate change simulations are based on current irrigation and operational practices. Under future changes in climate, irrigation activities could possibly begin earlier in the year and in that case, less water would accrue to the new reservoir space.

The findings from these climate change studies show the potential benefits of additional storage space in capturing and storing increased spring flows for use during the longer dry season during the late summer and fall seasons.

Implementation Options

Due to the relatively low prices for water and limitations on agricultural payment capacity in the Henrys Fork River basin and ESPA, development of water supply projects that can be funded solely by payments from direct beneficiaries may be challenging.

5.1.3 Elements Relevant to All Surface Storage Alternatives

Benefits and Impacts

The out-of-basin water budget would be temporarily reduced when water is diverted during the annual high flow period and stored in a reservoir, but some or all of that stored water may be available at a later time for numerous out-of-basin uses, including agricultural needs; domestic, commercial, municipal, and industrial needs; ecological needs; and as additional water supply to offset ground water pumping in the ESPA. The stored water may also alleviate some of the effects of climate change.

While any of the surface storage alternatives would be a barrier to fish migration, fish ladder facilities could facilitate migration around the structure. While on-stream dam structures would inhibit upstream and downstream movements of fluvial Yellowstone cutthroat trout, the greater impact would be from replacing free-flowing stream reaches with long stretches of slack water.

Limitations of Analysis

Geologic and geotechnical site analysis was based on available geologic literature, soil mapping, and review of geotechnical literature and reports. No field reconnaissance or geologic mapping was conducted as part of this investigation and analysis. No quantitative hazards analysis was performed.

A limited number of site and alignment alternatives were explored, and professional judgment was used to balance maximum storage potential with efficient embankment configurations. Embankment configurations were generalized and site-specific materials and material properties were not evaluated. No optimized dam approaches were proposed. Potential impacts along the canal and pipeline routes were not assessed during this evaluation and would require further investigation. Some of the canals needed for water delivery would be very long and may have high water losses due to seepage.

The hydrologic and environmental impacts on the supply sources would need to be investigated more thoroughly, as well as the impacts overall to the Henrys Fork River basin and ESPA system. Stream habitat changes in the affected tributaries and streams due to constructing the proposed dams and reservoirs were not evaluated in detail. Analysis would be needed to demonstrate how water storage in the proposed reservoirs meets the defined needs.

No accounting was done for direct precipitation on the reservoir and seepage and evaporation losses from the reservoir. Water balance considerations were not evaluated and would depend on the elevation-capacity relationship, reservoir operations, and drought conditions.

Cost estimates given in this Final Report are relative, comparative, and preliminary and are not intended for budgeting. Planning costs for designs, compliance with National Environmental Policy Act (NEPA) and the National Historical Preservation Act, land acquisitions, and other actions necessary for implementation were not included in the cost estimates. Some dam and canal sites may be prone to high seepage rates, and mitigation measures intended to ensure stability and limit seepage could lead to higher construction costs. Future concept refinements could potentially change the ranking of alternatives by cost (see Section 6.0).

Water rights issues are not known and water availability was approximated. Actual runoff was not measured and firm yield was not evaluated. All water supply issues and balances and refined operations would need to be evaluated.

Implementation Options

Analyses to fill in the data gaps as detailed in the Limitations of Analysis sections would need to be conducted. For example, some of the alternatives would require more geologic analyses for spillway designs or tunneling. Alternatives that have pump-back systems would need analyses for their impacts on fish and wildlife. Hydrologic impacts would need to be further investigated. Some canals may be prone to high rates of seepage and additional evaluations would need to be completed.

Construction of any surface storage alternative would require a Corps of Engineers 404 permit under the Clean Water Act, with the attendant requirements. The environmental, social, and economic analysis required to construct a dam would be extensive. The use of Federal funds (e.g., Reclamation Secure Water Act) would require meeting the funding agencies' environmental/policy requirements.

Due to the size and complexity of the surface storage alternatives, an environmental impact statement, including ESA Section 7 and National Historic Preservation Act Section 106 consultations, would likely be required as part of the 404 permit process. Compliance with these laws may cost upwards of $1 to $2 million and take 5 to 7 years.

Financing for the implementation of any of the surface storage alternatives may be difficult to obtain. Multiple Federal and State programs may be available for implementation for many of the alternatives, although some alternatives are more complex than others. IWRB is authorized to work with state-wide irrigation entities in securing State-backed bonds with a suitable irrigator payback schedule. Traditional sources for dam construction, such as Reclamation, may be limited in their ability to secure funding for a single-benefit project (i.e., irrigation). Funding may be more available for a water storage project which directly benefits the environment in addition to irrigation. Congressional authorization would be required for Federal financing.

If hydropower generation facilities are constructed with any of the alternatives, a FERC license would be required. In the Basin Study area, the Northwest Power and Conservation Council have designated protected areas where hydroelectric power development may incur unacceptable risks to fish and wildlife. Protected area status would need to be considered in any hydroelectric development.

If any surface storage alternative is implemented, a management plan would need to be developed for operation of the facilities with consideration to timing of storage and release with respect to ecological flow targets. The purpose of the management plan would be to provide the greatest benefit to irrigation and ecological flows.

5.2 Surface Storage Alternatives

The alternative reservoir sites discussed in this section emerged from the screening process described in Section 4.0. Each alternative was analyzed to determine potentially viable reservoir configurations, including water sources and dam configurations. The locations of these potential reservoir sites are shown on Figure 17. The configuration described for each site is the option that emerged from these studies as most potentially viable and most responsive to site opportunities and environmental resources. For all of the alternatives except the Island Park storage increase alternative, the estimated water storage volumes are based on normal reservoir levels, typically 14 feet below the crest of the dam. The full process of alternatives analysis and decision making related to the selected alternative for each site is documented in the technical reports listed in Section 8.0.

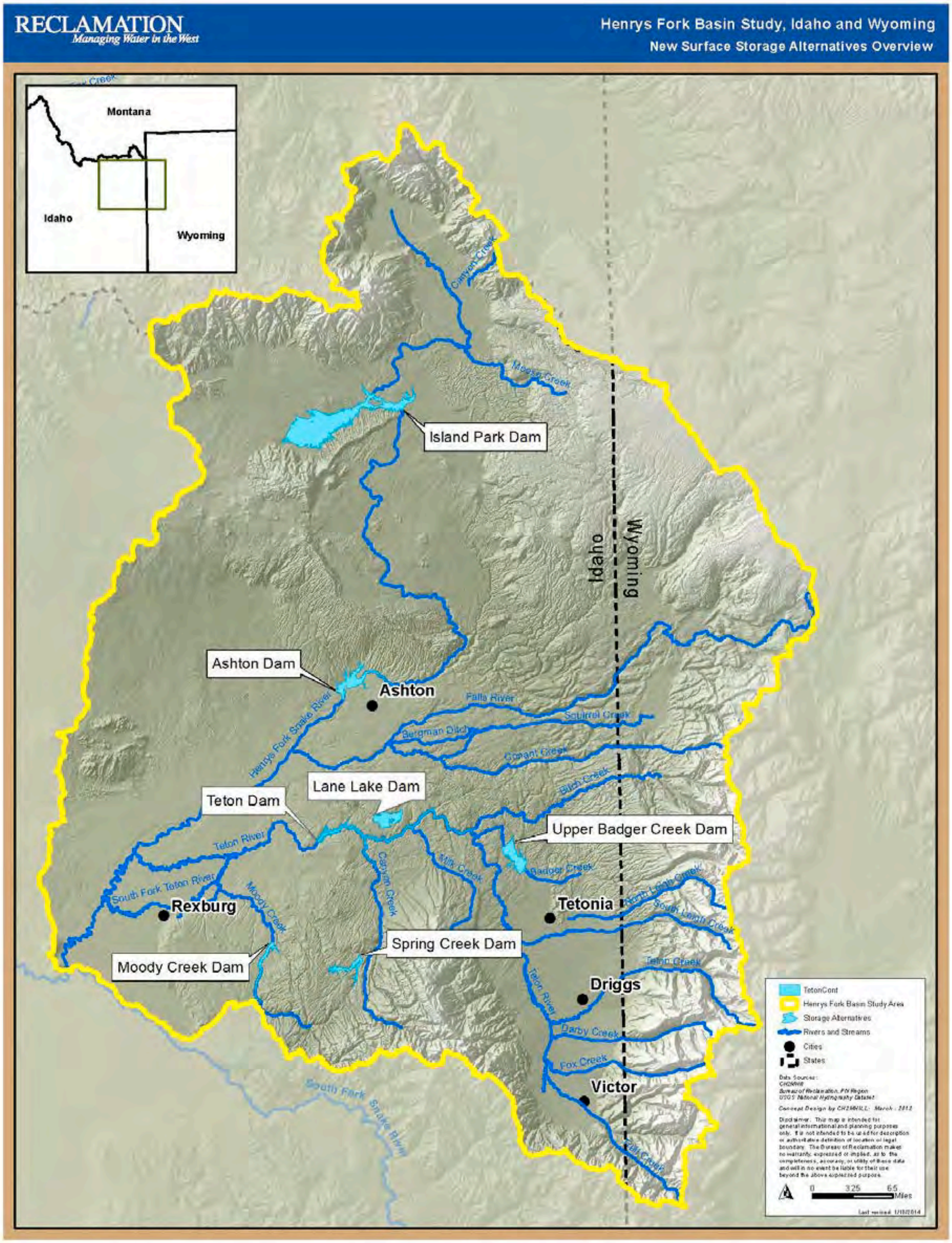


Figure 17. Map of the Henrys Fork River basin and the proposed locations of the seven surface storage alternatives.

5.2.1 Lane Lake Dam

Description

The Lane Lake Dam alternative features a proposed off-channel 101,000-acre-foot reservoir contained by a 160-foot-tall main dam and a smaller saddle dam (Figure 18). The dam site is located on a generally dry drainage that is situated about 1 mile north of the Teton River and 5 miles downstream of the Bitch Creek confluence (Figure 17). When full, Lane Lake could provide a roughly 145-foot drop to a proposed new hydropower facility at the base of the dam (CH2M HILL 2013); however, this addition was not considered as part of this cost estimate.

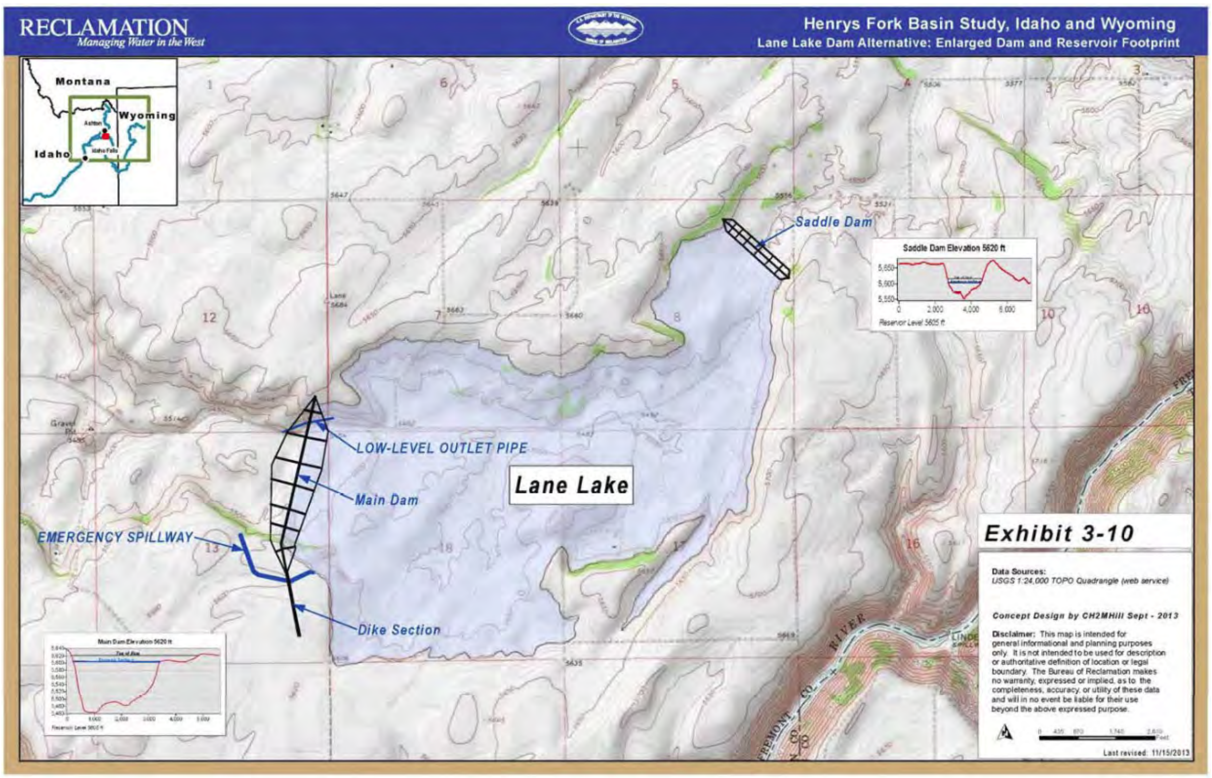


Figure 18. Map showing the proposed dam and reservoir of the Lane Lake Alternative (from CH2M HILL 2013).[7]

Since the natural watershed is only slightly larger than the reservoir itself, natural runoff from the watershed would be very low. Water for the reservoir could be supplied from several sources, including the Teton River and Fall River. The supply from the Teton River would require pumping. Bitch Creek is very important to Yellowstone cutthroat trout so it was not considered as a water source.

[7] A more detailed map may be found in CH2MHILL 2013.

In average water years (50 percent exceedence), the reservoir would capture 98,000 acre-feet or more, based on runoff availability with consideration to existing water rights. In the hydrology analysis for Lane Lake, Reclamation assumed a storage volume of 120,000 acre-feet; however, an expanded engineering analysis of Lane Lake concluded that only 101,000 acre-feet of storage would be available at this site. This report presents the data as related to the storage volume of 101,000 acre-feet.

The estimated construction cost for Lane Lake, without hydropower facilities, is about $462,000,000 ($4,600 per acre-foot). A lined concrete spillway was assumed for cost estimation purposes.

Impact to Water Budget

Lane Lake would provide additional storage water for the Teton River basin, effectively enhancing water supply by capturing peak flows and redistributing that water during periods of higher demand. The available storage would enhance the in-basin water budget by diverting up to 101,000 acre-feet (if the reservoir was initially empty) during the annual high flow period and storing that water until more critical, higher demand periods. This storage water could help satisfy unmet irrigation demands in the Lower Watershed irrigated region.

For the Lane Lake alternative, new ecological flow targets were modeled to minimize impacts on the Fall River and Teton River due to Lane Lake storage and in consideration of existing water rights. This analysis provided a more accurate reflection of the storage in Lane Lake. The same ecological flow targets s were applied to both the Fall River and the Teton River: 200 cfs from September to November, 400 cfs from December to February, and 300 cfs the rest of the year (Reclamation 2013b).

The modeling results showed that about 75 percent of the time, approximately 90,000 acre-feet or more would be available for storage. Approximately 15 percent of the time, no water would be available (Figure 19). Using the modeled period of record (water years 1928 to 2008), the model showed approximately 47,000 acre-feet from the Fall River would be stored in Lane Lake on average as compared to 41,000 acre-feet from the Teton River.

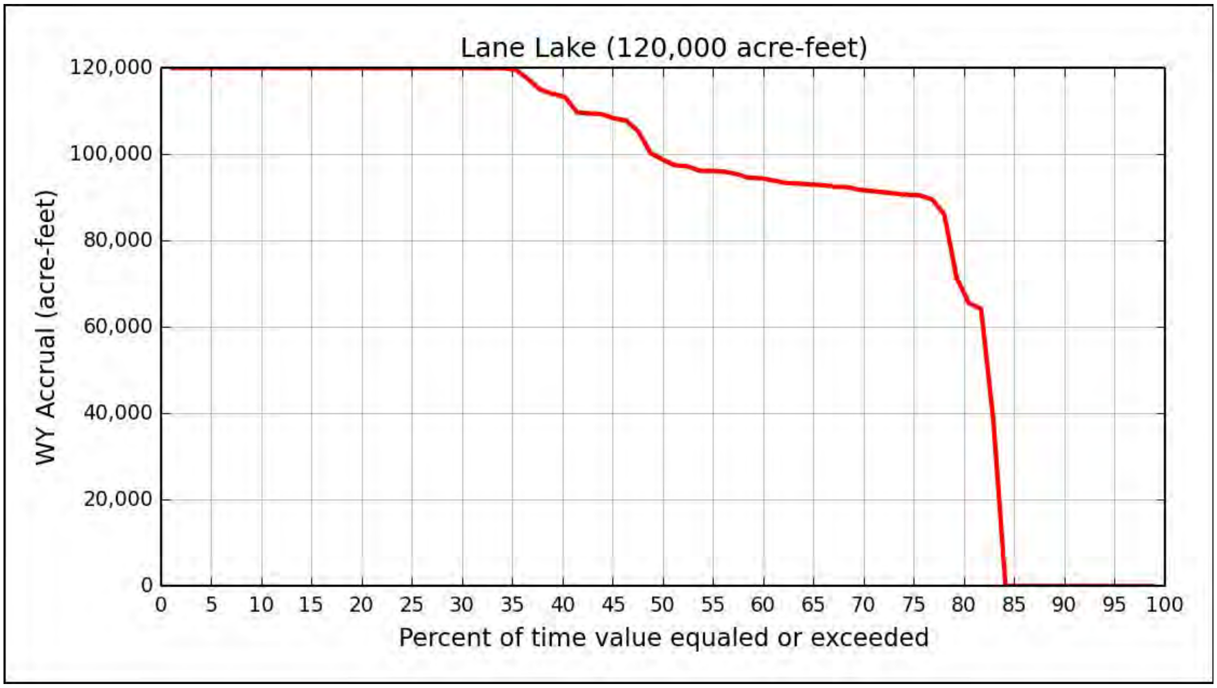


Figure 19. Volume stored in the new reservoir from the Fall River and Teton River per water year. This represents the volume of water that would be available for use.

Related to changes in flows of the Teton and Fall Rivers due to operation of Lane Lake, the analysis revealed the following:

- Projected change in flows on the Teton River at St. Anthony, ID: under mean conditions, there would be a decrease in the Teton River flow from February through April when excess flow would be captured in the reservoir and an increase in flow from May through August when stored water would likely be released. However, the water stored and released during those times may actually belong to other water users (see Section 3.1.1). Under low flow conditions from December through February, flows are higher because the flows would meet ecological flow targets.

- Projected change in flows on the Fall River near Chester, ID: due to the Lane Lake diversion, mean conditions would show a decrease in flow year-round as flows are diverted from Fall River and stored in Lane Lake. During low flow periods, ecological flow targets described above would be met.

Potential Climate Change Impacts

In the hydrologic models,[8] additional water would be stored more reliably in Lane Lake (Figure 20). This additional water would enter the reservoir during the winter and by April or May, the reservoir would be full or nearly full in up to 95 percent of years.

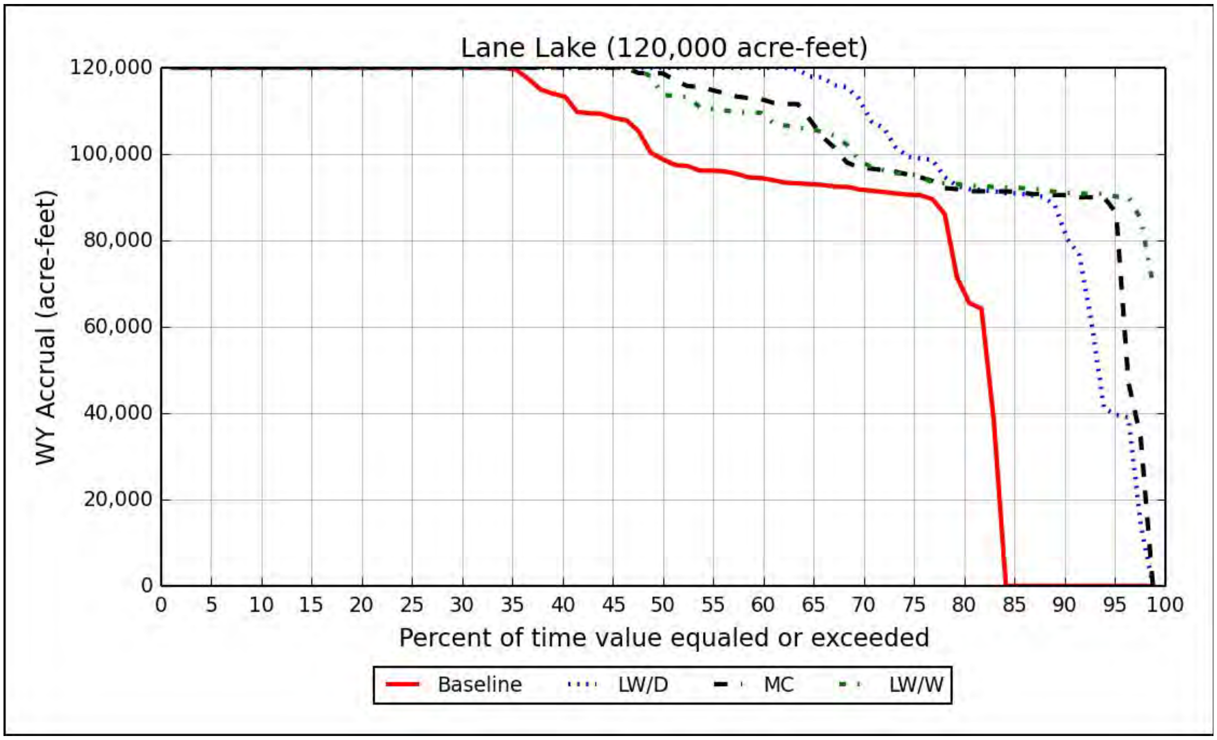


Figure 20. Volume stored by the new reservoir per water year for the Lane Lake alternative. This represents the volume of water that would be available for use. An increase in water year storage was seen for all climate change scenarios.

This increase in the reliability of the reservoir filling would not improve the extent to which ecological flow targets or other demands will be met in the late summer and fall months when compared with the baseline condition. Further, analysis indicates that ecological flow targets in the Fall River would not be satisfied from December through March in dry years because either downstream demand has priority for the water or natural flow would be insufficient.

Benefits and Impacts

Reservoir releases during low flow periods would improve fish habitat in downstream river segments, including the North Fork Teton River and South Fork Teton River, which have been identified as having additional ecological streamflow needs. Pumping for water storage

[8] A hydrologic model run for "climate change" is simply run with precipitation, temperature, and other inputs from a GCM rather than historical inputs. The hydrologic model itself is not changed.

in the reservoir would typically occur during periods of high flows; nonetheless, withdrawals may be expected to impact conservation populations of Yellowstone cutthroat trout in the Fall River and Teton River.

This alternative could also involve impacts to lands designated as eligible for Federal wilderness status and ESA-listed terrestrial species (grizzly bear [designated as threatened] and wolverine [designated as a candidate for listing]).

Key Points from Evaluation and Feedback

Local conservation stakeholders generally support further study of this alternative, due largely to its off-stream location and potential to enhance steam connectivity. Those stakeholders, however, remain focused on the imperative of no impacts to the aquatic ecosystem at the proposed Fall and Teton river diversion points. As long as that concern can be addressed, conservation stakeholders remain willing to explore this alternative further.

Lane Lake has the advantage of being off-stream; however, the proposed site is on private irrigated farmland and includes residences and numerous farm-related structures. Negotiations for acquiring the site could potentially be difficult.

Local water users in the Teton River drainage support this alternative as one of few that would enhance their water supplies. The substantial cost of the Lane Lake alternative would not be affordable to these users; however, they are willing to explore possibilities for investment only if costs can be reduced or shared by other parties.

While the IWRB remains interested in retaining this alternative for long-term consideration because of its large volume and potential to address statewide water supply issues, the high cost of Lane Lake, combined with the existence of other less expensive options to mitigate local water shortfalls, make short-term action on it unlikely.

Similarly, Reclamation is interested in retaining this alternative since it potentially has multi-purpose benefits to address statewide supply issues, provide more operational flexibility in the upper Snake River system, and increase the reliability for flow augmentation for ESA responsibilities. Given these potential benefits, Reclamation would be interested in participating if other parties wish to explore this option further.

Study participants suggested the investigation of a pump-back power system using a Lane Lake reservoir with the Teton River as a water source. Such a system would pump when power is abundant in the early spring and generate power when the power supply is constrained in the late summer or early fall; however, the costs to operate such a system could potentially be high or even prohibitive.

Additional Limitations of Analysis

Excavation for an open spillway would likely be in colluvial soils and/or rock and possibly in soft erodible materials. If an open channel spillway is used, it may require concrete or rock linings that are suitable to match the intended spillway flows. Alternative spillway approaches should also be investigated once the design flow has been established and local site conditions are better understood.

Fish and wildlife impacts from a pump-back system are likely to be significant and would need to be analyzed.

5.2.2 Spring Creek Dam

Description

The Spring Creek Dam alternative features a proposed 20,000 acre-foot reservoir, impounded by a new dam that would be 180 feet tall and 120 feet long (Figure 21). The maximum surface area of the reservoir would be 540 acres. On average, the reservoir would capture 10,800 acre-feet each year, based on runoff availability with no consideration of existing water rights. The dam site would be located on State and private lands in the Teton River watershed on the Spring Creek headwater tributary where it joins Canyon Creek (Figure 17). The water sources for Spring Creek Dam would be Spring Creek and Canyon Creek.

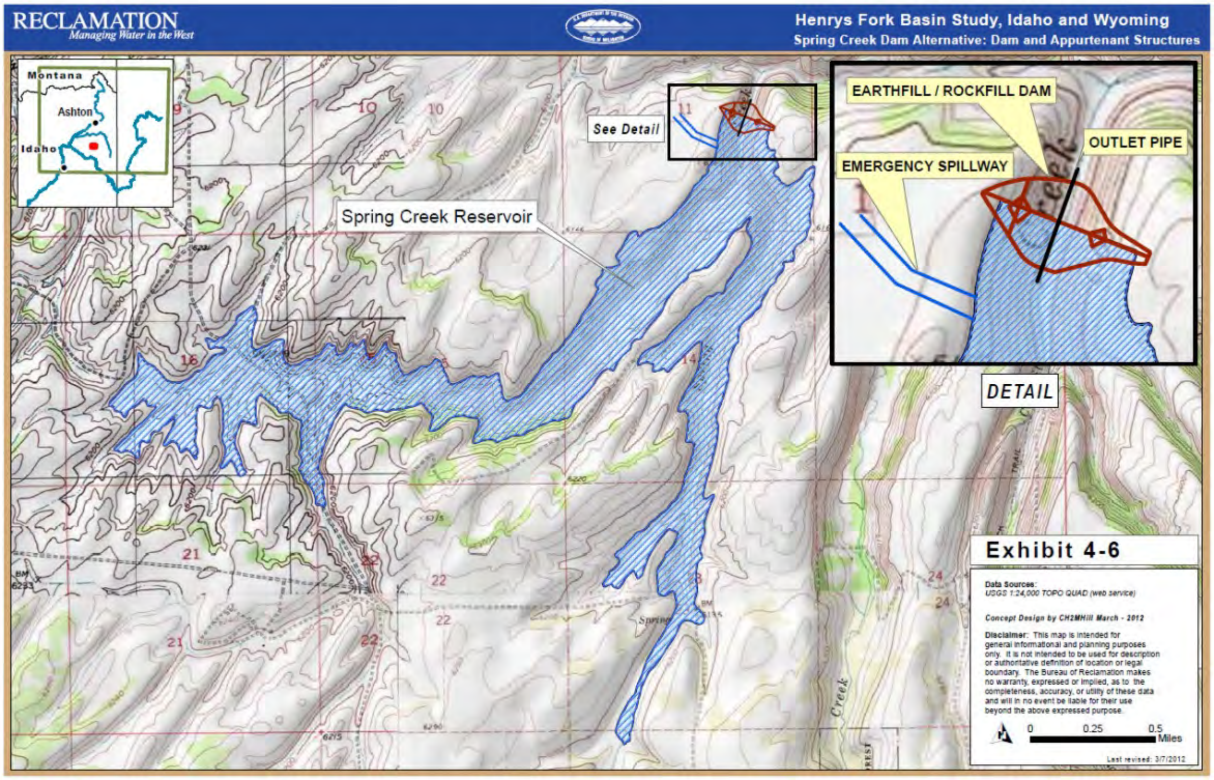


Figure 21. Map showing the proposed dam and reservoir of the Spring Creek Dam Alternative (Appendix B of Reclamation 2013a).[9]

The estimated cost for Spring Creek Dam is $41,760,000 ($3,900 per acre-foot). These costs may be reduced by constructing a smaller reservoir which only stores the 10,800 acre-feet of estimated annual runoff. The more costly options (each of which would have had a 20,000 acre-foot capacity) would require expensive conveyance systems and were eliminated from consideration, including pumping from the Teton River.

Impact to Water Budget

Water stored in Spring Creek Reservoir could be used to satisfy unmet irrigation needs in the Lower Watershed irrigated area by diverting and storing 10,800 acre-feet of water during the high flow period until needed in more critical, higher demand periods in the summer and early fall. Water withdrawal from Spring Creek Reservoir could be coordinated with irrigation use to augment late summer streamflows in Spring Creek.

[9] A more detailed map may be found in CH2MHILL 2012.

Benefits and Impacts

The increase in Spring Creek streamflows with reservoir releases during the irrigation season may benefit both irrigators and fish populations in Spring Creek and Teton River, or augment the ESPA. Yellowstone cutthroat trout are present in the proposed reservoir inundation area; consequently, the alternative would impact Spring Creek and Teton River's conservation population (Reclamation 2013a, Appendix B). The hydrology of Canyon Creek and the Teton River would be modified and possibly impact conservation populations as well. In Spring and Canyon creeks, potential impacts to river connectivity would be decreased flows where and when water is diverted; however, these diversions would occur during high spring flows, and releases from the reservoir would be made during low flow periods. Downstream segments of Spring Creek and Canyon Creek were identified as needing additional ecological streamflows and would benefit from augmented late summer flows.

Impacts may occur on big game migration corridors of one ESA-listed threatened species (grizzly bear) and one candidate species (wolverine).

Key Points from Evaluation and Feedback

Conservation stakeholders, consistent with their philosophy, oppose further investigation of the Spring Creek alternative, which they regard as a new in-stream dam.

Though they recognize this alternative would provide water to users in the Teton River drainage, where the need is greatest, local water users are deterred from supporting this alternative due to its comparatively small water yield, high cost and small contribution to local needs or State needs in the larger upper Snake River basin. Water users would be interested in investing in this option only if the costs could be reduced or shared by other parties.

While they recognize the contribution to local water needs with this alternative, both the IWRB and Reclamation see little opportunity for this small project with its minimal contribution to meeting regional/Federal needs to compete with other alternatives.

5.2.3 Moody Creek Dam

Description

The Moody Creek Dam alternative features a proposed 37,000 acre-foot reservoir contained by a new dam that would be 220 feet tall and 1,300 feet long (Figure 22). The maximum surface area of the reservoir would be 520 acres. On average, the reservoir would capture 34,400 acre-feet each year, based on runoff availability with no consideration of existing water rights. The proposed dam site would be located on State and private lands on Moody

Creek, just downstream of the Dry Canyon Creek confluence (Figure 17). The water sources for the Moody Creek Dam would be Moody Creek and Canyon Creek.

The estimated cost for Moody Creek Dam would be $123,920,000 ($3,600 per acre-foot). A lined concrete spillway was assumed for costing purposes. More costly options requiring expensive conveyance systems, including pumping from the Teton River, were eliminated from consideration.

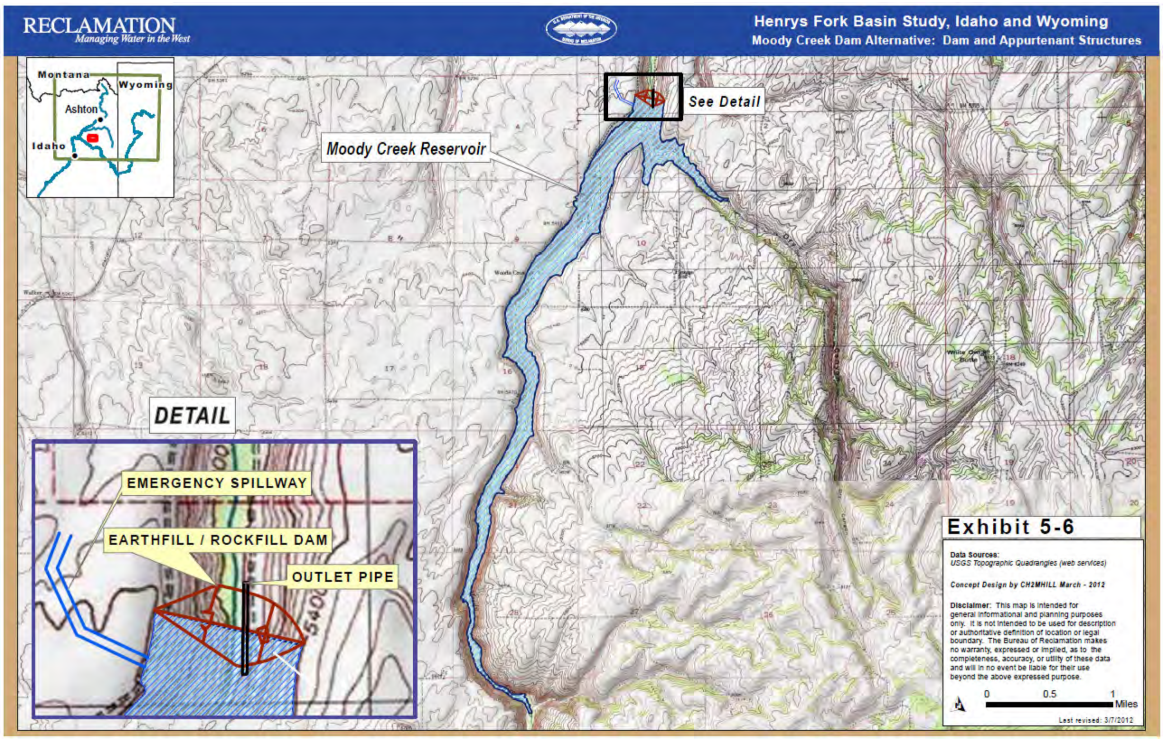


Figure 22. Map showing the proposed dam and reservoir of the Moody Creek Dam Alternative (Appendix B of Reclamation 2013a,).[10]

Impact to Water Budget

Water stored in Moody Creek could be used to satisfy unmet irrigation needs in the Lower Watershed irrigated area by diverting and storing 34,400 acre-feet during the high flow period until needed in more critical, higher demand periods in the summer and early fall. Reservoir releases would be managed for ecological instream targets. The out-of-basin water budget would be affected temporarily by diversion of 34,400 acre-feet, but the water could also be used to meet out-of-basin needs such as agricultural needs, M&I needs, ecological needs, or groundwater recharge. Water withdrawal from Spring Creek Reservoir may be coordinated with irrigation use to augment late summer streamflows in Spring Creek.

[10] A more detailed map may be found in CH2MHILL 2012.

Benefits and Impacts

The increase in storage volume related to Moody Creek Dam would help to alleviate problems associated with the shift in the timing of streamflows with climate change. By providing water storage, some of the additional water runoff expected from wetter years may be captured in the early spring and released later during the irrigation season. The reservoir may provide some increase to late season flows in Moody Creek. This increase in flows may benefit both irrigators and fish populations in Moody Creek and the Teton River and may augment the ESPA.

Yellowstone cutthroat trout are present in the proposed reservoir inundation area; consequently, the alternative would impact Moody Creek's conservation population. The hydrology of Moody and Canyon creeks and the Teton River would be modified and possibly impact conservation populations as well. Potential impacts to river connectivity would be decreased flow in Moody and Canyon creeks where and when water is diverted. These diversions would occur during high spring flows and releases from the reservoir would be made during low flow periods. Downstream segments of Moody Creek were identified as needing additional ecological streamflows and would benefit from augmented late summer flows.

Impacts may occur on big game winter range and migration corridors of one ESA-listed threatened species (grizzly bear) and one candidate species (wolverine).

Key Points from Evaluation and Feedback

Stakeholders see the same limitations for the Moody Creek alternative as for the Spring Creek alternative and, as such, have the same reservations about its utility and feasibility.

Additional Limitations of Analysis

Excavation for the open spillway would likely be in colluvial soils and/or rock and possibly in soft erodible materials. If an open channel spillway is used, it may require concrete or rock linings that are suitable to match the intended spillway flows. Alternative spillway approaches should also be investigated once the design flow has been established and local site conditions are better understood.

Some of the canals needed for water delivery are very long and may have high water loss due to seepage. Methods for reducing seepage may increase the estimated construction costs. Stream habitat changes in Moody and Canyon creeks due to constructing the Moody Creek Dam were not evaluated in detail.

5.2.4 Upper Badger Creek Dam

Description

The Upper Badger Creek Dam alternative features a proposed 47,000 acre-foot reservoir contained by a new dam that would be 290 feet tall and 2,400 feet long (Figure 23). The maximum surface area of the reservoir would be 520 acres. On average, the reservoir would capture 47,000 acre-feet each year, based on runoff availability with no consideration of existing water rights. Water for the reservoir would be supplied from Badger Creek and the Teton River. The conveyance system from the Teton River would be pressurized pipelines and a pump-back system which would pump when power is abundant in the early spring and generate power when the power supply is constrained in the late summer or early fall. The dam site would be located in the Teton River watershed on Badger Creek approximately 5 miles upstream of the Teton River (Figure 17). Stream diversions, intake and fish screen structures, pump stations, and siphons were also assessed during the evaluation.

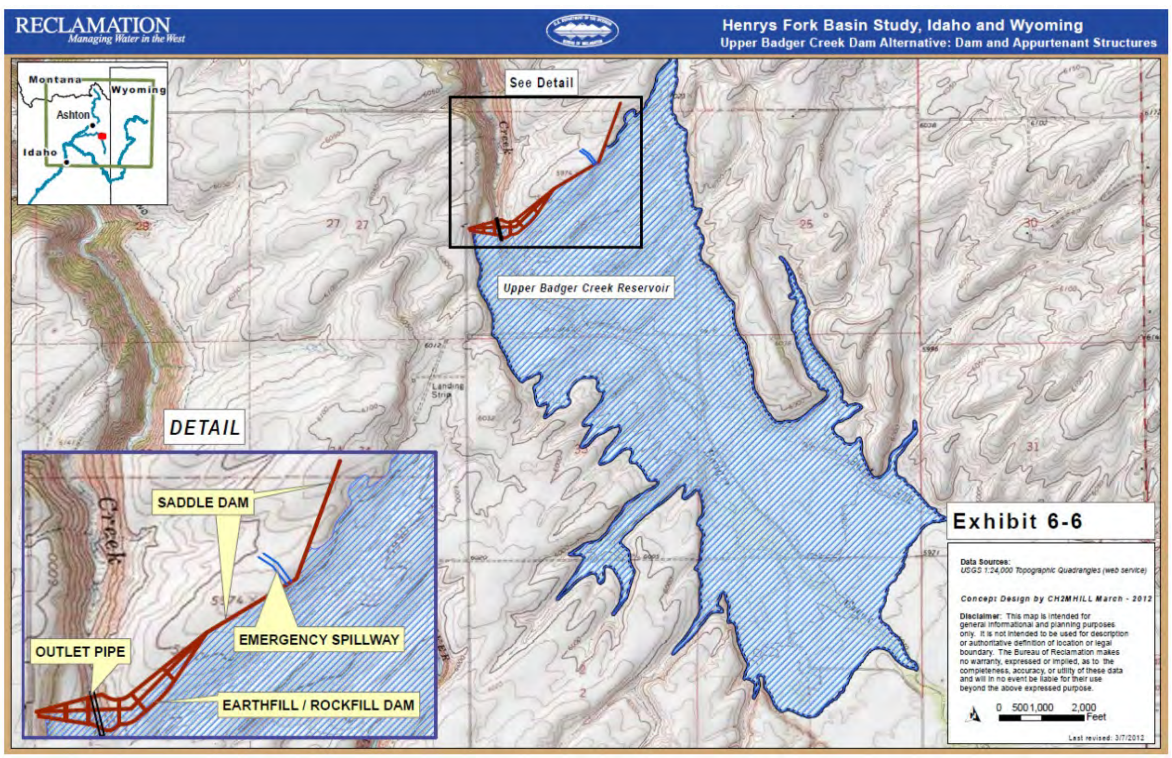


Figure 23. Map showing the proposed dam and reservoir of the Upper Badger Creek Dam Alternative (Appendix B of Reclamation 2013a,).[11]

[11] A more detailed map may be found in CH2MHILL 2012.

The cost estimates for Upper Badger Creek Dam would be $128,940,000 for 47,000 acre-feet of storage volume ($2,700 per acre-foot). Operating a pump-back system using the Teton River as a water source may be very costly. A lined concrete spillway was assumed for costing purposes.

Impact to Water Budget

Water stored in Upper Badger Creek Reservoir could be used to satisfy unmet irrigation needs in the Lower Watershed irrigated area by diverting and storing 47,000 acre-feet during the high flow period until needed in more critical, higher demand periods in the summer and early fall. Reservoir releases could also enhance ecological instream flows. The out-of-basin water budget would be affected temporarily by the diversion of 47,000 acre-feet, but water could also be used to meet out-of-basin needs such as agricultural needs, M&I needs, ecological needs, or groundwater recharge.

Benefits and Impacts

The increase in storage volume related to Upper Badger Creek Reservoir would help to alleviate problems associated with the shift in the timing of streamflows with climate change. By providing water storage, some of the additional water runoff expected from wetter years may be captured in the early spring and released later during the irrigation season. This increase in Badger Creek flows during the irrigation season may benefit both irrigators and fish populations in Badger Creek and Teton River or augment the ESPA. Water stored may be released and diverted much farther downstream on the Snake River. This surface water supply may replace groundwater supplies which would have a direct positive impact on the ESPA.

Potential impacts to river connectivity would be decreased flow in Badger Creek and Teton River where and when water is diverted. These diversions would occur during high spring flows and releases from the reservoir would be made during low flow periods.

Upper Badger Creek was identified as containing a core conservation population of Yellowstone cutthroat trout. The proposed location of Upper Badger Creek Dam currently goes dry during the summer, isolating a local Yellowstone cutthroat trout population in creek segments above the proposed site. The construction of Upper Badger Creek Dam may result in a change in behavior for this population which may be detrimental. Furthermore, the presence of a reservoir may increase the likelihood of a nonnative fish population being introduced into the reservoir and increase competition for the local Yellowstone cutthroat trout population.

Impacts may occur on big game winter range and migration corridors of one ESA-listed threatened species (grizzly bear) and one candidate species (wolverine).

Key Points from Evaluation and Feedback

Stakeholders view this option as having the same limitations as the Spring Creek and Moody Creek alternatives. IWRB remains interested in retaining the Badger Creek alternative because it could address local water user needs and have a cost estimate in the range of possible State investment. At the same time, IWRB acknowledges that the Badger Creek alternative has serious environmental impacts that would provide challenges not inherent in other alternatives.

Additional Limitations of Analysis

Excavation for the open spillway would likely be in colluvial soils and/or rock and possibly in soft erodible materials. If an open channel spillway is used, it may require concrete or rock linings that are suitable to match the intended spillway flows. Alternative spillway approaches should also be investigated once the design flow has been established and local site conditions are better understood.

Fish and wildlife impacts from a pump-back system are likely to be significant and would need to be analyzed.

5.2.5 Teton Dam

Description

The Teton Dam alternative features a proposed 265,000-acre-foot reservoir impounded by a new dam 300 feet tall and 2,300 feet long (Figure 24). In 50 percent of years, the reservoir would capture 202,000 acre-feet or more, based on runoff availability with consideration of existing water rights. The dam site is located on the Teton River approximately 16 miles upstream of the City of Rexburg at the site of the old Teton Dam and would require no secondary water sources (Figure 17). When full, Teton Reservoir could provide a roughly 285-foot drop to a proposed new hydropower facility at the base of the dam, but that option is not included in the cost estimate.

The estimated cost of Teton Dam construction, without fish passage or hydropower costs included in the total, is $492,210,000 ($1,900 per acre-foot). The site may be prone to high seepage rates, and measures intended to maintain stability and limit seepage may lead to increased construction costs (CH2MHILL 2013).

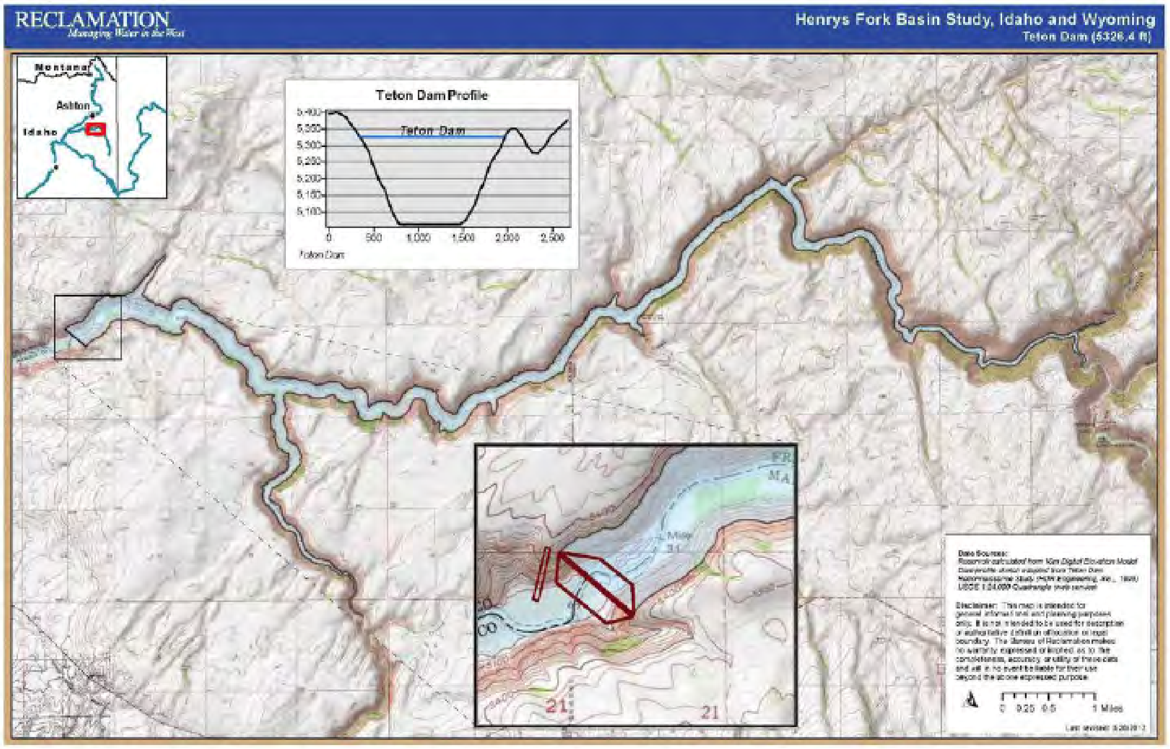


Figure 24. Map showing the proposed dam and reservoir of the Teton Dam Alternative (Appendix B of Reclamation 2013a).

Impact to Water Budget

Teton Dam would provide additional storage water for the Teton River basin, effectively enhancing water supply by capturing excess peak flows and redistributing that water during periods of higher demand. The available storage would enhance the in-basin water budget by storing 202,000 acre-feet (in 50 percent of the time, if the reservoir was initially empty) during the annual high flow period and storing that water until more critical, higher demand periods. This storage water could help satisfy unmet irrigation demands in the Lower Watershed irrigated region.

New ecological flow targets were modeled to minimize impacts on the Teton River due to Teton Dam storage. This analysis provided a more accurate reflection of the storage in Teton Reservoir since reservoir diversions cannot negatively affect instream flows. The ecological flow targets were modeled as 200 cfs from September to November, 400 cfs from December to February, and 300 cfs the rest of the year.

The modeling results showed that about 50 percent of years approximately 200,000 acre-feet would be available for storage and 75 percent of the time, approximately 85,000 acre-feet or more would be available. However, in approximately 15 percent of the time, no water would be available (Figure 25).

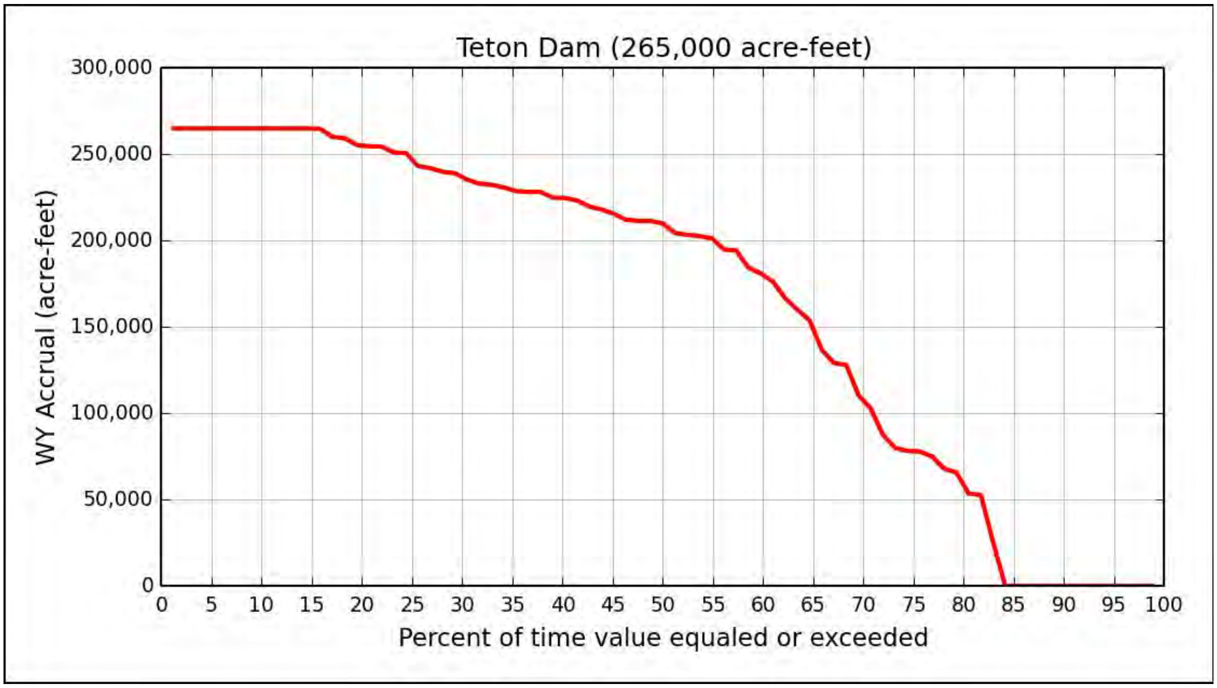


Figure 25. Volume stored in the new reservoir from the Teton River per water year. This represents the volume of water that would be available for use.

Regarding changes in flow of the Teton River, calculations for the Teton at St. Anthony stream gage show a median condition decrease in flow from March through mid-May (when excess flow would be captured in the reservoir) and an increase in flow from mid-May through July (when stored water would be released); however, the water stored and released during those times may actually belong to water users outside of the basin. Under low flow conditions, from December through February, the flows are higher because the flows would meet the ecological flow targets.

Potential Climate Change Impacts

In the hydrologic models, additional water would be stored more reliably in the reservoir during the winter. The reservoir would achieve its maximum storage for the year by April or May (Figure 26).

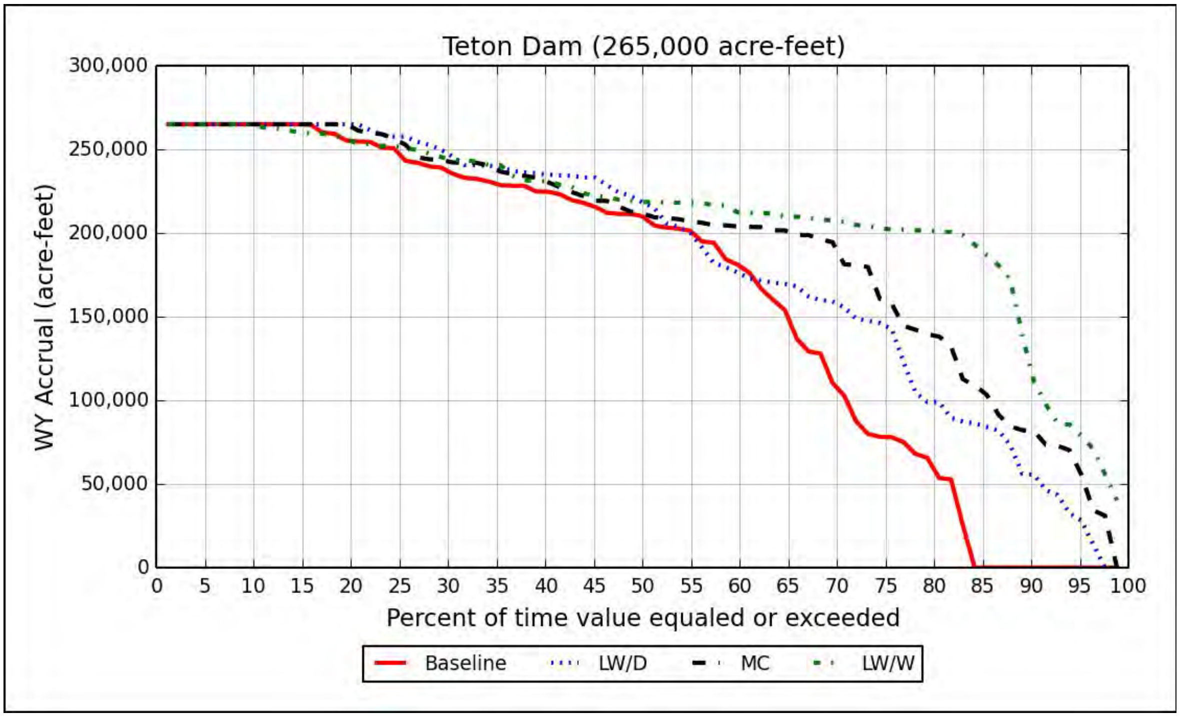


Figure 26. Volume stored by the new reservoir per water year. This represents the volume of water that would be available for use. An increase in water year storage was seen for all climate change scenarios.

Regarding changes in flows in the Teton River from climate change, additional water would be delivered downstream in the wet season, but due to the projected reduction in flows from July through September, the delivery of the additional water would not be apparent when compared to the baseline.

In wet and average water years, similar flows would occur through the spring until April when it would be likely that Teton Dam would be full and all flows would bypass the reservoir. The natural flow peaks in May would recede more quickly than the baseline.

Benefits and Impacts

Reservoir releases during low flow periods would improve flows in downstream river segments, including the North Fork Teton River and South Fork Teton River which have been identified as having additional ecological streamflow needs. Storage would typically occur during periods of high flows; nonetheless, water storage would impact conservation populations of Yellowstone cutthroat trout in the Teton River and Bitch Creek.

Teton Dam would have a major impact on fish populations by blocking migration in Teton River and eliminating riverine habitat needed by Yellowstone cutthroat trout. Free flowing river miles would be converted to slack water which would negatively impact fisheries.

Yellowstone cutthroat trout are present in the proposed reservoir inundation area and is a State aquatic Species of Greatest Conservation Need. Fluvial Yellowstone cutthroat trout are found above and below the proposed dam site. Rainbow trout are present upstream of the Teton Dam site so the migration barrier created by the dam would not isolate the Yellowstone cutthroat trout from the effects of nonnative fish; however, the dam would prevent additional up-migration of nonnative fish in the future. The reservoir would impact the Teton River's conservation population, which is defined as having less than 10 percent genetic introgression from other species.

The proposed Teton Reservoir inundation area contains important winter range and migration corridors for big game. The U.S. Fish and Wildlife Service tracks one candidate species in the area, the wolverine. The bald eagle, trumpeter swan, and Wyoming ground squirrel make their homes here and are considered at risk by the Bureau of Land Management and the U.S. Forest Service. Data from the National Wetlands Inventory indicate construction at this site would have an extensive impact on mapped wetlands, affecting an area greater than 200 acres. Hydrologic changes to the water source brought about by the proposed construction would also have direct impacts on a stretch of Teton River that is eligible for Wild and Scenic River status designation (CH2M HILL 2013).

Recreational benefits related to whitewater rafting, hunting, wildlife viewing, fishing, and fly fishing may be reduced which would impact the local economy; however, these impacts may be moderated by the advent of slack water recreation such as boating and swimming.

One of the purposes of the original Teton Dam was flood control and could be included in the purposes of this alternative.

Key Points from Evaluation and Feedback

Teton Reservoir, formed by water impounded by a new dam at the site of the Teton Dam that failed in 1976,[12] would provide additional storage water for the Teton River basin, effectively enhancing water supply by capturing excess peak flows and redistributing the water during periods of higher demand. The available storage would enhance the in-basin water budget by impounding up to 265,000 acre-feet (if the reservoir was initially empty) during the annual high flow period and storing that water until more critical, higher demand periods. This storage water could help satisfy unmet irrigation demands in the Lower Watershed irrigated region.

[12] Reclamation conducted a stringent investigation of the reasons for the Teton Dam failure and found the failure was due to poor grouting of the highly fractured rock abutments and foundation of the dam. Given the depth of knowledge of the Teton Dam site, a safe, reliable dam can be constructed.

Reservoir releases during low flow periods would improve connectivity in downstream river segments, including the North Fork Teton River and South Fork Teton River which were identified as having additional ecological streamflow needs. Storage of flows would typically occur during periods when connectivity is not an issue, but nonetheless, withdrawals may be expected to impact conservation populations of Yellowstone cutthroat trout in the Teton River.

Teton Dam presents a cost-effective alternative for the purpose of storing water, but may be environmentally unacceptable. The impact to Yellowstone cutthroat trout may be the most significant environmental impact, but loss of wildlife habitat, including important mule deer and elk winter range, and free-flowing river miles will also be significant.

Public acceptance of any new dam at or near the site of the original Teton dam would be problematic given the history of the dam's failure. A large reservoir on the mainstem of the Teton River would be strongly opposed by a number of groups. Several nongovernmental organizations have stated they would sue to stop the construction of Teton Dam. This would require extensive legal costs and judgments in those lawsuits may prevent the construction of Teton Dam. Environmental interests do not want to see Teton Dam replaced and would like it eliminated from future consideration. Conservation stakeholders are particularly opposed to this alternative because it creates an on-stream dam on a free-flowing river.

Reclamation has serious reservations about the environmental consequences and public acceptability of the Teton Dam alternative. Reclamation is not prepared to support Teton Dam due to national and international commitments with other Federal agencies, State agencies, and nongovernmental organizations which are focused on improved water management and environmental benefits. Construction of Teton Dam may impede meeting these commitments. In the current atmosphere of Federal budgeting, Congressional authorization may be difficult to obtain absent Reclamation's support.

The Teton Dam site is owned by Reclamation. Congressional authorization would be required to allow this site to be used for reconstructing Teton Dam or to be transferred to another party, such as the State. The original repayment contractors still have a repayment obligation to the Federal government for the original Teton Dam. This may prove to be a substantial obstacle to gaining congressional authorization.

While local water users recognize there are significant environmental issues with the Teton Dam alternative that may prove insurmountable, they also note that the development of this reservoir would be cost-effective, addressing the possibility that a critical water supply shortage would have severe impacts on the economy of the region. The water users support retaining this option, despite its drawbacks, until another option is available to mitigate local water shortages. IWRB shares the perspective of the water users.

Additional Limitations of Analysis

The hydrologic and environmental impacts on the Teton River should be reinvestigated thoroughly, as well as in the impacts overall to the Henrys Fork River basin and ESPA system. Neither stream habitat changes to the Teton River nor impacts to Yellowstone cutthroat trout due to constructing the Teton Dam were evaluated in detail. Additional analysis would be needed to demonstrate how water storage in Teton Reservoir would meet hydrologic and environmental needs.

The dam site alignment and feature configurations were the same as the original designs. Updated materials and material properties were not re-evaluated. Cost estimates were derived from past estimates and adjusted to reflect current dollars.

5.2.6 Island Park Storage Increase

Description

The Island Park Reservoir storage increase alternative consists of raising the normal reservoir water surface elevation by 4 feet which would increase reservoir storage by 26,700 acre-feet. In average water years, the reservoir would capture 26,700 acre-feet, based on runoff availability with consideration of existing water rights. The storage increase would also require expanding the spillway capacity of Island Park Dam to maintain or negligibly increase the same level of dam safety risk. Additional storage in Island Park Reservoir would be managed with consideration of the Henrys Fork Drought Management Plan.

Alternative Analysis

Due to preliminary findings and Workgroup interest, the Island Park Reservoir storage increase alternative was evaluated in more depth than most other storage alternatives. Eight floodwater routing scenarios were evaluated for four options for increasing Island Park Reservoir storage and raising the normal reservoir water surface elevation of 6303 feet (Reclamation 2013c).

The cost estimate for adding a 5-foot bladder to the service spillway and enlarging the existing emergency spillway would be approximately $6,400,000 for 26,700 acre-feet of storage volume ($240 per acre-foot). Power-generating costs were not included in the cost; however, the existing power facilities would generate additional power, due to an increase in water surface elevations, with only minor modification. Shoreline protection costs due to raising the normal water surface were not considered.

The purpose of the flood routing analysis was to evaluate various bladder heights on the service spillway and their impacts on Island Park Dam. Flood routings were performed through both Henrys Lake Dam and Island Park to determine the potential flood frequency return periods which could induce overtopping at Island Park Dam, as well as the discharge through Island Park Dam during a large flood event.

A 5-foot bladder with an increase in emergency spillway width to 1,130 feet is currently considered the preferred option. This option would raise the normal pool by 4 feet to increase reservoir storage by 26,700 acre-feet. Flood routing studies also revealed that this increase in reservoir capacity would potentially affect two buildings adjacent to the reservoir.

Impact to Water Budget

Water stored in Island Park Reservoir could be used to satisfy unmet irrigation needs in the Lower Watershed irrigated area by storing up to 26,700 acre-feet more during the high flow period and releasing it in more critical, higher demand periods in the summer and early fall. Reservoir releases from Island Park Dam would also enhance ecological instream flows. However, more detailed modeling of local hydrology indicates that this additional water storage would not be available in all years. As shown in Figure 27, the additional 26,700 acre-feet of storage would be available only approximately 78 percent of the time. In contrast, no additional water would be stored in approximately 20 percent of the time.

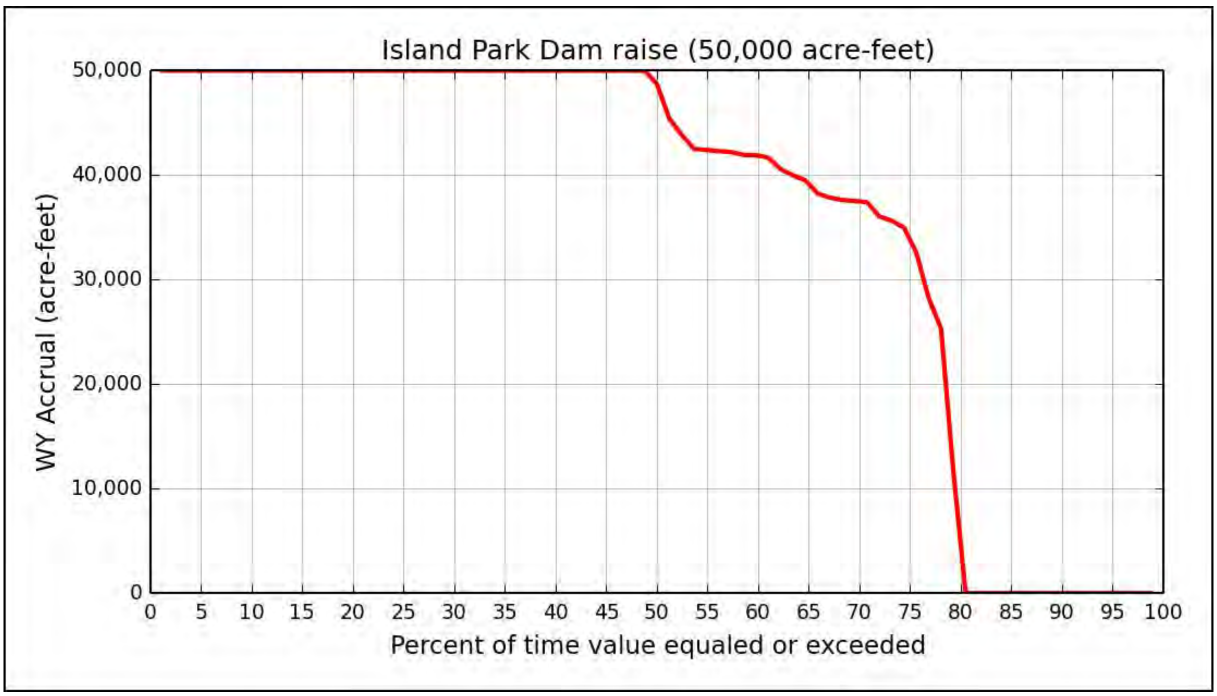


Figure 27. Additional water volume stored per water year with the Island Park storage increase alternative. This represents the volume of water that would be available; that is, about 70 percent of the time there would be approximately 37,000 acre-feet or more available and about 20 percent of the time no water would be available as additional storage.

The additional storage would also affect flows downstream of the reservoir. Under median conditions there would be a decrease in flows in the spring when excess flows would be stored in the reservoir and an increase in flows in July as the stored water would be released. In wet years, the full 26,700 acre-feet would be stored and delivered; hence, flows would increase from June through September. In dry years, less water would be stored in the spring and less would be delivered in the late summer.

Potential Climate Change Impacts

The baseline conditions described in Section 5.1.2 were compared to the same climate change scenarios specified for Lane Lake. In the hydrologic models, additional water would be stored more reliably in Island Park reservoir (Figure 28). This additional water would enter the reservoir during the winter and by April or May, the reservoir would be full or nearly full in most years.

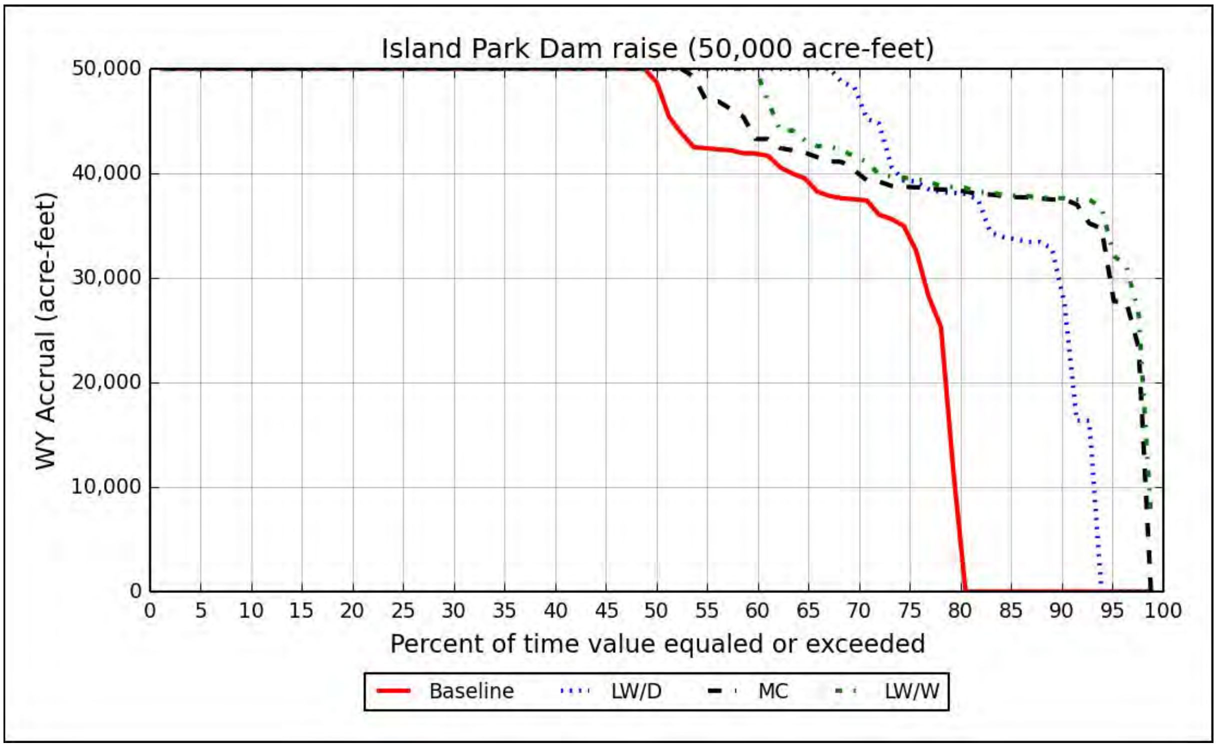


Figure 28. Volume accrued by the new reservoir water right per water year. This represents the volume of water that would be available for any new use. An increase in storage (water year accrual) was seen for all climate change projects.

In terms of changes in flow below Island Park reservoir, average and wet conditions would show increased storage or reduced downstream flows from October through December when the reservoir would fill. From January through May, inflows would be passed downstream. Because more water would be stored, additional water would be released downstream from

July through September to satisfy new demand. Even in the drier years, enough additional water would be captured to increase July flows to new demand.

Benefits and Impacts

The increase in storage volume in Island Park Reservoir would help alleviate problems associated with the shift in the timing of flows from climate change. By providing additional water storage, some of the additional water runoff expected from wetter years may be stored in the early spring and released under the Island Park Dam management plan. This increase in Henrys Fork River flows during the irrigation season may benefit irrigators and fish populations in the river or be used to augment ESPA recharge.

Bird habitat in the fringe wetlands and on Trude Island may also be inundated with an increased storage pool.

Key Points from Evaluation and Feedback

Conservation stakeholders support retention and further exploration of this alternative because environmental impacts would be less significant than with any alternative calling for construction of a new dam. They further recognize the potential for Island Park to provide additional water in winter droughts and improve stream connectivity.

Local water users and IWRB are greatly interested in the Island Park alternative, given its relative low cost. They note that, in addition to this alternative enhancing a structure currently operating, this alternative has the potential to address state-wide as well as local water supply issues.

Similarly, Reclamation supports further exploration of increasing storage in Island Park Reservoir, especially when additional storage has the potential to enhance the operational flexibility of the Minidoka Project in the Upper Snake River system.

Homeowners adjacent to the Island Parks Reservoir would be very involved in a pool raise due to concerns over the impacts to their properties.

Additional Limitations of Analysis

Cost estimates are preliminary and a more detailed analysis of the cost of tunneling and expanding the emergency spillway would be needed. Depending on the configuration of the tunnel, the site analysis could lead to increased estimated construction costs which could potentially change the ranking of alternatives by cost (see Section 6.0).

Hydrologic impacts on the supply sources and the downstream Henrys Fork River would need to be further evaluated, as well as impacts on the overall Henrys Fork River basin and ESPA system. Analyses to demonstrate how additional water storage in Island Park Reservoir would meet defined needs would also need to be conducted.

5.2.7 Ashton Dam Raise

Description

Ashton Dam is owned by PacifiCorp Energy and operated as a run-of-river project that generates hydropower (LIHI 2010). The Ashton Dam Raise alternative would involve increasing the height of Ashton Dam by approximately 43 feet to a total height of 100 feet. This increase in height would increase the reservoir storage by 20,400 acre-feet to a total of 30,200 acre-feet which would inundate additional areas around the existing reservoir (Figure 29). Ashton Reservoir is located on the Henrys Fork River adjacent to the Town of Ashton and would require no secondary water sources. In average water years, the reservoir would capture 24,000 acre-feet, based on runoff availability with consideration to existing water rights.

The cost estimate for enlarging Ashton Dam would be approximately $28,210,000 for 20,400 acre-feet of storage volume ($1,382 per acre-foot). When full, Ashton Reservoir could provide about 80 feet of drop to a new hydropower facility at the base of the dam, but that option was not included in the cost estimate.

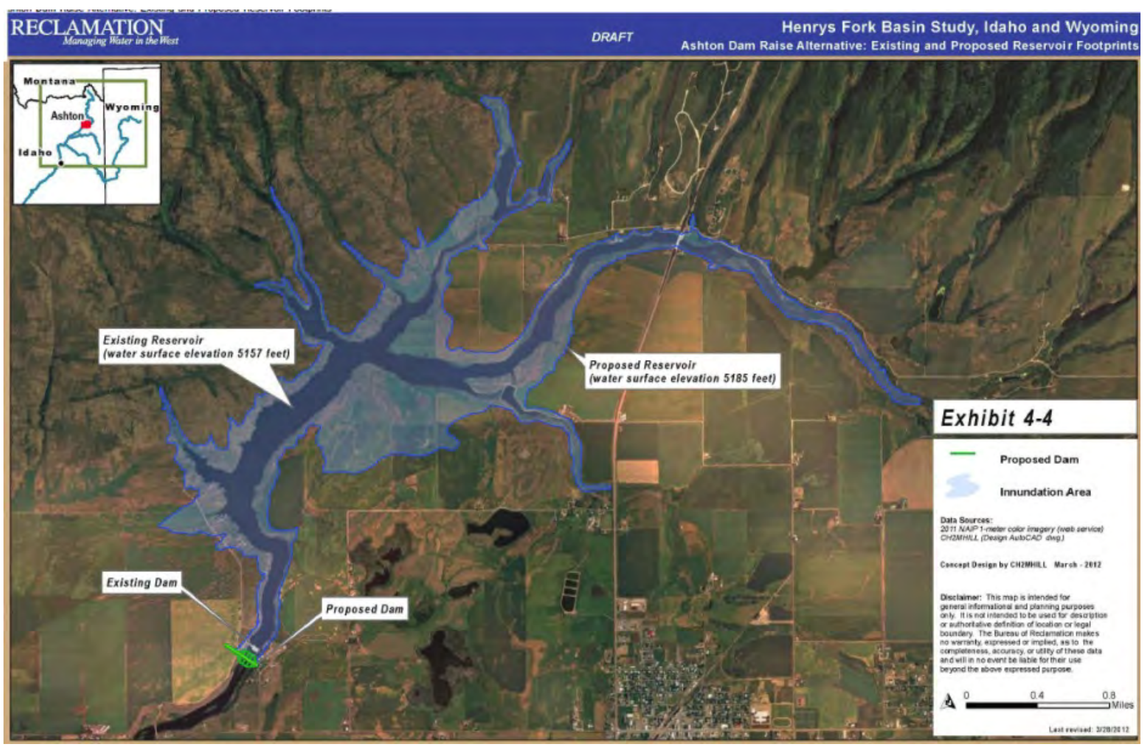


Figure 29. Aerial photo with the projected inundation area associated with the Ashton Dam raise alternative.

Impact to Water Budget

Water stored in Ashton Dam could be used to reduce demand for irrigation withdrawals from Island Park Reservoir to meet irrigation needs in the Lower Watershed irrigated area by storing an additional 20,400 acre-feet during the high flow period until needed in more critical, higher demand periods in the summer and early fall. Reservoir releases would also enhance ecological instream flows in the Henrys Fork River downstream of St. Anthony. The out-of-basin water budget would be affected temporarily by storage of 20,400 acre-feet, but the water could also be used to meet out-of-basin needs such as agricultural needs, municipal and industrial needs, ecological needs, or groundwater recharge.

Benefits and Impacts

The Henrys Fork River flows would be changed both during storage and releases at Ashton Dam. Streamflows could potentially be impacted from decreased flows in downstream river segments when water is being stored and increased flow for river segments when water is released from the reservoir. The water storage increase would likely occur during the excess spring runoff period and reservoir releases would likely occur during more critical low flow periods. Releases from Ashton Dam would need to be closely coordinated with those at Island Park Dam to improve ecological flows in the Henrys Fork River while delivering water supplies for irrigation or augmentation of the ESPA.

Key Points from Evaluation and Feedback

Similar to the Island Park storage increase alternative, conservation stakeholders support the Ashton Dam alternative for further study. Given the existing dam structure, modification of the structure would translate to less significant environmental impacts than construction of a new dam.

Local water users remain interested in this alternative, given its cost relative to other alternatives, but note the cost remains too high for local funding.

Though acknowledging recent rebuilding and license renewal for Ashton Dam, IWRB supports continuing to study this alternative for several reasons. The alternative is relatively inexpensive. Downstream water supply issues, including mitigation for wells within the ESPA, could also be addressed by this alternative.

Reclamation noted that Ashton Dam is privately owned and the identified storage volume of this alternative is relatively modest. Ashton Dam is a run-of-river operation which is not expected to change. Only incremental water stored would be used and there would be no impact to hydropower generation.

Additional Limitations of Analysis

Embankment configurations were generalized and site-specific materials and material properties were not evaluated. No optimized dam approaches were proposed. A detailed evaluation of dam-raise design considerations would need to be performed in future phases to assess feasibility.

5.3 Managed Recharge Alternative

5.3.1 Introduction

Managed recharge in the Henrys Fork River basin must be evaluated as a potential source of water supply for the basin as well as for stabilization and recovery of the ESPA. The importance of groundwater and its close integration with the basin's surface hydrology is widely recognized. Enhancement of managed recharge activities may improve in-basin storage as well as instream flow conditions downstream of the recharge sites.

Recent studies by IDWR related to the ESPA stabilization objectives indicate that recharge in the Henrys Fork River basin for the purpose of improving the condition of the ESPA is not as effective as focused recharge in locations downstream of American Falls Reservoir. Nonetheless, these studies have also highlighted the importance of recharge in the Henrys Fork River basin during above average water years to contribute to system-wide recharge capacity when water is available in excess of that needed to recharge in the downstream locations. Historically, the IWRB has partnered with FMID in the managed recharge program, recharging a total of nearly 150,000 acre-feet from 2008 to 2012.

Three locations in the Henrys Fork River basin were identified by Basin Study participants: 1) Egin Lake recharge site expansion, 2) lower Teton River, and 3) Teton Valley tributaries. Of these, only the expansion of the existing Egin Lake recharge site was assessed as part of this Basin Study; however, the other two sites may hold potential for future assessment and action.

Lower Teton River

Managed recharge near the lower Teton River has been identified for its potential to support unmet irrigation demands in the lower Teton Valley in the late summer and to enhance ecological flows in adjacent river reaches. A candidate site between the North and South Forks of the Teton River was evaluated in the early phases of the Basin Study. Initial modeling suggested that a portion of the water recharged in this area would be retained in the ESPA and the remaining volume would be discharged to the Teton and South Fork Teton rivers. This water could help satisfy both late season irrigation and fisheries needs. However, while this area was included in the ESPAM, it remains an area of uncertainty even in the newer version of the model (ESPAM 2.1). The surface and groundwater hydrology in the area is known to be complex. The contribution of surface water from the Henrys Fork and Fall rivers through the Crosscut Canal and the corresponding canal seepage complicates the system hydrology even further.

Teton Valley Tributaries

Groundwater recharge in the upper Teton River Valley was also identified during the Basin Study process. Most of the Teton River tributaries contain Yellowstone cutthroat trout while nonnative trout are located primarily in valley-bottom spring creeks throughout the Teton River (Van Kirk et. al. 2011). Surface water flow dries up in the alluvial fan reaches of the Teton Valley in the late summer of most years. While many of the stream channels would dry naturally, irrigation diversions have likely extended the period of desiccation. The purpose of managed recharge activities in the area, as proposed by conservation groups, would primarily be to increase the period of hydraulic connectivity between spawning and rearing areas and the mainstem river by increasing return flows to the tributary reaches later in the summer. This may improve late season flows for irrigation in the lower Teton as well (Van Kirk et. al. 2011).

Given the complexity of the hydrology, ecology, and water use in the Teton Valley, the effects of new management practices may have consequences throughout the watershed. Administrators, water users, and advocates for ecological streamflows acknowledge that thorough consideration and evaluation should be given to any proposed changes in water management practices.

Future Program and Actions

The potential effects of managed recharge at all of the identified sites must be considered within a legal, scientific, and social framework and taken into account with IWRB's goals for managed recharge as an aquifer stabilization tool. To refine recharge proposals at specific locations, future actions could include collection of additional data related to flow, trout, and aquatic life, and allowing water uses to better quantify the effects of low and modified flows in a specific reach as well as the watershed. Continued development and integration of watershed and basin-wide hydrologic models is also a critical component for identifying practical and effective changes in water management practices.

Any appropriation of water for managed recharge must be consistent with the State Water Plan and the ESPA CAMP. Projects involving the diversion of natural flow water appropriated pursuant to Idaho Code § 42-234 for managed recharge in excess of 10,000 acre-feet on an average annual basis must be submitted to the IWRB for approval prior to construction (Idaho Code § 42-1737).

The IWRB holds recharge water right permits (1980 priority dates) which authorize diversion of water from the Snake and Big/Little Wood rivers. IWRB resubmitted its 1998 applications on behalf of the State for groundwater recharge permits throughout the ESPA, including locations within the Basin Study area. The applications state that the IWRB will establish an environmental consultation committee to review potential impacts of recharge activities on fish and wildlife resources within the Henrys Fork and South Fork of the Snake Rivers, and the mainstem Snake River above American Falls Dam. The IWRB also intends to consult with IDFG to develop a protocol for evaluating and minimizing potential adverse impacts on these resources. This information will assist the IWRB and stakeholders in determining whether recharge activities in the Henrys Fork and Teton watersheds can address some of the water needs in the basin.

5.3.2 Egin Lake Recharge Site Expansion

Description

Expansion of the Egin Lake recharge site has the potential to enhance water supplies in the Henrys Fork River basin by improving groundwater table levels and increasing ecological flows in the river and to contribute to stabilization of the ESPA. Expansion of the site was initially evaluated during the Basin Study process using the ESPAM1.1 and by estimating costs associated with enlargement of the recharge facilities. An updated version of the model, ESPAM2.1, was released later in the study process and was used by IDWR in a broader analysis intended to prioritize aquifer recharge sites across the ESPA based on hydrogeologic characteristics and recharge water availability. The studies were initiated to help clarify where recharge activities would be most effective in achieving ESPA stabilization and recovery.

The hydrogeologic analysis compared the potential effectiveness of recharge locations across the ESPA relative to the retention time of water in the aquifer and capacity to receive recharge water (acre-feet per month). To evaluate potential retention time, IDWR modeled a recharge event of 100 cfs over one month in the spring and a second event in the fall at 13 recharge locations across the ESPA, including the Egin Lake site. The sites were first ranked based on the percentage of water retained in the aquifer after 5 years. They were ranked further based on recharge limitations corresponding to potential physical capacity (i.e., diversion, infiltration and groundwater capabilities). Evaluating recharge in the spring and fall was an important consideration given that increased water table elevations in the fall limit additional recharge capacity at some sites and in some cases, may result in infrastructure flooding/damage, or water wasted by returning to the river via drains.

Results of the hydrogeologic analysis indicated that the Egin Lake recharge site had highest 5-year retention potential relative to other sites across the ESPA. However, the total volume of recharge was limited by the site capacity. The analysis showed that of the 13 sites evaluated, the top 5 were located below American Falls Reservoir.

In addition to hydrogeologic considerations, the amount and frequency of water available for recharge upstream of Milner Dam at different locations across the ESPA was determined to be an important factor in prioritizing recharge activities. Several fundamental assumptions were applied in the water availability analysis: 1) recharge should be an opportunistic use of available natural flow; 2) recharge should not interfere with optimal capture of water in the storage system; 3) recharge must be in priority at the point of diversion; 4) Reclamation's hydropower water right at Minidoka Dam must be fully satisfied (2,700 cfs); 5) volume of water available for recharge was limited to water spilling past Milner or water at the recharge point of diversion less an assumed minimum streamflow (minimum stream flows were assumed as 0 cfs at Milner, 2,700 cfs at Minidoka, 200 cfs at Blackfoot, 900 cfs at South Fork, and 200 cfs at Henrys Fork).

Water District 01's water right uses accounting data for a period of record from 2000 through 2012 from five significant gage locations to represent all of the recharge points of diversion: Milner, Minidoka, Snake River near Blackfoot, the Snake River near Heise (South Fork of the Snake River), and the Henrys Fork near Saint Anthony. Results indicated that upstream of American Falls Reservoir, there is sufficient annual volume of water available for recharge in nearly half of the water years and zero water available for recharge in the other half. The volume of water for which there was at least a 50 percent likelihood of availability (exceedance) for recharge was also calculated and combined with the retention and capacity characteristics of each site. Sites with the best available supply were generally located below American Falls Reservoir. This was in part due to the fact that flows are not in priority for recharge during nearly half of the years evaluated.

Conclusions drawn from the analyses were that the best ranked sites were located below American Falls Reservoir, between the Minidoka-to-Milner reach of the Snake River, and that significant additional recharge capacity would be needed in this area of the aquifer. Recharge above American Falls Reservoir was determined to have value, but water supply was more limited (50 percent of years recharge water is not likely to be available). These sites, which included two locations in the Henrys Fork River basin, were generally ranked lower than sites downstream of American Falls, but would provide important additional recharge capacity in above-average water years. In addition, existing sites above American Falls have large canal capacities so minimal infrastructure investment would be required. The Egin Lake site was identified as an exception which may warrant enlargement of the conveyance capacity.

The hydrogeologic and water availability analyses indicated that recharge in the Henrys Fork basin for the purpose of improving the condition of the ESPA would not be as effective as focused recharge in locations downstream of American Falls Reservoir. The studies also underscored the importance of recharge in the Henrys Fork during above average water years to contribute to system-wide recharge capacity. While an expansion of Egin Lakes recharge site was not evaluated using the ESPAM2.1 as part of the Basin Study, IWRB, through its managed recharge program, is actively considering how to proceed with further development of infrastructure in critical locations across the ESPA that will provide for system-wide recharge capacity.

Impact to Water Budget

Impacts to the water budget would be minimized if diversions for recharge occurred during high spring runoff when water is being passed downriver for flood control purpose and when there is an adequate water supply for diversion at high-priority recharge sites that have been shown to increase long-term aquifer storage. Some of that water may be recovered when subsurface flow returns to the river, at which time it may be available for numerous out-of-basin uses, including needs resulting from climate change; agricultural needs; domestic, municipal, and industrial needs; ecological needs; and for recharge of the ESPA (CH2M HILL 2012).

Benefits and Impacts

Diversions to the recharge site would typically occur during periods when low flows are not an issue and would not adversely affect substantial populations of Yellowstone cutthroat trout. Diversions would need fish screens to prevent trout entrainment. Return flows to the river resulting from increased diversion to the recharge site may benefit a priority rainbow trout fishery in the Henrys Fork River by improving flows in downstream river segments and temperature conditions in the lower Henrys Fork River. Specifically, increased groundwater return flows would likely help mitigate temperature conditions associated with surface water diversions below the St. Anthony gage

The recharge site is located within the Nine Mile Knoll Area of Critical Environmental Concern, the St. Anthony Sand Dunes Special Recreation Management Area, and is directly adjacent to the Sand Mountain Wilderness Study Area. No ESA-listed threatened or at-risk species have been noted in the area, but the St. Anthony Sand Dunes host a Bureau of Land Management sensitive plant (St. Anthony Sand Dunes evening primrose) and the largest and most viable population of a rare tiger beetle. Expanding the volume of water recharged at the site should not result in adverse impact to these resources.

The National Wetland Inventory dataset indicates that further development of the site would have minimal impact on mapped wetlands, affecting an area less than 1 acre in size.

Key Points from Evaluation and Feedback

Recharge to support needs within the Henrys Fork River basin and the ESPA generally received wide support from involved agencies and the public. Expansion of these actions must be accompanied by the appropriate environmental impact analysis and assessment of benefits versus costs.

Conservation stakeholders recognize and support managed recharge for its local benefits of cooler/late season return flows as well as the contributions from the incidental recharge associated with irrigation delivery.

Local water users support continuation and expansion of the Egin Lakes recharge site to enhance the local economic benefit of the IWRB's managed recharge program. While IWRB will continue to prioritize recharge activities that result in long-term aquifer storage, it will continue to work with local water users and stakeholders to implement where feasible recharge activities within the study area that further the objectives of the ESPA CAMP and State Water Plan.

Reclamation also recognizes the value of incidental recharge within the basin resulting from irrigation deliveries. This would be considered when assessing or implementing water management actions in the future.

Limitations of Analysis

More detailed studies would be required to evaluate the optimal increase in volume of recharge at this site, including evaluation of the potential impact on instream flows and stream reconnection.

5.4 Water Markets

Description

The water marketing alternative consists of continued implementation of the State's water transactions programs as well as transactions among private entities. Such transactions can provide a source of adequate water supplies to facilitate all types of water use for improved economic returns, improved stream connection, and enhanced instream flows.

There is currently a significant amount of activity in the upper Snake River basin using existing administrative mechanisms such as the State's water supply bank, Upper Snake Water District 1 Rental Pool, and permanent water right transfers (see Section 1.5.2). Water marketing is often used to maximize the economic value of water by exchanging water rights that would have otherwise been unused and/or forfeited and to minimize the economic consequences of water shortages. Typically water marketing involves a voluntary water transfer agreement for a temporary or permanent change in the type, period, or place of use of water and/or a water right. Water transfers can be local or in specific cases, regional; be in the form of a permanent sale, temporary lease, or donation; and can move water among agricultural, municipal, industrial, and in some cases, to environmental uses.

The recently published *Water Transfers in the West* documented the extent of water transfers in Idaho from 1988 to 2009 (Western 2012). During this period, approximately 6.6 million acre-feet of water was transferred within Idaho, primarily through lease programs. Idaho ranked third among 12 western states in the volume of water transfers and has a highly developed water marketing system.

The primary water exchange market in Idaho is the water bank operated by IWRB (see Section 1.5.2). The water bank has two distinct categories of water marketing: the state-wide water supply bank and basin-specific rental pools. The exchange of natural flow water rights (both surface water and groundwater) is processed through the water supply bank and is administered by IDWR. Rental pools are administered by the local water district advisory committee for a given river basin and primarily rent reservoir storage water rights.

In general, water prices are low in Idaho as compared to other more urban markets largely as a result of the limited payment capacity of agricultural producers. A portion of the fees assessed for the lease and rental of water through the water bank is retained by the IWRB to assist with water bank administrative costs. Similarly, a portion of the fees assessed for the lease and rental of water through the rental pools is retained by the IWRB as a source of funding for water infrastructure across the state, while a portion is also retained by the local water district advisory committee to assist with rental pool administrative costs.

The water supply bank provides a centralized mechanism to lease (deposit water to the bank) and rent (withdraw water from the bank) surface water and groundwater rights throughout Idaho. Water rights are traded and leased to the water supply bank and made available for rent by other water users. Several criteria must be met for IDWR to process a rental agreement through the water supply bank. IDWR must determine (among other criteria):

1. There is a hydrological connection between the water right leased and the proposed rental location.
2. The rental causes no injury to other water users from the rental.
3. The water will be put to beneficial use.
4. The rental does not require a permanent water right (unless the renter can demonstrate a reasonable effort is being made to provide a permanent source for the long-term water use).
5. The rental does not result in an enlargement of the water right.

The rental pools are a central component of IWRB's water marketing activities. They almost exclusively rent storage water allocations and allow reservoir spaceholders to make excess water available to those with limited water supplies in a given year.

Idaho is a leading state in leasing water between water users and the Water District 1 Rental Pool which serves the Basin Study area and is the most active in the state. The local water district advisory committee, under appointment by the IWRB, establishes the pricing and operating procedures that govern each rental pool. The procedures define the priority for rentals, the order of assignments and the rental prices which may vary depending on the type of use and water supply. Rental pools serve an important role in water transactions given the significant volume of water and efficiency with which transactions are processed. While the water supply bank is relatively active in the Henrys Fork River basin, the Water District 1 Rental Pool handles much larger volumes of water.

Facilitating Water Markets

Assessment of the successes and limitations of Idaho's water bank focused on increasing the economic, environmental, and social benefits resulting from water transfers. These opportunities were evaluated: 1) removing transaction costs, 2) having a better understanding of the marginal value of water, 3) improving market clearing mechanisms, and 4) developing region-specific solutions. Due to the complexity of water market transactions, developing region-specific solutions offers the greatest potential for facilitating an increase in water market transfers. The following provides examples of existing programs which attempt to address region-specific solutions and reflect IWRB's efforts to support and expand the existing market system.

Idaho Water Transaction Program

As discussed in Section 1.5.2, the IWRB is a Qualified Local Entity (QLE) of the Columbia Basin Water Transactions Program (CBWTP) and manages activities in the upper Salmon River basin through the IWTP. Funding for the CBWTP is used to support projects that provide flows necessary for ESA-listed fish species while maintaining the agricultural economic base of the upper Salmon River basin. These projects are carried out using mechanisms such as water right leases (partial or full-season), water right subordination agreements, negotiated changes in points of diversion, and conservation easements. All of these mechanisms exist independent of the IWTP and can be utilized by any entity independent of the IWTP. The IWTP and the IWRB's QLE status under the CBWTP provide funding from the Bonneville Power Administration to the IWRB to carry out these projects. The IWTP is a good example of successful implementation of a region-specific solution to address fisheries issues, and illustrates the importance of an established a funding mechanism in combination with the use of existing legal and administrative tools.

The recent partnership between IWRB and the Friends of the Teton River to evaluate the effectiveness of directing IWTP funds into the Teton River basin (see section 1.5.2) may provide a method, through existing administrative systems, to achieve certain conservation goals in the Teton River basin.

Potential Aquifer Recharge and Mitigation Credit Bank

The concept of an aquifer credit and mitigation bank is currently under consideration by the IWRB, the State Legislature, the Governor's Office, and water users across the state. If enacted it would authorize the IWRB to develop a program, initially focused on the ESPA, and perhaps extended to other areas as needed, which would allow local entities to conduct managed aquifer recharge within the framework of the IWRB's recharge program and receive marketable mitigation credits after a "cut to the aquifer." The credits may allow for some new water uses and economic development while incentivizing additional managed recharge within the framework of IWRB's overall managed recharge efforts consistent with the ESPA CAMP and State Water Plan.

Impact to Water Budget

The current water market programs provide a mechanism for improvement of the Henrys Fork River basin's water budget. Continued support of existing water market programs and development of expanded programs in the region can provide additional system flexibility and opportunities to assist in managing available water supplies to satisfy the goals of the ESPA CAMP as well as meeting water needs in the Henrys Fork River basin. While water markets are not capable of increasing water supply, localized improvements to water budgets and mitigation of the economic consequences of water shortages may benefit from market activities.

Benefits and Impacts

Water marketing will help mitigate the economic consequences of increased demand and of water shortages during drought cycles and due to the effects of climate change throughout the Henrys Fork River basin, and may improve stream connectivity associated with lower summer streamflows.

Key Points from Evaluation and Group Feedback

Market activity may increase if constraints to market participation were addressed (e.g., the current $17 per acre-foot Water Bank-suggested rental rate). Expansion of competitive water markets is likely to experience obstacles related to the costs of payments which could be more than the direct beneficiaries could bear. In order to expand the use of water markets in the region to improve aquifer conditions and meet projected future demands, some level of public funding or a broader funding base will likely be required.

A high degree of pressure is placed on the existing surface water storage system and rental pool in the upper Snake River basin to help provide water for a variety of needs, including in-basin agricultural and downstream ESA needs. IWRB passed a resolution on January 27, 2012, stating that its managed recharge efforts would not utilize storage water and would utilize only excess natural flows. This places a significant limitation on the use of the water marketing system to meet aquifer management goals.

All stakeholders accept and support the water management alternative, with conservation groups actively working with IWRB to explore methods for ecosystem restoration by improving markets. IWRB, recognizing that modifications to the State water markets program are ongoing, continues to work within the boundaries of the existing program and law to address challenges with interested stakeholders. Reclamation sees existing water markets as a valuable management tool and supports expanding and improving water markets through competitive grants from the WaterSMART program.

Some conservation groups believe the current institutional barriers prohibiting the real use of markets in the State include 1) the restriction or inability to transfer a consumptive use water right (such as an irrigation right) to an instream flow right and protect that water instream; 2) failure to apply conjunctive management principles throughout the state; and 3) incomplete accounting of water use, both by failing to include the Upper Teton Valley area in accounting for water delivery and for the failure to accurately and consistently regulate irrigation diversion in certain locations.

Limitations of Analysis

Stream reconnection through instream flows is of significant importance to stakeholders in the Basin Study area. Low winter season flows below Island Park Reservoir are a significant concern for the Henrys Fork River. Potential benefits of water transactions in the upper Teton Valley are currently being explored. While existing administrative mechanisms for leasing, transferring, subordinating and selling water rights are available, there are inherent challenges in applying those processes to a specific situation. For example, throughout Idaho, water rights for water delivered through a canal system are generally owned by the water entity. Individual landowners do not have the authority to lease or sell water shares without canal company approval. In the upper Teton Valley, some landowners have expressed interest in leasing water with canal company approval. These types of challenges are not unique to this basin, but do reflect the need for localized solutions. This level of evaluation did not provide recommendations about any new proposed market structure or recommendations to mitigate constraints to using existing water markets.

Water markets can be regulated in a variety of ways to satisfy water supply objectives, including regulatory constraints on certain types of market transfers or the development of market demand through regulatory drivers that create incentives for trades. The existing regulatory environment for market-based mechanisms was not evaluated, but was considered.

The relationship between water pricing for water transfers and water needs is difficult to estimate due to insufficient (large enough) real time data. In many regions, water supplied to the water market is associated with surplus water supplies or obtained through fallowing irrigated land; however, the greatest demand for water transactions occur during periods of water shortages.

Implementation Options

IWRB has an advanced water market system and is coordinating efforts to enhance existing programs and advance new programs such as a potential aquifer recharge credit program. In combination with the necessary funding, existing programs may be used by all water users to address regional and local water demands.

5.5 Conservation Alternatives

5.5.1 Canal Automation Alternative

Description

The canal automation alternative consists of installing automated gates as primary diversion on high priority canals. The number and location of automated canals to be installed was not determined, but high priority canals were been identified. Primary diversions are the direct diversions from the Henrys Fork, Teton, or Fall rivers. Automated canals more accurately adjust and divert water than manual systems and are a useful tool that allows irrigators to match diversions with irrigation requirements. Flow measurement and data are transmitted to the operator and would reduce the demand for stored water, particularly late season storage withdrawals. Operation and maintenance costs may also be reduced.

Using information from another Reclamation project, estimated costs were developed for the installation of automated canal gates located at the principal stream diversion points and included costs for reworking of headgates, construction of concrete control sections, installation of the radial arm headgates with 200 cfs to 600 cfs capacities (Figure 30), and the installation of a telemetric data acquisition system. A regression equation was developed that directly estimated the cost of totally automated canal systems per cfs capacity: cost = $392/cfs x cfs capacity + $14,988. These cost estimates do not include fish screen costs.

Figure 30. Photo of an automated canal system with a Langemann gates structure.

Impact to Water Budget

Almost all of the canals in the Henrys Fork River basin divert both natural flows and flows from stored water. In general, the natural flows are diverted early in the irrigation season and stored water is withdrawn from reservoirs later in the irrigation season. Given the scarcity and/or options available via the Local Rental Pool, irrigators are more judicious in their water use when using stored water. Water not diverted during the later season remains in storage, giving irrigators more options. Water not diverted during the spring runoff season remains in the river.

The analysis of the conservation alternatives documented that reducing early season diversion would have a negative impact on later season recharge and subsequently a reduction in later season river flows (Reclamation 2012, Appendix E). For this reason, the preferred operation scenario would be for irrigators to continue their normal early season diversions, but to more precisely manage the diversion of stored water.

Automated canal costs were based on the maximum rate of diversion for a particular canal during the past 30 years. This maximum diversion was used as the basis for estimating the annual volume of water that may be saved by canal automation and estimating the cost of placing an automated canal at the head of the major canals (Table 11). The cost per acre-foot of water saved for the nine largest canals ranged from $399 to $2,843 per acre-foot.

The priority for installing automated canal systems would be on those canals which divert storage water when improved efficiencies would result in more water being left in storage. The priority rankings are shown in Table 11.

In terms of changes in streamflow in the Henrys Fork River near Rexburg, the canal automation alternative would result in a slight increase in flow in June due to the decreased diversion. A very slight decrease in winter flows would occur because the decreased summer diversions would result in a decrease in winter groundwater returns.

Table 11. Priority ranking of canal systems, estimated cost for automated canals at main diversion, and estimated storage volume saved.[1]

Canal	Island Park Storage (acre-feet)	Henrys Lake Storage (acre-feet)	American Fall Storage (acre-feet)	Total Storage (acre-feet)	Peak Diversion (cfs)[2]	Estimated Annual Water Saved (acre-feet)[3]	Cost Per Installation[3]	Cost Per Acre-foot Water Saved
Independent	9,147	24,120	0	33,267	522	333	$219,624	$660
Salem Union	7,752	22,374	0	30,126	339	301	$147,888	$491
Consolidated Farmers	4,857	18,459	0	23,316	612	233	$254,904	$1,093
Enterprise	10,233	0	10,024	20,257	168	203	$80,856	$399
Marysville (9A)	19,554	0	0	19,554	240	196	$109,080	$558
Last Chance	1,824	10,047	0	11,871	136	119	$68,312	$575
St. Anthony U (17A)	3,680	7,500	0	11,180	620	112	$258,040	$2,308
Egin	2,308	7,500	0	9,808	439	98	$187,088	$1,908
Teton Island FDR	9,229	0	0	9,229	631	92	$262,352	$2,843
Totals						**1687**	**$1,588,144.00**	**$941**

[1] In the hydrology analysis of automated canals, Reclamation simulated the automation of 44 canal headworks within the FMID in the Henrys Fork River basin and not just the canals listed here as high priority canals. Changes in diversions at the canal headworks were modeled using an analytical model developed by Dr. Rob Van Kirk as documented in *Conservation Alternatives Technical Series Report No. PN-HFS-006* in combination with the Reclamation's MODSIM model (Van Kirk 2013).

[2] Van Kirk 2013.

[3] Estimated amount of water saved is 1.00 percent of historic mean annual storage diverted. This is a conservative estimate.

Potential Climate Change Impacts

Using the best available datasets and data development methodologies, the modeling results showed little difference with canal automation in any of the climate change projections compared to the baseline conditions.

In the Henrys Fork near Rexburg, Idaho, a slight increase in flow was projected for June due to decreased diversion and a slight decrease in flow was projected in the winter as the decreased diversions cause a decrease in groundwater returns.

Benefits and Impacts

For all four of the irrigated regions shown in Figure 16, canal automation would increase both total annual and peak flow volumes and would have a positive impact on the overall water budget of the Henrys Fork River basin. Automated canals would reduce the demand for storage water withdrawal which would improve management options in both the Henrys Fork River basin and the ESPA. Installation of fish screens, in conjunction with construction of automated canal systems, would have a positive environmental impact, but are not considered part of this alternative.

For the North Fremont region, canal automation would increase nonpeak flows. The increase of nonpeak flows would be a positive effect during periods of normally low flows. While the benefit to low flows would be relatively small (less than a 2-percent nonpeak flows increase), the absolute quantity of improved nonpeak flows may make a positive impact.

For the Teton Valley, Lower Watershed, and Egin Bench regions, canal automation would decrease nonpeak flows and would have a negative environmental impact.

Key Points from Evaluation and Feedback

The analysis of automated canals in the Henrys Fork River basin only documented instream flows at existing USGS gaging stations. While model results show increased flows in the Henrys Fork River and Teton River, these increases would likely reduce recharge to the Snake River or the ESPA below Rexburg.

Automated canals appear to have a high degree of acceptance by irrigators, environmental interests, and State water managers. Automated canal projects could qualify for funding from the State's loan program.

Partial funding for this alternative could potentially come through Reclamation's WaterSMART program. Grants for the 50/50 cost share funding are awarded through a competitive process.

All stakeholders support canal automation, with Reclamation noting that WaterSMART grants may be available for this purpose. The support of environmental stakeholders is tempered by concerns that incidental canal recharge to rivers would be affected. At the same time, conservation stakeholders support the improved management of storage water, which could contribute to higher carry-over volumes and promotion of market activity. Similarly, conservation stakeholders recognize and support the benefit of automation to canal measurement and the positive impact that measurement could have in future market activity.

Limitations of Analysis

The amount of water remaining in storage was based on a practical estimate and not based on historical observations.

Existing data from previous projects using a limited number of factors and coupled with high-level assumptions were used to estimate the costs for canal automation. These costs were relative and meant to be used only for planning purposes. The cost analysis only considered the cost of installing an automated canal gate at the principal river or stream diversion point.

No detailed evaluations of stream habitat changes were made for the installation of automated canals.

Modeling estimates were used to determine potential impacts and benefits. Hydrologic and hydraulic modeling inherently contains assumptions, simplifications, and estimations. The modeling protocol allowed for impacts to be analyzed for many stream reaches in the Henrys Fork River basin, but the model was not linked to the ESPAM groundwater model. Consequently, the impacts of changes in diversions and subsequent changes in groundwater and surface water related to each conservation alternative were not calculated as to how they might meet out-of-basin needs (Reclamation 2013a, Appendix E).

Implementation Options

Given the relatively low cost, high social acceptance, and potential to reduce labor costs, automating canals would be a good candidate for early implementation. IWRB's Financial Program is available for developing and financially assisting in the development of the water resources of the State through the construction of water projects. Projects eligible for financing include new construction or rehabilitation of existing water projects. As such, automated canals to improve irrigation water management would be qualifying projects.

It is likely that local sponsors (e.g., a canal company or irrigation district) would be responsible for a portion of installation costs. Because of this, canals which serve a significant number of users or acres may best be able to manage these costs by distributing them to the project beneficiaries.

While the cost estimates for automated canals do not include fish screening, it would be practical to install fish screens when improving diversions. Conservation programs may be tapped to share the fish screen costs of proposed installations.

Installation of automated canals adjacent to waters of the United States with non-Federal dollars would require a Corps of Engineers' 404 permit under the Clean Water Act and its attendant requirements. The use of Federal funds (e.g., under Reclamation Secure Water Act) would also require meeting that particular agency's environmental/policy requirements.

5.5.2 Irrigation Canal Piping Alternative

Description

The irrigation canal piping alternative consists of IWRB continuing to provide financial assistance for the installation of gravity pressure pipelines in the North Fremont irrigated region. NRCS would continue to assist North Fremont irrigators with financial and technical support. In 2013, IWRB approved a loan application from the North Fremont irrigators for $2.5 million which would provide match money for about $6 million in Federal NRCS funds for Phase 4 of the North Fremont Gravity Pipeline Project. The project is being implemented in five phases. Both the IWRB and NRCS provided financial assistance for the previous phases of the project as well.

The installation of pipelines in irrigation canals to limit water loss due to canal seepage is a routine conservation practice. In the Henrys Fork River basin, pipelines and canal linings were determined to be of practical benefit only in the North Fremont irrigated region. Because of the interconnection between groundwater and surface water, piping canals in the other irrigated regions would reduce irrigation return flows to the river; consequently, canal piping does not show positive benefits for those areas.

Impact to Water Budget

For the Teton Valley, Lower Watershed, and Egin Bench irrigated regions (Figure 16), piping canals would reduce both total annual and nonpeak flows and would have a relatively small impact on peak flows, from a reduction of less than 1 percent to an increase of less than 1 percent. The reduction in total annual flows and nonpeak flows would have a negative impact on the Henrys Fork River basin's water budget.

In the North Fremont region, piping irrigation canals would increase total annual flows, peak flows, and nonpeak flows. This would have positive benefits to the Henrys Fork River basin's water budget.

Pipeline systems in the North Fremont irrigated region have reduced withdrawal from upstream storage by approximately 10,000 acre-feet in the past 10 years. Reductions in withdrawals from the upstream reservoir would help mitigate the expected increase in late season demands on storage throughout the Henrys Fork River basin.

Benefits and Impacts

The installation of pipelines in canals would likely reduce the number of irrigation-induced wetlands within the Henrys Fork River basin, due to decreased canal seepage. However, pipelines would reduce the demand for stored water withdrawal which would improve management options in both the Henrys Fork River basin and the ESPA.

Key Points from Evaluation and Feedback

Piping and lining of irrigation canals would be expensive, but pipelines would provide pressurized water which would reduce pumping needs and conserve electricity. The implementation of piping systems should continue in the North Fremont irrigated region.

Partial funding for this alternative could potentially come through Reclamation's WaterSMART program. Grants for the 50/50 cost share funding are awarded through a competitive process.

5.5.3 Demand Reduction Option

Description

The Demand Reduction alternative consists of reducing the number of irrigated acres, changing to lower water demand crop types or implementing rotational fallowing practices, or reducing overall pumping of groundwater to minimize impacts to the ESPA. As part of this alternative, IWRB would continue to support the Idaho ESPA CREP and AWEP (see Sections 1.5.1 and 1.5.2 for details about the programs). CREP targets the enrollment of up to 100,000 acres of eligible irrigated cropland primarily to reduce irrigation water use with secondary benefits of increased water quality, reduce soil erosion and sedimentation and increase wildlife populations.

IWRB's AWEP award encourages projects that reduce groundwater pumping within the ESPA. It provides a Federal project cost contribution of up to 75 percent while the producer is required to provide the remaining non-Federal portion. In specific cases, IWRB has provided additional financial assistance, particularly where measuring devices are required for water management compliance purposes. Eligible projects include 1) ground water to surface water conversions which allow for the delivery of additional surface water in order to reduce groundwater pumping; 2) improvements to water delivery systems in the Thousand Springs area; 3) regulating reservoirs; 4) demand reduction projects such as end gun removal and conversion to dryland farming.

Estimating the cost to achieve an acre of demand reduction is complex and variable. During this evaluation, the estimated cost to reduce irrigation, meaning the acre would no longer be irrigated, was $1,820 per acre. The estimated cost for deficit irrigation, meaning the acre would be partially irrigated (e.g., irrigation may be stopped only after the second cutting of alfalfa hay), was $3,600 per acre-foot.

Deficit Irrigation Option

After the evaluation of demand reduction, public comments indicated an interest in more analysis related to the practice of deficit irrigation. Deficit irrigation is an irrigation technique where farmers attempt to maximize crops produced per acre-foot of water used. This is sometimes used in regions where water resources are restricted and also incorporates concepts related to water marketing. In general, this is a common practice in the Basin Study area, especially during dry water years. Water savings from deficit irrigation may remain in storage, be transferred to other users, or simply be water not available, depending on the region's volume of water shortage, infrastructure, and legal requirements.

Costs were difficult to estimate due to a scarcity of information related to land prices, crop prices, reductions in yield under deficit irrigation, the economic impact to rural economies, and other socioeconomic factors. A simplified model was developed to estimate the cost of deficit irrigation in the Henrys Fork River basin by using alfalfa hay as the sample crop.

Using the methodology described in Orloff et al. (2005), the estimated costs to use deficit irrigation for alfalfa hay, where irrigation is stopped after the first cutting, were estimated as:

1. $161 per acre-foot of water saved. This is a onetime savings.

2. $3,612 per acre-foot saved with costs amortized over a project life of 50 years, with consideration only to the farm gate. The farm gate is the value of an agricultural product when it leaves the farm which is typically lower than the retail price.

Deficit irrigation would likely be applied in the Henrys Fork River basin during periods of low water supplies. In these dry years crop prices generally rise due to the scarcity of a commodity. Consequently, the costs estimated for deficit irrigation are higher than average, but are relative to the supply and demand for water and crops during dry years.

Impact to Water Budget

The impacts to the water budget for demand reduction were evaluated using an analytical model developed by Dr. Rob Van Kirk (Van Kirk 2013). Quantitative impacts discussed here are based on reductions to irrigation withdrawals of up to 50 percent in the irrigated regions of the Henrys Fork River basin.

For all four of the irrigated regions in the Basin Study area (Figure 16), demand reduction would increase total annual flows and peak period flows. This would have a positive impact on the Henrys Fork River basin's water budget.

For the North Fremont and Egin Bench regions, demand reduction would increase nonpeak period flows which would have a positive impact on the Henrys Fork River basin's water budget.

For the Teton Valley and Lower Watershed regions, demand reduction would decrease nonpeak period flows which would be a negative impact during periods of normally low flows. While the benefit to low flows would be relatively small (less than a 1.5 percent nonpeak flow decrease), the absolute quantity of reduced nonpeak flows may result in a negative impact.

Benefits and Impacts

For the North Fremont and Egin Bench irrigated regions, the demand reduction option would be beneficial to the water budget and environmental needs due to increased nonpeak flows. For the Teton Valley irrigated region, a negative impact would be expected due to a decrease in nonpeak flows. For the Lower Watershed irrigated region with a 25-percent demand reduction, a negative impact would be expected due to a decrease in nonpeak flows. For the Lower Watershed irrigated region, a 50-percent demand reduction would be beneficial to the water budget and environmental needs due to an increase in nonpeak flows.

In the upper Teton Valley irrigated region, demand reduction would be beneficial for streams which go dry or go dry earlier than they did historically due to irrigation withdrawals. Demand reduction was the only alternative considered which could address these specific reaches in the upper Teton Valley irrigated region.

Key Points from Evaluation and Feedback

With recent high commodity prices, there may be no interest in reducing agricultural production. Demand reduction would have other economic impacts due to the economic importance of agriculture in the Henrys Fork River basin.

Due to the limited ability to store the conserved water in the Henrys Fork River basin, the value of the water saved through deficit irrigation may be limited. Much of the irrigated land in the basin relies on natural flows that can only be saved in downstream reservoirs. If there is insufficient natural flow to meet demands in the basin, water stored downstream is of limited value. This situation would most likely occur in consecutive years of below normal water supplies.

Limitations of Analysis

There is not a readily available, large, and directly comparable database of land transactions involving water rights so the determination of the market value of water would be difficult.

Demand reduction involves producing fewer crops and would have a ripple effect on agriculturally based economies. The extent of this impact would be difficult to assess.

Implementation Options

IWRB would continue using the demand reduction programs that are currently in place.

6.0 COMPARATIVE EVALUATION OF ALTERNATIVES

This chapter provides a summary comparison of study findings related to key parameters for the alternatives presented in Section 5.0.

6.1 Surface Storage Alternatives

Surface storage alternatives were assessed and compared from the following perspectives:

- **Benefits**: Relative performance in terms of hydrology was stated directly as potential surface storage volume. The alternatives vary widely in terms of water supply provided.
- **Costs**: The costs of implementing each alternative were compared in terms of both total cost and cost per acre-foot.
- **Environmental Effects**: Environmental effects were compared from two different perspectives: biophysical factors, and sociocultural factors.
- **Viewpoints of Involved Agencies and Stakeholders**: Reclamation, IDWR, and the Workgroup provided an indication of the relative feasibility and desirability of each alternative from the standpoint of ability to obtain required permits and gain political/stakeholder acceptance.

To enable comparison of alternatives from such widely differing perspectives and units of measure, a common numerical value system was used. This system was based simply on rating the top/best performing alternative in any evaluation factor (i.e., benefits, costs, environmental performance, or potential for acceptance) with a value of 10. Conversely, the worst performing alternative was assigned a value of zero. All other alternatives were scored as a percentage of the range between the top- and bottom-rated alternatives. For example, an alternative that would yield 50 percent as much water storage as the range between the largest and smallest storage alternative would receive a score of five. In the case of the environmental factors assessed, data available was simply ratings on a scale of 1 to 3, with one representing a high level of adverse impact, two representing a moderate level of adverse impact, and three representing low/no potential for adverse impact and/or potential for beneficial effect. For these environmental data, a score of one was given a value of zero on the graphs with a score of two rated at five and a score of three given a rating of ten.

6.1.1 Benefits – Water Storage

Surface Storage

Figure 31 illustrates how the surface storage alternatives compare from the standpoint of storage volume. As shown, the Teton Dam alternative would provide the largest amount of storage at a median annual volume of approximately 202,000 acre-fee and the lowest volume of storage would be provided by Spring Creek Dam at 10,800 acre-feet.

Related to the Teton Dam, Lane Lake Dam and Island Park Dam alternatives (for which more detailed hydrologic studies were performed), the storage volumes shown in Figure 31 are median (50-percent exceedance) values. In all three cases, as discussed further in Section 5.1.3, water available to fill additional storage capacity would be higher in a substantial proportion of years. Conversely, water to fill the additional capacity provided by these reservoirs would fall to zero in 15 to 20 percent of years. Also for these three reservoirs, projections based on climate change modeling indicate that the percentage of years in which they would meet or exceed the 80-percent fill level would increase significantly, with the percentage of years in which no or a low level of fill would occur being reduced to less than 5 percent. The same conditions related to fill variability may also be anticipated for other reservoir sites under study in this report, based on both historic and climate change conditions. Further study would be necessary to confirm this probability.

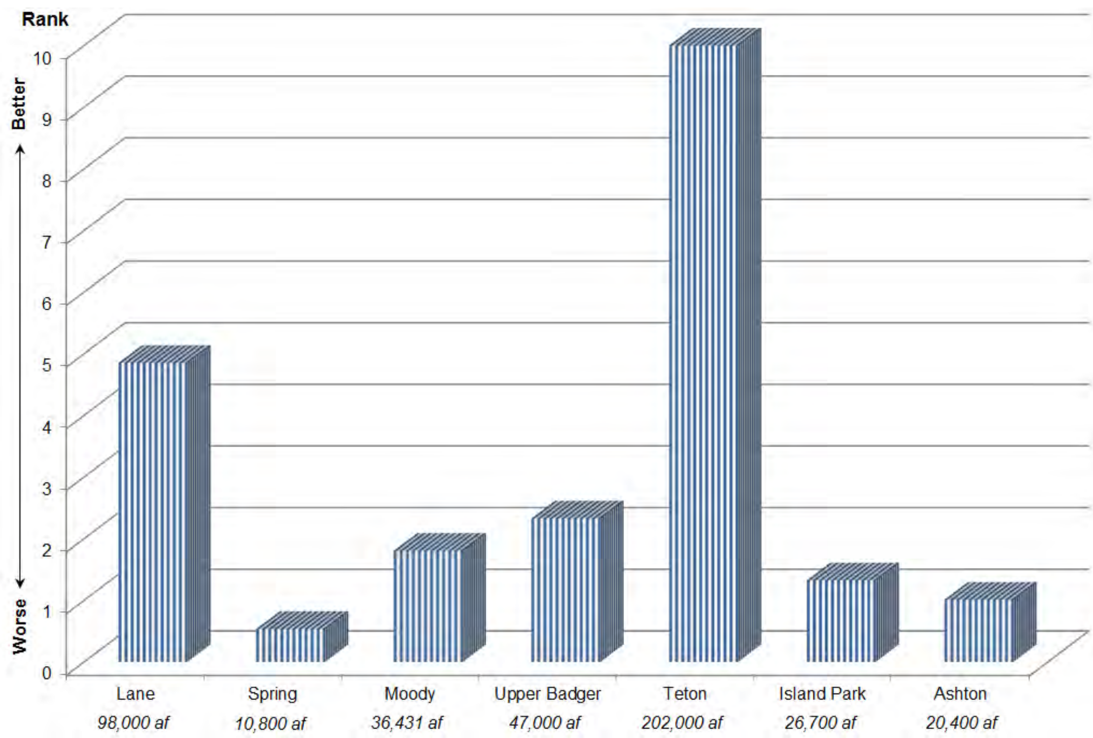


Figure 31. Water storage volumes for all of the surface storage alternatives.[13]

Secondary Benefit - Hydropower

A secondary benefit of surface storage reservoirs would be hydropower production. The Teton Dam alternative would provide the most power at a median value of over 5,870 kW; this is also the only alternative under consideration that would provide new hydropower throughout the year. The remainder of the surface storage alternatives would likely provide power on a seasonal basis, with the highest among these being 2,430 kW at the Upper Badger Creek Dam location. The next highest seasonal power production would be made available by the Lane Lake Dam alternative at 1,500 kW. The remainder of the alternatives would provide less than 1,000 kW, with Spring Creek Dam alternative providing the least, at 177 kW.

---

[13] Storage quantities represent median values. The method used to calculate these values for each alternative is specified in Section 5.0. In some cases, the values shown represent average annual flow volume; in other cases, additional analysis was performed and the data shown represents the 50 percent exceedance value.

6.1.2 Implementation Costs

Estimated Total Construction Costs

Figure 32 compares the total construction cost for each reservoir alternative. As shown, the highest construction cost by a wide margin would be for Teton Dam and Lane Lake Dam alternatives at up to $492,210,000 and $460,000,000, respectively. The lowest development cost would be associated with the increase in storage capacity at the two existing reservoirs being considered: Island Park Dam storage increase alternative at approximately $6,400,000 and Ashton Dam raise alternative at approximately $28,210,000. When compared with Lane Lake Dam and Teton Dam alternatives, the cost of Spring Creek, Moody Creek, and Upper Badger Creek dams are also relatively low at approximately $41,760,000, $123,920,000, and $128,940,000, respectively.

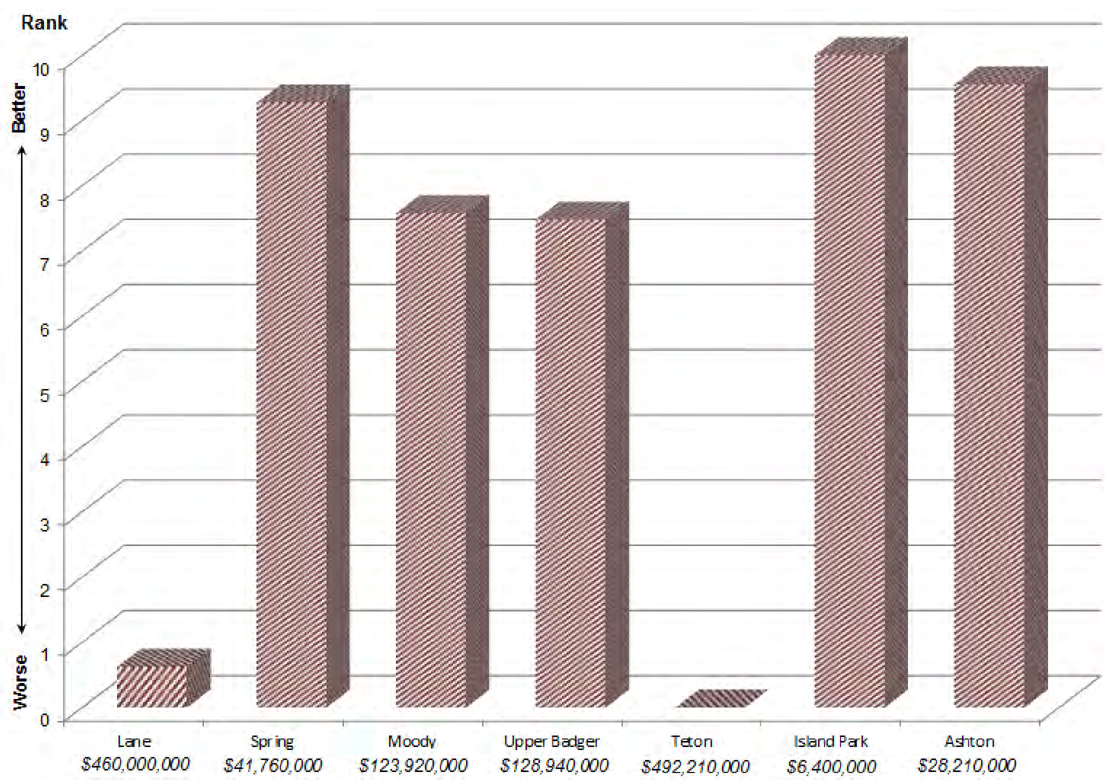


Figure 32. Estimated total construction costs for surface storage alternatives.

Estimated Costs per Acre-Foot

When viewed from the perspective of cost per acre-foot (Figure 33), a somewhat different picture is seen. While the Lane Lake Dam alternative is still the most expensive alternative at $4,600 per acre-foot, the difference between it and other new reservoir alternatives is not as severe and the relatively high cost of developing this new surface storage alternative is illustrated. Specifically, the cost per acre-foot for the Spring Creek Dam alternative would be $3,900; for the Moody Creek Dam alternative, the cost would be $3,600 per acre-foot; for the Badger Creek Dam alternative, the cost per acre-foot would be $2,700, and for the Teton Dam alternative, the cost would be over $1,900. The enlargement of the existing reservoirs, especially Island Park Dam at $240 per acre-foot, shows a clear cost advantage over the new reservoir site alternatives.

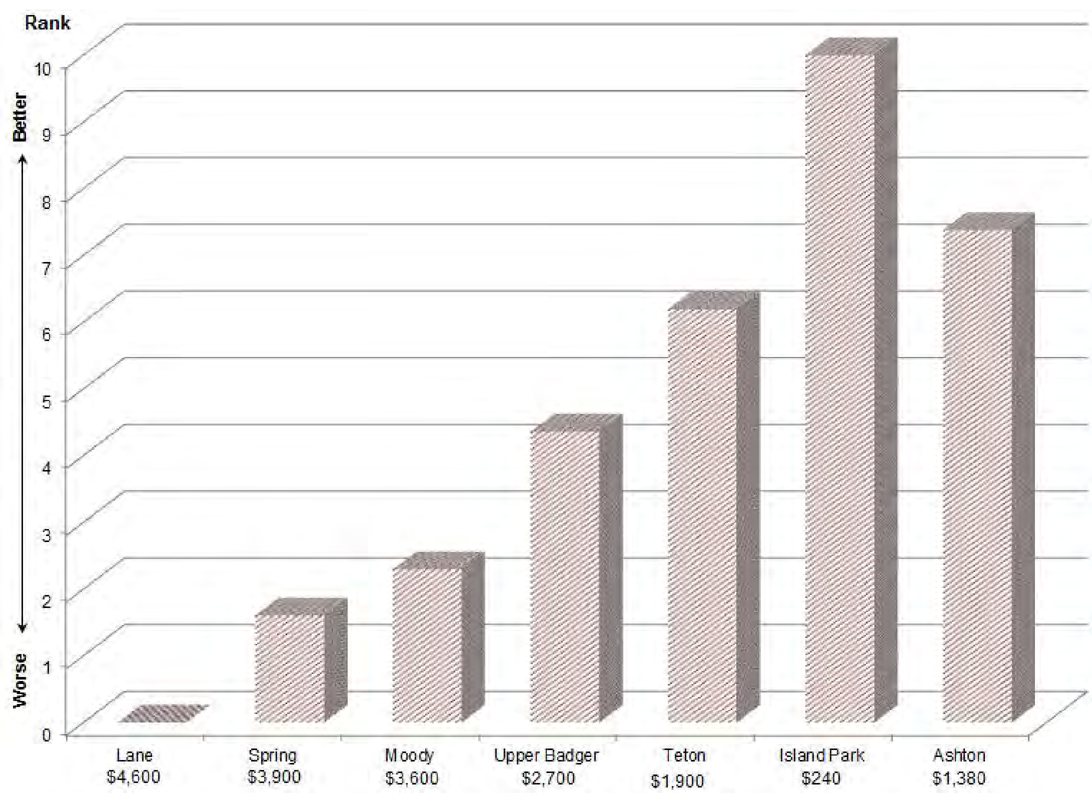


Figure 33. Estimated cost per acre-foot for all surface storage alternatives.

Composite Estimated Costs Comparison

When the total development cost and the cost per acre-foot perspectives are looked at together, the high costs of the Lane Lake and Teton Dam alternatives stand out when compared to all other alternatives. Also, the expansion of the existing reservoirs can be accomplished at the lowest relative cost with expansion of Island Park Reservoir representing the most cost-efficient option. The costs of the other three new reservoir options (Spring Creek, Moody Creek, and Upper Badger Creek dam alternatives) are similar, both substantially better than Lane Lake and Teton Dam alternatives, and considerably less cost-effective than the existing reservoir locations.

6.1.3 Environmental Impacts

Biophysical Impacts

Biophysical factors used to measure potential impact and compare alternatives are listed in Table 12. These are the factors that were considered most important in determining the potential acceptability of alternative surface storage sites. As shown in Table 12, surface storage alternative sites were rated on a scale of 1 to 3 for each of these factors, with a rating of 1 representing a high level of adverse impact and a rating of 3 representing a range from a low level of adverse impact to a beneficial effect. The resources that would be adversely affected by each alternative are shown with scores of 1 or 2 on the table.

Table 12. Biophysical resources impact evaluation. Ratings are based on probable impacts: 1 = high level of adverse impact; 2 = moderate adverse impact; and 3 = low/no adverse impact and/or potential for beneficial environmental effects (Appendix B of Reclamation 2013a).

Biological Resources	Lane Lake	Spring Creek	Moody Creek	Upper Badger Creek	Teton	Island Park Dam	Ashton Dam
Wildlife habitat – big game habitat	1	1	1	1	1	3	2
ESA-listed species	2	2	2	2	2	2	2
Wetland/Habitat value	3	3	3	2	1	3	2
State Species of Greatest Conservation Need – Yellowstone cutthroat trout present in affected streams	2	2	2	1	2	3	1
Special designation – ESA-eligible streams, State natural river, State recreational river, or designated wilderness	2	2	2	2	2	3	3
Stream connectivity	2	1	1	1	1	3	3

The results of the analysis shown in Table 12 were converted to a scale of 0 to 10 as explained above, with the results displayed in Figure 34. As illustrated on this figure, the surface storage alternative with the least biophysical resource impacts would be the Island Park Dam storage increase alternative. This alternative would have low or no impact in all but one biophysical resource category, with a moderate impact rating related to ESA-listed species. The highest level of impact is associated with the Upper Badger Creek and Teton dam alternatives. The Upper Badger Creek Dam alternative would have a high level of impact to upland large game, Yellowstone cutthroat trout and stream conductivity; and a moderate impact rating in all other categories. The Teton Dam alternative would have a high level of impact on upland large game, wetland habitats and stream conductivity; and a moderate level of impact in all other categories. The other alternatives receive relatively low to moderate scores, but vary in the resources affected, as shown in Table 12.

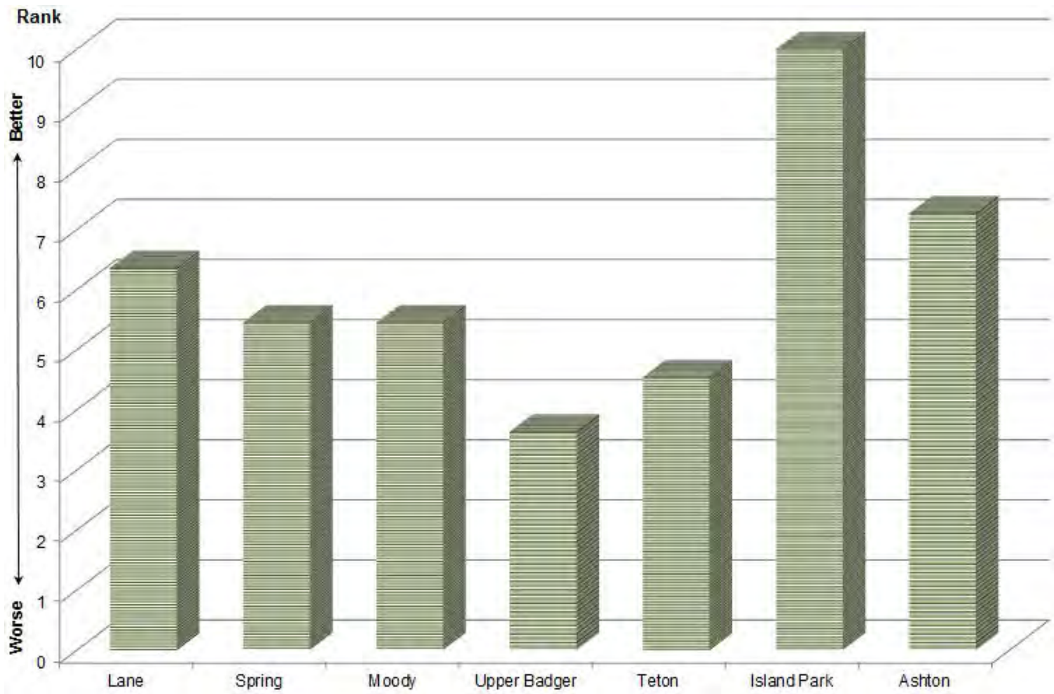


Figure 34. Biophysical environmental impacts of the surface storage alternatives.

Sociocultural Effects

Sociocultural factors used to measure potential impact and compare alternatives are listed in Table 13. As with biophysical resources, alternative surface storage sites were rated on a scale of 1 to 3 for each of the evaluation factors shown. The resources that would be adversely affected by each alternative are shown in Table 13.

Table 13. Sociocultural resources impact evaluation for the surface storage alternatives. Ratings are based on probable impacts: 1 = high level of adverse impact; 2 = moderate adverse impact; and 3 = low/no adverse impact and/or potential for beneficial effects (Appendix B of Reclamation 2013a).

Biological Resources	Lane Lake	Spring Creek	Moody Creek	Upper Badger Creek	Teton	Island Park Dam	Ashton Dam
Land Management – land ownership or special designation	3	2	3	2	1	3	1
Recreation/Economic value – potential for significant adverse impact to high-value resources	3	2	3	3	1	3	1
Developed land use/infrastructure – relative value and potential for significant adverse impact	3	3	3	3	3	3	1

As with other evaluation categories, the results of the analysis shown in Table 13 were converted to a scale of 0 to 10, with 10 being the best (least impact among the alternatives). As shown in Figure 35, the alternatives with the least sociocultural impacts in this analysis would be Lane Lake, Moody Creek Dam, and the Island Park raise alternatives, each with low or no impact in any sociocultural resource category. The highest levels of impact (lowest scores) would be associated with the Ashton Dam raise and Teton Dam alternatives. Impacts with the Ashton Dam raise alternative would be high from the standpoints of land management, recreation/economic value, and developed land use/infrastructure. With the Teton Dam alternative, impacts would be high related to land management and recreation/economic value, and would be low related to developed land use/infrastructure.

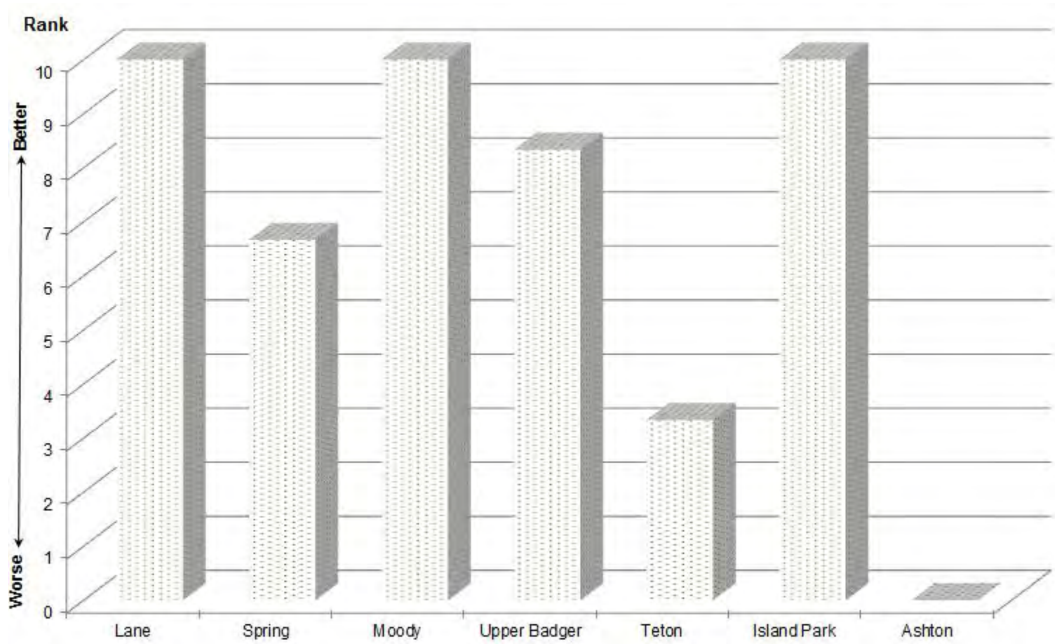


Figure 35. Sociocultural environmental impacts of the surface storage alternatives.

Summary Environmental Impact Comparison Observations

Overall, if both biophysical and sociocultural impacts are looked at together, the Island Park alternative would rank the highest by a relatively high margin. The next-highest ranked alternatives would be Lane Lake and Moody Creek because of their relative absence of sociocultural impacts despite rating relatively low for biophysical impacts. The lowest ranking alternatives would be Ashton Dam raise and Teton Dam. In the case of the Ashton Dam raise alternative, the major reason for the low overall environmental rating would be its high levels of impact in all sociocultural evaluation factors, as described previously. Related to the Teton Dam alternative, a low rating is due to the relatively high levels of adverse impact in both biophysical and sociocultural categories.

6.1.4 Viewpoints of Involved Agencies and Stakeholders

This perspective represents a consolidated review and assessment of input received from both involved agencies and stakeholders through the planning process. Much of this input is summarized in the discussions of each alternative in Section 5.0. After considering all the evaluation factors for each alternative, study participants were able to determine those storage alternatives they can support for further study and evaluation. Conversely, clear indications have been provided regarding alternatives that either do not have broad support (including agency support) or would be actively opposed by participating stakeholder groups. Figure 36 illustrates a ranking of the alternatives based on the input received.

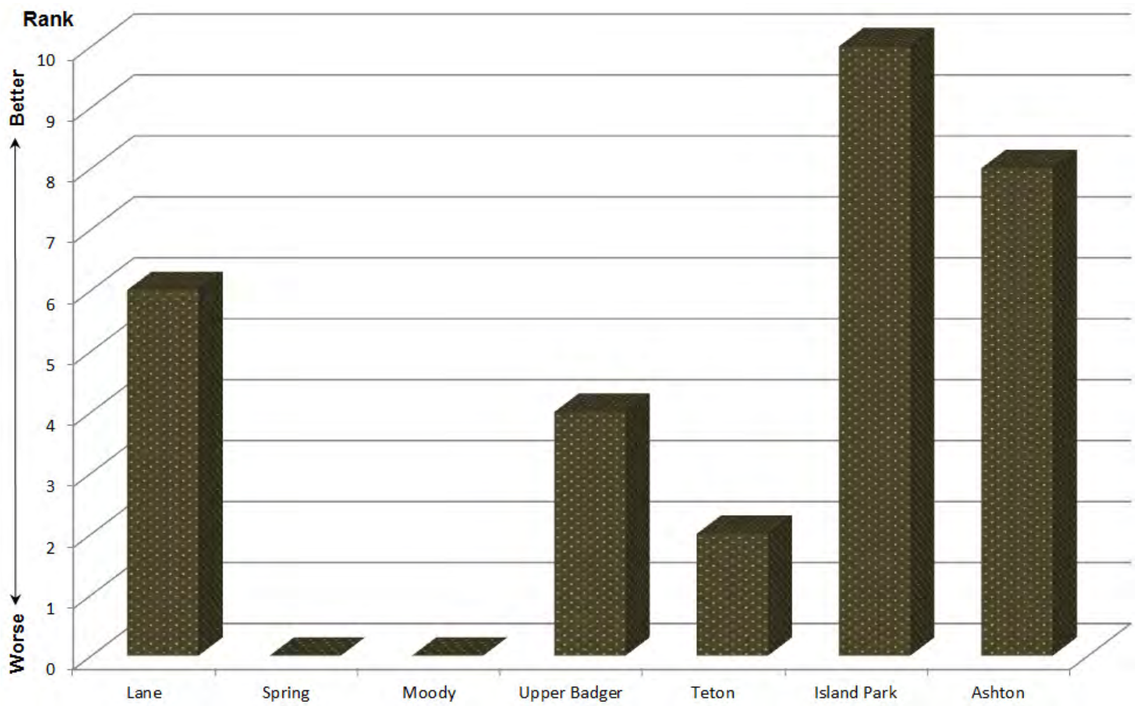


Figure 36. Relative ranking of storage alternatives based on the viewpoints of agencies and stakeholders.

The Island Park Dam storage increase alternative on the Henrys Fork River drainage appears to have the highest degree of acceptance and support by irrigators, conservation groups, and State water managers. Because Island Park Dam is a Federal facility, there is a clear Federal nexus associated with this alternative and future Federal involvement in the planning processes would be necessary. IWRB water managers and water users consider this to be a high State priority and are interested moving forward on this alternative in the near future.

Ashton Dam raise also appears to have a certain degree of acceptance by the irrigators, conservation groups, and State water managers for further study; however, the willingness of the private dam owners to raise Ashton Dam has not yet been explored. IWRB water managers place interest in further evaluating Ashton Dam raise behind/below State interests in moving forward on Island Park Dam, and consider this something to be pursued in future decades if necessary. The Ashton Dam status as a privately owned dam eliminates any Federal nexus by Reclamation, but future Federal involvement in studies would be necessary because Ashton Dam is part of a hydropower plant licensed by FERC.

Water storage alternatives in the Teton River drainage have received mixed support. Conservation groups cautiously support further study of Lane Lake while water users and State water managers consider this alternative an option for long-term consideration in the next quarter century.

State water managers and irrigators would also like to keep their long-range options open to include future studies on Teton River or Upper Badger Creek. These are two on-stream reservoir alternatives the conservation groups have clearly stated they would not support.

The two smaller potential reservoirs in the Teton River drainage, Spring Creek and Moody Creek, do not appear to have support from any of the stakeholders.

6.2 Managed Groundwater Recharge Alternative

6.2.1 Egin Lake Expansion

Benefits

Expansion of the Egin Lakes recharge program would enhance the in-basin water budget by annually recharging an additional 2,500 to 5,000 acre-feet (7,500 to 10,000 acre-feet total), depending on the alternative. At the end of the 20-year period that was examined, approximately 22 percent of the water recharged would be expected to be stored in the ESPA, helping satisfy unmet irrigation demands in the Egin Bench irrigated region. The remaining volume would be discharged to the Henrys Fork River, which has been identified as having additional ecological streamflow needs. The increase in instream flow is predicted to be from 1.6 to 3.2 cfs in the Ashton to Rexburg reach, depending on the recharge volume considered. However, these results must be evaluated in light of the State's goals of stabilization and recovery of the ESPA.

Estimated Implementation Costs

The estimated construction costs for increasing the capacity the recharge facilities, including necessary canal improvements, is $10,063,567 ($4,000 per acre-foot) for 2,500 acre-foot and $13,617,795 ($2,700 per acre-foot) for a 5,000 acre-foot enlargement.

Environmental Impacts

Expanding recharge volume at the Egin Lake site would have few, if any, significant adverse environmental impact and may have beneficial impacts on streamflow (especially temperature) below the St. Anthony gage. The potentially adverse consequences would be in direct effects on a priority rainbow trout fishery in the Henrys Fork River, the entrainment of trout in new diversions, and reduced flows. Diversion structures could be designed with fish screens to prevent entrainment and flows would need to be managed with consideration to fisheries needs.

6.3 Water Marketing

The water marketing alternative does not lend itself to the kind of comparative analysis provided above for surface and groundwater storage options, but it is common to all of the alternatives put forward in Section 5.0. Water markets (water banks, rental pools) do not increase the water supply in a region or watershed such as the Henrys Fork River basin; instead, they provide a means of managing available water supplies. They are used to maximize the economic and/or environmental value of water by exchanging water rights that would have otherwise been unused and/or forfeited and minimize the economic and/or environmental consequences of water shortages. Typically water marketing involves a voluntary water transfer agreement for a temporary or permanent change in the type, time, or place of use of water and/or a water right (see Section 5.4 for details).

These water management tools are already in use in parts of the Henrys Fork River basin, and can be expected to expand over time, especially in light of the predictions for climate change. In fact, the Water Transaction Program in the Teton River basin would be the only alternative analyzed capable of addressing stream connectivity and Yellowstone cutthroat trout issues in the basin. Other such programs would undoubtedly be part of the long-term water management program in the basin.

6.4 Conservation Alternatives

The alternatives discussed in this section do not lend themselves to the kind of comparative analysis provided above for surface storage alternatives. Instead, each was discussed individually with available indications of water volume, cost, and environmental effects addressed to the extent information is available. In each case, more information is provided in the corresponding sections of Section 5.5.

6.4.1 Canal Automation

Benefits

Automated canals allow irrigators to match diversions with irrigation requirements and reduce the demand for water, particularly late-season storage withdrawals, especially given the effects of projected climate changes. These benefits could have a significant value in the Henrys Fork River basin.

Installation of automated gates at the nine principal stream diversion points in the basin would conserve approximately 1,687 acre-feet annually. Among the nine diversion points, individual water savings from gate installation would range from 333 to 92 acre-feet.

Estimated Implementation Costs

The total cost of gate installation at all nine principal stream diversion points is estimated to be $1,588,000, with individual location/facility costs ranging from approximately $68,000 to $262,000. The average cost per acre-foot would be $941, with individual location costs ranging from $491 to $2,843 per acre-foot.

Environmental Impacts

Overall, automated canals would reduce the demand for stored water withdrawal which would improve management options in both the Henrys Fork River basin and the ESPA.

For all four of the irrigated regions in the Henrys Fork River basin, canal automation would increase both total annual and peak flow volumes and would have a positive impact on the basin's overall water budget. For the North Fremont region, canal automation would increase nonpeak flows by approximately 2 percent. While this increase is relatively small, it would still represent a positive effect during periods of normally low flows. For the Teton Valley, Lower Watershed, and Egin Bench regions, canal automation would decrease nonpeak flows and thus would have a negative environmental impact.

6.4.2 Canal Piping

The installation of pipelines in irrigation canals to limit water loss due to canal seepage has been shown to be of practical benefit only in the North Fremont irrigated region. Irrigators in this region have installed several gravity pressurized pipeline systems which have (1) increased total annual flows, peak flows, and nonpeak flows, (2) reduced the demand for Fall River flows (both natural and stored water), and (3) saved significant amounts of energy. Overall, the pipelines and canal linings installed to date have reduced withdrawal from upstream storage by approximately 10,000 acre-feet in the past 10 years, an average of 1,000 acre-feet per year. These reductions in withdrawals from Island Park Reservoir would help mitigate the expected increase in late season demands on storage throughout the Henrys Fork River basin due to climate change. Current proposed projects were estimated to cost $10 million. The total volume of water to be conserved in this next program increment was not determined for this report.

Because of the interconnection between groundwater and surface water, pipelines in canals in the other irrigated regions (Teton Valley, Lower Watershed, and Egin Bench) would reduce later summer return flows to the Henrys Fork or Teton rivers and result in a negative environmental impact.

6.4.3 Agricultural Demand Reduction

Agricultural demand reduction, as a means of managing local water supply and meeting State needs, means reducing the number of irrigated acres or changing farming practices to use less water. There are active State programs pursuing each of these strategies; for example, one State program provides financial assistance for irrigated-to-dryland crop conversions. Another program, focused more on groundwater restoration, promotes conversions of cropland from groundwater to surface water sources.

Though specific data related to these programs within the Henrys Fork River basin was not gathered for this study, the programs are active in the basin and would be part of any water management strategy in the future. The cost for converting irrigated cropland to dryland farming or simply ceasing irrigation was estimated to be $1,860 per acre, while the estimate for such an approach as deficit irrigation, meaning the acre would be partially irrigated (e.g., irrigation may be stopped only after the second cutting of alfalfa hay), was $3,600 per acre.

From an environmental standpoint, reducing or stopping irrigation would have different consequences in different parts of the overall Henrys Fork River basin. In the North Fremont, Egin Bench, and Upper Teton Valley irrigated regions, reduced irrigation would generally have positive environmental effects focused on increases in nonpeak streamflows. However, in the Teton Valley and Lower Watershed, adverse impacts would be expected due to a decrease in nonpeak flows, with the degree of adverse impact varying dependent upon the percentage reduction in irrigation.

7.0 Conclusions and Next Steps

The findings of this study make it clear that a meaningful contribution to meeting the existing and future water supply needs of the Henrys Fork Basin, as well as such high state priorities as the ESPA, cannot be made by any single action. Rather, it is clear that success in meeting these needs must be built through an integrated program of actions. Grouping of alternatives into one or more integrated packages is likely to be necessary in order to meet the broadest set of needs.

However, groups of projects would involve discussions of the likelihood and risk of funding and developing the facilities; the viability of proposed combination(s); and the environmental, fisheries, and ESPA components to assure that all three needs are addressed. Even when implementation details are finalized, more rigorous analyses would be necessary before progressing with the project or group of projects. In the end, IWRB will decide what actions it can take to address the challenges and how it will move forward to resolve the remaining issues of funding and implementation.

Public acceptability would likely mean compromises on all sides and finding a balance that all participants could support could be a challenging process. Maximizing the benefits for all categories of need is likely not realistic so some of the total potential water supply needs may have to be ceded to accommodate the agricultural, environmental, and fisheries needs.

Once public acceptability is achieved, obtaining sufficient funding can be particularly challenging. Depending on the total cost of the package, IWRB could move forward with funding on its own, seek partnerships with local entities, or seek the assistance of the Federal government in funding the projects; however, State and Federal funding are getting increasingly difficult to secure. A number of funding sources will likely be required to implement any package.

Resolving any inherent legal problems, like existing ownership of land and facilities, obtaining rights-of-way or easements, and the needed legal framework, could be a daunting process. In addition, if project implementation were to trigger litigation, then the legal entanglements become more complex and deplete funding that would have otherwise been available for project implementation.

Should a Federal nexus exist in any implementation package (more than likely some nexus will exist), then compliance with the NEPA, ESA, National Historic Preservation Act, and other Federal statutes has historically been time consuming and costly. Issues with potential new ESA listings and designations of Wild and Scenic Rivers in the Basin Study area could significantly complicate implementation efforts.

In completing the efforts of the Basin Study, IWRB and Reclamation agreed to utilize a two-document approach. This Final Report contains the technical information and the discussions of the Basin Study. A companion document will be produced by the IWRB in collaboration with the Workgroup and Reclamation to document IWRB's decisions regarding the path forward in future actions in the Henrys Fork River basin; the recommendations and prioritization for which alternatives to pursue; and the sequence of steps for the recommended alternatives or group of alternatives. The Path Forward document will be submitted to the Governor and the Legislature to comply with the State Senate Bill 1511 and inform those officials of the recommendations and prioritization of alternatives, the investments in water management infrastructure most advantageous to the State, and seek further financial support to help implement alternatives.

A Path Forward document does not preclude any member of the Workgroup from independently developing its own vision for a path forward. Since the Basin Study presents an array of alternatives, any person or group, private or public, may seek to move an alternative(s) forward as they deem appropriate.

8.0 DOCUMENTS COMPLETED DURING THE BASIN STUDY

Table 14 shows the reports that were produced by Reclamation, IWRB, and CH2MHILL (Reclamation contractor) during the course of the Basin Study.[14]

Table 14. List of reports produced during the course of the Henrys Fork Basin Study.

Report Name	Author(s)	Date of Release
Henrys Fork Watershed Basin Study, Water Needs Assessment, Technical Series No. PN-HFS-001	Reclamation	October 2012
Henrys Fork Basin Study, New Surface Storage Alternatives, Technical Series No. PN-HFS-002	CH2MHill	November 2012
Henrys Fork Basin Study, Dam Raise Alternatives, Technical Series No. PN-HFS-003	CH2MHill	November 2012
Henrys Fork Basin Study, Managed Recharge Alternatives, Technical Series No. PN-HFS-004	CH2MHill	November 2012
Henrys Fork Basin Study, Teton Dam Storage Alternative, Technical Series No. PN-HFS-005	Reclamation	October 2012
Henrys Fork Basin Study, Conservation Alternatives, Technical Series Report No. PN-HFS-006	Reclamation	October 2012
Henrys Fork Basin Study, Municipal Water Conservation Measures and New Non-potable Water Supply Options, Technical Series PN-HFS-007	CH2MHill	November 2012
Henrys Fork Basin Study, Preliminary Water Market Analysis, Technical Series PN-HFS-008	CH2MHill	November 2012
Henrys Fork Basin Special Study, Interim Report	Reclamation and State of Idaho	July 2013
Addendum to Henrys Fork Basin Study, New Surface Storage Alternatives, Technical Series No. PN-HFS-002	CH2MHill	February 2014
Technical Memorandum, MODSIM modeling of Henrys Fork basin alternatives	Reclamation	September 2013
Technical Memorandum No. ISL-8130-FEA-2013-1- Island Park Dam Flood Routing for Service Spillway Raise	Reclamation	September 2013

[14] These reports may be accessed from Reclamation's web site at http://www.usbr.gov/pn/programs/studies/idaho/henrysfork/techrept/index.html.

9.0 LITERATURE CITED

Parenthetical Reference	Bibliographic Citation
Bayrd 2006	Bayrd, G. 2006. *The Influences of Geology and Water Management on Hydrology and Fluvial Geomorphology in the Henry's Fork of the Snake River, Eastern Idaho and Western Wyoming*. A master's thesis at Idaho State University. 2006.
BLM 2009	Bureau of Land Management. 2009. Wild and Scenic River Eligibility Report. U.S> Department of the Interior, Bureau of Land Management, Upper Snake Field Office, Idaho Falls, Idaho. March 2009.
Census 2011	U.S. Census Bureau. http://quickfacts.census.gov/qfd/states/16000.html. Site visited on February 18, 2011.
CH2MHILL 2012	CH2MHILL. 2012. *Henrys Fork Basin Study New Surface Storage Alternatives Technical Series No. PN-HFS-02*. Prepared for the Bureau of Reclamation, Idaho Water Resource Board, and Henrys Fork Watershed Council. November 2012.
CH2MHILL 2013	CH2MHILL. 2013. Draft *Henrys Fork Basin Study New Surface Storage Alternatives, Addendum to Technical Series No. PN-HFS-02*. Prepared for the Bureau of Reclamation, Idaho Water Resource Board, and Henrys Fork Watershed Council. November 2013.
DeRito 2012	DeRito, J. 2012. Presentation at the Henry's Fork Watershed Council 2011 Annual Watershed Conference. "Yellowstone Cutthroat Trout Status for the Henry's Fork, Teton, and Sinks Drainages." November 29, 2011. http://www.henrysfork.org/shared/hff/files/HFWC%20Nov%2029%202011%20mtg%20notes%20FINAL.pdf accessed on June 21, 2012.
Gresswell 2011	Gresswell, R.E. 2011. "Biology, Status, and Management of the Yellowstone Cutthroat Trout." *North American Journal of Fisheries Management*, 31:5, 782-812. September 20, 2011.

Parenthetical Reference	Bibliographic Citation
IDEQ 2005	Idaho of Department of Environmental Quality. "Idaho's treasure: the Eastern Snake Plain Aquifer" from the *Oversight Monitor*. State of Idaho, Department of Environmental Quality, Idaho National Laboratory Oversight & Radiation Control Program. May 2005.
IDFG 1978	Idaho Department of Fish and Game. 1978. *Stream Flow Investigations: Stream Resource Maintenance Flow Determinations on Idaho Streams*. Authored by T. Cochnauer and E. Buettner. State of Idaho, Department of Fish and Game. June 1978.
IDFG 1999	Idaho Department of Fish and Game. 1999. *Special Report: Instream Flow Recommendations for Maintenance of Fisheries in the Upper Snake River*. State of Idaho, Department of Fish and Game. 1999.
IDFG 2005	Idaho Department of Fish and Game. 2005. Idaho Comprehensive Wildlife Conservation Strategy. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. http://fishandgame.idaho.gov/cms/tech/CDC/cwcs.cfm.
IDFG 2007	Idaho Department of Fish and Game. 2007. *The Management Plan for Conservation of Yellowstone Cutthroat Trout in Idaho.* Idaho Department of Fish and Game. April 2007.
IDOL 2012	Idaho Department of Labor. http://lmi.idaho.gov/PopulationCensus.aspx. Site accessed on January 5, 2012.
IDWR 1978	Idaho Department of Water Resources. 1978. *Water Resources of the Upper Henrys Fork Basin in Eastern Idaho*. Idaho Department of Water Resources, Water Information Bulletin No. 46. May 1978.
IDWR 1992	Idaho Department of Water Resources. 1992. *Comprehensive State Water Plan: Henrys Fork Basin*. Idaho Water Resource Board. 1992.
IDWR 1992	Idaho Department of Water Resources. 1992. *Comprehensive State Water Plan: Henrys Fork Basin*. Idaho Water Resource Board. 1992.

Parenthetical Reference	Bibliographic Citation
IDWR 1999	Idaho Department of Water Resources. 1999. *Feasibility of Large-Scale Managed Recharge of the Eastern Snake Plain Aquifer System.* Prepared in cooperation with the Bureau of Reclamation. State of Idaho, Idaho Department of Water Resources. 1999.
IDWR 2009	Idaho Department of Water Resources. 2009. *Eastern Snake Plain Aquifer (ESPA), Comprehensive Aquifer Management Plan*. I Idaho Department of Water Resources. January 2009.
IDWR 2012a	Idaho Department of Water Resources. 2012. *Idaho Department of Water Resources Annual Report 2012.* http://www.idwr.idaho.gov/WaterManagement/WaterRights/WaterSupply/pdfs/2012%20annual%20report.pdf accessed on February 4, 2014. Idaho Department of Water Resources 2012.
IDWR 2013	Idaho Department of Water Resources. 2013. *2013 Water District 1 Rental Pool Procedures*. Accessed at http://www.idwr.idaho.gov/WaterManagement/WaterRights/waterSupply/PDFs/2013%20Rental%20Pool%20Rules-Proposed%201-3-13.pdf on September 9, 2013.
IDWR 2014a	Idaho Department of Water Resources. 2014. http://maps.idwr.idaho.gov/StateProtectedStreams/Plan accessed on January 10, 2014.
ISWCC 2013	Idaho Soil and Water Conservation Commission. 2013. Accessed at http://swc.idaho.gov/what-we-do/district-support on September 9, 2013.
IWRB 1992	Idaho Water Resource Board. 1992. *Comprehensive State Water Plan: Henrys Fork Basin*. Idaho Water Resource Board. 1992.
IWRB 2009	Idaho Water Resource Board. 2009. *Eastern Snake Plain Aquifer Comprehensive Aquifer Management Plan*. Boise, Idaho. January 2009.
IWRB 2010	Memorandum to the Idaho Water Resource Board from Bill Quinn, Recharge Coordinator, dated September 14, 2010. Subject: 2010 Early Season ESPA Recharge Summary and Late Season Plan.
IWRB 2012a	Idaho Department of Water Resources. 2012. *Idaho State Water Plan*. Idaho Water Resource Board, Boise Idaho. November 2012.

Parenthetical Reference	**Bibliographic Citation**
IWRB 2012b	Memorandum to the Idaho Water Resource Board from Bill Quinn, Recharge Coordinator, dated January 17, 2012. Subject: 2012 Eastern Snake Plain Aquifer Recharge Summary Expected Recharge Activities for 2012.
LIHI 2010	Low Impact Hydropower Institute. http://www.lowimpacthydro.org/lihi-pending-application-ferc-no.-2381-ashton-hydroelectric-project-henrys-fork-river-idaho.html. Accessed on June 12, 2012.
Loomis 2005	Loomis, John. 2005. *The Economic Value of Recreational Fishing & Boating to Visitors & Communities along the Upper Snake River*. Dr. John Loomis, Department of Agricultural and Resource Economics, Coloration State University. May 2005. http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/Final%20Loomis%20%20HFF%20TU%20SR%20Full%20Report%205-02-05.pdf accessed on June 11, 2012.
NASS 2012	National Agricultural Statistics Service. U.S. Department of Agriculture. Idaho Statistics, County Estimates. http://www.nass.usda.gov/Statistics_by_State/Idaho/Publications/County_Estimates/index.asp accessed on January 17, 2012.
NPS 2014	National Park Service. "Greater Yellowstone Ecosystem." U.S. Department of the Interior, National Park Service. http://www.nps.gov/yell/planyourvisit/upload/RI_2013_ecosystem.pdf accessed on February 3, 2014.
Orloff et al. 2005	Orloff, S., D. Putnam, B. Hanson, and H. Carlson. 2005. *Implications of Deficit Irrigation Management of Alfalfa*. California Alfalfa and Forage Symposium, Visalia, California. University of California, Davis, California. December 2005.
Reclamation 1980	Bureau of Reclamation. 1980. *Modification of Island Park Dam, Stage Two, Minidoka Project, Idaho-Wyoming*. U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. June 1980.
Reclamation 1991	Bureau of Reclamation. 1980. *Teton Dam Reappraisal Working Document*. U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. February 1991.

Parenthetical Reference	**Bibliographic Citation**
Reclamation 2004	Bureau of Reclamation. 2004. *Final Environmental Assessment, Fremont-Madison Irrigation District Proposed Title Transfer, Minidoka Project, Idaho-Wyoming*. U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. September 2004.
Reclamation 2006	Bureau of Reclamation. 2006. *Teton River Canyon Resource Management Plan*. U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. December 2006.
Reclamation 2011	Bureau of Reclamation. 2011. *Climate and Hydrology Datasets for Use in the RMJOC Agencies' Longer-Term Planning Studies: Part II – Reservoir Operations Assessment for Reclamation Tributary Basins*. U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. January 2011.
Reclamation 2012	Bureau of Reclamation. 2012. *Henrys Fork Basin Study Water Needs Assessment.* U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. October 2012.
Reclamation 2013a	Bureau of Reclamation. 2012. *Henrys Fork Basin Special Study Interim Report.* U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. July 2013.
Reclamation 2013b	Bureau of Reclamation. 2013. Technical Memorandum, MODSIM modeling of Henrys Fork basin alternatives. U.S. Department of the Interior, Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho. September 2013.
Reclamation 2013c	Bureau of Reclamation. 2013. *Technical Memorandum No. ISL-8130-FEA-2013-1- Island Park Dam Flood Routing for Service Spillway Raise, Minidoka Project, Idaho, Pacific Northwest Region. Sensitive – For Official Use Only.* U.S. Department of the Interior, Bureau of Reclamation, Technical Service Center, Denver Colorado. September 2013.
SR3 2001	Snake River Resources Review. 2001. *Aquatics Resources Parameters Manual*. March 2001.

Parenthetical Reference	**Bibliographic Citation**
Van Kirk 2011	Van Kirk, R. 2011. "Conservation of surface and ground water in a Western watershed experiencing rapid loss of irrigated agricultural land to development." Presentation to the Henrys Fork Watershed Council, Boise, Idaho. January 11, 2011.
Van Kirk 2012	Van Kirk, R. 2012. "Components of Irrigation Water Budget Related Sprinkler Application." http://www.humboldt.edu/henrysfork/Documents_Presentations/sprinkler%20irrig.pdf accessed on June 20, 2012.
Van Kirk 2013	Van Kirk, R. 2013. "Teton Valley Groundwater – Surface Water Model." September 23, 2013. May be found at http://www.humboldt.edu/henrysfork/Documents_Presentations/TV%20GW-SW%20model.pdf. Accessed on December 9, 2013.
Van Kirk and Jenkins 2005	Van Kirk, R. and A. Jenkins. 2005. *Hydrologic Alteration in the Upper Teton Watershed and Its Implications for Cutthroat Trout Restoration*. Completed for Friends of the Teton River, Driggs, Idaho. January 2005.
Van Kirk et al. 2011	Van Kirk, R., S. Rupp, and J. De Rito. *Ecological Streamflow Needs in the Henry's Fork Watershed.* Paper presented to Henry's Fork Watershed Council by Van Kirk (Humboldt State University), Rupp (Friends of the Teton River), and De Rito (Henry's Fork Foundation). September 2011.
Western 2012	Western Governors' Association and Western States Water Council. 2012. *Water Transfers in the West: Projects, Trends, and Leading Practices in Voluntary Water Trading*. The Western Governors' Association, Denver, Colorado and Western States Water Council, Murray, Utah. December 2012.

ESP Delivery Call Update

Presented by Mathew Weaver to the Idaho Water Resource Board

March 20, 2014

Current SW/GW Delivery Calls

1. Surface Water Coalition Delivery Call

2. Aquarius Fish Hatchery Delivery Call

3. Rangen Springs Delivery Call

Conjunctive Management Rules

1. Details Specific Steps in Responding to a Delivery Call

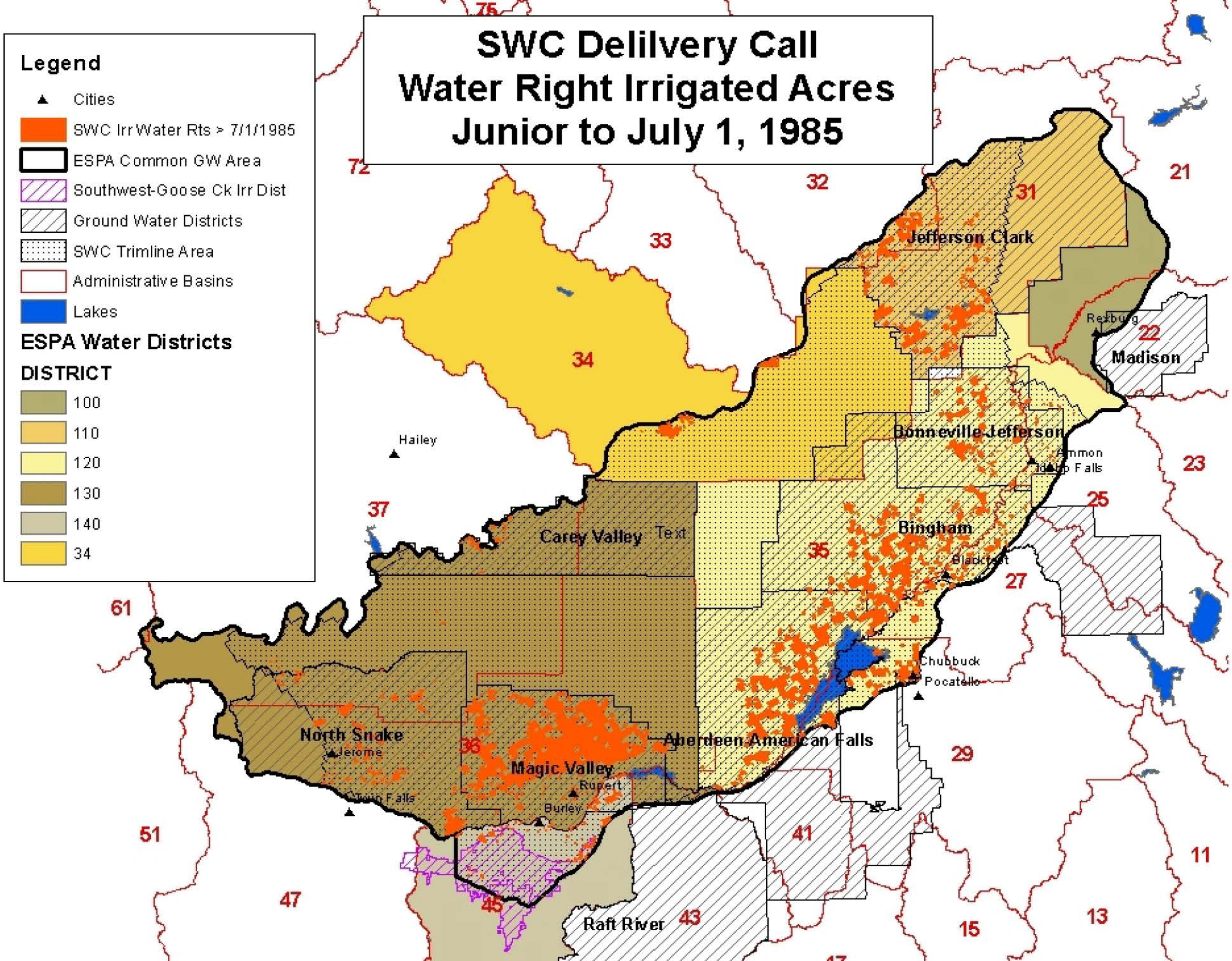
2. Issue of “Material Injury”

3. Issue of “Reasonableness of Diversions”

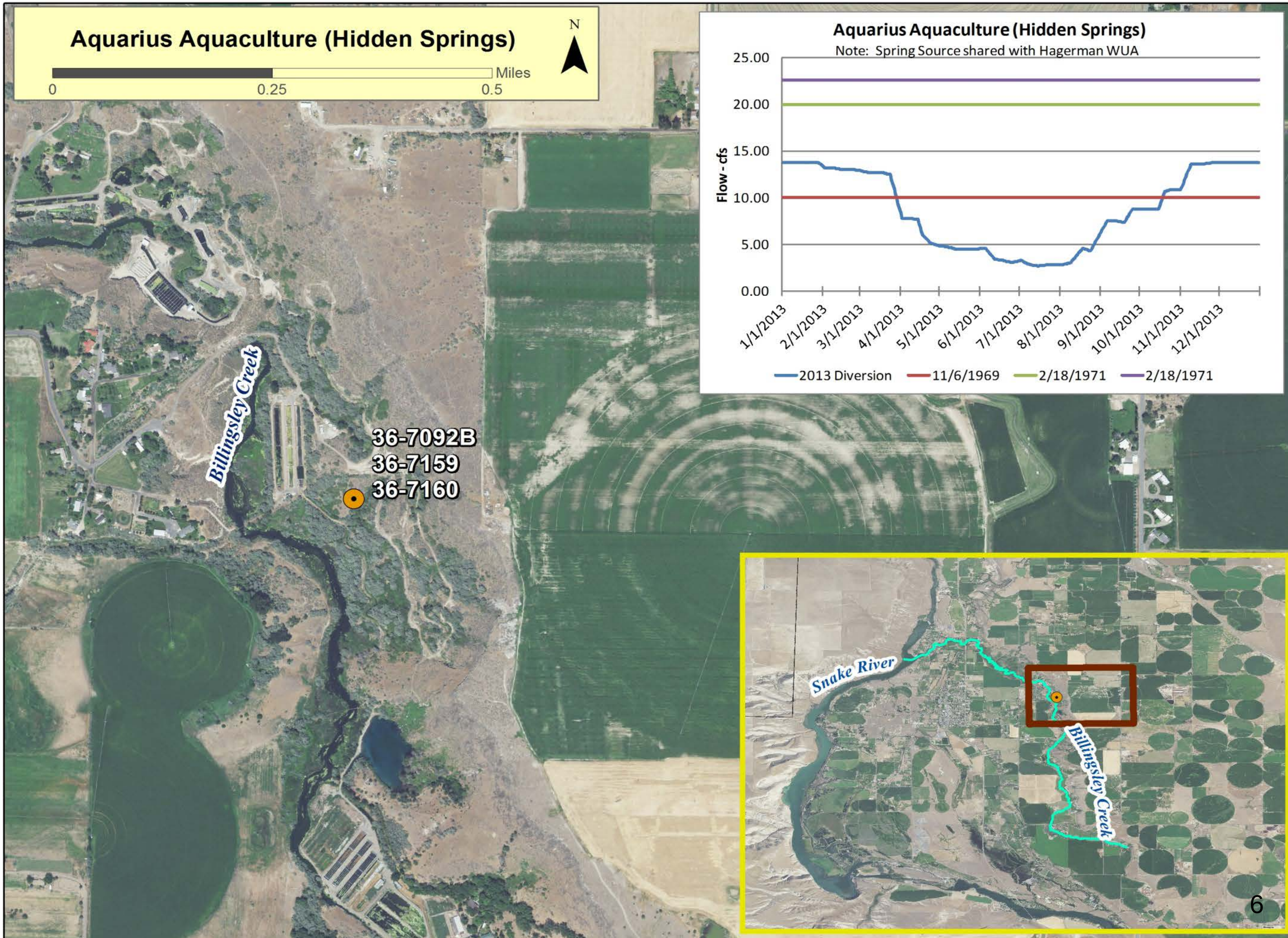
Material Injury

1. Definition: "Hindrance to or impact upon the exercise of a water right caused by the use of water by another person as determined in accordance with Idaho Law, as set forth in Rule 42. IDAPA 37.03.11.010.14.

2. CM Rule 42 – Considerations for material injury:
   - Amount of water available to Calling Party at their POD
   - Expense to divert water from the source by Calling Party
   - Whether Jr.'s affect quantity and timing of water availability
   - Amount of water used and diverted by Calling Party
   - Existence of water measurement devices
   - Whether needs can be met w/ existing water supply
   - Reasonableness of Calling Party's diversions and activities



Surface Water Coalition Delivery Call


Aquarius Aquaculture (Hidden Springs)
N
Miles
0
0.25
0.5
Aquarius Aquaculture (Hidden Springs)
Note: Spring Source shared with Hagerman WUA
Flow - cfs
25.00
20.00
15.00
10.00
5.00
0.00
1/1/2013
2/1/2013
3/1/2013
4/1/2013
5/1/2013
6/1/2013
7/1/2013
8/1/2013
9/1/2013
10/1/2013
11/1/2013
12/1/2013
2013 Diversion
11/6/1969
2/18/1971
2/18/1971
Billingsley Creek
36-7092B
36-7159
36-7160
Snake River
Billingsley Creek

Rangen Delivery Call - Background

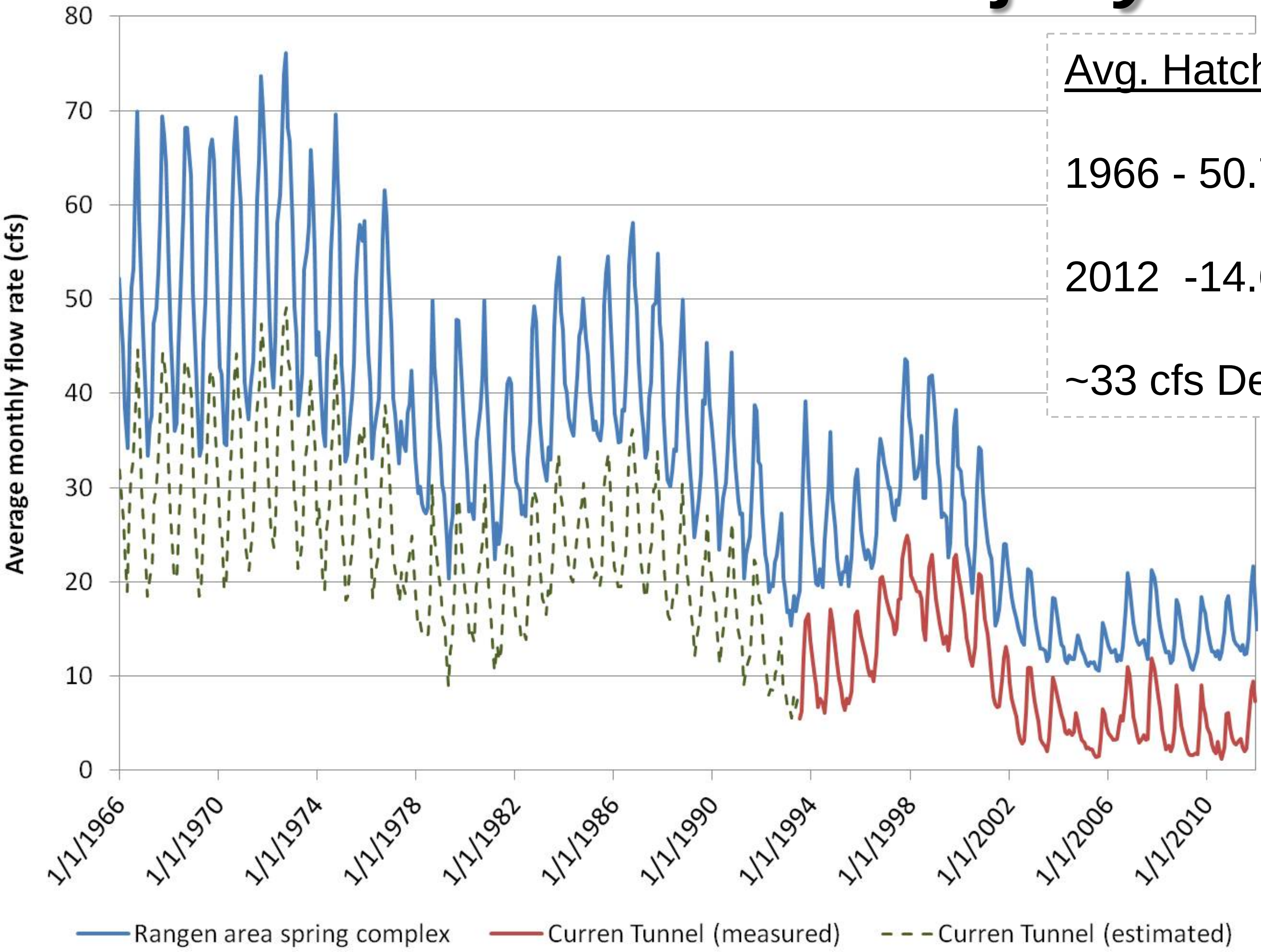
1. Conjunctive Management Rules – Adopted 1994

2. Eastern Snake Plain Aquifer Model Development (ESPAM)
   - Versions: 1.0, 1.1, 2.0, & 2.1

3. First Rangen Delivery Call – Filed on September 2003
   - Ruled a Futile Call - Model v1.0 Analysis

4. Second Delivery Call – Filed on December 2011
   - Found Injury of 9.1 cfs - Model v2.1 Analysis
   - Resulted in Curtailment 157,000 acres
   - Resulted in Issuance of N.O.V. to Rangen

Material Injury



<u>Avg. Hatchery Flows</u>

1966 - 50.7 cfs

2012 -14.6 cfs

~33 cfs Decline in 46 years

Material Injury - Findings

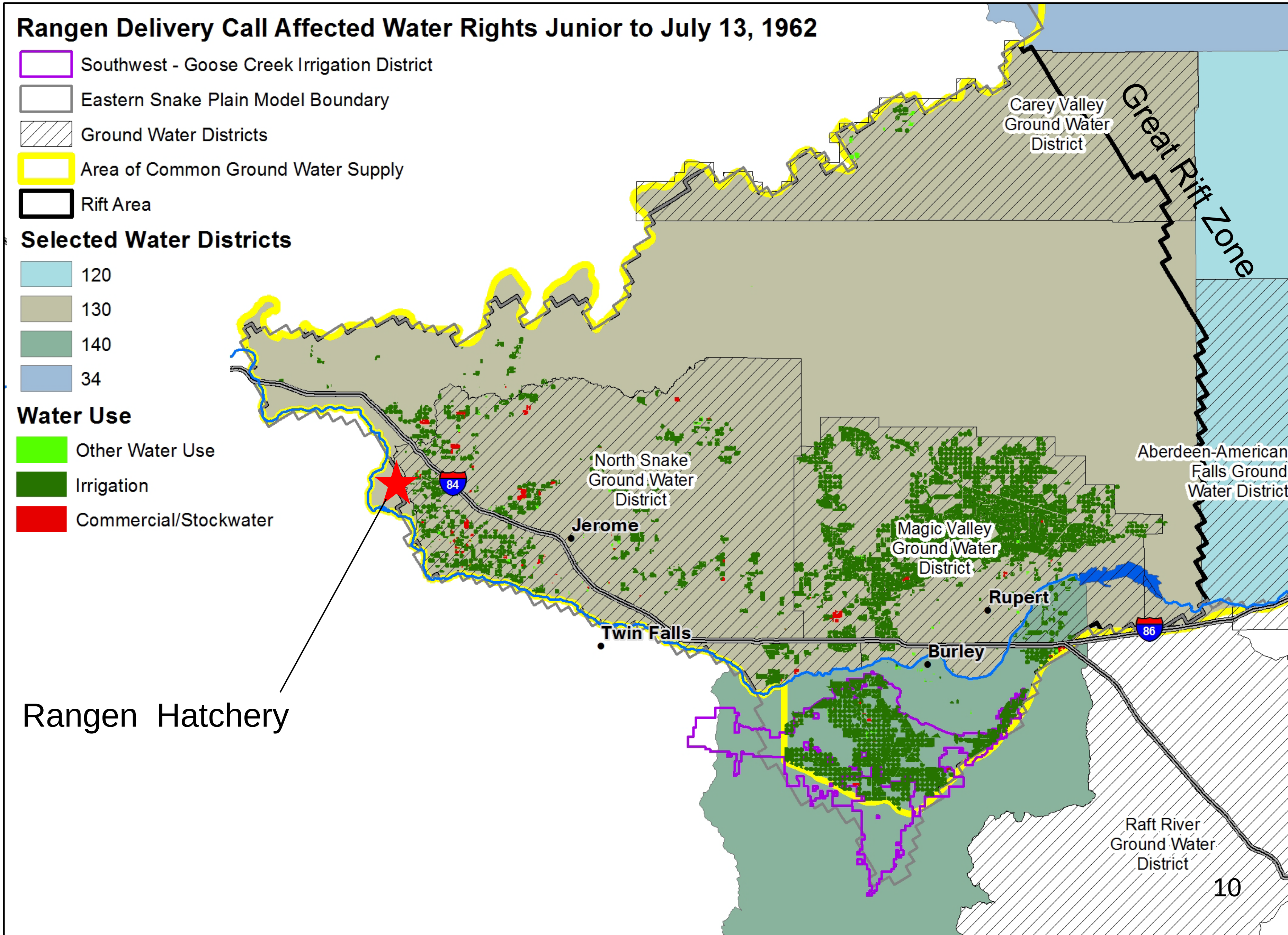
1. Rangen did have measurement devices and procedures in place

2. Rangen spring flows declined "*significantly*" from 1966-2012

3. "*The reduction in flows from the Curren Tunnel have caused a reduction in the number of fish that Rangen could raise…and impeded Rangen's full beneficial use of water…"*

4. "*ESPAM 2.1 simulations establish that junior-priority ground water pumping is a substantial component of the decline in [Rangen's] spring complex discharge*."

5. "*Rangen employs reasonable diversion and conveyance efficiency and conservation practices in diverting water from Current Tunnel*."


Rangen Delivery Call Affected Water Rights Junior to July 13, 1962
Southwest - Goose Creek Irrigation District
Eastern Snake Plain Model Boundary
Ground Water Districts
Area of Common Ground Water Supply
Rift Area
Selected Water Districts
120
130
140
34
Water Use
Other Water Use
Irrigation
Commercial/Stockwater
Carey Valley Ground Water District
Great Rift Zone
North Snake Ground Water District
Magic Valley Ground Water District
Aberdeen-American Falls Ground Water District
Raft River Ground Water District
Jerome
Rupert
Twin Falls
Burley
84
86
Rangen Hatchery

IDAHO Department of Water Resources

Trim Line - Support

1. The Department has historically used a Trim Line

2. In the Clear Springs delivery call the District Court concluded, "*the use of a trim-line for excluding juniors within the margin of error is acceptable…the Director did not abuse discretion by applying the 10% margin of error 'trim line'*."

3. In the Clear Springs delivery call the Idaho Supreme Court affirmed the Director's application of the trim line, finding the Director properly exercised discretion in making the trim line determination: *"The Director perceived the issue as discretionary, he acted within the outer limits of his discretion and consistently with the legal standards applicable to the available choices, and reached his decision through an exercise of reason."*

IDAHO Department of Water Resources

Trim Line - Discussion

1. Difference Between Model 1.1 and 2.1…reaches vs. model cell

2. Clear Springs delivery call:
   - 10% Trim Line based on accruals to the **Buhl to Thousand Springs Reach (BtoTS)** - 9 model cells
   - Multiple springs were contained within the BtoTS Reach
   - Clear Springs represents 6.9% of total spring flows in the BtTS Reach
   - Benefit to Clear Springs = 0.069*(0.1) = 0.0069 = 0.69%

3. Blue Lakes delivery Call
   - 10% Trim Line Based on Accruals to **Devil's Washbowl to Buhl Reach (DWtoB)** - 14 model cells
   - Multiple springs contained within the DWtoB Reach
   - Blue Lakes represents 20% of total spring flows in the DWtB Reach
   - Benefit to Blue Lakes = 0.2*(0.1) = 0.02 = 2.0%

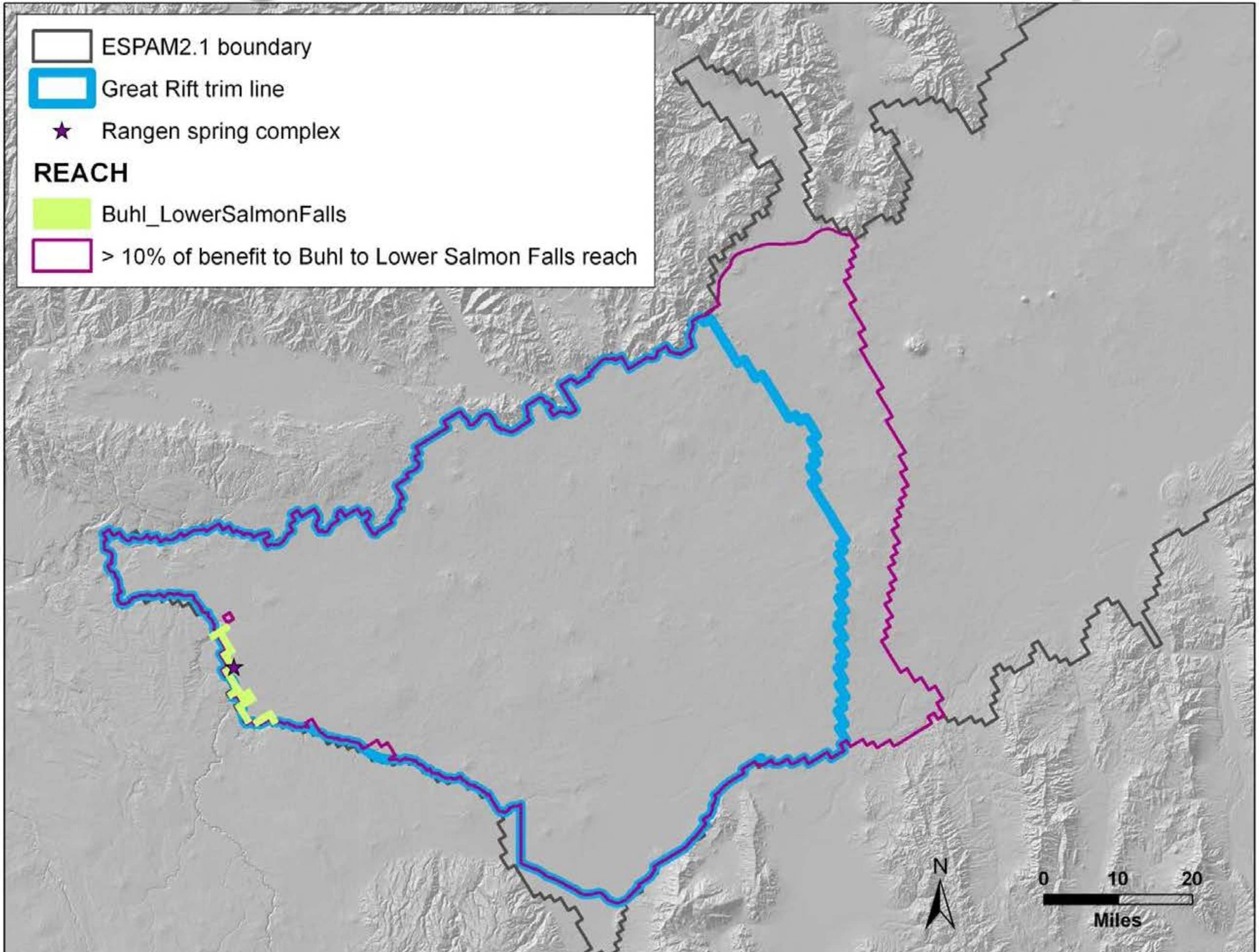
4. Comparison: Rangen (1%) vs. Clear Springs (0.69%) vs. Blue Lakes (2.0%)

Trim Line - Discussion

5. SWC delivery call

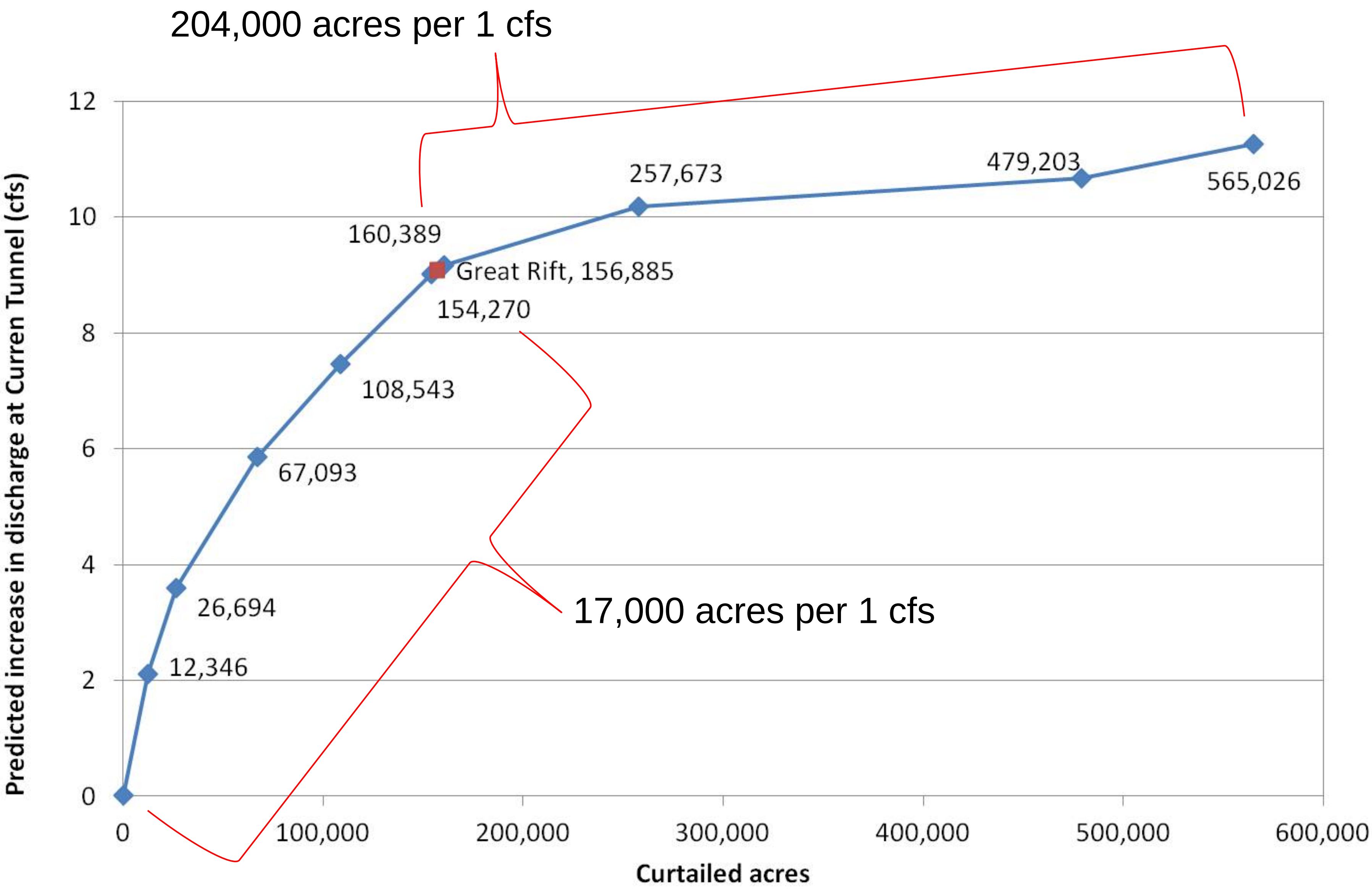
- 10% Trim Line Based on Accruals to Near Blackfoot to Neeley and Neeley to Minidoka Reaches (NBtoM) - >100 cells
- SWC diverts natural flow and storage water from PODs located in the NBtoM reaches, primarily in the downstream end of the reaches
- Unlike spring flow delivery calls, all accruals to the NBtM reaches benefit the SWC water users
- The SWC delivery call is different then the spring user delivery calls and what works for one delivery call does not necessarily work for another one.

Rangen – Trim Line Comparison



Trim Line – Great Rift

- Geologic Feature
- Not a model-dependent feature
- Broadly applicable to other 1000 Springs Area DCs
- Coincident with break point of diminishing returns


204,000 acres per 1 cfs
17,000 acres per 1 cfs
Predicted increase in discharge at Curren Tunnel (cfs)
Curtailed acres
0
2
4
6
8
10
12
0
100,000
200,000
300,000
400,000
500,000
600,000
12,346
26,694
67,093
108,543
154,270
Great Rift, 156,885
160,389
257,673
479,203
565,026

Where is the Rangen DC Now?

- Curtailment Order – January 29, 2014
- 1st Mitigation Plan Filed – February 12, 2014
- 2nd Mitigation Plan Filed – March 10, 2014
- Contested Case Hearing on 1st Plan: 3/17 – 3/19
- Contested Case Hearing on 2nd Plan: ???
  - Protest Period Ends 4/7
- Curtailment this Irrigation Season Still a Possibility

Questions?

Milepost 31 Recharge Site, Milner-Gooding Canal. Spring 2013.

MATERIALS FOR THIS SECTION WILL BE PROVIDED AT THE MEETING.

IDAHO WATER RESOURCE BOARD

TO: IDAHO WATER RESOURCE BOARD

FROM: Neal Farmer

DATE: March 21, 2014

SUBJECT: Aquifer Recharge Update

MANAGED RECHARGE OPERATIONS FOR SPRING 2014

Despite limited available water for recharge under winter conditions, recharge diversions out of the Milner Pool started on Saturday February 8th, 2014 with Southwest Irrigation District turning on under the Boards Recharge water right. Twin Falls Canal Company started diverting water into their system to fill Murtaugh Lake at a rate of about 155 cfs, but their diversion was not under the Boards Recharge water right nor is their diversion for recharge but rather to simply fill Murtaugh Lake. Southwest Irrigation District indicated that they might try to pump some water out of Murtaugh Lake for recharge purposes under the Boards water right. On Monday March 3, Twin Falls reduced their diversion rate to 100 cfs and AFRD2 (Milner Gooding canal) turned water in for recharge at an initial rate of 50 cfs later to be increased. AFRD2 informed us they have communicated with Northside Canal Company to switch the recharge water from the Milner Gooding canal into the NSCC after about 7 days. Low flows in the Snake River at the Murphy gage means that additional coordination needs to done so that the minimum flows at Murphy are not breached through recharge operations above Milner.

Southwest Irrigation District

Southwest Irrigation District (SWID) has been diverting recharge water since Saturday February 8th at 22 cfs rate until February 19th when a leak developed. About 500 ac-ft of water had been recharged as of the 19th of February. They resumed pumping recharge on Saturday February 22nd. Southwest I.D. noted they are in the process of gathering information to ascertain what additional modifications are needed for continuous winter time operations.

Mile Post 31 Recharge Site

Recharge water was turned into the Milner Gooding Canal (AFRD2) on Monday March 3 routed to Mile Post 31 in order to stress test the site for longer than 3 days which was done last spring. There may be approximately 150 cfs turned into the canal system if water supply conditions permit. IDWR staff will be measuring flow rates into the basin. LSRARD will be collecting water quality samples. Water level loggers are in place in three nearby monitor wells to record the effects of

322 East Front Street, Boise, Idaho 83720 Tel: (208) 287-4800 Fax: (208) 287-6700

recharge on the water table. If more recharge water than about 150 cfs becomes available and MP31 is at capacity, then the remaining recharge water may be conveyed down the canal and turned out into the Shoshone Recharge site. LSRARD is working on a tracer test at MP31 to track the path of the recharge waters to help improve the understanding of where the waters go which will aid water quality sampling efforts and public safety. A similar trace was completed at the W-canal site with good results.

ADDITIONAL RECHARGE CAPACITY DEVELOPMENT

Walcott Recharge Site

Magic Valley Groundwater District and A&B Irrigation District indicate the drill rig will be available in about a month to continue the site investigation. Late last year, an aquifer pump test was performed on Test Well #1. Magic Valley Groundwater District organized a pump company to deploy a line shaft turbine pump into the well with a top end gear drive connected to a diesel engine. IDWR staff installed water level loggers and flow rate meters, and despite challenges, a good estimate of 450 gallons per minute or 1 cfs was determined from the test. On December 16 a coordination meeting was held at the Rupert BOR office with vested parties to discuss the project. Most of the discussion was centered on design options that CH2M Hill provided to the group. Currently, A&B's drilling rig is obligated to another project and won't be available for a couple of weeks. The next step in the subsurface investigation process is to attempt to drill deeper in one of the existing test wells and then perform another aquifer pump test in a deeper zone from 330 feet down to approximately 500 feet depending on the geology encountered. A&B Irrigation District submitted a WaterSMART: Water and Energy Efficiency Grant to the Bureau of Reclamation for fiscal year 2014. A&B Irrigation District proposes the Lake Walcott Recharge Project located near the Snake River in southern Idaho. The project will divert water from Lake Walcott and convey the water through a pipeline to a State section of land located north of the reservoir. Water will then be injected into the aquifer through a series of injection wells. The project will conserve surface water and result in energy efficiency for A&B's deep well pumps by helping slow or prevent the decline of aquifer levels in the District's irrigation project. Pending award, construction of this project will begin in the summer/fall of 2014 and be completed by the fall of 2015.

Milner Pool

Efforts are progressing to investigate possibilities of recharge through injection wells near the Milner Pool. Preliminary hydrogeologic analysis has been completed to ascertain subsurface geologic and water table conditions and on the ground field inspection. Canal and irrigation companies have been contacted regarding this possibility seeking their knowledge and information. Modeling efforts have been initiated with results forthcoming. There are two optimal locations identified at this point in time and they are similar in nature as Southwest Irrigation District and Lake Walcott sites for modeled benefits to the aquifer. Efforts are proceeding to define information, records and conditions at both sites. A big advantage to locating recharge diversions off the Milner Pool is because the location is below Minidoka dam and there would be no interference with water rights associated with the Minidoka dam.

North Side Canal Company

Recharge related discussions with North Side C.C. (NSCC) staff have continued by both the Lower Snake River Aquifer Recharge District (LSRARD) and IDWR staff. Northside C.C. continues to work on major construction projects about 12 miles downstream of Wilson Lake and below the main gates at Milner. They have confirmed they will likely not be able to do any recharge this spring. LSRARD assisted with setting up a meeting on January 6, 2014 to explore a needs assessment and ideas to increase the potential of recharge through the North Side system especially during winter months.

The K canal site on the Northside System has been re-evaluated recently by a geologist with LSRARD and hydrogeologist from IDWR for potential development as a recharge site. This site was identified in a 1999 recharge report as a potential recharge site. Dave Blew with IDWR evaluated the site and wrote a report on it in year 2005 noting a much lower potential than the 1999 report. The recent foot survey concurs with Dave Blew's findings. It is located at T8S R18E, section 22 on the northeast side of the North Side Main Canal and it is discussed on page 177 in a 1999 report titled "Feasibility of Large-Scale Managed Recharge of the Eastern Snake Plain Aquifer System" prepared by the Idaho Department of Water Resources. This area contains a closed basin that is owned by the U.S. Bureau of Land Management of approximately 76 acres. The site geology does not look promising for development as a spreading basin recharge site.

<u>Little Wood River Options</u>
<u>The IWRB also holds a water right permit for recharge from the Big and little Wood Rivers.</u>

<u>Shoshone Bifurcation Site</u>
The canal manager for Milner Gooding Canal was contacted about infrastructure needs for utilizing water in the Little Wood channel for recharge. If a check dam is placed at the bifurcation site in the Little Wood channel, water can be diverted into the Milner Gooding canal and routed down to the 'Shoshone Recharge Site.' The canal manager recommended an easy solution of installing a temporary check dam using concrete barriers that could be installed and removed as needed with less impact on the stream channel or any alteration needs.

<u>Potential Richfield Aquifer Recharge Site</u>
Another option for utilization of Little Wood River flows is potential recharge site south of the city of Richfield as shown in Figure 1. The site is on State land and the Dietrich canal flows through the location. The city of Richfield is located approximately 1 mile north of the State land. An onsite inspection of the area has been made by an IDWR hydrogeologist. There are geologic features that are promising for recharge capacity. The Big Wood Canal Company manager has been contacted for his knowledge about the area, water rights, conveyance and possibilities. The depth to the regional aquifer is in excess of 300 feet so the unsaturated zone is thick above the water table. Additional work is ongoing to evaluate this site for possible development.

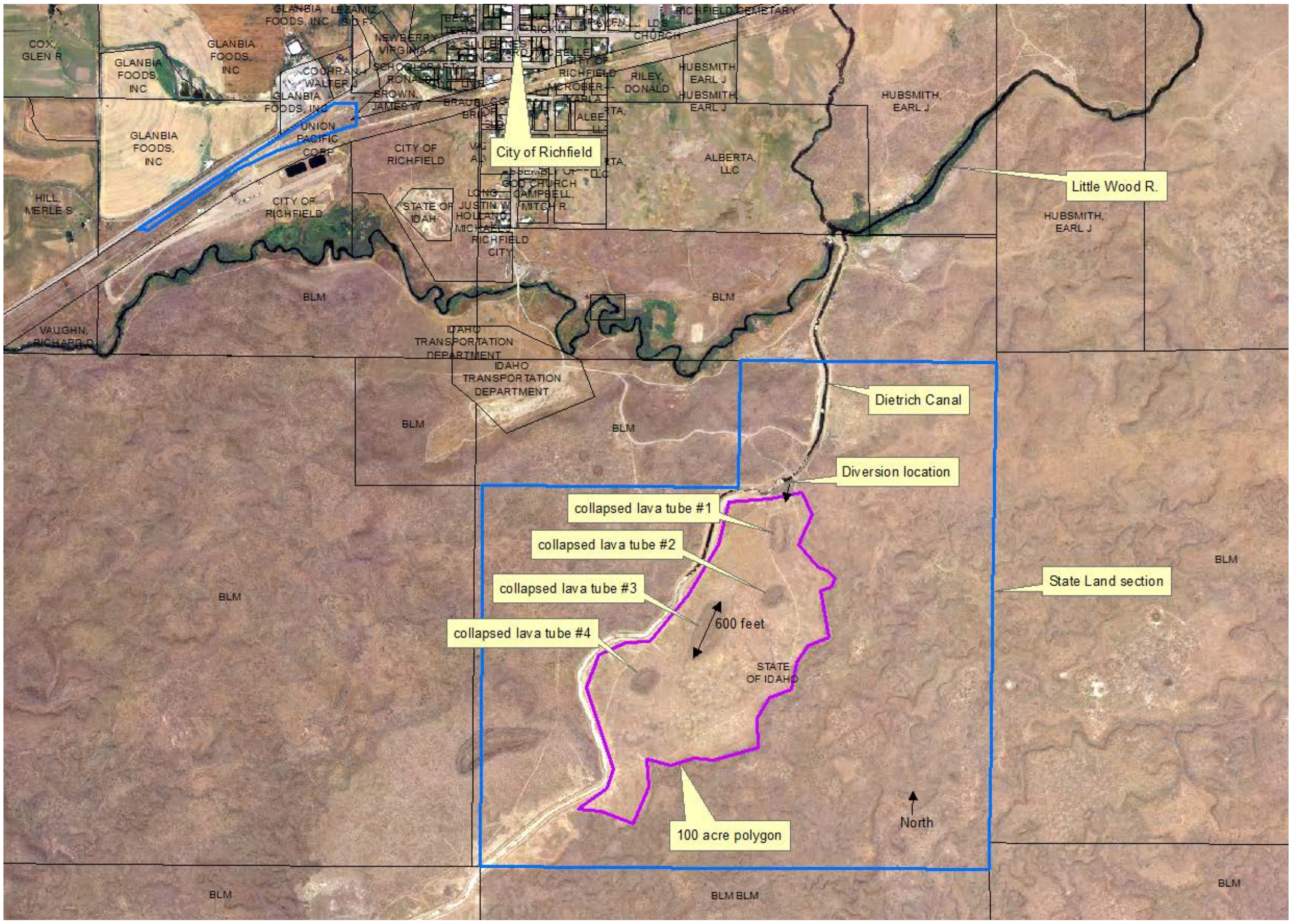


Figure 1. The location of State land south of city of Richfield is outlined with a blue line. The Dietrich canal flows through the State land. Four large collapsed lava tube depressions exist on State land with the largest being 6oo feet long.

TO: Idaho Water Resource Board

FROM: Neeley Miller

DATE: March 7, 2014

RE: Status Report – Implications of the 2014 Farm Bill

Background

In 2009 the Idaho Water Resource Board's (IWRB) Agricultural Water Enhancement Program (AWEP) application was awarded funding by United States Department of Agriculture (USDA) to implement projects over five years that support the Eastern Snake Plain Aquifer Comprehensive Aquifer Management Plan (ESPA CAMP). The Board's AWEP Program was administered by the Natural Resources Conservation Services (NRCS) and provided financial and technical assistance to agricultural producers to implement water enhancement activities on agricultural land for the purpose of conserving surface and ground water and improving water quality.

Between 2009 and 2013 the IWRB's AWEP program has facilitated the conversion from ground water to surface water of approximately 12,800 acres. These conversions include over 5,000 acres converted on the Hazelton Butte project and over 1,300 acres converted in the A&B Irrigation District. Additional reductions in demand on the aquifer have been achieved through structural improvements in the Thousand Springs Area.

2014 Farm Bill

The 2014 Farm Act ("2014 Farm Bill") was signed into law on February 7, 2014 and will remain in force through 2018. The 2014 Farm Bill maintains strong overall funding for USDA conservation programs. The AWEP program that was authorized under the 2008 Farm Bill is replaced in the 2014 Farm Bill with a new program called the Regional Conservation Partnership Program (RCPP). The RCPP consolidates functions of the AWEP program and other conservation programs into one program – RCPP – and is designed to coordinate conservation efforts across states and programs to solve problems that must be addressed on a regional or watershed scale. Projects and strategies similar to what was available through the IWRB's AWEP program would be eligible under RCPP. Funding for the RCPP is anticipated to be $100,000,000 for each of the fiscal years 2014 through 2018.

A joint committee consisting of IWRB staff, NRCS, and other interested parties has been meeting since last summer to identify eligible future projects and develop a framework that can be included in an application in anticipation of the Regional Conservation Partnership Program (RCPP) application roll-out. Board staff plans to continue coordinating with NRCS staff and will brief the Board as we prepare to submit an RCPP application later this year.

AGENDA

IDAHO WATER RESOURCE BOARD
MEETING NO. 3-14

March 21, 2014 at 7:30 am

Idaho Water Center
Conference Rooms 602 B,C,D
322 East Front St, Boise, ID 83702

1. Roll Call
2. Executive Session – Board will meet pursuant to Idaho Code § 67-2345 (1) subsections (c) and (f), for the purposes of considering the acquisition of an interest in real property not presently owned by a public agency and to communicate with legal counsel regarding legal ramifications of and legal options for pending litigation, or controversies not yet being litigated but imminently likely to be litigated. Executive Session is closed to the public.

   Following adjournment of Executive Session -- meeting reopens to the public

3. Agenda and Approval of Minutes 1-14 & 2-14
4. Public Comment
5. Legislative Update
6. Committee Reports
   - a. Water Resource Planning
   - b. Water Supply Bank
   - c. Finance
   - d. Upper Snake River Advisory
7. Planning Programs
   - a. South Fork Clearwater River Basin Plan- Crooked River Rehabilitation Project
8. Financial Programs
   - a. Status Update
   - b. Interest Rate
9. Water Supply Bank
10. Water District 01 Rental Pool Procedures
11. Galloway Project
12. IDWR Director's Report
13. Other Non-Action Items for Discussion
13. Next Meetings and Adjourn

Americans with Disabilities

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email Mandi.Pearson@idwr.idaho.gov or by phone at (208) 287-4800.

322 East Front Street, Boise, Idaho 83720 Tel: (208) 287-4800 Fax: (208) 287-6700

MATERIALS FOR THIS SECTION WILL BE PROVIDED AT THE MEETING.

IDAHO WATER RESOURCE BOARD

MEETING MINUTES 1-14

Idaho Water Center
Conference Rooms 602 B, C, and D
322 East Front Street, PO Box 83720, Boise, Idaho 83720

January 23, 2014
Work Session

Chairman Roger Chase called the meeting to order at approximately 1:30 pm. Pete Van Der Meulen and Albert Barker were absent. All other Board members were present.

During the Work Session the following items were discussed:

- Western States Water Council Sustainability Presentation by Tony Willardson
- Reasonably Anticipated Future Needs Water Rights Presentation by Mat Weaver
- At approximately 4:15 pm the Board resolved into Executive Session by unanimous consent pursuant to Idaho Code Section 67-2345 (1) subsections (c) and (f), for the purposes of considering the acquisition of an interest in real property not presently owned by a public agency and to communicate with legal counsel regarding legal ramifications of and legal options for pending litigation, or controversies not yet being litigated but imminently likely to be litigated. No action was taken by the Board during the Executive Session. The Board resolved out of Executive Session and into Regular Session at approximately 5:30 am.

No action was taken by the Board during the Work Session.

January 24, 2013
IWRB Meeting

Chairman Roger Chase called the meeting to order at approximately 8:30 am. Pete Van Der Meulen and Albert Barker were absent. All other Board members were present.

Agenda Item No. 1, Roll Call

Board Members Present

Roger Chase, Chairman	Jeff Raybould
Bob Graham, Secretary	Chuck Cuddy
Vince Alberdi	Bert Stevenson

Staff Members Present

Gary Spackman, Director	Mat Weaver, Deputy Director
Brian Patton, Planning Bureau Chief	Helen Harrington, Planning Section Manager
Harriet Hensley, Deputy Attorney General	Clive Strong, Deputy Attorney General
John Homan, Deputy Attorney General	Michael McVay, Hydrologist
Neal Farmer, Project Coordinator	Cynthia Bridge Clark, Engineer
Neeley Miller, Water Resource Planner	Alison Burnop, Hydrologist
Mandi Pearson, Administrative Assistant	

Guests Present

Walt Poole, Idaho Fish and Game	Peter Anderson, Trout Unlimited
Stan Clark, Idaho Water Engineering	Bryce Contor, Rocky Mountain Environmental Assoc.
Jon Bowling, Idaho Power	Chris Pratt, Recharge Development Corporation
Ron Carlson, Recharge Development Corp	Hal Anderson, Idaho Water Engineering
Liz Paul, Idaho Rivers United	Gayle Buhrer-Poorman, Friends of the Weiser River Trail
Linda Jones, Holland & Hart	Bob Lorkowski, LSRARD
Sarah Lien, Friends of the Teton River	John J. Williams, Bonneville Power Administration
Bob Barber, Weiser	Mark Mendenhall, US Army Corps of Engineers
Bruce Sandoval, USDA-NRCS	Peter Anderson, Trout Unlimited

Agenda Item No. 2, Agenda and Approval of Minutes

There were no additions or deletions from the agenda. Mr. Stevenson made a motion that the minutes for meeting 11-13 be approved as printed. Mr. Cuddy seconded the motion. Voice Vote. All were in favor. Motion passed.

Agenda Item No. 3, Public Comment

Chairman Chase opened up the meeting for public comment. Mr. Chris Pratt introduced the Recharge Development Corporation (RDC) and described the background and positions of the RDC, including Purposes of RDC, Justification for the RDC Initiative, Water Resource Sustainability, and Public/Private Partnerships to Achieve Water Management Objectives.

Liz Paul of Idaho Rivers United addressed the Board. Ms. Paul discussed Idaho Rivers United opposition to new reservoir storage. Ms. Paul advocated for improved water efficiency and the completion of comprehensive basin plans to address concerns for future water supplies. Mr. Raybould asked Ms. Paul how she would propose to deal with flood control in the Boise basin. Ms. Paul suggested partnerships between federal, state, and local entities, and discussed some of the options for flood control. Mr. Cuddy commented on Idaho dams that were built for flood control in Portland, Oregon.

Ms. Gayle Buhrer-Poorman addressed the Board on behalf of the Friends of the Weiser River Trail (FWRT). She discussed the FWRT Board of Directors’ firm stand on the Weiser-Galloway Dam proposal and discussed the obstacles before the project. There was discussion among the parties regarding the Union-Pacific rail corridor.

Mr. John J. Williams of Bonneville Power Administration addressed the Board. He updated the Board on work done under the Biological Opinion developed by NOAA fisheries. He also updated the Board on the negotiations regarding the Columbia River Treaty. There was further discussion among the parties regarding the Columbia River Treat.

Mr. Bob Barber, a citizen of Weiser, addressed the Board regarding the Weiser-Galloway Dam studies. He expressed appreciation and support of the continued studies. He asked that the Board expand the scope of the studies to include basin studies of other potential sites in the basin.

Mr. Dave Tuthill of Idaho Water Engineering discussed the importance of recharging ground water and managed ground water recharge legislation. There was discussion among the parties regarding the legislation.

Agenda Item No. 4, Hearing Officer Appointment

Mr. Patton discussed the need to appoint a hearing officer to review the decision of the Director to reject an application for permit to alter a stream channel. Staff recommends the Board adopt a Resolution appointing Mathew Weaver as the hearing officer in this matter.

Mr. Raybould moved to adopt the resolution to appoint Mat Weaver as the hearing officer in this matter. Mr. Cuddy seconded the motion. There was discussion regarding the statutes that allow an applicant the opportunity for a hearing before the Board. There was also discussion regarding a possible conflict for the hearing officer. Mr. Patton noted that the date on the resolution needed to be corrected. Voice Vote. All were in favor. Motion passed.

Agenda Item No. 5, Financial Program

a. Status Update *(Brian Patton, Staff)*

As of November 1st, the Board has about $17.7 million committed but not disbursed, about $16 million total loan principal outstanding, and an available balance of about $5 million dollars. There was discussion among the parties regarding the Board's current interest rates.

b. Annual Financial Report *(Brian Patton, Staff)*

Mr. Patton discussed the FY2013 Annual Financial Report before the Board. With the Board's approval, it will be submitted to the Governor and the Legislature. Mr. Raybould moved to approve the FY2013 Annual Financial Report. Mr. Graham seconded the motion. Voice Vote. All were in favor. Motion passed.

c. South Liberty Irrigation Company *(Brian Patton, Staff)*

Mr. Patton discussed the South Liberty Irrigation Company's request of $5000 for the unforeseen need to create the Franklin County Local Improvement District No. 2010-2 as part of the process to issue the Water Resource Pooled Loan Program Revenue Bond.

Mr. Stevenson made a motion to approve the resolution in the matter of South Liberty Irrigation Company. Mr. Alberdi seconded the motion.

Roll Call Vote: Mr. Cuddy: Aye; Mr. Alberdi: Aye; Mr. Stevenson: Aye; Mr. Raybould: Aye; Mr. Van Der Meulen: Absent; Mr. Graham: Nay; Mr. Barker: Absent; Chairman Chase: Aye. Motion passed.

Agenda Item No. 6, Water Transactions

a. Morgan Creek *(Helen Harrington, Staff)*

Ms. Harrington discussed the 2014 Morgan Creek transaction. This transaction is in the Upper Salmon Basin. Morgan, Creek, a tributary to the Salmon River near Challis, is important for the spawning, migration and rearing of ESA-listed steelhead and bull trout. It also supports the rearing of ESA-listed juvenile Chinook salmon. Morgan Creek typically becomes dewatered below the lowest two diversions during the irrigation season, blocking access to those fish species. Board staff is working with Upper Salmon Basin partners to develop transactions that can complement projects addressing all limiting factors while maintaining the local economy. The water users have expressed a willingness to develop another long-term flow restoration transaction and have agreed to enter into a one-year agreement not to divert while those discussions are underway. This would be an extension of the previous 5-year agreement. The maximum payment is based upon a five percent increase from the 2013 payment, with the total not to exceed $8000. On January 10, 2014 the IWRB Streamflow Enhancement and Minimum Streamflow Committee recommended this transaction be approved by the IWRB.

There was discussion among the parties regarding monitoring results of the program. Mr. Graham made a motion to approve the resolution in the matter of the 2014 Morgan Creek Water Transaction. Mr. Alberdi seconded the motion.

Roll Call Vote: Mr. Cuddy: Aye; Mr. Alberdi: Aye; Mr. Stevenson: Aye; Mr. Raybould: Aye; Mr. Van Der Meulen: Absent; Mr. Graham: Aye; Mr. Barker: Absent; Chairman Chase: Aye. Motion passed.

Ms. Harrington shared that IDWR recently hired a new staff member, Amy Cassel. She will be helping with the Idaho Water Transactions program, and will be located in Salmon, Idaho.

b. South Leigh Creek *(Sarah Lien, Friends of the Teton River)*

Ms. Lien discussed two proposed water transactions on South Leigh Creek. South Leigh Creek is a tributary to the Teton River located in the upper Teton Valley. The tributary offers excellent fish and wildlife habitat and supports a Yellowstone cutthroat trout (YCT) population. Currently, irrigation withdraws result in the annual dewatering of the stream, which restricts fish movement and migration, reduced valuable habitat, and elevates stream temperatures. Overall, the flow restoration strategy on South Leigh Creek aims to provide additional in stream habitat for native YCT, as flow is the primary limiting factor preventing development of a more robust YCT population in this tributary. The proposed transactions will help reach these goals. The first transaction is a proposed water donation agreement for a term of five years. The second transaction is a water use agreement for a term of one year. On January 10, 2014 the IWRB Streamflow Enhancement and Minimum Streamflow Committee recommended both of these transactions be approved by the IWRB. There was discussion among the parties regarding community participation, particularly from the agriculture community. There was also discussion among the parties regarding analysis on consumptive use and carriage value.

Mr. Graham moved to approve the resolution in the matter of the South Leigh Creek Water Donation Agreement. Mr. Raybould seconded the motion.

Roll Call Vote: Mr. Cuddy: Aye; Mr. Alberdi: Aye; Mr. Stevenson: Aye; Mr. Raybould: Aye; Mr. Van Der Meulen: Absent; Mr. Graham: Aye; Mr. Barker: Absent; Chairman Chase: Aye. Motion passed.

Mr. Raybould moved to approve the resolution in the matter of the South Leigh Creek Water Use Agreement. Mr. Graham seconded the motion.

Roll Call Vote: Mr. Cuddy: Aye; Mr. Alberdi: Aye; Mr. Stevenson: Aye; Mr. Raybould: Aye; Mr. Van Der Meulen: Absent; Mr. Graham: Aye; Mr. Barker: Absent; Chairman Chase: Aye. Motion passed.

Agenda Item No. 7, State Water Plan *(Helen Harrington, Staff)*

Ms. Harrington referred back to item 6a, specifically fish monitoring on Morgan Creek. Staff noted that Idaho Dept of Fish and Game has documented steelhead spawning in Morgan Creek.

Ms. Harrington discussed the proposed revisions to the Idaho State Water Plan adopted by the Board in 2012. The proposed revisions range from minor edits to more significant changes. The Water Resource Planning Committee met on December 12, 2013 to discuss a strategy for considering the proposed revisions and has recommended the following strategy: to review all of the revisions proposed by some members of the House Resources & Conservation Committee, and to categorize the proposed revisions into three categories: reviewed, no revision recommended; reviewed and revised; and referred for further review. Any amendments adopted by the Board would be published and public hearings would be held with opportunity for the submission of testimony and written comments. The Board will then determine whether any amendments should be revised and submit final amendments as a group to the legislature. The Committee will also be working on the Sustainability policy and it will be combined into one package. There was discussion among the parties regarding the options identified for the Committee's review of the proposed revisions. There was further discussion regarding the hearings needed and the public comment period.

Agenda Item No. 8, Water District 02 WaterSMART Grant *(Neeley Miller, Staff)*

Mr. Neely Miller provided a status report on the WaterSMART grant. In 2013, the Board authorized application to the US Bureau of Reclamation (BOR) for a WaterSMART grant to assist with the installation of measuring devices and telemetry equipment for diversions in the newly created Water District 02 (WD02). In May 2013 the BOR announced that the Board's WaterSMART proposal for phase-one of the project would receive funding in the amount of $151,425. Installation and calibration of equipment is on-going and will continue through spring/summer 2014.

The Dept and Board staff plans to work with the WD02 and BOR to submit one additional grant application (phase 2) in 2014 to address the remaining large diversions in the district. Similar to phase-one, the WaterSMART grant application for phase-two will require a 50+% match by the applicant. If the Board agrees to be the applicant the 50+% share of the cost will be carried by third party water users in WD02. The WaterSMART application is requesting approximately $300,000 in federal cost share, with the balance of the costs to be provided by the water users in WD02.

Mr. Stevenson moved to approve the resolution in the matter of the WaterSMART application to BOR for measurement devices in WD02. Mr. Cuddy seconded the motion.

Roll Call Vote: Mr. Cuddy: Aye; Mr. Alberdi: Aye; Mr. Stevenson: Aye; Mr. Raybould: Aye; Mr. Van Der Meulen: Absent; Mr. Graham: Aye; Mr. Barker: Absent; Chairman Chase: Aye. Motion passed.

Agenda Item No. 9, ESPA Management

a. Update *(Mike McVay, Staff; Neal Farmer, Staff; Mat Weaver, Staff)*

Mr. McVay presented updated information about storage changes in the aquifer. He discussed the wells that were used to gather data. From 2008 to 2013 the aquifer lost about 250,000 acre-feet. In comparison, from 2001-2002 the aquifer lost almost 2 million acre-feet. There was discussion among the parties regarding the aquifer changes in specific areas. There was further discussion among the parties regarding the significance of the recent data.

Mr. Farmer provided a brief update on recent recharge activities. An aquifer pump test on a well at Lake Walcott resulted in 1 cfs water. The next step will be to drill deeper and test at a deeper zone. Continued discussions are ongoing with Northside Canal Company and Lower Snake River Aquifer Recharge District about enhancing and expanding recharge capabilities in their system. There was discussion among the parties regarding current and upcoming construction and maintenance on canals.

Mr. Weaver provided meeting notes from the last Upper Snake River Advisory Committee Meeting. A meeting will be scheduled in the near future. He noted that it would be a good opportunity for Board members to participate.

b. Request for Cloud Seeing Funding *(Dale Swenson, High Country Resource Conservation and Development Area, Inc)*

Mr. Swenson, on behalf of the High Country RC&D Board of Directors and Upper Snake River Cloud Seeking Project Steering Committee, thanked the Board for their support over the last two cloud seeding seasons. High Country RC&D is requesting that the Board consider ongoing funding for the Cloud Seeding Project. Mr. Swenson outlined two options for the Board to consider: 1) to donate $20,000 each year to be used to cover project operation costs, information/education efforts, maintenance/replacement of existing equipment, and purchasing additional seeders, or 2) to cover 40% of the project costs not to exceed $66,000 through the 2019-2020 winter cloud seeding season. There was discussion among the parties regarding how previous money was spent, a timeline for the Board's decision, additional information regarding the project, and alternative options. Chairman Chase suggested a sub-committee look further into the issue. Mr. Stevenson moved to establish a subcommittee too address cloud-seeding program funding. Mr. Cuddy seconded. Voice Vote. All were in favor.

Motion passed. Chairman Chase assigned Mr. Alberdi, Mr. Stevenson, Mr. Raybould, and Mr. Van Der Meulen to the subcommittee.

Agenda Item No. 10, IDWR Director's Report *(Gary Spackman, Director)*

Director Spackman discussed the possibility of a curtailment order this year. There was discussion among the parties regarding the impacted part of the State. The Director also discussed the status of the current recharge legislation. He expressed disappointment that participants in the development of the legislation withdrew their commitment. There was further discussion among the parties regarding this topic. The Director reported on recent releases of water from Palisades in comparison to releases from previous years. Releases this year are not consistent with past BOR operations. Director Spackman expressed concern that BOR has unnecessarily increased the risk that the reservoir system will not fill and that water stored for irrigation and other purposes will need to be released past Milner and wasted. Discussions with BOR regarding this issue are ongoing. Mr. Raybould expressed appreciation for the Director's efforts in this matter. There was discussion among the parties regarding this topic. Director Spackman presented an IDWR Annual Report for fiscal year 2013.

There was discussion among the parties regarding a possible curtailment this year, the staff needed to enforce the order, and the ability to alert water users who may be impacted by the order.

Agenda Item No. 11, Other Non-Action Items for Discussion

Mr. Graham discussed the importance of alerting water users of a possible curtailment this year. Mr. Alberdi expressed appreciation for the Chairman's presentations to the Legislature. He also suggested that the Board discuss topics that were brought up during the Public Comment period at the next Work Session. Chairman Chase also discussed getting handouts ahead of time if possible.

Agenda Item No. 12, Next Meetings and Adjourn

The next regularly scheduled meeting is set for March 20-21, 2014 in Boise. There was discussion among the parties regarding a possible March 19th tour of the Mountain Home Air Force Base, and possible committee meetings on March 20th before or after the Work Session. In May, a tour of Hells Canyon has tentatively been scheduled with Idaho Power. The tour would be May 14-15, 2014, with a Board Meeting in Boise on May 16th. The parties also discussed upcoming committee meeting dates. The Water Resource Planning Committee will be meeting on February 7, 2014 to discuss revisions to the State Water Plan, and again on February 26, 2014 to discuss a policy on sustainability. The Water Supply Bank Committee and the Finance Committee may also be meeting in the near future. Mr. Raybould made a motion to Adjourn, and Mr. Cuddy seconded the motion. Voice Vote. All were in favor. Motion Carried.

The IWRB Meeting 1-14 adjourned at approximately 12:30 pm.

Respectfully submitted this _____ day of March, 2014.

____
Bob Graham, Secretary

____
Mandi Pearson, Administrative Assistant II

Board Actions:

1. Mr. Stevenson made a motion that the minutes for meetings 11-13 be approved. Mr. Cuddy seconded the motion. Voice Vote. All were in favor. Motion passed.

2. Mr. Raybould moved to adopt the resolution to appoint Mr. Weaver as the hearing officer in the matter of the joint application for permit no. S-82-20044 to alter a stream channel. Mr. Cuddy seconded the motion. Voice Vote. All were in favor. Motion passed.

3. Mr. Raybould moved to approve the FY2013 Annual Financial Report. Mr. Graham seconded the motion. Voice Vote. All were in favor. Motion passed.

4. Mr. Stevenson made a motion to approve the resolution in the matter of South Liberty Irrigation Company. Mr. Alberdi seconded the motion. Roll Call Vote. 5 Ayes, 1 Nay, 2 Absent. Motion passed.

5. Mr. Graham made a motion to approve the resolution in the matter of the 2014 Morgan Creek Water Transaction. Mr. Alberdi seconded the motion. Roll Call Vote. 6 Ayes, 2 Absent. Motion passed.

6. Mr. Stevenson moved to establish a subcommittee to address cloud-seeding program funding. Mr. Cuddy seconded. Voice Vote. All were in favor. Motion passed.

IDAHO WATER RESOURCE BOARD

MEETING MINUTES 2-14

Idaho Water Center
Conference Room 602B
322 East Front St, Boise ID 83720

February 5, 2014

Chairman Roger Chase called the meeting to order at approximately 7:30 am. Mr. Peter Van Der Meulen was absent. All other Board members were present.

Agenda Item No. 1, Roll Call

Board Members Present

Roger Chase, Chairman
Bob Graham, Secretary
Chuck Cuddy
Vince Alberdi
Jeff Raybould
Bert Stevenson
Albert Barker

Staff Members Present

Brian Patton, Planning Bureau Chief
Clive Strong, Deputy Attorney General
John Homan, Deputy Attorney General
Jack Peterson, Senior Advisor Emeritus
Mandi Pearson, Administrative Assistant

Agenda Item No. 2, Executive Session

At approximately 7:30 am the Board resolved into Executive Session by unanimous consent pursuant to Idaho Code Section 67-2345 subsection (1)(c), for the purpose of considering the acquisition of an interest in real property not presently owned by a public agency. The topic of the session was acquisition of water rights not owned by a public agency. No action was taken by the Board during the Executive Session. The Board resolved out of Executive Session and into Regular Session at approximately 8:00 am.

Agenda Item No. 3, Water Rights Acquisition

Mr. Brian Patton discussed the resolution authorizing execution of a term sheet and appraisal in the matter of the purchase of water right numbers 2-10300A, 2-10300B, and 225/240ths of 2-10472. The term sheet is a non-binding term sheet intended to summarize the principal terms of a proposed purchase of water rights by the Board to supply the Mountain Home Air Force

Base. Mr. Patton described the principal terms in the term sheet.

Mr. Stevenson moved to approve the resolution authorizing execution of a term sheet and appraisal in the matter of the purchase of water rights 2-10300A, 2-10300B, and 225/240ths of 2-10472. Mr. Raybould seconded the motion.

Roll Call Vote: Mr. Cuddy: Aye; Mr. Alberdi: Aye; Mr. Stevenson: Aye; Mr. Raybould: Aye; Mr. Van Der Meulen: Absent; Mr. Graham: Aye; Mr. Barker: Aye; Chairman Chase: Aye. Motion passed.

Mr. Barker commented that the term sheet should now be a public record. Mr. Patton and Mr. Homan confirmed that the term sheet will now be public record. There was discussion among the parties regarding public disclosure of the issue.

Agenda Item No. 4, Adjourn

Mr. Alberdi made a motion to Adjourn, and Mr. Raybould seconded the motion. Voice Vote. All were in favor. Motion Carried.

The IWRB Meeting 2-14 adjourned at approximately 8:10 am.

Respectfully submitted this _____ day of March, 2014.

____
Bob Graham, Secretary

____
Mandi Pearson, Administrative Assistant II

Board Actions:

1. Mr. Stevenson moved to approve the resolution authorizing execution of a term sheet and appraisal in the matter of the purchase of water rights 2-10300A, 2-10300B, and 225/240ths of 2-10472. Mr. Raybould seconded the motion. Roll Call Vote. All were in favor. Motion passed.

IDAHO DEPARTMENT OF WATER RESROUCES
IDAHO CODE PROPOSED LEGISLATION (2014)
Updated 3/20/14

RS	TITLE	I.C.	STATEMENT OF PURPOSE/ SUMMARY	STATUS
22415	Water Remediation	42-201	• Provides legislation to clarify that an operator of a remediation project acting to remove hazardous substances or petroleum from contaminated water is not required to obtain a water right, but is required to file with IDWR a notice of remediation prior to any diverting of water. • The director of IDWR maintains jurisdiction over any diversion of water.	• 12/3/13 Director withdrew proposed legislation for 2014 Legislative Session.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22416	Managed Ground Water Recharge	42-234 42-1762	• Provides legislative authority to the Idaho Water Resource Board (IWRB) to promulgate rules governing managed ground water recharge and serves as a guide for the IWRB with the appropriate scope of the rules. • Provides legislation clarifying new applications for permits of water on managed ground water recharge or aquifer credits must show with reasonable certainty that they will sustain a sufficient supply of water for their future use. • Provides legislative authority to IWRB to create an aquifer credit program as part of its existing water supply bank and to promulgate the aquifer credit program rules. • The promulgation of the rules addressed in this proposed legislation will be discretionary in all parts of the state except for the Eastern Snake Plain Aquifer.	• 12/3/13 Bill submitted to the Governor's office for final approval before delivery to the Senate. • Bill held in committee.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22393 H410	Injection Well Definition Amendment	42-3902	• Provides legislation to replace the term "drilled" with "used" in the definition of an injection well to clarify IDWR's authority to regulate underground oil and gas production wells that are converted to injection wells and used for the injection of waste fluids.	• 12/3/13 Bill submitted to the Governor's office for final approval before delivery to the Senate. • 1/23/14 Presented by IDWR at H Res&Con committee meeting • 1/24/14 Introduced, read 1st time, referred to JRA for printing. • 1/27/14 Reported, printed and referred to H Res&Con Committee. • 2/13/14 Presented by IDWR at H Res&Con committee meeting. Committee voted to send bill to floor with Due Pass Recommendation. • 2/17/14 Read 2nd time, filed for 3rd reading. • 2/18/14 U.C. to hold place on 3rd reading calendar one legislative day.

				• 2/19/14 Read 3rd time; Passed 62-5-3. Titled apvd – to Senate. • 2/20/14 Received from the House passed; Filed for 1st reading; Introduced, read 1st time, referred to S Res&Env Committee. • 2/27/14 Presented by IDWR at S Res&Env committee meeting. Reported out of committee; to 14th Order for amendment. • 3/4/14 Reported out without amendments, filed for 2nd reading. • 3/5/14 Read 2nd time, filed for 3rd reading. • 3/11/14 Read 3rd time, Passed 35-0-0. Titled apvd – to House. • 3/12/14 Returned from Senate Passed; to JRA for Enrolling, Reported Enrolled, Signed by Speaker, Signed by President; Returned to House. • 3/13/14 Returned signed by the President; Ordered transmitted to Governor. • 3/14 14 Delivered to Governor. • 3/18/14 Reported signed by Governor, Session Law Chapter 107, Effective 7/1/14.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22395 H411	Returning Applications to Appropriate Water in Moratorium Areas	42-1805	• Provides the director of IDWR the authority to return applications to appropriate water back to the applicants when the applications seek to divert water in an area where a moratorium order has been issued or is issued in the future.	• 12/3/13 Bill submitted to the Governor's office for final approval before delivery to the Senate. • 1/23/14 Presented by IDWR at H Res&Con committee meeting. • 2/13/14 Committee voted to hold in committee.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22453 H412	Director Qualifications	42-1701	• Provides legislation to revise and broaden the required qualifications of the director of IDWR to include: agricultural engineers; registered geologist with not less than five (5) years experience in the active practice of hydrology; hydrologist holding a bachelor's or	• 12/3/13 Bill submitted to the Legislative Services Office for drafting. • 1/3/14 Bill submitted to the Governor's

			advanced degree in hydrology from a college or university accredited by a nationally recognized accrediting organization and with not less than five (5) years experience in surface water and ground water modeling, water delivery, and water measurement; and must demonstrate experience and expertise in interpreting and applying Idaho water law.	office for final approval before delivery to the Senate. • 1/23/14 Presented by IDWR at H Res&Con committee meeting. • 1/24/14 Introduced, read 1st time, referred to JRA for printing. • 1/27/14 Reported, printed and referred to H Res&Con Committee. • 2/13/14 Presented by IDWR at H Res&Con committee meeting. Committee voted to send bill to floor with Due Pass Recommendation. • 2/17/14 Read 2nd time, filed for 3rd reading. • 2/18/14 U.C. to hold place on 3rd reading calendar one legislative day. • 2/19/14 Read 3rd time; Passed 67-0-3. Titled apvd – to Senate. • 2/20/14 Received from the House passed; Filed for 1st reading; Introduced, read 1st time, referred to S Res&Env Committee. • 2/26/14 Presented by G. Spackman at S Res& Env committee meeting. • 2/27/14 Reported out of committee with Due Pass Recommendation, filed for 2nd reading. • 2/28/14 Read 2nd time, filed for 3rd reading. • 3/7/14 Read 3rd time, Passed 34-0-1, Title apvd – to House. • 3/10/14 Returned from Senate passed, to JRA for Enrolling, reported enrolled, Signed by Speaker, Transmitted to Senate. • 3/11/14 Received from the House enrolled/signed by Speaker, Signed by President; returned to House • 3/12/14 Returned signed by President; Ordered transmitted to Governor.

				• 3/13/14 Delivered to Governor. • 3/17/14 Reported signed by Governor, Session Law Chapter 103, Effective 7/1/14.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22823 H479	IDWR / IWRB Add'l Appropriation		• A key part of the budget request is the IDWR/IWRB sustainability initiative, which requests 15 million for IWRB to undertake a number of water projects to meet current and future water needs throughout the state.	• Presentation scheduled for 1/13/14 to H R&C and S R&E Committees by G. Spackman (IDWR) and R. Chase (IWRB) • 1/28/14 JFAC Hearing • 1/31/14 JFAC Hearing; Motion to approve 15,000,000 General Funds, $10.5 mil. Transferred to Revolving Devl. Fund, $4.5 mil. Transferred to Secondary Aquifer PM&I Fund. Do Pass Recommendation (20-0-0). So ordered by Chairman. • 2/7/14 Introduced, read 1st time, referred to JRA for printing. • 2/10/14 Reported printed, filed for 2nd reading. • 2/11/14 Read 2nd time, filed for 3rd reading. • 2/12/14 Read 3rd time, Passed 69-0-1. Title apvd – Bill moves to Senate. • 2/13/14Received from House passed; Filed for 1st reading; Introduced, read 1st time, referred to Finance. • 2/14/14 Reported out of Committee with Do Pass Recommendation; Filed for 2nd reading. • 2/17/14 Read 2nd time, filed for 3rd reading. • 2/28/14 Read 3rd time, Passed 34-0-1. Titled apvd – to House. • 3/3/14 Returned from Senate Passed; to JRA for enrolling; reported enrolled; signed by Speaker; transmitted to Senate. • 3/4/14 Received from the House enrolled/signed by Speaker; Signed by

RS	TITLE	I.C.	STATEMENT OF PURPOSE/ SUMMARY	STATUS
				President; Returned to House. • 3/5/14 Returned signed by the President; Ordered transmitted to Governor. • 3/6/14 Delivered to Governor. • 3/7/14 Reported signed by Governor, Session Law Chapter 41, Effective 3/7/2014.

RS	TITLE	I.C.	STATEMENT OF PURPOSE/ SUMMARY	STATUS
22889 H513	Distribution of Cigarette Tax Funds to Aquifer Recharge Planning & Management	42-1780	• Provides legislation to allocate the distribution of cigarette taxes beginning FY 2015. The distribution to the Water Resource Board for aquifer recharge will be: 1) \$3,000,000 annually under a continuous appropriation for the Secondary Aquifer Planning, Management, and Implementation Fund; and 2) a fixed distribution of \$2,000,000 to the Aquifer Planning and Management Fund subject to appropriation by IDWR.	• 2/14/14 Introduced, read 1st time, referred to JRA for Printing. • 2/17/14 Reported, printed and referred to Revenue and Taxation Committee • 2/24/14 This bill was replaced by H547.

RS	TITLE	I.C.	STATEMENT OF PURPOSE/ SUMMARY	STATUS
22894C1 H526	Applications for Aquifer Recharge / Public Waters Use	42-401	• Provides legislation to ensure that applications for aquifer recharge within the State of Idaho that have a place of use outside the State of Idaho will fall within the scope of the Statute and are processed by the Director of IDWR. • Provides legislation to ensure that any Rathdrum Prairie recharge projects are within the scope of 42-401. • Provides legislation to broaden the scope of 42-401 to encompass all withdrawals of Idaho water for uses outside the state.	• 2/19/14 Introduced, read 1st time, referred to JRA for printing. • 2/20/14 Reported, printed and referred to H Res&Con Committee. • 3/6/14 Reported out of Committee with Do Pas Recommendation, filed for 2nd reading. • 3/7/14Rules suspended, read 3times, Passed 64-1-5, Titled apvd – to Senate. • 3/10/14 Received from the House, filed for 1st reading; Introduced, read 1st time, referred to S. Res& Env Committee. • 3/13/14 Reported out of Committee with Do Pass Recommendation; filed for 2nd reading. • 3/14/14 Read 2nd time, filed for 3rd reading. • 3/17/14 Read 3rd time in full, Passed 35-0-0, Titled apvd – to House. • 3/18/14 Returned from Senate Passed, to JRA for Enrolling, Reported enrolled, Signed by Speaker; Transmitted to Senate.

				• 3/19/14 Received from the House enrolled, Signed by Speaker and President, returned to House, Signed by President, Ordered transmitted to Governor.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22944C1 H547	Distribution of Remaining Cigarette Tax Revenue	42-401	• Provides legislation to distribute $5,000,000 to the secondary aquifer planning, management and implementation fund for statewide aquifer stabilization.	• 2/24/14 Introduced, read 1st time, referred to JRA for printing. • 2/26/14 Presented by Rep. Moyle @ H Revenue and Taxation Committee Meeting. Reported out of Committee with Do Pass Recommendation, filed for 2nd reading. • 2/27/14 Read 2nd time, filed for 3rd reading. • 3/3/14 Received from the House passed, filed for 1st reading; Introduced, read 1st time; Referred to S Local Gov&Tax Committee. • 3/5/14 Presented in S Local Gov&Tax Committee. • 3/6/14 Reported out of Committee with Do Pass Recommendation, filed for 2nd reading. • 3/7/14 Read 2nd time, filed for 3rd reading. • 3/11/14 Read 3rd time in full, Passed 33-1-1, Titled apvd – to House. • 3/12/14 Returned from Senate Passed; to JRA for Enrolling, Reported Enrolled, Signed by Speaker, Signed by President; Returned to House. • 3/13/14 Returned signed by the President; Ordered transmitted to Governor. • 3/14/14 Delivered to Governor. • 3/18/14 Reported signed by Governor, Session Law Chapter 115, Effective 7/1/14.

RS	TITLE	I.C.	STATEMENT OF PURPOSE/ SUMMARY	STATUS
23072 H618	IDWR Appropriation	67-3519	• Provides legislation to appropriate $21,667,200 to IDWR for fiscal year 2015 and caps the number of authorized full time equivalent positions at 152. The amount includes funding for increased employer's share of health insurance costs, rent increases, stream gage contract increases, accounts for reduction in statewide cost allocation, and adjustments for network billing costs from the Dept. of Administration. Provides $362,800 from the General Fund for the replacement of five vehicles, two flowmeters, computer software, 50 desktop computers, seven network switches, a plotter, a server, a map scanner and chairs. Also provides for funding for a 1% ongonign salary increase and a 1% one-time bonus, both on merit, and guidance for employee compensation. • Provides legislation for the transfer of $716,000 from the Revolving Development Fund to the Secondary Aquifer Planning, Management and Implementation Fund to further the ESPAM Plan. Provides legislation for $183,600 from the General Fund to pay the IDWR's share of the costs to replace the cooling system at the Water Center.	• 3/11/14 Introduced, read 1st time, referred to JRA for printing. Reported printed, filed for 2nd reading. • 3/12/14 Read 2nd time, filed for 3rd reading. Read 3rd time, Passed 61-8-1. Titled apvd – to Senate. • 3/13/14 Received from the House passed, filed for 1st reading; Introduced, read 1st time, referred to Finance. • 3/14/14 Reported out of Committee with Do Pass Recommendation, filed for 2nd reading. • 3/17/14 Read 2nd time, filed for 3rd reading. • 3/18/14 Read 3rd time in full, Passed 35-0-0, Title apvd – to House. • 3/19/14 Received from the House enrollsed/signed by Speaker, Signed by President, Returned to House, Retured signed by President, Ordered transmitted to Governor.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
23167 H644	Dept. of Parks & Recreation Sale of Aqua Life Aquaculture Facility to IWRB		• Provides legislation for the appropriation of $250,000 to the Department of Parks and Recreation for fiscal year 2015. • Provides legislation for the sale of the Aqua Life Aquaculture Facility and water rights to the IWRB at the 2011 appraised value of $1,635,000.	• 3/19/14 Introduced, read 1st time, referred to JRA for printing, Reported printed, filed for 2nd reading, rules suspended, read three times, Passed 67-0-3, Titled apvd – to Senate.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
23041 HCR57	CSRBA Coeur d'Alene Tribe –Federal Water Rights Negotiations		• Provides legislation requesting that the Governor and the Attorney General enter into negotiations with the Coeur d'Alene Tribe to resolve its federal reserved water right claims in the Coeur d'Alene-Spokane River Basin Adjudication (CSRBA).	• 3/6/14 Introduced, read 1st time, referred to JRA for printing. • 3/7/14 Reported printed and held at desk. • 3/11/14 Bill previously held at desk, referred to H Res&Con Committee. • 3/18/14 This bill was replaced by HCR62.

RS	TITLE	I.C.	STATEMENT OF PURPOSE/ SUMMARY	STATUS
23182C1 HCR62	CSRBA Coeur d'Alene Tribe –Federal Water Rights Negotiations		• Provides legislation requesting that the Governor and the Attorney General enter into negotiations with the Coeur d'Alene Tribe to resolve its federal reserved water right claims in the Coeur d'Alene-Spokane River Basin Adjudication (CSRBA).	• 3/18/14 Introduced, read 1st time, referred to JRA for printing. • 3/19/14 Reported printed, filed for 2nd reading, Rules suspended, read three times, Adopted 67-0-3, Titled apvd – to Senate; Received from House passed, filed for 1st reading, Introduced read 1st time, referred to S Res&Env. • 3/20/14 Presented by Sen. Nonini @ S Res&Env Committee Meeting.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
22527C1 S1345	Conditions for Crediting a Water Right for Releases & Diversions	42-201	• Provides legislation to require that diversions and releases of water from storage reservoirs and water delivery and drainage facilities are coordinated to prevent injury to authorized beneficial uses of water. • Provides legislation to ensure that diversions or releases of water to protect life of property from injury or damage to not diminish water rights.	• 2/10/14 Introduced, read 1st time, referred to JR for printing. • 2/11/14 Reported printed, referred to S Res&Env Committee.
RS	**TITLE**	**I.C.**	**STATEMENT OF PURPOSE/ SUMMARY**	**STATUS**
23163 S1412	Use as Storage of Water	42-201, 42-204, 42-607	• Provides legislation to amend 42-201, to assure that water may be used for fire abatement and defined forestry practices without a water right in a manner equitable to the holder of a water right. • Provides legislation to amend 42-204 to assure that water appropriated by new water rights do not diminish the fill of the State's reservoir systems. • Provides legislation to amend Section 42-607 so that the release of water for flood control purposes from Arrowrock Reservoir, Anderson Ranch Reservoir and Lucky Peak Reservoir does not diminish storage water rights. This amendment does not affect other reservoirs.	• Introduced, read 1st time, referred to JR for printing, Reported printed, U.C. to Lay on the Table.

Memorandum

To: Idaho Water Resource Board

From: Helen Harrington

Re: IWRB Water Resource Planning Committee Status Report

Date: March 7, 2014

Information; no action necessary

Since the November 2013 IWRB meeting, the Water Resource Planning Committee, chaired by Board Member Jeff Raybould, has met three times to continue progress on two key items:

- Review the Idaho State Water Plan (ISWP) adopted in November 2012 and recommend revisions to the IWRB; and
- Develop a recommendation for integrating Sustainability into the ISWP, as directed by Governor Otter.

Idaho State Water Plan Review

The WRP Committee established a strategy to review and recommend revisions to the IWRB regarding changes proposed by some members of the House Resources & Conservation Committee during the 2013 Idaho Legislative Session. The proposed changes affect 14 policies. The proposed revisions range from minor edits to significant changes or elimination. The Committee will review the proposed changes as a group.

The Water Resource Planning Committee has completed an initial categorization of the affected policies. A table of the recommended action on each policy is shown on the attached table. The categories considered by the WRP Committee are:

- Reviewed, no revision recommended
- Reviewed and revised (as suggested or other revisions)
- Referred for further review and establish a timeframe for review

The committee will be developing recommended revisions for submission to the IWRB. The intent is to complete the recommendations to meet a timeframe which will allow the revisions acted on by the end of 2014. As required by Idaho Code § 42-1734A, any amendments considered for adoption by the IWRB must be published with a 60-day comment period and public hearings held. After those statutory requirements are met, the IWRB may consider final action on revisions. If revisions are adopted, the revisions must be submitted to the Idaho Legislature at the next session.

Sustainability

On February 26, 2014, the WRP Committee held a meeting with a panel of speakers to discuss the concept and perspectives of different interests regarding sustainability. This was the committee's second panel discussion on the issue. The panel members were Dr. Randy MacMillan (Clean Springs Foods, Inc.); David Miles (City of Meridian); Alex LaBeau (Idaho Association of Commerce and Industry); and, Mark Davidson, (Trout Unlimited). Similar to the first panel discussion in November 2013, the committee was able to ask questions and expand ideas about issues which might be considered as the committee develops a recommendation for incorporating sustainability into the ISWP.

Although not yet scheduled, it is anticipated that a third panel of presentations will be planned in the near future to hear from additional perspectives on water resource sustainability.

2/7/2014WRP Committee Recommendations

Proposed Legislative Revisions to the State Water Plan

Policy	Reviewed/ Rejected	Reviewed/ Accepted	Reviewed/ Moved for further work	Comments
Policy 1I Aquifer Recharge	X			
Policy 1K Comprehensive Aquifer Management Plans	X			
Policy 2B Federally listed and Other Aquatic Species			X	
Policy 2C Minimum Stream Flows			X	
Policy 2D State Protected River System	X			
Policy 2E Riparian Habitat and wetlands			X	Proposed for elimination
Policy 2F Stream Channel Rehabilitation		X		
Policy 2G Safety Measures Program	X			
Policy 3D Funding Program	X			
Policy 3E Water Resource Planning Program	X			
Policy 3G Climate Variability			X	Proposed for elimination
Policy 4E Snake River Basin New Storage	X			
Policy 6A Conservation Plans in the Salmon/Clearwater River Basins			X	
Policy 6B Minimum Stream Flow Water Rights and Other Innovative Measures to Address Aquatic Species Concerns			X	

Memorandum

To: Idaho Water Resource Board

From: Remington Buyer

Date: March 10, 2014

Re: Water Supply Bank Committee Meeting 1-14

Information; no action necessary

On March 6, 2014, Water Supply Bank Committee Meeting 1-14 was held at the Idaho Department of Water Resources, 322 East Front St, Boise, ID. Committee Chair Vince Alberdi called the meeting to order at 1 pm. Committee members Roger Chase and Al Barker attended in person, Bert Stevenson telephoned in and Jeff Raybould was unavailable. The Committee received a presentation from Water Supply Bank Coordinator Remington Buyer, who covered the 2013 Annual Report for the Board's Water Supply Bank, and presented on Bank initiatives for 2014, including a Procedural Guidance Memo for Bank staff and an abbreviated work schedule for development of a Water Supply Bank software application.

Mr. Buyer began by communicating organizational changes that occurred within the Water Supply Bank in 2013 (summarized in Water Supply Bank Memo #1) and he introduced members of the Committee to Mrs. Cherie Palmer, the Senior Water Resource Agent and Lead Agent for the Board's Bank. Following the discussion of organizational changes, Mr. Buyer presented on the 2013 water right transactions and finances for the Board's Bank, followed up by a summary of 2014 initiatives of the Board's Bank. One initiative presented to the Committee was to clarify administrative policies for Bank staff through issuance of a Procedural Guidance Memo.

The Procedural Guidance Memo covers three administrative policies: establishing a timeframe for receiving rental applications and a process for prioritizing rental applications; a policy on rental fee refund requests; and a policy for considering Lease Contract release requests. The Committee heard the full memo and recommended that language be included in the procedural guidance to clarify that the establishment of a timeframe and process for receiving and prioritizing rental applications should not prevent applicants from being able to submit companion applications (applications to jointly lease in and rent out a water right). Following Mr. Buyer's confirmation that this language would be included in an updated copy of the Procedural Guidance Memo, the Committee recommended that the full Board consider and approve the procedural guidance.

Abbreviated Meeting Notes
Water District 01
Upper Snake River Advisory Committee Meeting, February 27, 2014
Pocatello Airport

DRAFT

Notes: This meeting was held directly following the Committee of Nine's (Co9) United States Bureau of Reclamation (USBR) Reservoir & River Coordination Committee meeting, which was chaired by Stan Hawkins, and started at 9:00 AM. The USBR made a joint presentation titled Upper Snake River Water Operations 2014, to members of both the C09's Reclamation Reservoir & River Coordination Committee and the Idaho Water Resource Board's (IWRB) Upper Snake River Advisory Committee (USRAC). The presentation included the following topics: (1) Upper Snake operations so far in 2014; (2) A Brief History: 1200 CFS in November; (3) [Water Supply] Projections: What Comes Next?; and (4) Power: What's the Impact. Although only topic three was specifically presented to the USRAC, all of the topics are relevant as they deal in some way with the operations of the Upper Snake River. Therefore, I have included a copy of the Bureau's entire presentation as an attachment to these meeting notes.

Following the completion of the USBR's presentation, the Co9's Reclamation Reservoir River Coordination Committee adjourned and the IWRB's Upper Snake River Advisory Committee meeting officially convened.

Finally, I would like to thank Roland Spring with the USBR, for graciously allowing us to share their conference room reservation at the Pocatello Airport.

12:15 PM – Introductions were made and an attendance list was circulated. The following people were in attendance:

Mike Beus (USBR)
Ted Day (USBR)
John Hildrete (USBR)
Roland Springer (USBR)
Brian Olmstead (TFCC)
Alan Hansten (NSCC)
Lynn Harmon (AFRD2)
Bert Stevenson (IWRB)
Chris Pratt (RDC)
Mat Weaver (IWRB)
Tony Olenichak (WD01)
Lyle Swank (WD01)
Dan Temple (A&B)
Walt Mullins (Milner ID)
Julie Sievers (Milner ID)
Harold Mohlman (A&B)

12:16 PM – Mat Weaver with the Idaho Department of Water Resource (IDWR or Department) outlined the agenda, which included:

- Introduction and Attendance
- Water Supply Update – Mike Beus (presented prior to the official convening of the IWRB meeting)
- WD01 Briefing – Lyle Swank
- New Business

11:41 AM – Mike Beus with the United States Bureau of Reclamation (USBR or Bureau) gave a presentation on the state of the reservoirs and the water supply. Mike started by contrasting the Natural Resources Conservation Service's (NRCS) snow water equivalent (SWE) and total precipitation SnoTel data for the Snake Basin Above Palisades as reported on January 30 (99% and 89% of normal respectively) and February 26 (136% and 116% of normal respectively). Mike made a case study of the Lewis Lake Divide SnoTel site pointing out that the site gained 11.5 inches between 1/30 and 2/26, which is 209% of normal for this four week period. Mike opined that it would be hard to imagine that the snowpack would be below normal at the end the season, indicating the April forecast will likely be between 110% and 130% of normal. Mike presented four analog years for the April-July Unregulated Flow at Heise, as possible indicators of where we might be headed this year, they included 1999, 2009, 2008, and 1989. In two of the four example years, 1999 and 2009, the reservoir system physically filled and the Bureau enacted flood control operations. In the other two years Jackson and Palisades reservoirs filled, American Fall Reservoir (AFR) did not fill, and no flood control operations were necessary. Mike presented graphs depicting Snake River Flows near Heise, Lewis Lake Divide SnoTel data, Togwotee Pass SnoTel data, Blind Bull Summit SnoTel data, Jackson Lake reservoir content, Palisades reservoir content, and American Falls reservoir content.

- Allan Kelsch asked questions regarding the last to fill status of the Palisades Reservoir power head space.

12:18 PM – Lyle Swank, Watermaster of Water District 01 (WD01), gave a brief recap of upper Snake River water supply conditions from his perspective. He started by reviewing SnoTel data for the Henry's Fork/Teton basins, Snake Basin Above Palisades basin, Willow/Blackfoot/Portneuf basins, and Snake Above American Falls basin. He indicated that in deriving the Basin Index numbers the SnoTel stations were weighted by a number of factors and that not all stations are equally meaningful. Lyle initiated a discussion on potential Jackson Lake operations that might be a departure from normal operations, but would help fill the reservoir. Lyle conclude by pointing out the record low, or near record low, reach gains in the Snake River above the AFR. Lyle's handout material (four pages) is included with these notes.

~12:30 PM – Mat Weaver called for any new or additional business.

1. Brian Olmstead started a discussion on Spring recharge operations, indicating that spring recharge operations would begin in the Milner-Gooding canal the following week. It was planned to start slowly and ramp up to 150-200 cfs to test the ability of the MP31 site to handle a sustained diversion of water. Brian also indicated that there was an opportunity to recharge through Wilson Lake and that there would be about 25 cfs diverted down the main South Side Canal at Milner to Wilson Lake.

~12:50 PM – The group discussed the scheduling of the next committee meeting. It was decided to schedule the next meeting for the first part of April and that a meeting time would be coordinated via email. It was suggested that when possible, future meeting should be planned in coordination with other meetings, such as the C09's USBR Reservoir & River Coordination Committee meeting, to facilitate efficiencies in travel and to minimize potential calendar conflicts.

RECLAMATION

Managing Water in the West

Upper Snake River Water Operations 2014

Michael Beus
Upper Snake Field Office
Heyburn, Idaho

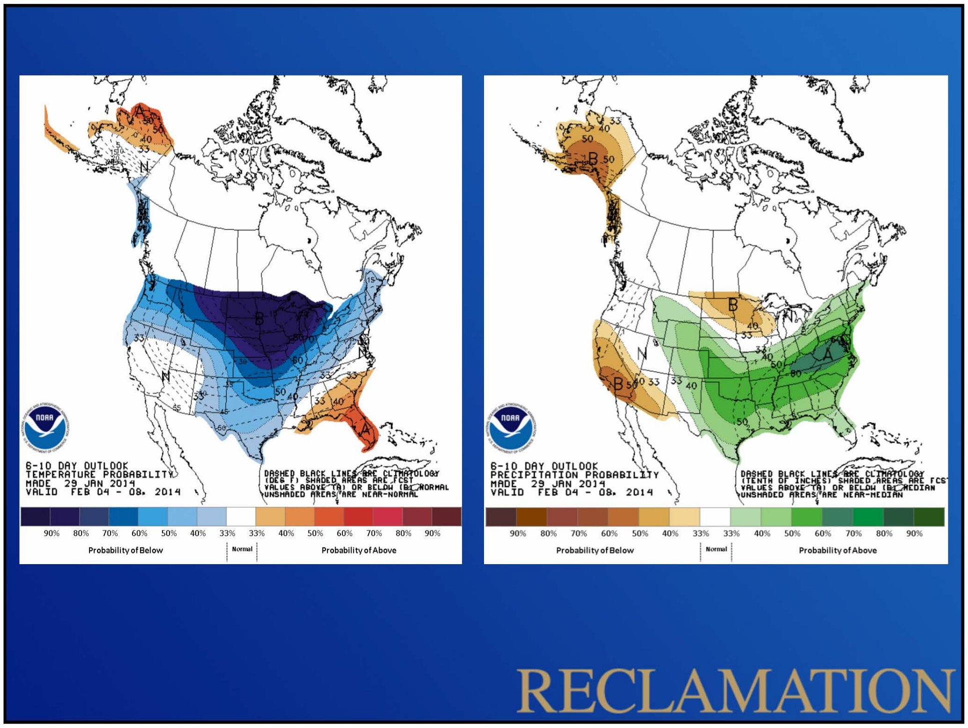
Ted Day
Pacific Northwest Regional Office
Boise, Idaho

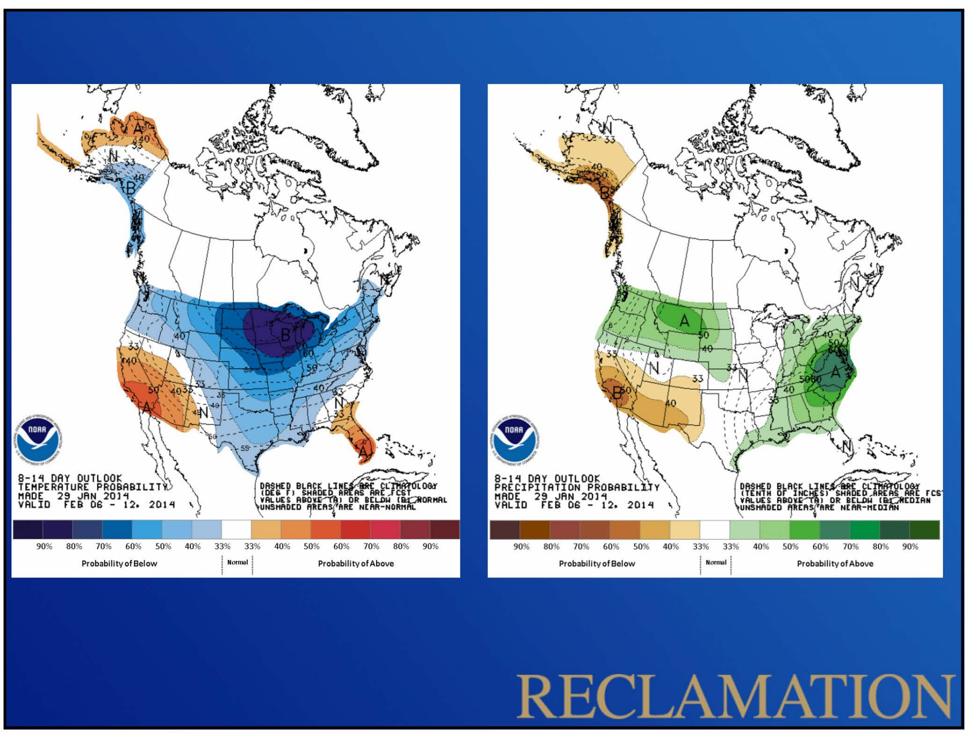
U.S. Department of the Interior
Bureau of Reclamation

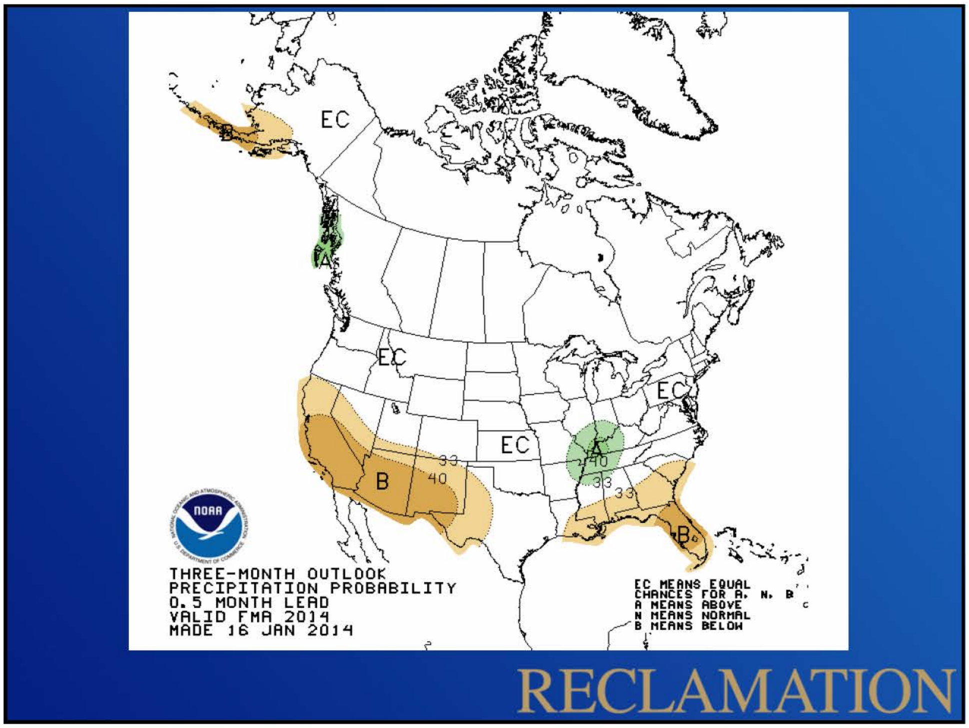
Our Biggest Concern?

- Winter precip turns off
- Deterioration of runoff forecast
- A repeat of 2013?
- Where do we run out of water?

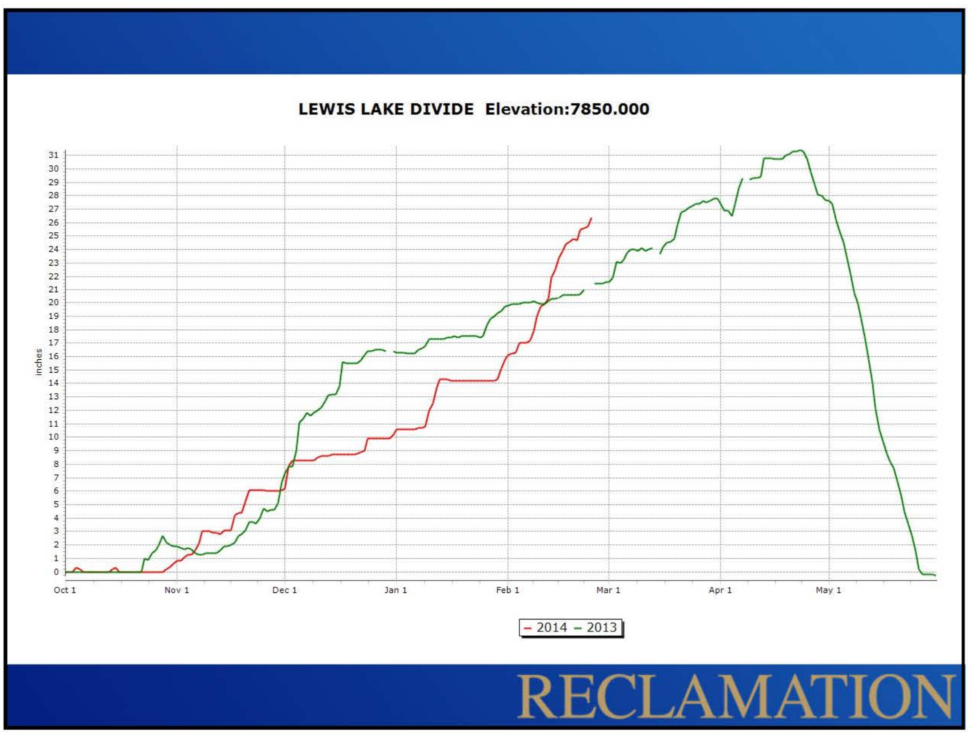
RECLAMATION


6-10 DAY OUTLOOK
TEMPERATURE PROBABILITY
MADE 29 JAN 2014
VALID FEB 04 - 08, 2014
DASHED BLACK LINES ARE CLIMATOLOGY (DEG F) SHADED AREAS ARE FCST VALUES ABOVE (A) OR BELOW (B) NORMAL UNSHADED AREAS ARE NEAR-NORMAL
90% 80% 70% 60% 50% 40% 33% 33% 40% 50% 60% 70% 80% 90%
Probability of Below
Normal
Probability of Above
6-10 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 29 JAN 2014
VALID FEB 04 - 08, 2014
DASHED BLACK LINES ARE CLIMATOLOGY (TENTH OF INCHES) SHADED AREAS ARE FCST VALUES ABOVE (A) OR BELOW (B) MEDIAN UNSHADED AREAS ARE NEAR-MEDIAN
90% 80% 70% 60% 50% 40% 33% 33% 40% 50% 60% 70% 80% 90%
Probability of Below
Normal
Probability of Above
RECLAMATION

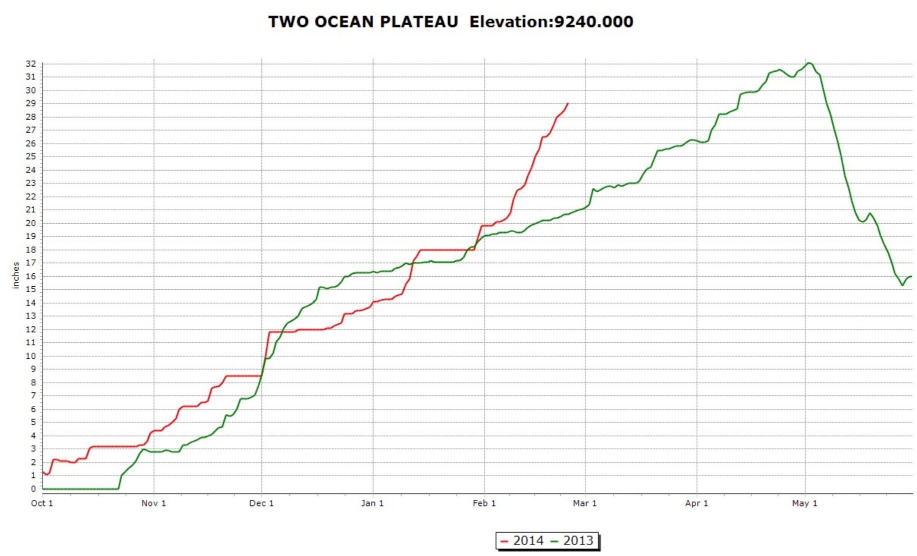

8-14 DAY OUTLOOK
TEMPERATURE PROBABILITY
MADE 29 JAN 2014
VALID FEB 06 - 12, 2014
DASHED BLACK LINES ARE CLIMATOLOGY (DEG F) SHADED AREAS ARE FCST VALUES ABOVE (A) OR BELOW (B) NORMAL UNSHADED AREAS ARE NEAR-NORMAL
90% 80% 70% 60% 50% 40% 33% 33% 40% 50% 60% 70% 80% 90%
Probability of Below
Normal
Probability of Above
8-14 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 29 JAN 2014
VALID FEB 06 - 12, 2014
DASHED BLACK LINES ARE CLIMATOLOGY (TENTH OF INCHES) SHADED AREAS ARE FCST VALUES ABOVE (A) OR BELOW (B) MEDIAN UNSHADED AREAS ARE NEAR-MEDIAN
90% 80% 70% 60% 50% 40% 33% 33% 40% 50% 60% 70% 80% 90%
Probability of Below
Normal
Probability of Above
RECLAMATION



EC
EC
EC
EC
A
B
B
B
33
40
THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID FMA 2014
MADE 16 JAN 2014
EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW
RECLAMATION



LEWIS LAKE DIVIDE Elevation:7850.000
inches
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
2014
2013
RECLAMATION



RECLAMATION

A BRIEF HISTORY:
1200 CFS IN NOVEMBER

RECLAMATION

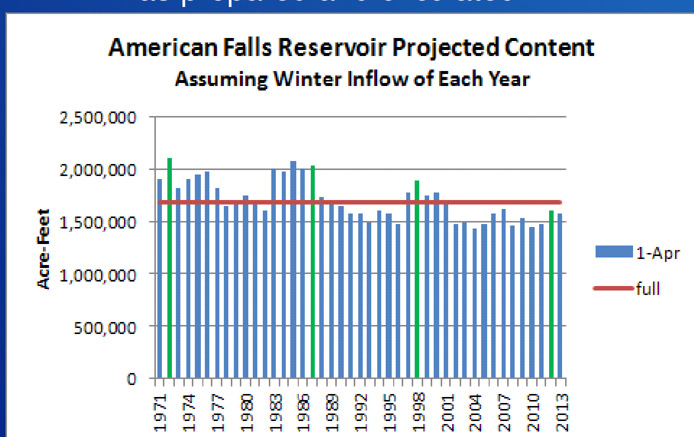
November 1

- Palisades flow set based upon American Falls initial storage
  - 90 KAF less than fall 2012
  - 90 KAF = 300 cfs for 150 days
  - November through March 2013 average flow at Palisades was 929 cfs
  - April 1, 2013 Content was 120 KAF short of full
    - Adequate Margin
  - Expectation of lower reach gains added additional safety
- Result – 1200 cfs

RECLAMATION

November 7

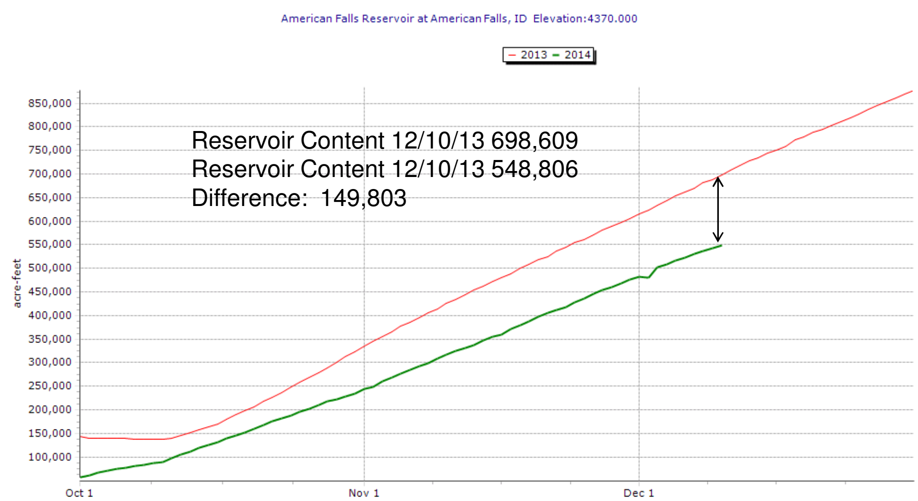
- In response to questions raised this bar chart was prepared and circulated



- Result – 1200 cfs

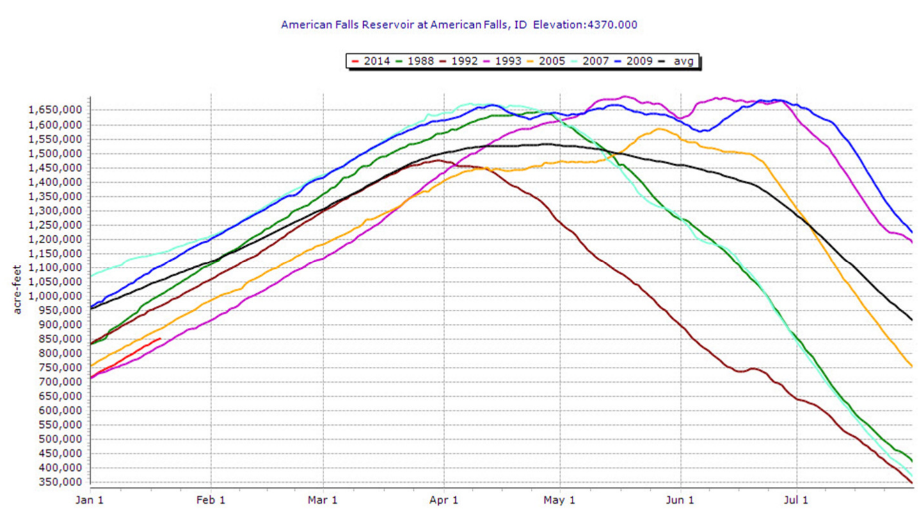
RECLAMATION

December 11



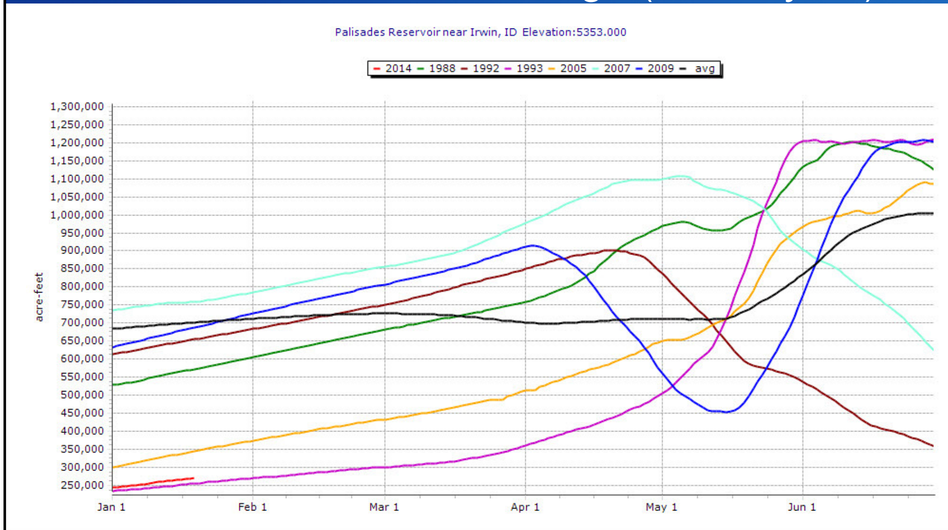
RECLAMATION

American Falls Storage (January 23)



RECLAMATION

Palisades Reservoir Storage (January 23)



RECLAMATION

PROJECTIONS: WHAT COMES NEXT?

RECLAMATION

January 30, 2014 SnoTel Report

SNAKE BASIN ABOVE PALISADES							
BASE CAMP	7030	11.3	10.7	106	12.5	13.8	91
BLIND BULL SUM	8650	15.4	13.6	113	11.3	12.6	90
COTTONWOOD CREEK	7670	13.8	12.5	110	15.6	15.6	100
EAST RIM DIVIDE	7930	8.1	6.7	121	7.0	7.6	92
GRANITE CREEK	6770	9.2	10.2	90	10.3	13.4	77
GRASSY LAKE	7265	18.1	19.8	91	19.6	23.6	83
GROS VENTRE SUMMIT	8750	8.1	8.2	99	7.2	8.1	89
GUNSIGHT PASS	9820	9.5	8.1c	117	9.1	8.7c	105
LEWIS LAKE DIVIDE	7850	15.1	19.6	77	18.1	22.8	79
LOOMIS PARK	8240	9.9	9.4	105	11.2	11.1	101
PHILLIPS BENCH	8200	14.0	15.9	88	14.8	18.0	82
SALT RIVER SUMMIT	7760	7.7	7.6	101	9.7	10.5	92
SNAKE RIVER STATION	6920	9.6	10.5	91	12.4	15.2	82
SPRING CREEK DIVIDE	9000	15.0	14.0	107	15.0	15.2	99
THUMB DIVIDE	7980	7.6	9.5	80	8.1	12.0	68
TOGWOTEE PASS	9580	15.7	14.8	106	15.5	15.6	99
TWO OCEAN PLATEAU	9240	18.9	17.1	111	15.5	17.1	91
WILLOW CREEK	8380	16.8	16.9	99	20.0	21.3	94
Basin Index (%)				**99**			**89**

RECLAMATION

February 26, 2014 SnoTel Report

SNAKE BASIN ABOVE PALISADES							
BASE CAMP	7030	17.5	13.3	132	18.4	17.0	108
BLIND BULL SUM	8650	28.1	17.5	161	18.1	15.7	115
COTTONWOOD CREEK	7670	25.3	16.3	155	27.1	19.2	141
EAST RIM DIVIDE	7930	13.8	7.8	177	12.2	9.4	130
GRANITE CREEK	6770	18.2	13.4	136	18.7	16.2	115
GRASSY LAKE	7265	27.6	25.6	108	27.7	29.1	95
GROS VENTRE SUMMIT	8750	12.1	9.5	127	11.2	9.9	113
GUNSIGHT PASS	9820	15.6	10.4c	150	14.3	10.6c	135
LEWIS LAKE DIVIDE	7850	26.6	25.1	106	28.3	28.4	100
LOOMIS PARK	8240	18.5	11.5	161	19.2	13.8	139
PHILLIPS BENCH	8200	25.8	19.3	134	25.7	22.4	115
SALT RIVER SUMMIT	7760	14.6	10.4	140	15.8	13.2	120
SNAKE RIVER STATION	6920	15.4	14.0	110	18.4	18.4	100
SPRING CREEK DIVIDE	9000	29.1	18.0	162	27.5	19.0	145
THUMB DIVIDE	7980	12.2	11.8	103	11.7	14.4	81
TOGWOTEE PASS	9580	25.5	17.4	147	24.3	19.1	127
TWO OCEAN PLATEAU	9240	29.5	21.3	138	-M	21.4	*
WILLOW CREEK	8380	31.0	21.9	142	31.1	26.4	118
Basin Index (%)				**136**			**116**

RECLAMATION

Change in SWE

- Lewis Lake Divide on 1/30
  - 15.1”, 77%   Normal is 19.6”
- Lewis lake Divide on 2/26
  - 26.6 ”, 106% Normal is 25.1
- Change is 11.5”, 209% of normal for this 4-week period
- Change is 6.0” above the normal rate of accumulation for this period

RECLAMATION

February 26, 2014 SnoTel Report

SNAKE BASIN ABOVE PALISADES							
BASE CAMP	7030	17.5	13.3	15.2	Apr 07	132	115
BLIND BULL SUM	8650	28.1	17.5	24.3	Apr 25	161	116
COTTONWOOD CREEK	7670	25.3	16.3	21.3	Apr 02	155	119
EAST RIM DIVIDE	7930	13.8	7.8	10.2	Apr 10	177	135
GRANITE CREEK	6770	18.2	13.4	15.0	Mar 30	136	121
GRASSY LAKE	7265	27.6	25.6	31.6	Apr 03	108	87
GROS VENTRE SUMMIT	8750	12.1	9.5	13.2	Apr 19	127	92
GUNSIGHT PASS	9820	15.6	10.4C	13.9	Apr 09	150	112
LEWIS LAKE DIVIDE	7850	26.6	25.1	30.7	Apr 26	106	87
LOOMIS PARK	8240	18.5	11.5	14.4	Mar 30	161	128
PHILLIPS BENCH	8200	25.8	19.3	26.0	Apr 15	134	99
SALT RIVER SUMMIT	7760	14.6	10.4	13.0	Apr 04	140	112
SNAKE RIVER STATION	6920	15.4	14.0	15.9	Mar 28	110	97
SPRING CREEK DIVIDE	9000	29.1	18.0	24.3	May 01	162	120
THUMB DIVIDE	7980	12.2	11.8	15.1	Mar 28	103	81
TOGWOTEE PASS	9580	25.5	17.4	25.4	May 11	147	100
TWO OCEAN PLATEAU	9240	29.5	21.3	29.9	May 04	138	99
WILLOW CREEK	8380	31.0	21.9	28.4	Apr 07	142	109
Basin Index (%)						**136**	**105**

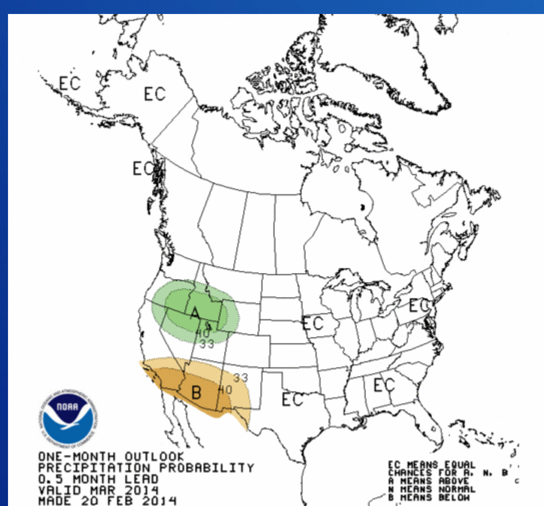
RECLAMATION

Change in SWE

- February 1, Coordinated Forecast
  - 92%
- April 26, Normal Peak SWE
  - 30.7
- 6” extra = 120%
- 120% of 92% = 110%

RECLAMATION

And …



RECLAMATION

Comparison Years Apr-Jul HEII QU

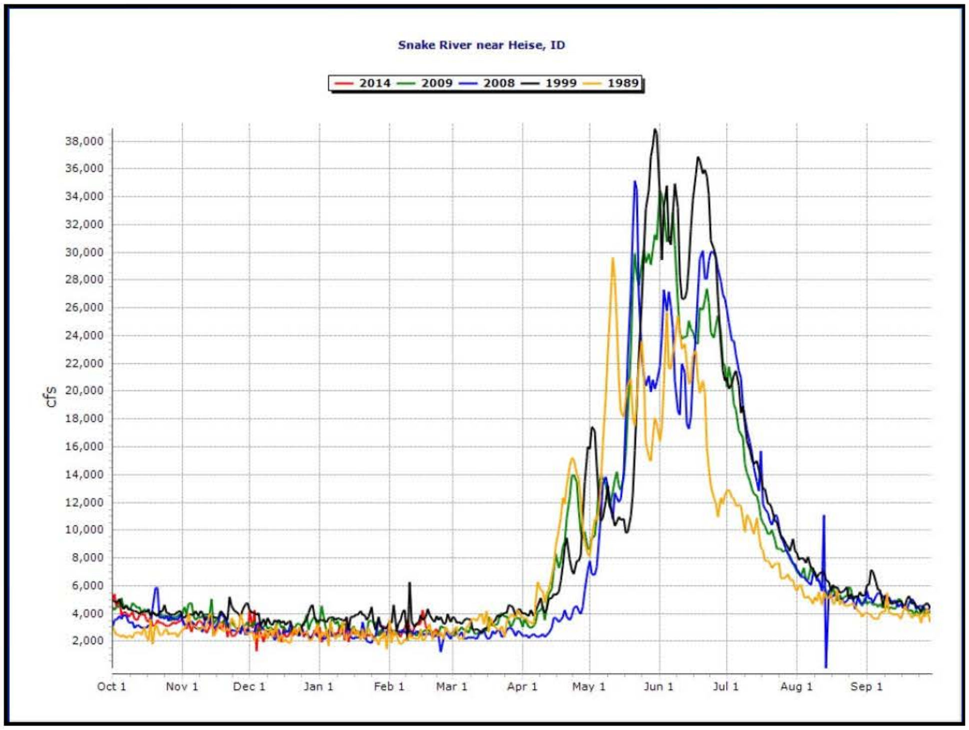
- 1999 - 131% of average - 4,252 kaf
- 2009 - 123% of average - 3,991 kaf
- 2008 - 113% of average - 3,654 kaf
- 1989 - 103% of average - 3,330 kaf

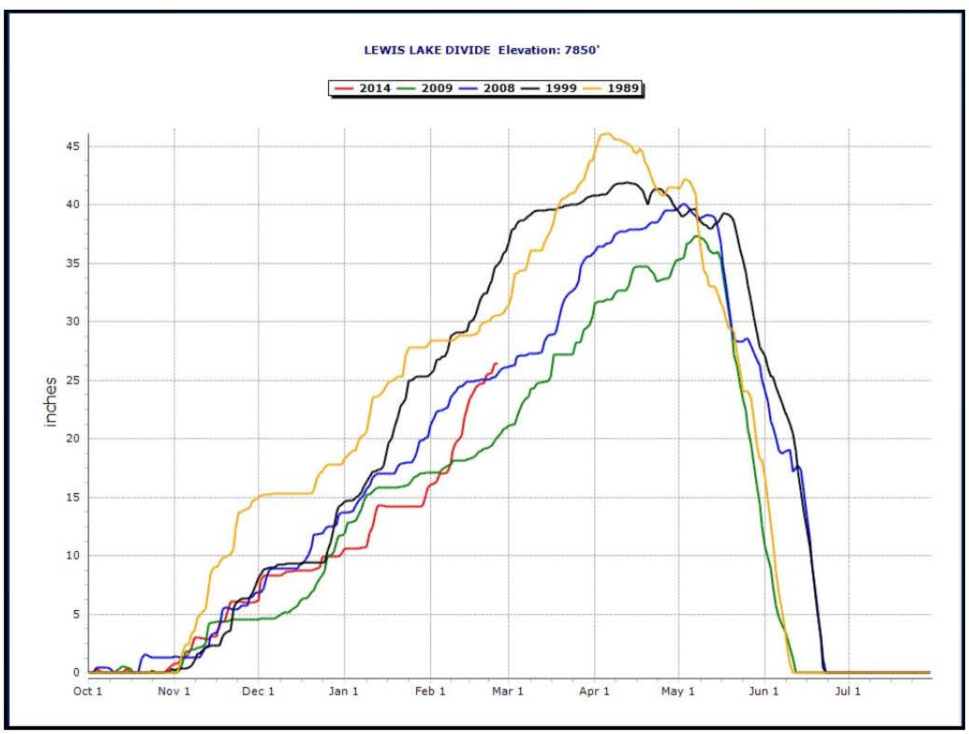
RECLAMATION

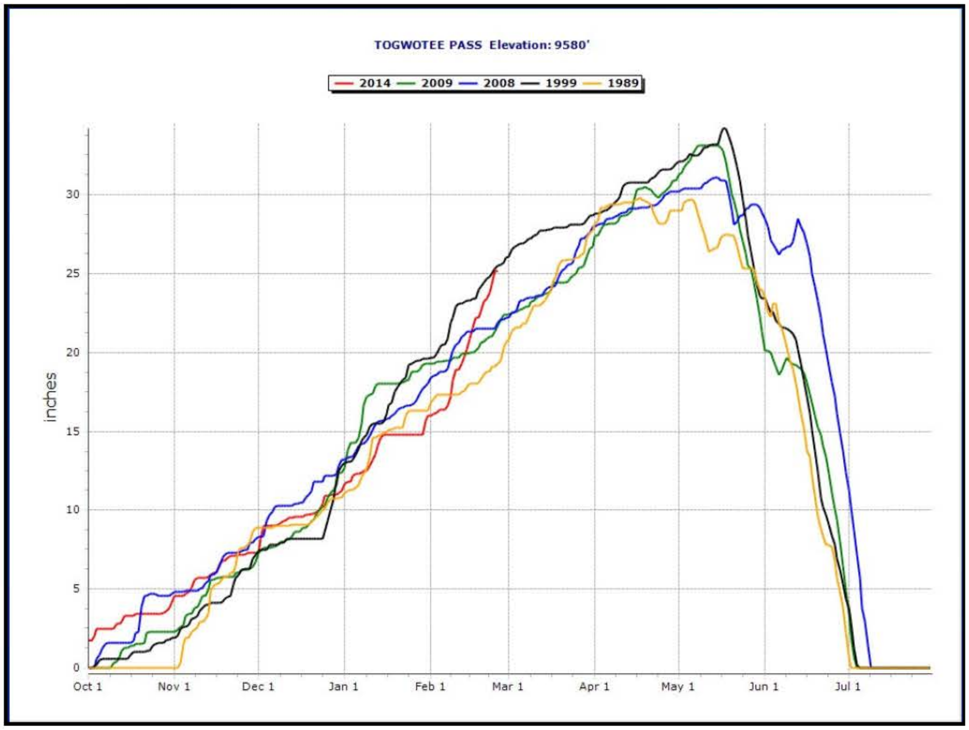
Spreadsheet Modeling

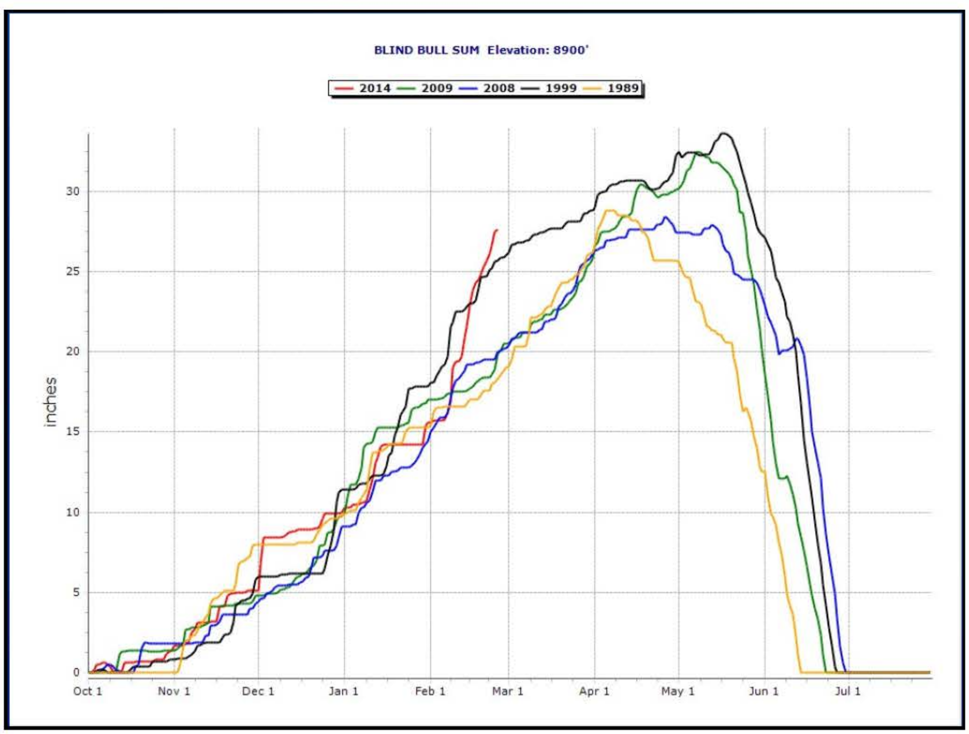
- 1999 (131% runoff)
  - All Reservoirs Physically Fill
  - Flood Control Operations
- 2009 (123% runoff)
  - All Reservoirs Physically Fill
  - Flood Control Operations
- 2008 (113% runoff)
  - Jackson and Palisades Fill
  - Flood Control at Palisades
  - American Falls Fills to 88%
    - Due to poor gains
    - Delayed runoff (10-15 days)
- 1989 (103% runoff)
  - Jackson and Palisades Fill
  - No flood control operations
  - American Falls Fills to 98%

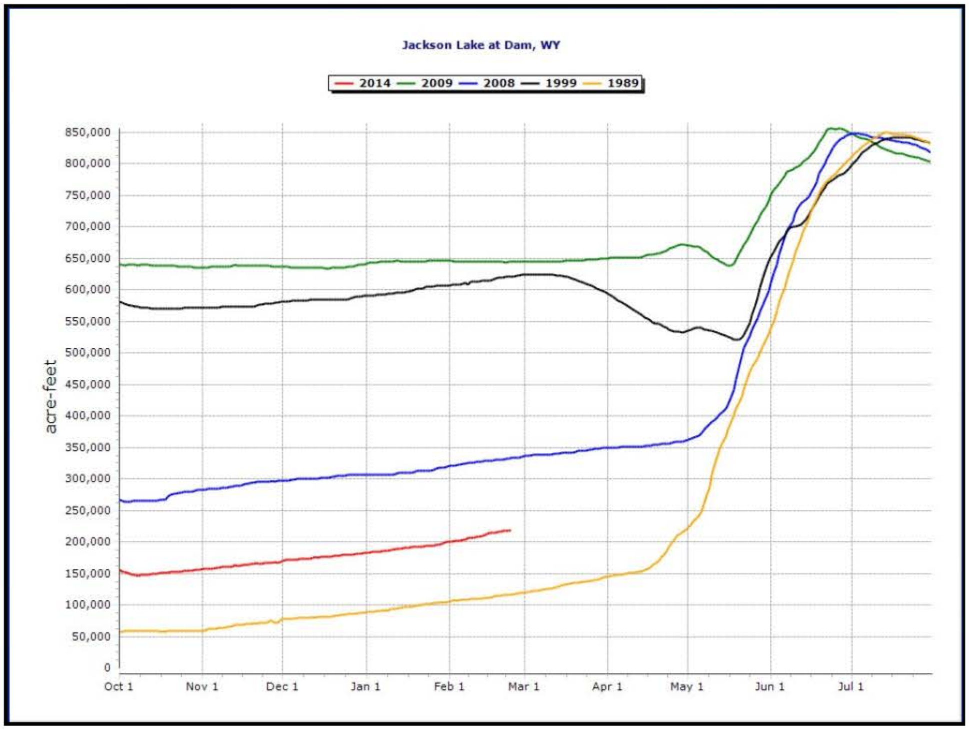
RECLAMATION

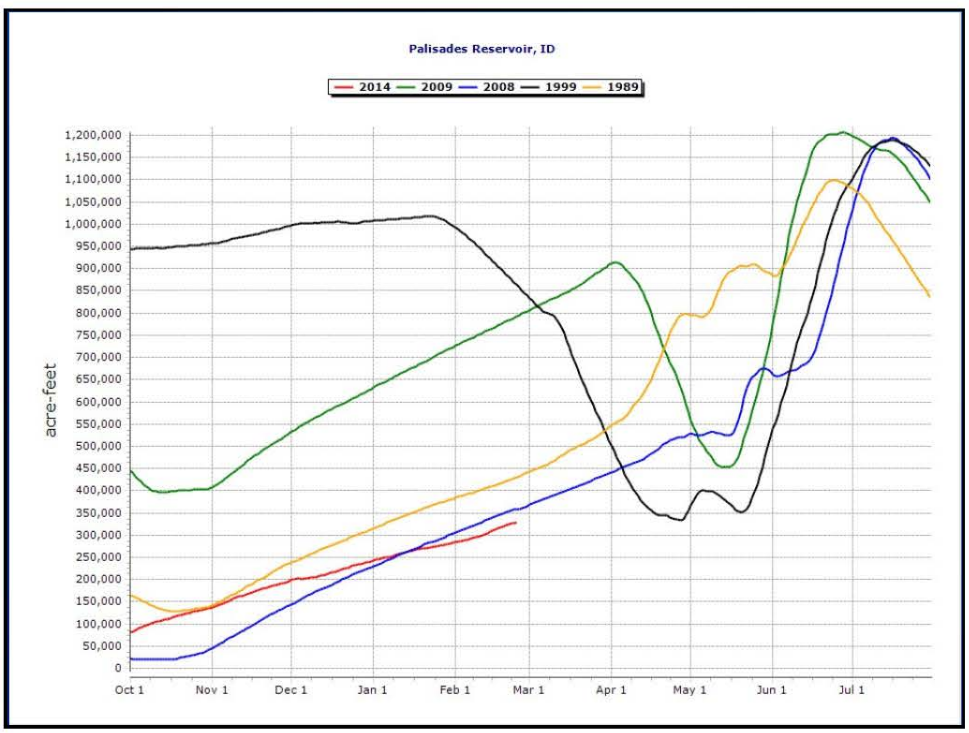

Snake River near Heise, ID
2014
2009
2008
1999
1989
cfs
38,000
36,000
34,000
32,000
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1

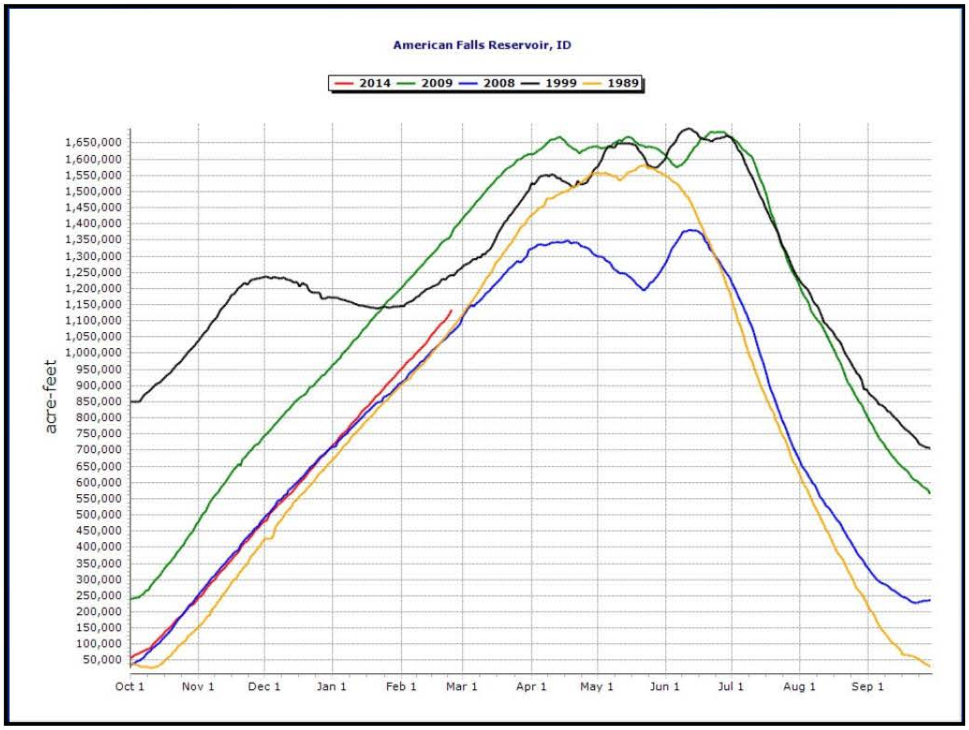

LEWIS LAKE DIVIDE Elevation: 7850'
2014
2009
2008
1999
1989
inches
45
40
35
30
25
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1

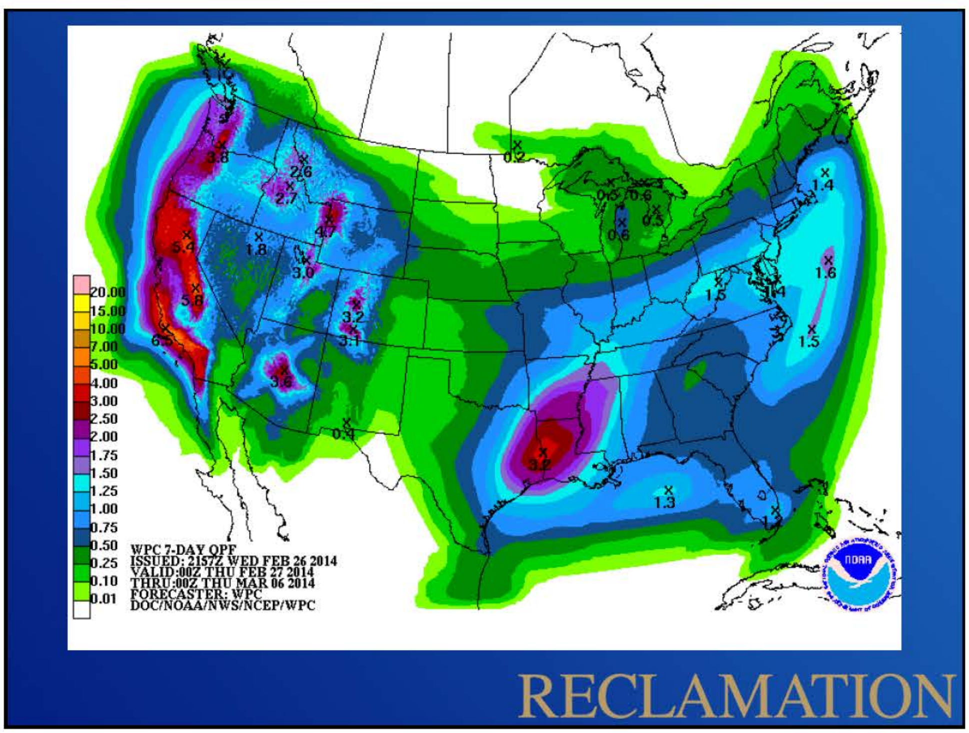

TOGWOTEE PASS Elevation: 9580'
2014
2009
2008
1999
1989
inches
0
5
10
15
20
25
30
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1

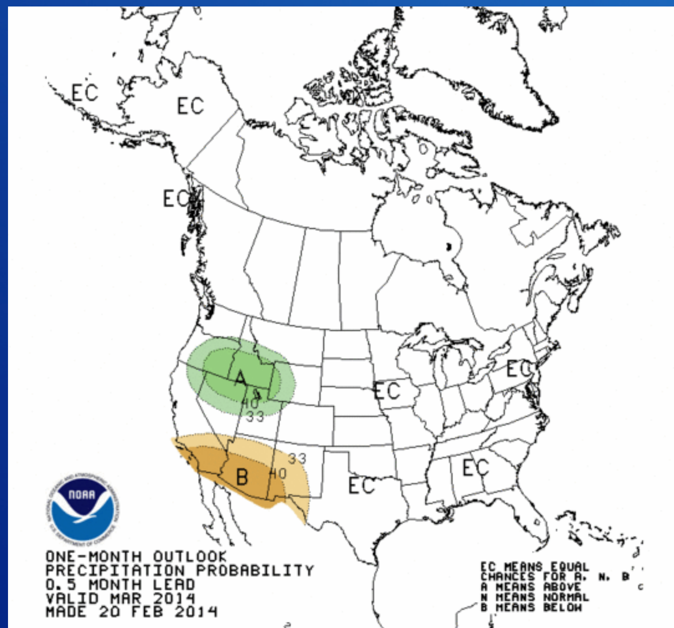

BLIND BULL SUM Elevation: 8900'
2014
2009
2008
1999
1989
inches
0
5
10
15
20
25
30
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1


Jackson Lake at Dam, WY
2014
2009
2008
1999
1989
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
acre-feet
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1


Palisades Reservoir, ID
2014
2009
2008
1999
1989
1,200,000
1,150,000
1,100,000
1,050,000
1,000,000
950,000
900,000
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
acre-feet
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1


American Falls Reservoir, ID
2014
2009
2008
1999
1989
acre-feet
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1


WPC 7-DAY QPF
ISSUED: 2157Z WED FEB 26 2014
VALID:00Z THU FEB 27 2014
THRU:00Z THU MAR 06 2014
FORECASTER: WPC
DOC/NOAA/NWS/NCEP/WPC
RECLAMATION

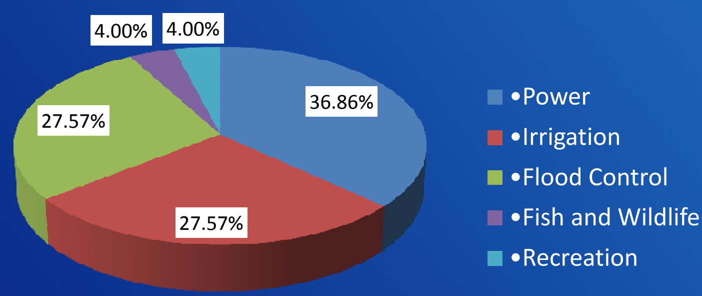


RECLAMATION

POWER:
WHAT'S THE IMPACT

RECLAMATION

Palisades Cost Allocations



RECLAMATION

Power Values

Month	Projected Value	$/mwh
13-Dec	$120,096.00	$46.12
14-Jan	$110,727.00	$42.52
14-Feb	$99,270.00	$42.21
14-Mar	$107,399.25	$41.24

RECLAMATION

Power Rate Affects

- Energy foregone by change from 1200 cfs to 900 cfs in February 2014
  - 2,095,200 kwh
- Change in rate caused by reduced generation
  - .04 mils
- Annual cost to Southern Idaho Pool customers at .04 mils
  - $10,000

RECLAMATION

WD01 WATERMASTER 1/4

United States Department of Agriculture
NRCS Natural Resources Conservation Service

National Water and Climate Center

NWCC Home | About Us | Products | Publications | News | Partnerships | Contact Us

Idaho SNOTEL Snow/Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

Provisional data, subject to revision

Data based on the first reading of the day (typically 00:00) for Wednesday, February 26, 2014

Basin Site Name	Elev (ft)	Snow Water Equivalent Current (in)	Snow Water Equivalent Median (in)	Snow Water Equivalent Pct of Median	Water Year-to-Date Precipitation Current (in)	Water Year-to-Date Precipitation Average (in)	Water Year-to-Date Precipitation Pct of Average
HENRYS FORK, TETON BASINS							
BLACK BEAR	8170	28.2	28.9	98	26.9	30.3	89
GRAND TARGHEE	9260	34.6	29.2R	118	25.9	24.5R	106
GRASSY LAKE	7265	27.6	25.6	108	27.7	29.1	95
ISLAND PARK	6290	11.4	12.1	94	11.0	14.9	74
LEWIS LAKE DIVIDE	7850	26.6	25.1	106	28.3	28.4	100
PHILLIPS BENCH	8200	25.8	19.3	134	25.7	22.4	115
PINE CREEK PASS	6720	15.2	12.4	123	17.8	17.1	104
WHITE ELEPHANT	7710	16.8	20.3	83	17.5	23.3	75
Basin Index (%)				**108**			**95**
SNAKE BASIN ABOVE PALISADES							
BASE CAMP	7030	17.5	13.3	132	18.4	17.0	108
BLIND BULL SUM	8650	28.1	17.5	161	18.1	15.7	115
COTTONWOOD CREEK	7670	25.3	16.3	155	27.1	19.2	141
EAST RIM DIVIDE	7930	13.8	7.8	177	12.2	9.4	130
GRANITE CREEK	6770	18.2	13.4	136	18.7	16.2	115
GRASSY LAKE	7265	27.6	25.6	108	27.7	29.1	95
GROS VENTRE SUMMIT	8750	12.1	9.5	127	11.2	9.9	113
GUNSIGHT PASS	9820	15.6	10.4C	150	14.3	10.6C	135
LEWIS LAKE DIVIDE	7850	26.6	25.1	106	28.3	28.4	100
LOOMIS PARK	8240	18.5	11.5	161	19.2	13.8	139
PHILLIPS BENCH	8200	25.8	19.3	134	25.7	22.4	115
SALT RIVER SUMMIT	7760	14.6	10.4	140	15.8	13.2	120
SNAKE RIVER STATION	6920	15.4	14.0	110	18.4	18.4	100
SPRING CREEK DIVIDE	9000	29.1	18.0	162	27.5	19.0	145
THUMB DIVIDE	7980	12.2	11.8	103	11.7	14.4	81
TOGWOTEE PASS	9580	25.5	17.4	147	24.3	19.1	127
TWO OCEAN PLATEAU	9240	29.5	21.3	138	-M	21.4	*
WILLOW CREEK	8380	31.0	21.9	142	31.1	26.4	118
Basin Index (%)				**136**			**116**

2/4

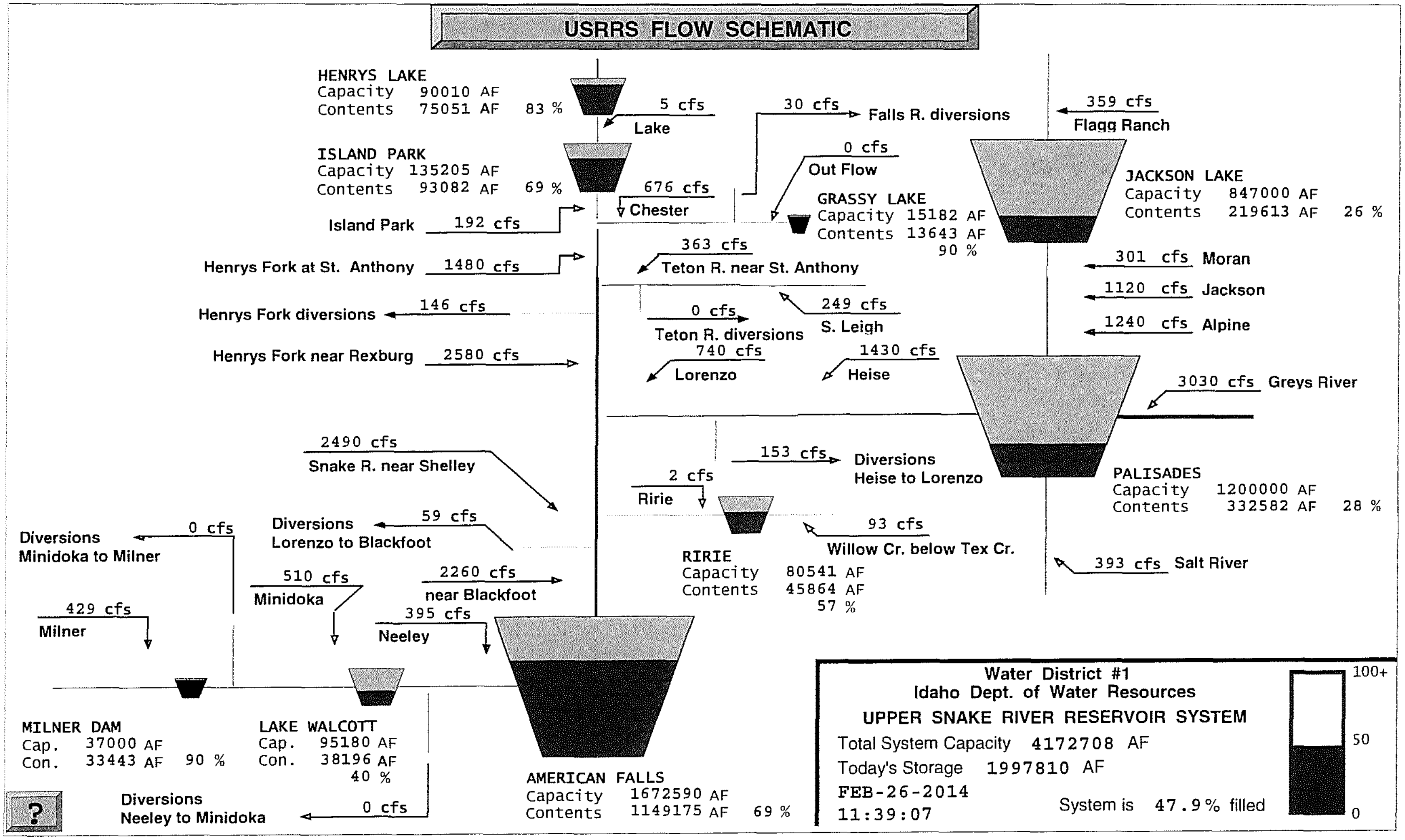
Idaho SNOTEL Snow/Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

Provisional data, subject to revision

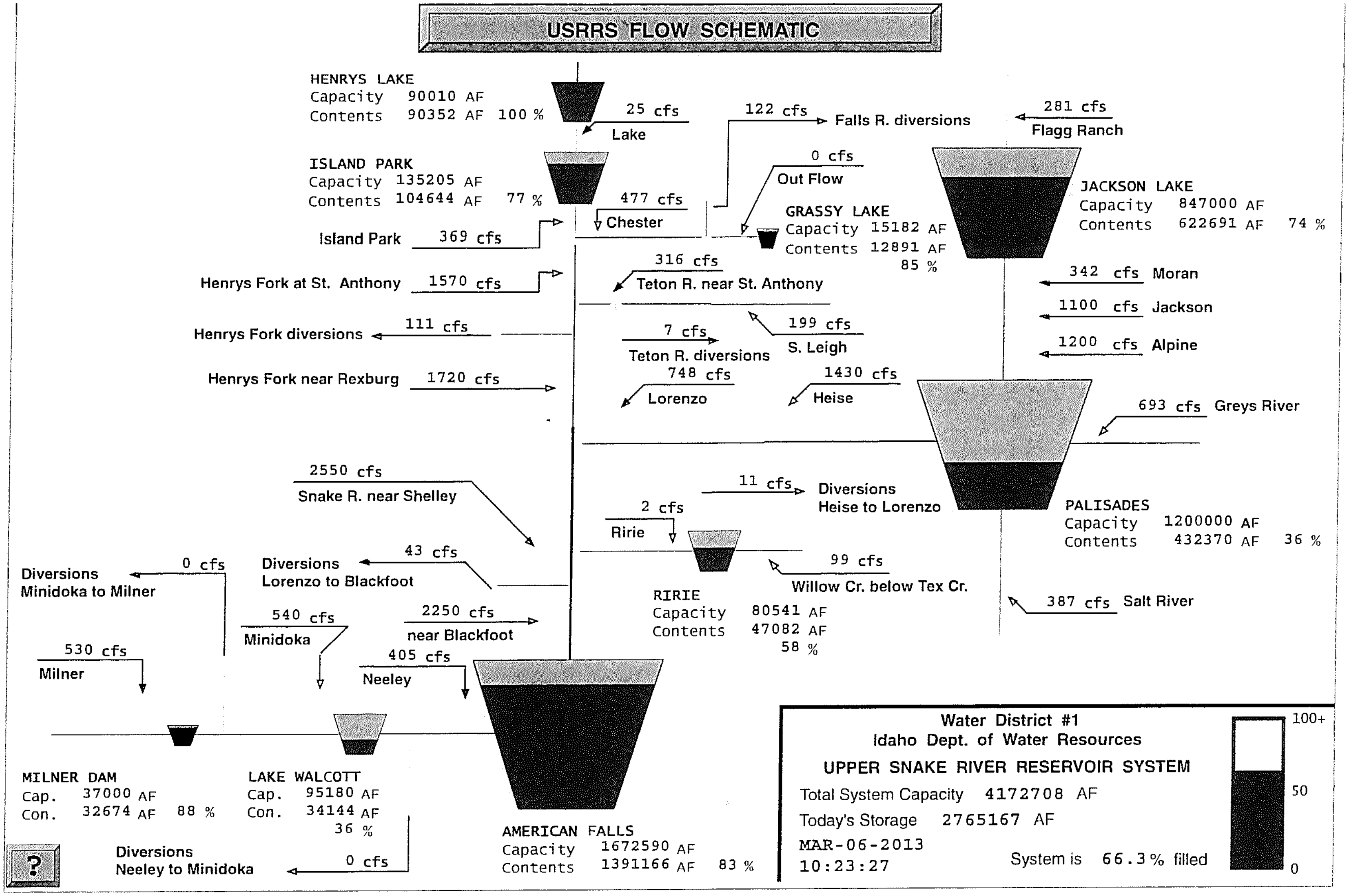
Data based on the first reading of the day (typically 00:00) for Wednesday, February 26, 2014

Basin Site Name	Elev (ft)	Snow Water Equivalent Current (in)	Snow Water Equivalent Median (in)	Snow Water Equivalent Pct of Median	Water Year-to-Date Precipitation Current (in)	Water Year-to-Date Precipitation Average (in)	Water Year-to-Date Precipitation Pct of Average
WILLOW, BLACKFOOT, PORTNEUF BASINS							
OXFORD SPRING	6740	8.7	9.5	92	10.7	13.6	79
SEDGWICK PEAK	7850	13.0	15.6	83	14.2	16.6	86
SHEEP MTN.	6570	11.0	10.9	101	11.2	13.2	85
SLUG CREEK DIVIDE	7225	16.5	11.8	140	19.6	16.5	119
SOMSEN RANCH	6800	-M	10.6	*	-M	13.4	*
WILDHORSE DIVIDE	6490	8.1	12.4	65	10.9	15.5	70
Basin Index (%)				95			88
SNAKE BASIN ABOVE AMERICAN FALLS							
BASE CAMP	7030	17.5	13.3	132	18.4	17.0	108
BLACK BEAR	8170	28.2	28.9	98	26.9	30.3	89
BLIND BULL SUM	8650	28.1	17.5	161	18.1	15.7	115
COTTONWOOD CREEK	7670	25.3	16.3	155	27.1	19.2	141
EAST RIM DIVIDE	7930	13.8	7.8	177	12.2	9.4	130
GRAND TARGHEE	9260	34.6	29.2R	118	25.9	24.5R	106
GRANITE CREEK	6770	18.2	13.4	136	18.7	16.2	115
GRASSY LAKE	7265	27.6	25.6	108	27.7	29.1	95
GROS VENTRE SUMMIT	8750	12.1	9.5	127	11.2	9.9	113
GUNSIGHT PASS	9820	15.6	10.4C	150	14.3	10.6C	135
ISLAND PARK	6290	11.4	12.1	94	11.0	14.9	74
LEWIS LAKE DIVIDE	7850	26.6	25.1	106	28.3	28.4	100
LOOMIS PARK	8240	18.5	11.5	161	19.2	13.8	139
OXFORD SPRING	6740	8.7	9.5	92	10.7	13.6	79
PHILLIPS BENCH	8200	25.8	19.3	134	25.7	22.4	115
PINE CREEK PASS	6720	15.2	12.4	123	17.8	17.1	104
SALT RIVER SUMMIT	7760	14.6	10.4	140	15.8	13.2	120
SEDGWICK PEAK	7850	13.0	15.6	83	14.2	16.6	86
SHEEP MTN.	6570	11.0	10.9	101	11.2	13.2	85
SLUG CREEK DIVIDE	7225	16.5	11.8	140	19.6	16.5	119
SNAKE RIVER STATION	6920	15.4	14.0	110	18.4	18.4	100
SOMSEN RANCH	6800	-M	10.6	*	-M	13.4	*
SPRING CREEK DIVIDE	9000	29.1	18.0	162	27.5	19.0	145
THUMB DIVIDE	7980	12.2	11.8	103	11.7	14.4	81
TOGWOTEE PASS	9580	25.5	17.4	147	24.3	19.1	127
TWO OCEAN PLATEAU	9240	29.5	21.3	138	-M	21.4	*
WHITE ELEPHANT	7710	16.8	20.3	83	17.5	23.3	75
WILDHORSE DIVIDE	6490	8.1	12.4	65	10.9	15.5	70
WILLOW CREEK	8380	31.0	21.9	142	31.1	26.4	118
Basin Index (%)				123			106



USRRS FLOW SCHEMATIC
HENRYS LAKE
Capacity 90010 AF
Contents 75051 AF 83 %
5 cfs
Lake
30 cfs
Falls R. diversions
359 cfs
Flagg Ranch
ISLAND PARK
Capacity 135205 AF
Contents 93082 AF 69 %
0 cfs
Out Flow
676 cfs
Chester
GRASSY LAKE
Capacity 15182 AF
Contents 13643 AF
90 %
JACKSON LAKE
Capacity 847000 AF
Contents 219613 AF 26 %
Island Park 192 cfs
363 cfs
Teton R. near St. Anthony
Henrys Fork at St. Anthony 1480 cfs
301 cfs Moran
1120 cfs Jackson
1240 cfs Alpine
Henrys Fork diversions 146 cfs
0 cfs
Teton R. diversions
249 cfs
S. Leigh
Henrys Fork near Rexburg 2580 cfs
740 cfs
Lorenzo
1430 cfs
Heise
3030 cfs Greys River
2490 cfs
Snake R. near Shelley
153 cfs
Diversions
Heise to Lorenzo
2 cfs
Ririe
PALISADES
Capacity 1200000 AF
Contents 332582 AF 28 %
0 cfs
Diversions
Minidoka to Milner
59 cfs
Diversions
Lorenzo to Blackfoot
93 cfs
Willow Cr. below Tex Cr.
RIRIE
Capacity 80541 AF
Contents 45864 AF
57 %
393 cfs Salt River
510 cfs
Minidoka
2260 cfs
near Blackfoot
429 cfs
Milner
395 cfs
Neeley
MILNER DAM
Cap. 37000 AF
Con. 33443 AF 90 %
LAKE WALCOTT
Cap. 95180 AF
Con. 38196 AF
40 %
AMERICAN FALLS
Capacity 1672590 AF
Contents 1149175 AF 69 %
?
Diversions
Neeley to Minidoka
0 cfs
Water District #1
Idaho Dept. of Water Resources
UPPER SNAKE RIVER RESERVOIR SYSTEM
Total System Capacity 4172708 AF
Today's Storage 1997810 AF
FEB-26-2014
11:39:07
System is 47.9 % filled
100+
50
0

3/4


USRRS FLOW SCHEMATIC
HENRYS LAKE
Capacity 90010 AF
Contents 90352 AF 100 %
25 cfs
Lake
ISLAND PARK
Capacity 135205 AF
Contents 104644 AF 77 %
477 cfs
Chester
Island Park 369 cfs
Henrys Fork at St. Anthony 1570 cfs
111 cfs
Henrys Fork diversions
Henrys Fork near Rexburg 1720 cfs
122 cfs
Falls R. diversions
0 cfs
Out Flow
GRASSY LAKE
Capacity 15182 AF
Contents 12891 AF
85 %
281 cfs
Flagg Ranch
JACKSON LAKE
Capacity 847000 AF
Contents 622691 AF 74 %
316 cfs
Teton R. near St. Anthony
7 cfs
Teton R. diversions
199 cfs
S. Leigh
748 cfs
Lorenzo
1430 cfs
Heise
342 cfs Moran
1100 cfs Jackson
1200 cfs Alpine
693 cfs Greys River
2550 cfs
Snake R. near Shelley
11 cfs
Diversions
Heise to Lorenzo
2 cfs
Ririe
PALISADES
Capacity 1200000 AF
Contents 432370 AF 36 %
43 cfs
Diversions
Lorenzo to Blackfoot
0 cfs
Diversions
Minidoka to Milner
99 cfs
Willow Cr. below Tex Cr.
RIRIE
Capacity 80541 AF
Contents 47082 AF
58 %
387 cfs Salt River
540 cfs
Minidoka
2250 cfs
near Blackfoot
530 cfs
Milner
405 cfs
Neeley
MILNER DAM
Cap. 37000 AF
Con. 32674 AF 88 %
LAKE WALCOTT
Cap. 95180 AF
Con. 34144 AF
36 %
AMERICAN FALLS
Capacity 1672590 AF
Contents 1391166 AF 83 %
?
Diversions
Neeley to Minidoka
0 cfs
Water District #1
Idaho Dept. of Water Resources
UPPER SNAKE RIVER RESERVOIR SYSTEM
Total System Capacity 4172708 AF
Today's Storage 2765167 AF
MAR-06-2013
10:23:27
System is 66.3% filled
100+
50
0

4/4

Memorandum

To: Idaho Water Resource Board

From: Helen Harrington

Re: South Fork Clearwater River Basin Plan, Crooked River Rehabilitation Project

Date: March 7, 2014

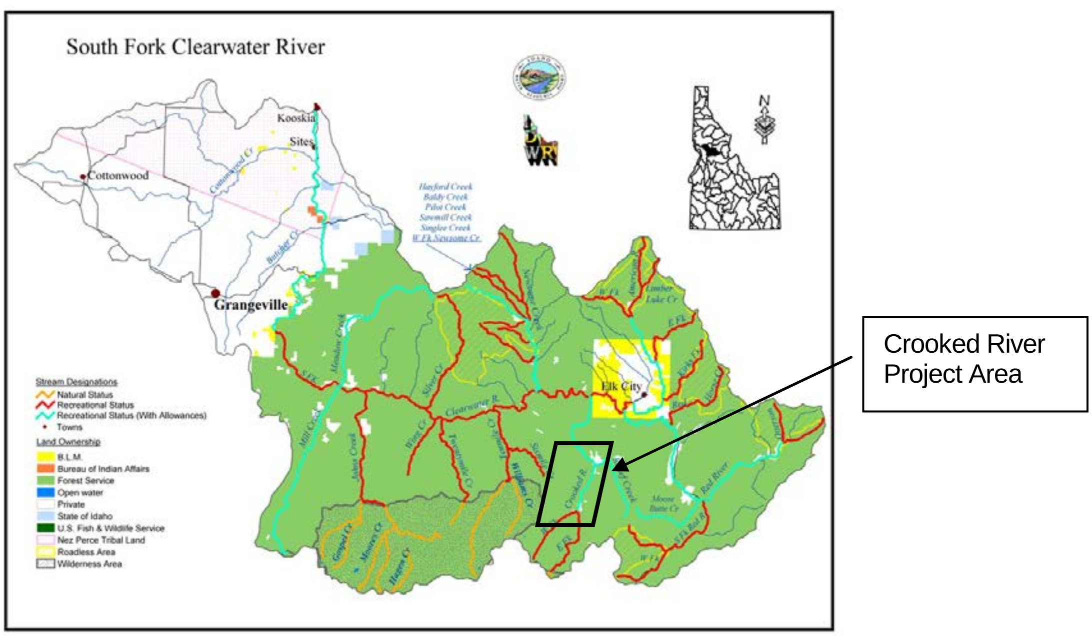
Action: Consider resolution to allow channel reconstruction project in IWRB designated Crooked River Recreational Reach

In 2004, the IWRB adopted the South Fork Clearwater Comprehensive State Water Plan, a basin component of the Idaho State Water Plan. The plan designated the Crooked River as a Recreational River in the reach from the headwaters to the confluence with the South Fork Clearwater River (11.6 miles).

The US Forest Service has proposed a stream channel reconstruction project on the Crooked River within the IWRB-designed reach. The project would involve reconstruction of the lower two miles of the Crooked River valley above the confluence with the South Fork Clearwater River by reshaping mine tailings, reconstructing the stream channel, adding stream channel complexity through large woody debris placement and replanting the valley bottom. A short summary of the project is attached, including a map showing the location of the project. The Forest Service is currently preparing an Environmental Impact Statement and is working toward a decision in September 2014. The purpose of the project is to improve habitat for Endangered Species Act-listed steelhead and bull trout, as well as spring/summer Chinook salmon and cutthroat trout. The project is developed with the Nez Perce Tribe and would be funded by Bonneville Power Administration.

On June 19, 2013, I attended an agency field tour to view the proposed project site and to discuss the IWRB designation. The Forest Service has been working with the IDWR Stream Channel Alternation Program to ensure compliance with permit requirements. Aaron Golart, IDWR Stream Channel Program Coordinator is aware of the project proposal and will work with the FS to ensure it meets IDWR Stream Channel Program permit requirements.

The designation as a Recreational River, carries with it prohibitions of specific activities, including alteration of the stream bed although there are exceptions. The Crooked River Recreational River designation contained in the South Fork Clearwater River Comprehensive State Water Plan explicitly allows for channel reconstruction projects if approved by the IWRB. Staff recommends approval of this proposed project through a resolution.



BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF THE	)	
US FOREST SERVICE	)	RESOLUTION
CROOKED RIVER REHABILITATION	)	
PROJECT	)	

WHEREAS**,** on June 9, 2004, the Idaho Water Resource Board adopted the South Fork Clearwater River Basin Comprehensive State Water Plan and the Plan specifies that alterations to stream channel for constructions and maintenance of channel reconstruction projects are allowed with approval by the Idaho Water Resource Board; and

WHEREAS, the US Forest Service has proposed a stream channel reconstruction project on the Crooked River for the purpose of improving habitat for endangered Species Act-listed steelhead and bull trout, as well as spring/summer Chinook salmon and cutthroat trout; and

WHEREAS, it has been concluded that the proposed stream channel alteration would support the intent and goals of the South Fork Clearwater River Basin Comprehensive State Water Plan; and

WHEREAS, the proposed project on the Crooked River is in the public interest.

NOW THEREFORE BE IT RESOLVED that the Board hereby approves the Crooked River Rehabilitation Project as described in the project proposal.

Dated this 21st day of March, 2014.

____
ROGER W. CHASE
Chairman

Attest: ________________________________
BOB GRAHAM
Secretary

United States Department of Agriculture
Forest Service
Nez Perce-Clearwater National Forests
Forest Supervisor's Office
903 3rd Street
Kamiah, ID 83536
Grangeville Office 208-983-1950
Orofino Office 208-476-4541

File Code: 1950/2520
Date: January 14, 2014

Roger Chase
Chairman
Idaho Water Resource Board
P.O. Box 83720
Attn: Helen Harrington
Boise, ID 83720-0098

Dear Chairman Chase:

The Nez Perce-Clearwater National Forest requests approval from the Idaho Water Resource Board to undertake a stream channel reconstruction project on the Crooked River, a tributary of the South Fork Clearwater River.

The IWRB adopted a comprehensive basin plan for the South Fork Clearwater River in 2004 and the Idaho Legislature adopted the plan in 2005. Crooked River, from its headwaters to the confluence with the South Fork Clearwater River, is designated as a Recreational River. The state designation allows for channel reconstruction projects, as approved the IWRB (page 31). The proposed project is within the designated reach of Crooked River.

This project would involve reconstruction of the lower two miles of the Crooked River valley by reshaping mine tailings, re-constructing the stream channel, adding stream channel complexity through large woody debris placement and replanting the valley bottom. A short summary of the proposed project is attached, including a map showing the location of the proposed project. The Forest is currently preparing an Environmental Impact Statement and is working toward a decision in September 2014. More detailed information about this project is available on our project website: http://www.fs.fed.us/nepa/fs-usda-pop.php/?project=40648.

The purpose of the projects is to improve habitat for Endangered Species Act-listed steelhead and bull trout, as well as spring/summer Chinook salmon and cutthroat trout. The project is developed with the Nez Perce Tribe and would be funded by the Bonneville Power Administration.

The Forest Service is working with IDWR Stream Channel Alteration Program to ensure compliance with permit requirements. The Nez Perce-Clearwater National Forest and Nez Perce Tribe will seek all appropriate permits including Section 404, 401 Certification, and stream alteration. We will also complete all necessary ESA, Heritage, and Tribal consultations.

If you have questions or would like additional information on this project, please contact Jennie Fischer at (208) 983-4048.

Sincerely,

Rick Brazell

RICK BRAZELL
Forest Supervisor

Attachment (1): Crooked River Valley Rehabilitation – Meanders Summary

Crooked River Valley Rehabilitation- Meanders Summary

During the 1930s through the 1950s, the lower two miles of the Crooked River Valley were heavily impacted by dredge mining, leaving behind large tailings piles and deep ponds. Physical changes to the valley bottom have altered stream and riparian process, and have affected aquatic and terrestrial habitat conditions, resulting in degraded ecosystem conditions relative to historical conditions.

Crooked River is a tributary to the South Fork Clearwater River; its mouth is approximately 57 miles upstream from Kooskia, Idaho and 5 miles downstream from Elk City, Idaho (Figure 1-1). It is located within the Nez Perce – Clearwater National Forests and the 1855 Treaty lands of the Nez Perce Tribe. There are parcels of private land in the project area, most resulting from patented mining claims. Most of the watershed is federally owned. The project area is shown in Figure 1, below.

The overall goal of the project is to restore habitat for Endangered Species Act-listed Snake River Basin steelhead and bull trout as well as spring/summer Chinook salmon and westslope cutthroat trout.

The Crooked River Valley Rehabilitation project objectives for the Meanders include:

- Reconnecting the river and its floodplain to restore hydrologic function
- Creating conditions for higher quality, connected wetlands
- Creating more natural stream sinuosity and morphology
- Returning sediment transport processes and functions to a more natural, system in equilibrium
- Constructing in-river habitat to provide spawning and rearing for steelhead and bull trout, as well as spring/summer Chinook salmon and westslope cutthroat trout
- Reducing temperature through connection of surface water and groundwater and increasing shade along all water in the valley
- Re-vegetating the valley bottom with native riparian grasses, forbs, shrubs and trees
- Maintaining recreational opportunities within valley

The proposed project was developed in coordination with Nez Perce Tribe, Watershed Division, and the Nez Perce – Clearwater National Forests. Over the past 25-30 years, many iterations of restoration in the valley bottom have been planned and some realized. Monitoring and observations of past restoration helped shape the proposed project.

The following is a summary of the current conditions of the project area and the proposed project with the desired future condition. More information can be found in Crooked River Valley Rehabilitation Design Criteria Report (RDG et al 2012), Crooked River Valley Rehabilitation Final Design Report (RDG et al 2013), Crooked River Valley Rehabilitation Project Wetland Delineation Report (Geum Environmental Consulting Inc. 2012), and the Crooked River Valley Rehabilitation 95% Designs (RDG et al 2013). These documents are available upon request.

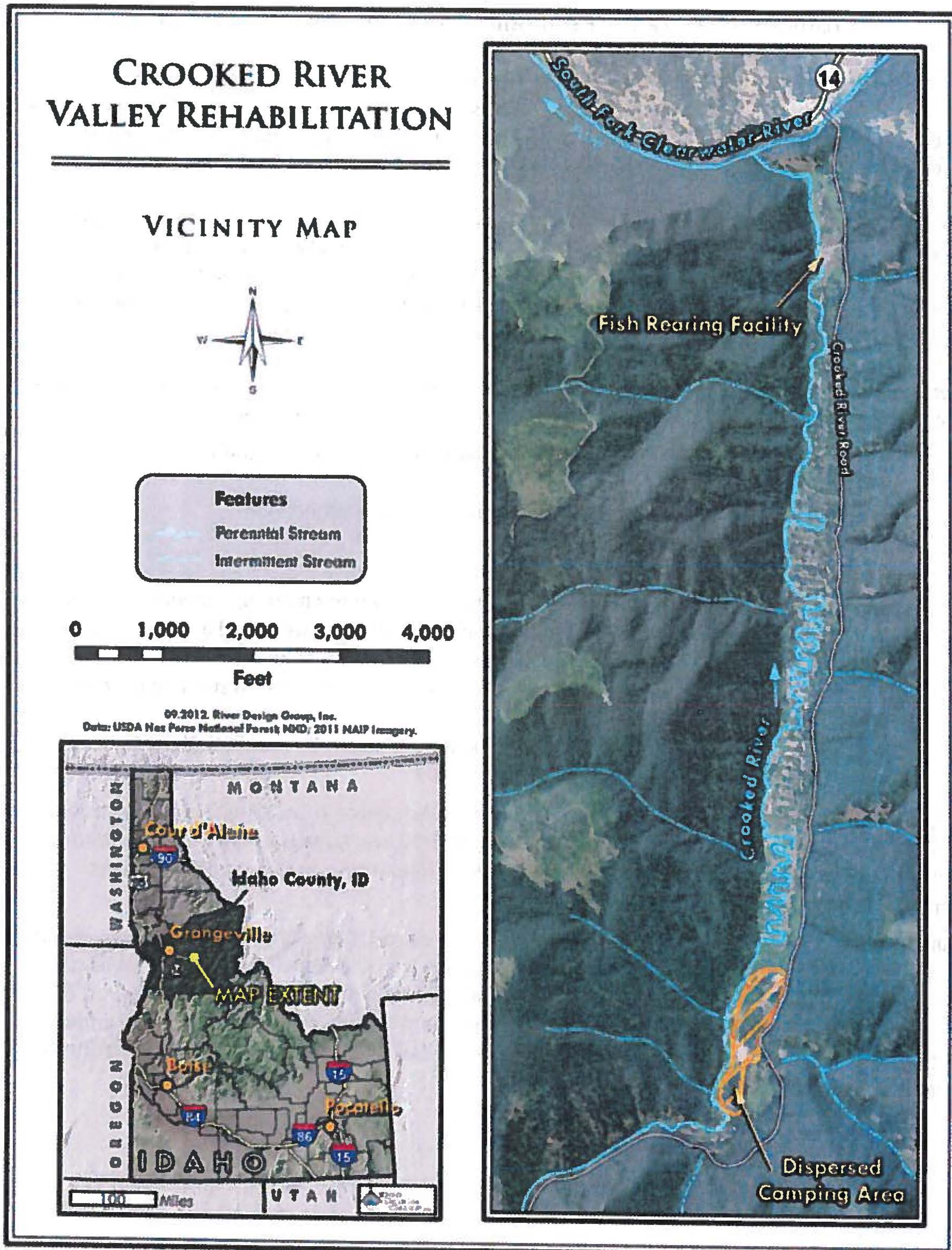


Figure 1. Vicinity map of the Crooked River Meanders project.

The proposed project will rehabilitate approximately 115 acres of floodplain by moving dredge tailings, reconstructing approximately 7,400 feet of new stream channel, installing woody bank treatments, constructing more than 2,700 feet of side channels, creating conditions for 64 acres of wetlands, and replanting the valley bottom with native plant communities. This includes 190,000 cubic yards of earthwork, 58 in-river large woody debris structures and 54 acres of floodplain roughness treatments.

Primary elements of the project developed to meet the objectives include:

- Salvaging existing material onsite (trees, brush, rocks, etc.) to use in the new channel and floodplain.
- Constructing a temporary bypass channel to provide fish passage during construction.
- Constructing a temporary access route in the project area to reduce the impact to Road 233.
- Creating stream morphology features, including stream slope, meanders, and pool/riffle ratios that provide quality habitat for fish and allow for a more natural hydrologic function to maintain these features in the future.
- Balancing earthwork quantities to maximize bankfull floodplain area by filling in tailings ponds and developing a sloped valley bottom along the east edge of the project area without removing material from the project area.
- Stabilizing newly constructed streambanks using woody material and brush.
- Creating areas that would support wetland development over time.
- Re-vegetating the floodplain with native vegetation and maintain for several years after project completion through replanting and protection from browse.

The following provides a summary of the current conditions of the project area, including the channel morphology and floodplain function, hydrology, vegetation, water quality, and fisheries. A full description of the proposed future condition expected from implementing the Crooked River Meanders project follows the current condition section.

Current Conditions

Channel Morphology

The current stream channel morphology exhibits an exaggerated sinuosity (1.2 – 2.7), a reduced slope (0.0036-0.0086), and a highly entrenched (1.7-2.5) and overly wide channel (width to depth ratio of 24-36.4). As shown in the photo below, the river channel has 90 degree angles (Figure 2). There are large pools, typically located on the 90 degree bends. These pools offer little overhead cover. The riffle:pool ratio in the project area is 40:60, which is generally opposite of what is necessary to provide appropriate sediment routing and rearing habitat for juvenile fish.

Figure 2. Aerial photo of Crooked River (USFS 1987).

Floodplain Function

The channel-floodplain interaction has been greatly altered by the distribution of the dredge tailings and ponds in the valley bottom. The river is entrenched and only 30% of the 115 acres of valley bottom are suitable for riparian vegetation due to the disconnection of the river to the floodplain (Figure 3). The disconnection of river and floodplain has greatly altered the hydrologic function of the watershed and limited the desired vegetation.

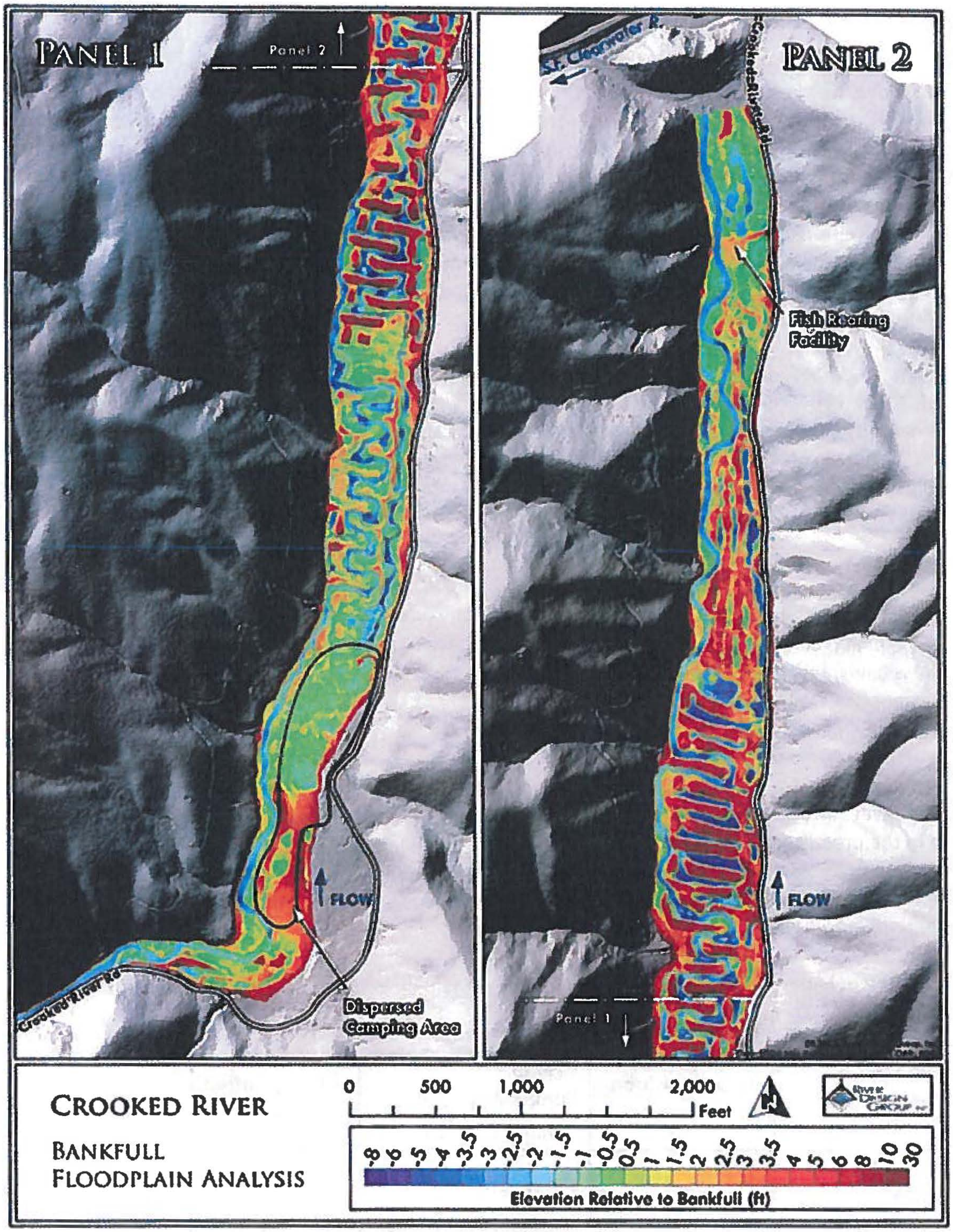


Figure 3. Elevation of the floodplain relative to field surveyed bankfull indicators (RDG et al 2012).

Hydrology

River Design Group was contracted in 2012, to evaluate the current hydrologic conditions of the project area. Flows were estimated by looking at the Idaho regression equation for Region 4 based on drainage area and means as well as bankfull indicators. The regression equations were tracked with other local watersheds with stream gages. The watersheds were all found to exhibit a classic snowmelt driven hydrograph of a rising limb between March and May with a descending limb lasting a couple of months. Bankfull indicators, as measured in the field, however, indicate that Crooked River hydrology behaves more like a spring fed creek with a truncated peak flow regime in the spring. Based on the regression analysis, bankfull flows should be about 600 cfs. Bankfull indicators indicate that the Q_2 is approximately 300 cfs. The flows are truncated due to the porosity of the tailings piles and the ponds throughout the valley bottom.

The truncated peak flows coupled with a very low gradient limits the substrate sorting in the project area. Channel hydraulics and surficial particle size distributions were used to make estimates of particle size mobility (RDG et al 2012). Results show that the 500-year flow return interval is necessary to move even the small cobbles throughout the project area. Flow regimes have left most of the project area void of appropriate sized spawning gravels and flows are unable to clean interstitial spaces in cobbles necessary for overwinter habitat for ESA-listed fish.

Vegetation

Vegetation cross sections and greenline transects were used to document vegetation communities in the project area (RDG et al 2012). The current vegetation community in the project area is an early seral, lodgepole pine community. Because of the lack of depositional areas in the project area, woody species, such as willows, red osier dogwood and alders are lacking, even along the river channel. Reed canarygrass is prolific in the southern end of the project area and can be found throughout the valley bottom. Conifers are found on the dredge tailings; however, the trees are found at the top of the piles (approximately 15 feet above the stream) and provide little to no shade over the water. Solar pathfinder data indicates that only 28% of the vegetation in the project area provides shading to Crooked River. Table 1, below provides the percent composition of each vegetation community type found in the project area and Figure 4 depicts the area and location of each community type. More information on the current vegetative condition can be found in Crooked River Valley Rehabilitation Design Criteria Report (RDG et al 2012) and the Crooked River Valley Rehabilitation Project Wetland Delineation Report (Geum 2012).

Table 1. Percent composition of vegetation community type in the Crooked River Meanders (Geum 2012).

Vegetation Community Type	% Composition	Vegetation Community Type	% Composition
Alder	1.8	Conifer/Tall forb	11.1
Mesic Forb Meadow	8.2	Dredge- Conifer	30
Bare colonizing	1.1	Dredge- Herbaceaous	4.6
Reed canarygrass	16.4	Sedge	8.5
Cattail	0.3	Spruce	18

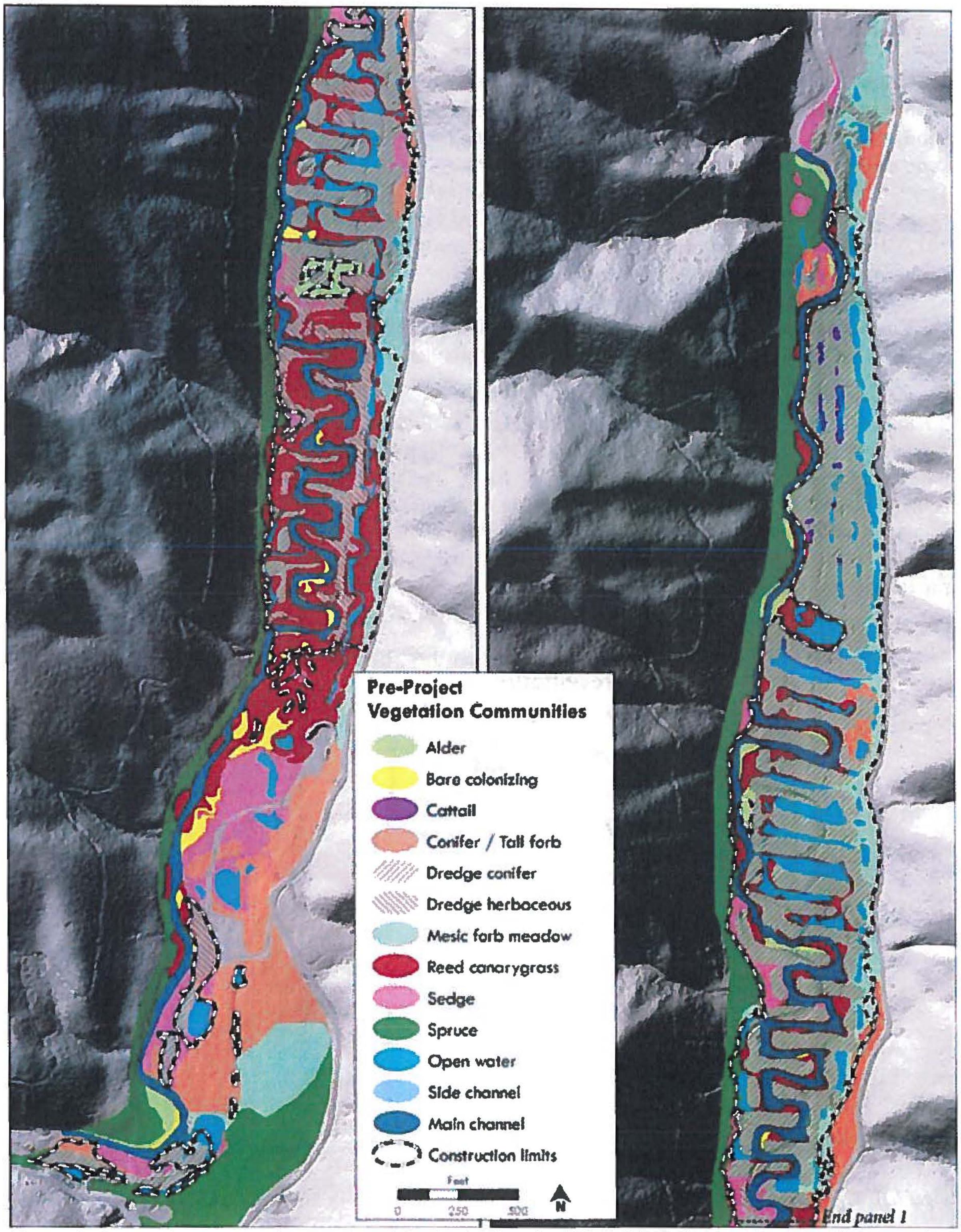


Figure 4. Pre-project vegetation communities in the Crooked River Meanders project area (RDG et al 2012).

Water Quality

Mine tailing have potential issues with soil and water contamination from heavy metals, and mercury is typically the heavy metal of concern. Although mercury was not used in dredge mining in the upper South Fork Clearwater, there is a small potential to find this element during restoration activities. Past geochemistry studies, including the *Crooked River Stream Survey and In-Situ Toxicity Results* (Baldigo 1986), *Water Quality Status Report 80: Crooked River* (Mann and Lindern 1988), and *Idaho Champion Group Lode and Pacific Group Load Claims: Preliminary Assessment and Site Inspection Report* (IDEQ 2011), have all shown that concentrations of heavy metals in both soil and water are generally equivalent to background levels or below detection limits. Recent heavy metals monitoring data collected within the Meanders project area in 2013, by the Nez Perce Tribe did not exceed cold water biota water quality standards (Nez Perce Tribe 2013 unpublished data). Based on these studies, mercury levels are not considered to be a water quality issue in the project area.

Temperature data were collected in the mainstem of Crooked River and Relief Creek between June 6, 2013, and October 10, 2013. Data were collected at six locations from below the confluence of the East and West Forks of Crooked River (upstream of Orogrande) to the IDFG weir intake structure near the mouth as shown in Figure 5. HOBO Water Temp Pro v2 data loggers were installed in the stream by cabling to a tree or shrub on the bank and setting large rocks on the cable in ensure the loggers remained submerged. Locations were selected to capture the main influences to temperature for the Meanders project area. Microsites were selected to be inconspicuous, stable, and deep enough to maintain water through the low flow season.

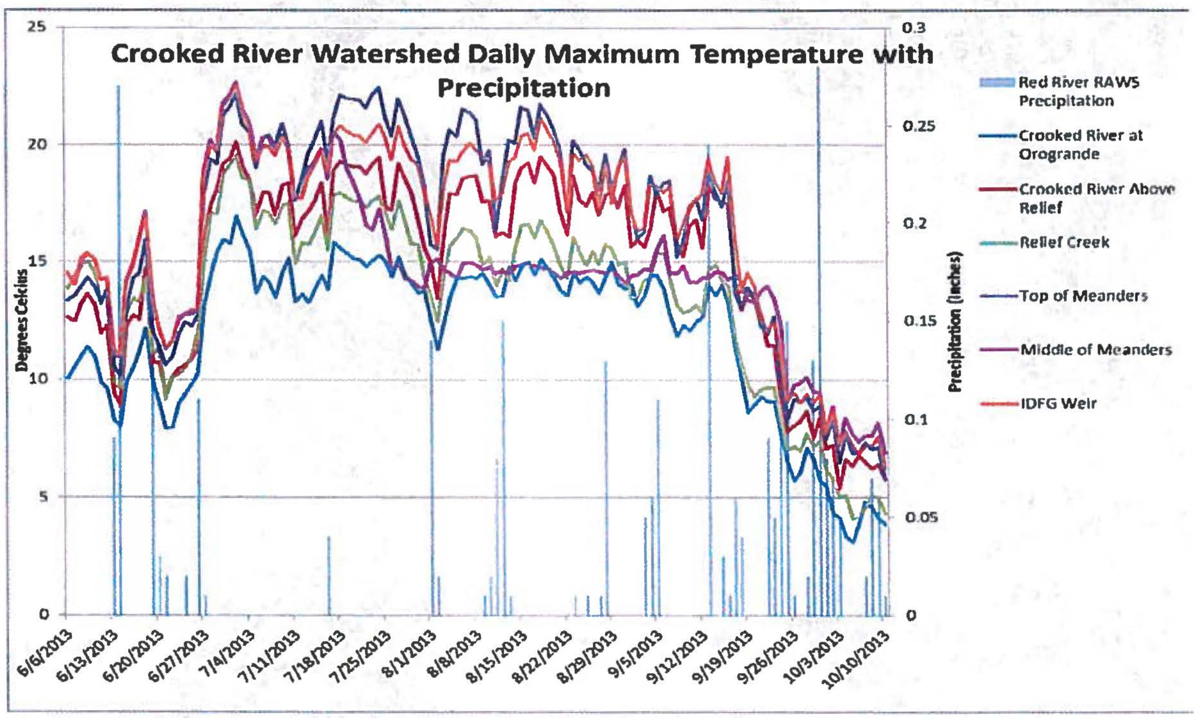


Figure 5. Daily maximum water temperatures in Crooked River from June 6, 2013, to October 10, 2013.

Proposed Project and Desired Future Conditions

Channel Morphology

The new channel was specifically designed to meet aquatic habitat objectives for Snake River Basin steelhead, spring/summer Chinook salmon, bull trout and westslope cutthroat trout. The criteria provided included hydraulic complexity to support fish rearing and migration, woody cover for instream complexity, substrate size suitable for spawning, backwater areas to support juvenile rearing, high flow refugia, and reduced water temperatures from groundwater/surface-water interaction, shade, and lower width to depth ratios.

Approximate 2.6 miles of new channel will be constructed under the proposed project. The new channel will be constructed to exhibit a more natural riffle pool morphology, slope and sinuosity (Table 2). This new morphology will support pool development processes and a mobile gravel bed, which are currently lacking in the project area. The new channel will support sustainable habitat conditions by maintaining sediment transport continuity through the project area and will be able to respond to changes in watershed hydrology resulting from disturbance and flow attenuation. Large woody debris will be increased from approximately 3-7 pieces per 100 meters to over 100 pieces per 100 meters. Over 2,700 linear feet of side channels will be constructed to provide high flow refugia and juvenile rearing areas.

Table 2. Comparison of channel morphology pre- and post- project.

Indicator	Current Condition	Proposed Condition
Geomorphology		
- Channel entrenchment ratio	1.6–2.9	10.0–12.5
- Channel entrenchment	Moderate	Slight
- Channel width-to-depth ratio	17.0–31.0	25.0–32.0
- Channel sinuosity	2.2–2.7	1.2–1.6
- Sediment transport/bed mobility	Maintain current mobility	Increased mobility of gravel and cobble particle sizes
Pool Quality and Quantity		
- Pool:riffle ratio	63:37	40:60
- LWD input	LWD input limited	LWD input improved
- Entrenchment	1.7–2.5	3–10
Habitat Features		
- Large woody debris	2–5 pieces/100 m	100+ pieces/100 m
- Spawning habitat	<2 acres	3.5 acres
- Rearing habitat	2.45 acres (poor quality)	1.94 acres (high quality)

Floodplain Function

Up to 115 acres of valley bottom (dredge tailing piles and ponds) will be re-graded to provide connectivity of the river channel to the floodplain. The new floodplain will include a variety of geomorphic surfaces including a defined main channel, point bars, bankfull floodplain, side channels and depression features (alcoves and swales) with the bankfull floodplain being the dominate feature. The bankfull floodplain is designed to be inundated on a 1.5 year flood return interval. The upland floodplain is designed to flood at a 25-year interval. The secondary floodplain features, which are the side channels and depression features, will be inundated at bankfull or less.

Reconstructing the valley bottom will fill approximately 53 acres of wetland. Many of these wetlands have been classified as emergent palustrine wetlands. About 64 acres of wetland will be reconstructed, most of which will be a shrub-scrub type wetland. A full wetland inventory of the project area was complete in 2012, by Geum Environmental Consulting Inc. and is available. Table 3 provides a comparison of floodplain functions pre- and post-project.

Table 3. Comparison of estimated floodplain functions pre- and post-project (RDG et al 2013).

Ecological Function	Pre-Project	Post-Project	Change
Streambank stability index[1]	8.5	6.6	-1.9
Percent of area composed of undisturbed vegetation communities[1]	50%	88%	+41%
Wetland area	52.6 acres	64.1 acres	+11.5
Floodplain connectivity[2]	50.2 acres	67.2 acres	+17.0
Natural recruitment[3]	3.1 acres	35.2 acres	+32.1
Streambank shading[4]	31.8%	83.2%	+51.4%

[1] Streambank stability index based on percent composition of vegetation community types from Appendix B of Winward (2000).
[2] Acres of vegetation located within approximately 1 foot above bankfull or lower. Estimates include alter and bare colonizing vegetation communities.
[3] Vegetation communities with elevation, geomorphic location, and substrate suitable for natural recruitment of woody vegetation.
[4] Percent of channel length expected to support woody vegetation.

Hydrology

The new stream channel was designed for a bankfull ($Q_{1.1}$) of 300 cfs (Table 4). The sinuosity of the new channel will be reduced which will result in higher water velocities and sediment transport capacity. Increasing water velocity coupled with increased instream complexity (large woody debris and riffle:pool sequencing), would improve stream's ability to maintain pool quality, as well as clean gravels and intestinal spaces critical to ESA-listed fish.

Table 4. Estimated stream discharge for the proposed Crooked River Meanders project.

Recurrence Interval (years)	Discharge (cfs)
Baseflow	50
1.1 Bankfull	300
2	597
10	1,061
25	1,316
100	1,688

Vegetation

The new valley bottom will be re-vegetated using 1 to 8-gallon sized plants as well as sedge and rush plugs. Areas in the valley bottom have been identified as preservation areas; meaning the vegetation community is Alder, spruce, willows, dogwood, cottonwoods and native grasses and sedges will be used to re-vegetate the new floodplain. River Design Group et al (2013) provided a comparison of the current vegetation community found in the lower Crooked River with the proposed vegetation condition (Table 5, Figure 6). The community type will change from a predominantly dredge-conifer/reed canarygrass community type to an alder/spruce community type.

Table 5. Comparison of current vegetation communities and post-project vegetation communities.

Vegetation Community	Current Condition	Proposed Condition	% Change
Alder	1.9	33.5	32.1
Bare colonizing	1.2	1.7	0.5
Cattail	0.3	0	-0.3
Conifer/Tall forb	11.9	10.3	-1.6
Dredge conifer	31.7	2.2	-29.5
Dredge herbaceous	5.1	0.2	-4.9
Mesic forb meadow	10.1	7.8	-2.3
Mixed shrub	0	0.3	0.3
Reed canarygrass	17.6	4.6	-13
Sedge	8	6.4	-1.6
Spruce	19.3	44.8	25.5

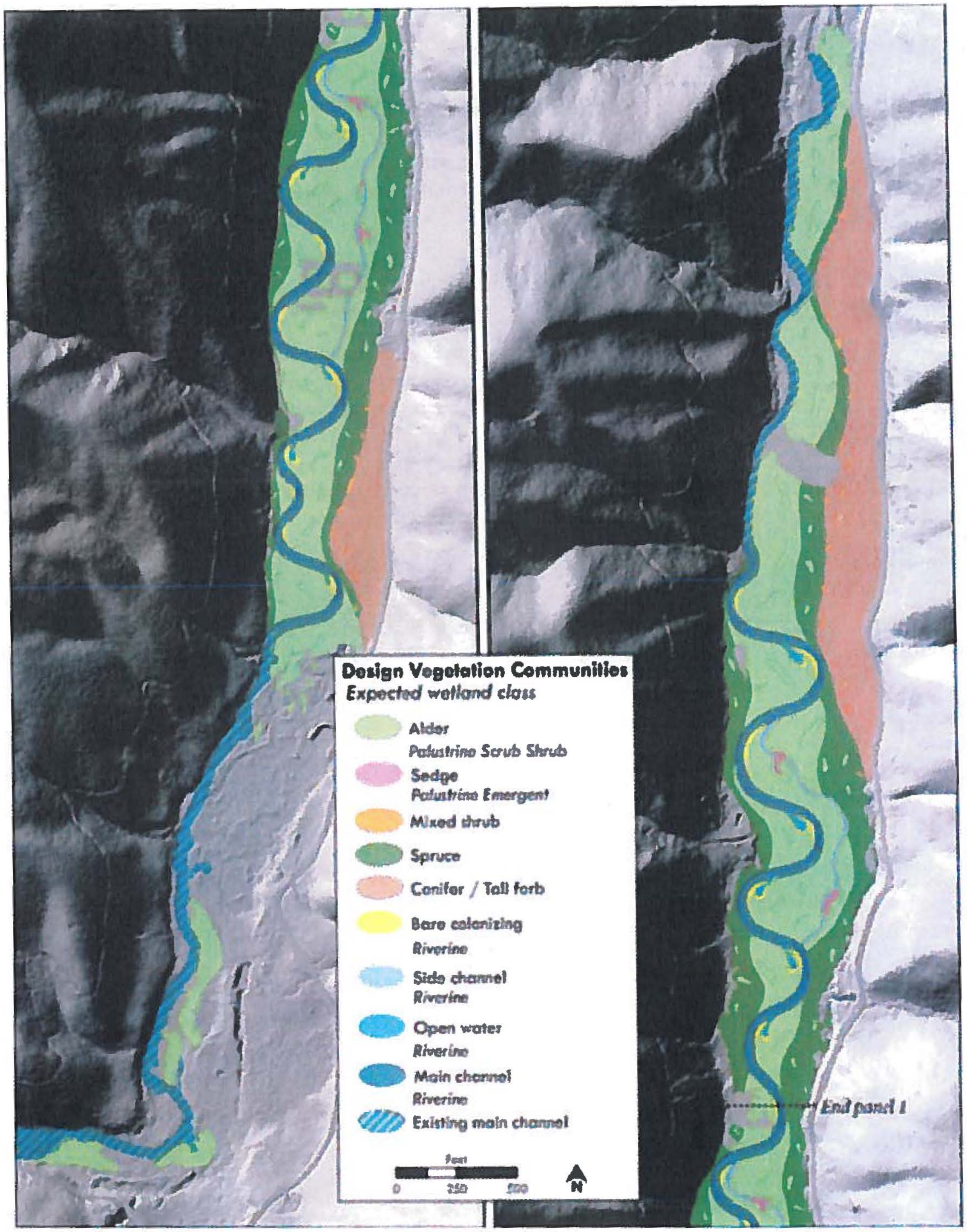


Figure 6. Post-project vegetation communities.

Water Quality

Implementing the Crooked River Meanders Rehabilitation project will impact water quality during construction and for a short period post-construction. Project implementation will result in increased turbidity levels during construction. The following mitigation measures will be applied to reduce turbidity and suspended sediment:

- Complete ground-disturbing activities during low-flow conditions. Adjust instream work dates site-specifically through coordination with the Central Idaho Level 1 team and other agencies.
- Install silt fences, straw bales, and/or sand bag windrows as needed before excavation occurs to separate the disturbed areas from the live water and prevent eroded soil from entering the stream channel. Stabilize any road cuts, fills, and treads with a cover of annual rye and/or mulch where roads would remain for more than 1 year.
- Grade and shape all disturbed sites to allow drainage. Seed disturbed sites as needed immediately upon completion of work in that area. Replant any small trees excavated from the work sites on the rehabilitated disturbed areas to help stabilize the soils.
- Stop work if erosion or saturated soil conditions exist at the work site. Resume work when erosion is mitigated or saturated conditions subside.
- Apply the State of Idaho Best Management Practices and Forest Service Soil and Water Conservation Practices (IDL 2013; USDA Forest Service 1988b and 2012).
- Obtain and comply with all appropriate permits prior to ground-disturbing activities (such as Joint Application for Stream Alteration Permit [Clean Water Act Section 404], 401 Water Quality Certification, National Pollutant Discharge Elimination System or Storm Water Discharge Permit). Adjust any mitigation or monitoring through coordination with regulatory agencies.
- Conserve plants and active soil materials for re-use in valley and roadside reclamation and upland restoration activities.
- Secure side-slopes after construction activities using onsite materials where available, including natural mulch from residual vegetation slash, chipping/masticated material, and/or transplanted trees and shrubs.

The potential to impact water quality from other sources, such as oil and lubricants, will be mitigation through the following measures:

- Thoroughly wash and inspect all equipment used in stream restoration activities before it enters the Nez Perce – Clearwater National Forests to help prevent the introduction of chemicals to the site. Keep all equipment in a well-maintained condition to minimize the likelihood of a fluid leak.
- Stage all construction equipment in a location and manner to minimize air, soil, and water pollution.
- Require a spill prevention and control plan that is approved by the Forest Service contracting officer representative for handling and storage of petroleum products. Keep any storage of petroleum products in excess of 200 gallons within constructed containment structures that have an impervious liner with a capacity equal to or larger than the storage container. Locate the containment structure at least 150 feet from live water. Before being used within 300 feet

of the stream reconstruction site, inspect all heavy equipment or other machinery for hydraulic leaks or other leaks. Do not use leaking or faulty equipment. Clean equipment that has accumulations of oil, grease, or other toxic materials prior to use in these areas. Do not permit disposal of petroleum products on national forest land.

- Fuel and lubricate at least 150 feet from all waterbodies. Service and refuel in a manner that avoids spills and overfills.
- Require a pollution and erosion control plan, approved by the Forest Service contracting officer representative, prior to commencing construction activities. Ensure that erosion control measures are in place before construction or staging of erodible materials begins.
- Stage sanitary facilities such as chemical toilets at least 150 feet from waterbodies to prevent contamination of surface or subsurface water.

There could be short term impacts to stream temperature. Although scant riparian vegetation exists that contributes shading to surface waters, there is a potential to increase stream temperatures once vegetation is removed from the valley bottom. However, the proposed project will improve surface groundwater interactions, reduce holding in the ponds, which increases the area of surface water exposed to solar radiation, reconnect groundwater connection with hillslope subsurface water, and reduce width to depth ratios. Planting riparian vegetation will reduce solar radiation to surface waters in the long-term, while stream channel reconstruction should improve stream temperatures in the short-term. In the long-term, reconstructing and replanting the project area will result in reduced stream temperatures and will meet the TMDL objectives of increasing shade potential by greater than 24% in the Crooked River watershed.

Conclusion

The project will provide a benefit to fish by reducing stream temperatures, providing higher quality and quantity spawning and rearing habitat, and increasing allocthonous inputs through increased riparian vegetation. Hydrologic functions will be provided by re-connecting the river channel to the floodplain, restoring proper wetland functions, and reconnecting groundwater and surface water interactions. There may be short-term impacts of increased turbidity and water temperatures; however, the long-term benefits to fish habitat greatly outweigh these short term impacts.

References

Baldigo, B. P. 1986. *Crooked River Stream Survey and* In–Situ *Toxicity Results*. EPA Contract 68-03-3249, Lockheed Engineering and Management Services Company, Inc. Las Vegas, Nevada. 16 pp.

Geum Environmental Consulting. 2012. *Crooked River Valley Rehabilitation Project Wetland Delineation Report.* Hamilton, MT. Prepared for Nez Perce – Clearwater National Forests, Grangeville, ID. 166 pp.

Idaho Department of Environmental Quality (IDEQ). 1987. *Water Quality Status Report No. 80*: Crooked River, Idaho County, Idaho. Lewiston, ID.

Idaho Department of Environmental Quality (IDEQ). 2011. *Idaho Champion Group Lode and Pacific Group Lode Claims; Preliminary Assessment and Site Inspection Report*. Grangeville, ID.

Mann, H. and P. Von Lindern. 1988. *Water Quality Status Report No. 80 for Crooked River, Idaho County, ID.* Prepared for Idaho Department of Health & Welfare, Division of Environmental Quality, Water Quality Bureau. Boise, ID. 39 pp.

River Design Group, Geum Environmental Consulting, Inc., and TerraGraphics Environmental Engineering, Inc. 2012. *Crooked River Valley Rehabilitation Design Criteria Report*. Hamilton, MT.

River Design Group, Geum Environmental Consulting, Inc., and TerraGraphics Environmental Engineering, Inc. 2013, *Crooked River Valley Rehabilitation Final Design Report*. Hamilton, MT.

MEMO

To: Idaho Water Resource Board
From: Brian W. Patton
Subject: Water Resource Projects Funding Program Status Report
Date: March 12, 2014

As of **December 1st** the IWRB's available and committed balances in the Revolving Development Account, Water Management Account, and the Secondary Aquifer Management Account are as follows.

Revolving Development Account (main fund)		
Committed but not disbursed		
Loans for water projects	$4,358,503	
Water storage studies	1,555,198	
Total committed but not disbursed		5,913,701
Loan principal outstanding		8,707,666
Uncommitted balance		2,917,053
Estimated revenues next 12 months		2,300,000
Commitments from revenues next 12 months		0
Estimated uncommitted funds over next 12 months		5,217,053
Rev. Dev. Acct. ESPA Sub-Account		
Committed but not disbursed		
CREP	2,419,581	
Aquifer recharge	343,494	
Bell Rapids	361,620	
Palisades storage	10,000	
Black Canyon Exchange	529,445	
Loan for water project	250,000	
Total committed but not disbursed		$3,914,140
Loan principal outstanding		321,316
Uncommitted balance		149,491
Estimated revenues next 12 months		172,000
Commitments from revenues over next 12 months		0
Estimated uncommitted funds over next 12 months		321,491
Rev. Dev. Acct. Bell Rapids Sub-Account		
Committed but not disbursed (finance costs)		$180,180
Estimated revenues next 12 months *(1)*		2,000
Commitments from revenues over next 12 months		2,000
Estimated uncommitted funds over next 12 months		0
Rev. Dev. Acct. Water Supply Bank Sub-Account		
Committed but not disbursed (payments to owners)		$516,723
Estimated revenues next 12 months *(1)*		1,000
Commitments from revenues over next 12 months		516,724
Estimated uncommitted funds over next 12 months		1,000
Rev. Dev. Acct. Dworshak Hydropower (2)		
Committed but not disbursed (repair fund, etc.)		$1,337,151

Estimated revenues next 12 months *(3)*	200,000
Commitments from revenues over next 12 months	200,000
Estimated uncommitted funds over next 12 months	0

Rev. Dev. Acct. Treasure Valley & Rathdrum Prairie CAMP Sub-Account

Committed but not disbursed	$90,000
Reserved for RP and TV CAMP projects	178,745
Estimated revenues next 12 months (5)	200,000
Estimated uncommitted funds over next 12 months	0

Rev. Dev. Acct. Pristine Springs Sub-Account

Committed but not disbursed

Repair fund	$1,177,428	
ESPA CAMP		0 (to be transferred to Secondary Aquifer Fund)

Total committed but not disbursed	$1,777,428
Loan principal outstanding	7,127,940
Uncommitted balance	0
Estimated revenues next 12 months	800,000
Commitments from revenues over next 12 months	800,000
Estimated uncommitted funds over next 12 months	0

Rev. Dev. Acct. Upper Salmon/CBWTP Sub-Account

Committed but not disbursed (Upper Salmon flow enhancement/reconnect projects)	$2,568,481
Estimated revenues next 12 months *(4)*	30,000
Commitments from revenues over next 12 months	30,000
Estimated uncommitted funds over next 12 months	0

Water Management Account

Committed but not disbursed:	$111,376
Loan principal outstanding	201
Uncommitted balance	9,666
Estimated revenues next 12 months	201
Commitments from revenues over next 12 months	0
Estimated uncommitted funds over next 12 months	$9,867

Secondary Aquifer Management Fund

Committed but not disbursed:	$1,603,124
Uncommitted balance	2,509,124
Estimated revenues next 12 months	716,000
Commitments from revenues over next 12 months	0
Estimated uncommitted funds over next 12 months	3,225,124

Total committed but not disbursed	**$17,591,049**
Total loan principal outstanding	**16,166,588**
Total uncommitted balance	**5,586,032**
Total estimated uncommitted funds over next 12 months	**8,773,535**

(1) Exclusive of pass-through payments made by the U.S. Bureau of Reclamation.

(2) Excess funds generated by the Dworshak Hydropower Project are deposited into the Revolving Development Account (Main Fund) on a monthly basis. To the date of this report this has totaled $2,540,100.

(3) This line item includes power sales and interest income after removing debt service. Debt service is paid prior to the funds being deposited in the Revolving Development Account.

(4) Exclusive of project funds provided by Bonneville Power Administration or federal appropriation sources. These funds are provided to the Board based on individual project proposals and so are not included in the income projection.

The following loans have been paid in full:

- Powder Valley-Shadowbrook Homeowners Association has repaid its $201,500 loan used to connect into the City of Driggs municipal water supply.
- City of Butte City has repaid its $7,425 loan for water system improvements.

The following is a list of potential loans that we know about:

Potential Applicant	Potential Project	Preliminary Loan Amount	Comment
Northside Pumping Company	Rebuild pump plant and rehab system	$1 million	Project in planning and design. Applying for NRCS cost share grants
Brialsford Ditch Company	Repair canal breach	$200,000	
Raft River Ground Water District	Ground water-to-surface water conversion pipeline	$2 million	Project in planning and design. Applying for NRCS cost share grants.
Marysville Irrigation Company/North Fremont	Gravity pipeline system – next phase	$1.5 million	Project in planning and design. Applying for NRCS cost share grants

IDAHO WATER RESOURCE BOARD
Sources and Applications of Funds
as of November 30, 2013
REVOLVING DEVELOPMENT ACCOUNT

Original Appropriation (1969)		$500,000.00
Legislative Audits		($49,404.45)
IWRB Bond Program		($15,000.00)
Legislative Appropriation FY90-91		$250,000.00
Legislative Appropriation FY91-92		$280,700.00
Legislative Appropriation FY93-94		$500,000.00
IWRB Studies and Projects		($249,067.18)
Loan Interest		$6,493,876.88
Interest Earned State Treasury (Transferred)		$1,624,902.76
Filing Fee Balance		$47,640.20
Bond Fees		$1,469,601.45
Arbitrage Calculation Fees		($12,000.00)
Protest Fees		($375.00)
Series 2000 (Caldwell/New York) Pooled Bond Issuers fees		$43,657.93
2012 Ground Water District Bond Issuer fees		$377,000.00
Bond Issuer fees		$48,774.09
Attorney fees for Jughandle LID		($3,600.00)
Water Supply Bank Receipts		$3,434,816.56
Legislative Appropriation FY01		$200,000.00
Pierce Well Easement		$2,000.00
Transferred to/from Water Management Account		$317,253.80
Legislative Appropriation 2004, HB843		$500,000.00
Legislative Appropriation 2009, SB 1511 Sec 2, Teton/Minidoka Studies		$1,800,000.00
Legislative Appropriation 2009, SB 1511 Sec 2, Teton/Minidoka Studies Expenditures		($1,221,960.18)
Weiser Galloway Study - US Army Corps of Engineers		($1,345,225.70)
Boise River Storage Feasibility Study		($24,585.07)
Bell Rapids Water Rights Sub-Account		
Legislative Appropriation 2005, HB392	$21,300,000.00	
Interest Earned State Treasury	$692,320.58	
Bell Rapids Purchase	($16,006,558.00)	
Bureau of Reclamation Principal Amount Lease Payment Paid	$8,294,337.54	
Bureau of Reclamation Interest Paid	$179,727.97	
Bureau of Reclamation Remaining Amount Lease Payment Paid	$9,142,649.54	
First Installment Payment to Bell Rapids	($1,313,236.00)	
Second Installment Payment to Bell Rapids	($1,313,236.00)	
Third Installment Payment to Bell Rapids	($1,313,236.00)	
Fourth Installment Payment to Bell Rapids	($1,040,431.55)	
Interest Credit due to Bureau of Reclamation (Part of Fourth Installment)	($19,860.45)	
Fifth Installment Payment to Bell Rapids	($1,055,000.00)	
Transfer to General Fund - Principal	($21,300,000.00)	
Transfer to General Fund - Interest	($772,052.06)	
BOR payment for Bell Rapids	$1,040,431.55	
BOR payment for Bell Rapids	$1,313,236.00	
BOR prepayment for Bell Rapids	$1,302,981.70	
BOR prepayment for Bell Rapids	$1,055,000.00	
BOR payment for Alternative Financing Note	$7,117,971.16	
Payment to US Bank for Alternative Financing Note	($7,118,125.86)	
Payment for Ongoing Bell Rapids Finance Costs (trustee fees, water bank, etc.)	($6,740.10)	
Commitments		
Ongoing Bell Rapids Finance Costs (trustee fees, etc.)	$180,180.02	
Committed for alternative finance payment	$0.00	
Total Commitments	$180,180.02	
Balance Bell Rapids Water Rights Sub-Account	**($0.00)**	
Pristine Springs Project Sub-Account		
Legislative Appropriation 2008, SB1511, Pristine Springs	$10,000,000.00	
Legislative Appropriation 2006, HB870, Water Right Purchases	$5,000,000.00	
Interest Earned State Treasury	$32,934.86	
Loan Interest	$1,443,691.29	
Transfer from ESP Sub-Account	$1,000,000.00	
Payment for Purchase of Pristine Springs (3)	($16,000,000.00)	
Payment from Magic Valley & Northsnake GWD for Pristine Springs	$2,872,059.82	
Appraisal	($25,500.00)	
Insurance	($26,246.25)	
Recharge District Assessment	($6,051.00)	
Water District 130 Annual Assessment	($1,467.81)	
Hydro Plants Engineering Certification (Straubhar)	($3,000.00)	
Payment to EHM Engineers for pipeline work	($1,200.00)	
Payment to John Root for Easement Survey	($1,000.00)	
Payment to MWH Americas Inc	($11,326.27)	
Telemetry Station Equipment	($15,193.92)	
Rein Tech LLC (Satellite phone annual payment)	($495.00)	
Standley Trenching (Trac system for communication equip)	($2,783.99)	
Property Taxes and other fee assessments (Jerome County)	($6,319.39)	
Rental Payments	$1,428,392.46	
Payments to Scott Kaster	($25,599.17)	
Utility Payments (Idaho Power)	($23,317.15)	
Costs for property maintenance	($20,389.18)	
Travel costs for property maintenance	($351.30)	
Transferred to Secondary Aquifer Fund (2011 Legislature; HB 291)	($2,465,300.00)	
Transferred to Secondary Aquifer Fund (2012 Legislature; SB 1389)	($1,232,000.00)	
Transferred to Secondary Aquifer Fund (2013 Legislature; HB 270)	($716,000.00)	
Pristine Springs Hydropower Projects		
Net power sales revenues	$284,876.17	
Pristine Springs Committed Funds		
ESPA CAMP (to be transferred to Secondary Fund) 0.00		

Repair/Replacement Fund	$1,177,427.96		
TOTAL COMMITTED FUNDS	$1,177,427.96		
Loans Outstanding			
North Snake and Magic Valley Ground Water Districts	$7,127,940.18		
Total Loans Outstanding	$7,127,940.18		
Funds to RP CAMP & TV CAMP Sub-Account		**$271,672.34**	
Pristine Springs Revenues into Main Revolving Development Account			**$29,313.87**
Rathdrum Prairie CAMP & Treasure Valley CAMP Sub-Account			
Pristine Springs Hydropower and Rental Revenues		$271,672.34	
Interest Earned State Treasury		$573.11	
Spokane River Forum		($3,000.00)	
Treasure Valley Water Quality Summit		($500.00)	
Committed Funds			
Kootenai-Shoshone Soil & Water Cons. Dist. - Agrimet Station	$20,000.00		
Rathdrum Prairie-Spokane Valley Aquifer Pumping Study	$70,000.00		
Treasure Valley Water Quality Summit	$0.00		
TOTAL COMMITTED FUNDS	$90,000.00		
Balance Rathdrum Prairie CAMP & Treasure Valley CAMP Sub-Account		**$178,745.45**	
Upper Salmon/CBWTP Sub-Account			
Water Transaction Projects Payment Advances from CBWTP/Accord		$2,846,171.47	
PCSRF Funds for Administration of Non-Diversion Easements on Lemhi River		$237,807.26	
Interest Earned State Treasury		$94,265.14	
Transfer to Water Supply Bank		($54,088.93)	
Change of Ownership		($600.00)	
Alturas Lake Creek Appraisal		($8,989.23)	
Payments for Water Acquisition		($478,804.14)	
Committed Funds			
Administration of Non-Diversion Easements on Lemhi River	$151,326.69		
Alturas Lake Creek (Breckenridge)	($0.00)		
Bayhorse Creek	$27,772.86		
Beaver Creek (DOT LLP)	$15,756.01		
Big Hat Creek	$270.85		
Big Timber Tyler (Leadore Land Partners)	$407,228.77		
Canyon Creek/Big Timber Creek (Beyeler)	$384,847.61		
Fourth of July Creek (Vanderbilt)	$17,581.57		
Iron Creek (Phillips)	$201,594.12		
Lemhi River & Little Springs Creek (Kauer)	$17,945.49		
Little Springs Creek (Snyder)	$240,020.90		
Lower Eighteenmile Creek (Ellsworth Angus Ranch)	$6,058.63		
Lower Lemhi M Olson (Mark Olson)	$11,218.29		
Lower Lemhi Thomas (Robert Thomas)	$2,070.46		
P-9 Bowles (River Valley Ranch)	$262,421.07		
P-9 Charlton (Sydney Dowton)	$17,316.25		
P-9 Dowton (Jim Dowton Ranch)	$207,503.73		
P-9 Elzinga (Elzinga)	$256,665.14		
Patterson-Big Springs (PBSC9)	$160,787.34		
Sulphur Creek	$12,305.00		
Whitefish (Leadore Land Partners)	$167,789.90		
Total Committed Funds	$2,568,480.66		
Balance CBWTP Sub-Account		**$67,280.91**	
Water Supply Bank Sub-Account			
Payments received from renters for 2013 season		$516,723.39	
Payments made to owners for 2013 season		$0.00	
Interest Earned State Treasury		$352.96	
Committted Funds:			
Owners Share	$516,723.39		
Total Committed Funds	$516,723.39		
Balance Water Supply Bank Sub-Account		**$352.96**	
Eastern Snake Plain Sub-Account			
Legislative Appropriation 2005, HB392		$7,200,000.00	
Legislative Appropriation 2005, HB392, CREP Program		$3,000,000.00	
Interest Earned State Treasury		$1,888,174.25	
Loan Interest		$195,705.49	
Bell Rapids Water Rights Closing Costs		($6,558.00)	
First Installment Payment to Bell Rapids Irr. Co. (Partial)		($361,800.00)	
Second Installment Payment to Bell Rapids Irr. Co. (Partial)		($361,800.00)	
Third Installment Payment to Bell Rapids Irr. Co. (Partial)		($361,800.00)	
Fourth Installment Payment to Bell Rapids Irr. Co. (Partial)		($614,744.00)	
Fifth Installment Payment to Bell Rapids Irr. Co. (Final)		($1,675,036.00)	
Reimbursement from Commerce & Labor W-Canal		$74,709.77	
Transfer to Pristine Springs Sub Account		($1,000,000.00)	
Reimbursement from Magic Valley GWD - Pristine Springs		$500,000.00	
Reimbursement from North Snake GWD - Pristine Springs		$500,000.00	
Reimbursement from Water District 1 for Recharge		$159,764.73	
Palisades (FMC) Storage Costs		($3,511,902.39)	
Reimbursement from BOR for Palisades Reservoir		$2,381.12	
W-Canal Project Costs		($326,834.11)	
Black Canyon Exchange Project Costs		($71,680.00)	
Black Canyon Exchange Project Revenues		$23,800.00	
2008 Recharge Conveyance Costs		($14,580.00)	
2009 Recharge Conveyance Costs		($355,253.00)	
2010 Recharge Conveyance Costs		($484,231.62)	
Additional recharge projects preliminary development		($6,505.89)	
Pristine Springs Cost Project Costs		($6,863.91)	
Loans and Other Commitments			
Commitment - ESPA Comprehensive Aquifer Management Plan - CDR Contract		$0.00	
Commitment - North Snake & Magic Valley GWD Loan - Mitigation Pipeline		$250,000.00	
Commitment - Remainder of Bell Rapids Water Rights Purchase (1)		$361,620.00	
Commitment - CREP Program (HB392, 2005)		$2,419,580.50	

Commitment - Recharge Conveyance		$0.00	
Commitment - Additional recharge projects preliminary development		$343,494.11	
Commitment - Palasades Storage O&M		$10,000.00	
Commitment - Black Canyon Exchange Project (fund with ongoing revenues)		$529,444.95	
Commitment - W-Canal Aquifer and Recharge Conveyance		$0.00	
Total Loans and Other Commitments		$3,914,139.56	
Loans Outstanding:			
American Falls-Aberdeen GWD (CREP)	$105,055.70		
Bingham GWD (CREP)	$0.00		
Bonneville Jefferson GWD (CREP)	$62,317.68		
Magic Valley GWD (CREP)	$100,453.62		
North Snake GWD (CREP)	$53,488.61		
TOTAL ESP LOANS OUTSTANDING	$321,315.61		
Uncommitted Balance Eastern Snake Plain Sub-Account		**$149,491.27**	
Dworshak Hydropower Project			
Dworshak Project Revenues			
Power Sales & Other	$6,135,542.85		
Interest Earned State Treasury	473,367.77		
Total Dworshak Project Revenues		$6,608,910.62	
Dworshak Project Expenses (2)			
Transferred to 1st Security Trustee Account	$148,542.63		
Construction not paid through bond issuance	$226,106.83		
1st Security Fees	$314,443.35		
Operations & Maintenance	$1,622,329.62		
Powerplant Repairs	$58,488.80		
Capital Improvements	$318,366.79		
FERC Payments	$43,381.35		
Total Dworshak Project Expenses		($2,731,659.37)	
Dworshak Project Committed Funds			
Emergency Repair/Future Replacement Fund	$1,314,575.00		
FERC Fee Payment Fund	$22,576.30		
Total Dworshak Project Committed Funds		$1,337,151.30	
Excess Dworshak Funds into Main Revolving Development Account			$2,540,099.95
TOTAL			**$17,538,419.91**

Loans Outstanding:	Amount Loaned	Principal Outstanding
Aberdeen-Springfield Canal Company (WRB-491; Diversion structure)	$329,761	$176,089.24
Big Wood Canal Company (23-Jan-09; Thorn Creek Flume)	$90,000	$15,311.59
Boise City Canal Company (WRB-492)...18th St Canal Rehab	$82,362	$10,712.08
Boise City Canal Company (WRB-492)...Grove St Canal Rehab	$110,618	$42,410.13
Bonnie Laura Water Corporation (14-Jul-06; Well repairs)	$71,000	$31,928.91
Canyon County Drainage District No. 2 (28-Nov-12; Drain tile pipeline	$35,000	$32,054.85
Carlin Bay Property Owners Association.	$115,609	$0.00
Challis Irrigation Company (28-Nov-07; river gate replacement)	$50,000	$25,843.98
Chaparral Water Association	$90,154	$11,271.74
Chaparral Water Association (21-Jan-11; Well deepening & improvem	68,000	$27,853.56
Cloverdale Ridge Water Corp. (irrigation system rehab 25-sep-09)	106,400	$72,611.48
Consolidated Irrigation Company (July 20, 2012; pipeline project)	1,500,000.00	$475,000.00
Country Club Subdivision Water Association (18-May-07, Well Project).	$102,000	$57,568.63
Cub River Irrigation Company (18-Nov-05; Pipeline project)	$1,000,000	$813,111.70
Cub River Irrigation Company	$500,000	$402,731.19
Dalton Water Association (14-Mar-08; Water main replacement)	$375,088	$0.00
Deep Creek Property Owners Association	$25,115	$0.00
Enterprise Irrigation District (14-Jul-06; Pipeline project)	$37,270	$17,396.11
Enterprise Irrigation District (North Lateral Pipeline)	$105,420	$44,658.95
Evergreen Terrace Water Association (water study; 25-sep-09)	$15,000	$0.00
Firth, City of	$112,888	$38,715.57
Foothills Ranch Homeowners Association (7-oct-11; well rehab)	$150,000	$128,960.06
Garden Valley Ranchettes Homeowners Association (25-Jan-05)	$2,716	$1,326.46
Genesee, City of (Storage tank, 22-Jan-10)	$250,000	($2,000.00)
Georgetown, City of	$278,500	$44,142.45
Harbor View Water & Sewer District (Combined Loans)	$602,819	$0.00
Harvest Valley Homeowners Association (22-Mar-13; Pump Replacem	4,500.00	$4,271.48
Hoyt Bluff Water Association (Rathdrum Prairie Well)	$273,029	$0.00
Jefferson Irrigation Company (well deepenings)	$110,780	$0.00
Jefferson Irrigation Company (well deepenings)	$207,016	$48,947.11
Jefferson Irrigation Company (9-May-2008 Well Replacement)	$81,000	$57,168.03
Jughandle HOA/Valley County Local Improvement District No. 1 (well p	$907,552	$755,084.37
King Hill Irrigation District (24-Sep-10; Pipeline replacement_	$300,000	$123,313.41
Lake Reservoir Company (29-July-11; Payette Lake-Lardo Dam Outle	$594,000	$308,243.11
Lakeview Water District	$45,146	$0.00
Last Chance Canal Company (WRB-497)	$500,000	$133,482.81
Lava Hot Springs, City of	$347,510	$165,572.78
Lindsay Lateral Association (22-Aug-03)	$9,600	$2,100.26
Lindsay Lateral Association (Engineering Design Project & Pipeline Stu	$19,700	$18,053.07
Live-More Lake Community (9-Jun-04)	$42,000	$14,084.43
Lower Payette Ditch Company (2-Apr-04; Diversion dam replacement)	$875,000	$374,320.29
Marsh Center Irrigation Company (13-May-05; Hawkins Dam)	$236,141	$148,277.20
Marysville Irrigation Company (18-May-07, Pipeline Project Phase 1)	$625,000	$331,877.80
Marysville Irrigation Company (9-May-08, Pipeline Project Phase 2)	$1,100,000	$631,477.52
McGuire Estates Water Users Association (4-Mar-05)	$60,851	$14,610.10
Meander Point Subdivsion Homeowners Association (7-Sep-07; comn	$330,000	$58,236.25
Meridian Heights Water & Sewer Association (18-May-07)	$350,000	$248,719.30
Monument Ridge Homeowners Association (20-Mar-09; irrigation syst	$360,000	$0.00
Mores Creek Rim Ranches Water District	$221,400	$51,154.62
New Hope Water Corporation	$151,460	$59,973.25
North Fremont Canal Systems (25-Jan-13; Marysville Project)	$2,500,000	$1,541,272.69
Powder Valley-Shadowbrook Homeowners Assoc.	$201,500	$2,063.33
Point Springs Grazing Association (July 20, 2012; storck water pipeline)	48,280.00	$47,382.73

PPRT Water System	$70,972	$0.00	
Preston Riverdale & Mink Creek Canal Co	$400,000	$0.00	
Preston-Whitney Irrigation Company (29-May-09; Fairview Lateral Pipe	$800,000	$159,040.85	
Producers Irrigation Company (17-Mar-06; well replacements)	$185,000	$43,181.96	
Ranch Subdivision Property Owners Assoc	$24,834	$11,232.12	
Riverside Independent Water District	$350,000	$174,787.77	
Skin Creek Water Association	$188,258	$89,000.48	
Sourdough Point Owners Association (23-Jan-07; water supply & treat	$750,000	$60,852.81	
Spirit Bend Water Association	$92,000	$47,881.62	
Sunset Heights Water District (17-May-13; Exchange water project)	$48,000	$47,555.59	
Thunder Canyon Owners Association (6-Feb-04)	$92,416	$28,957.08	
Twenty-Mile Creek Water Association	$104,933	$0.00	
Twin Lakes Canal Company - Winder Lateral Pipeline Project (13-Jul-0	$500,000	$350,383.45	
Twin Lakes Canal Company (2-Apr-04)	$90,000	$8,814.82	
Twin Lakes-Rathdrum Fld Cont Dist (24-Oct-02; Twin Lakes Dam)	$399,988	$24,875.90	
Whitney-Nashville Water Company	$225,000	$53,717.20	
TOTAL LOANS OUTSTANDING			**$8,707,666.27**
Loans and Other Funding Obligations:			
Senate Bill 1511 - Teton Replacement and Minidoka Enlargement Studies		$678,161.82	
Boise River Storage Feasibility Study		$325,414.93	
Weiser-Galloway Study (28-May-10)		$551,620.87	
Canyon Creek Canal Company (14-Mar-08; Pipeline project)		$133,599.00	
Canyon County Drainage District No. 2 (28-Nov-12; Drain tile pipeline replacement)		$0.00	
Chaparral Water Association (21-Jan-11; Well deepening & imprevement)		$18,465.16	
Clearwater Water District - pilot plant (13-jul-07)		$80,000.00	
Consolidated Irrigation Company (July 20, 2012; pipeline project)		$1,500,000.00	
Dover, City of (23-Jul-10; Water Intake project)		$194,063.00	
Evergreen Terrace Water Association (water study; 25-sep-09)		$1,316.09	
Foothills Ranch Homeowners Association (7-oct-11; well rehab)		$14,812.24	
Garden Valley Ranchettes Homeowners Association (25-Jan-05)		$8,183.69	
Harvest Valley Homeowners Association (22-Mar-13; Pump Replacement)		$0.00	
Lake Reservoir Company (29-July-11; Payette Lake-Lardo Dam Outlet Gates)		$285,756.89	
Lindsay Lateral Association		$15,300.00	
North Fremont Canal Systems (25-Jan-13; Marysville Project)		$958,727.31	
North Snake & Magic Valley GWD Loan - Mitigation Pipeline		$250,000.00	
North Snake Ground Water District et al (Blue Lakes Pipeline 24-Apr-13)		$850,000.00	
Point Springs Grazing Association (July 20, 2012; storck water pipeline)		$48,280.00	
Sunset Heights Water District (17-May-13; Exchange water project)		$0.00	
TOTAL LOANS AND OTHER FUNDING OBLIGATIONS			**$5,913,701.00**
Uncommitted Funds			**$2,917,052.64**
TOTAL			$17,538,419.91

(1) Actual amount needed may vary depending on final determination of water actually purchased and interest income received.

(2) Debt service on the Dworshak Project bonds is paid before the Dworshak monies are deposited into the Revolving Development Account and is therefore not shown on this balance sheet.

Idaho Water Resource Board
Sources and Applications of Funds
as of November 30, 2013
WATER MANAGEMENT ACCOUNT

Original Appropriation (1978)		$1,000,000.00
Legislative Audits		($10,645.45)
IWRB Appraisal Study (Charles Thompson)		($5,000.00)
Transfer funds to General Account 1101(HB 130, 1983)		($500,000.00)
Legislative Appropriation (6/29/1984)		$115,800.00
Legislative Appropriation (HB988, 1994)		$75,000.00
Turned Back to General Account 6/30/95, (HB988, 1994)		($35,014.25)
Legislative Appropriation (SB1260, 1995, Aquifer Recharge, Caribou Dam)		$1,000,000.00
Interest Earned		$120,427.04
Filing Fee Balance		$2,633.31
Water Supply Bank Receipts		$841,803.07
Bond Fees		$277,254.94
Funds from DEQ and IDOC for Glenns Ferry Water Study		$10,000.00
Legislative Appropriation FY01		$200,000.00
Western States Wate Council Annual Dues		($7,500.00)
Tranfer to/from Revolving Development Account		($317,253.80)
Legislative Appropriation (SB1239, Sugarloaf Aquifer Recharge Project)		$60,000.00
Legislative Appropriation (HB 843 Sec 6)		$520,000.00
Legislative Appropriation (SB1496, 2006, ESP Aquifer Management Plan)		$300,000.00
Legislative Appropriation (HB 320, 2007, ESP Aquifer Management Plan)		$849,936.99
TOTAL		**$4,497,441.85**
Grants Disbursed:		
Completed Grants	$1,291,110.72	
Arco, City of	$7,500.00	
Arimo, City of	$7,500.00	
Bancroft, City of	$7,000.00	
Bloomington, City of	$4,254.86	
Boise City Canal Company	$7,500.00	
Bonners Ferry, City of	$7,500.00	
Bonneville County Commission	$3,375.00	
Bovill, City of	$2,299.42	
Buffalo River Water Association	$4,007.25	
Butte City, City of	$3,250.00	
Cave Bay Community Services	$6,750.00	
Central Shoshone County Water District	$7,500.01	
Clearwater Regional Water Project Study, City of Orofino et al	$10,000.00	
Clearwater Water District	$3,750.00	
Cottonwood Point Water and Sewer Association	$7,500.00	
Cottonwood, City of	$5,000.00	
Cougar Ridge Water & Sewer	$4,661.34	
Curley Creek Water Association	$2,334.15	
Downey, City of	$7,500.00	
Fairview Water District	$7,500.01	
Fish Creek Reservoir Company, Fish Creek Dam Study	$12,500.00	
Franklin, City of	$6,750.00	
Grangeville, City of	$7,500.00	
Greenleaf, City of	$3,000.00	
Hansen, City of	$7,450.00	
Hayden Lake Irrigation District	$7,500.00	
Hulen Meadows Water Company	$7,500.00	
Iona, City of	$1,425.64	
Kendrick, City of	$7,500.00	
Kooskia, City of	$7,500.00	
Lakeview Water District	$2,250.00	
Lava Hot Springs, City of	$7,500.00	
Lindsay Lateral Association	$7,500.00	
Lower Payette Ditch Company	$5,500.01	
Maple Grove Estates Homeowners Association	$5,020.88	
Meander Point Homeowners Association	$7,500.00	
Moreland Water & Sewer District	$7,500.00	
New Hope Water Corporation	$2,720.39	
North Lake Water & Sewer District	$7,500.00	

Northside Estates Homeowners Association	$4,492.00	
North Tomar Butte Water & Sewer District	$3,575.18	
North Water & Sewer District	$3,825.00	
Parkview Water Association	$4,649.98	
Payette, City of	$6,579.00	
Pierce, City of	$7,500.00	
Potlatch, City of	$6,474.00	
Preston Whitney Irrigation Company	$7,500.00	
Preston & Whitney Reservoir Company	$3,606.75	
Preston & Whitney Reservoir Company	$7,000.00	
Roberts, City of	$3,750.00	
Round Valley Water	$3,000.00	
Sagle Valley Water & Sewer District	$2,117.51	
South Hill Water & Sewer District	$3,825.00	
St Charles, City of	$5,632.88	
Swan Valley, City of	$5,000.01	
Twenty-Mile Creek Water Association	$2,467.00	
Valley View Water & Sewer District	$5,000.02	
Victor, City of	$3,750.00	
Weston, City of	$6,601.20	
Winder Lateral Association	$7,000.00	
TOTAL GRANTS DISBURSED		**($1,632,755.21)**
IWRB Expenditures		
Lemhi River Water Right Appraisals	$31,000.00	
Expenditures Directed by Legislature		
Obligated 1994 (HB988)	$39,985.75	
SB1260, Aquifer Recharge	$947,000.00	
SB1260, Soda (Caribou) Dam Study	$53,000.00	
Sugarloaf Aquifer Recharge Project (SB1239)	$55,953.69	
ESPA Settlement Water Rentals (HB 843 2004)	$504,000.00	
ESP Aquifer Management Plan (SB1496, 2006)	$300,000.00	
ESP Aquifer Management Plan (HB320, 2007)	$801,077.75	
TOTAL IWRB AND LEGISLATIVE DIRECTED EXPENDITURES		**($2,732,017.19)**
WATER RESOURCE BOARD RECHARGE PROJECTS		**($11,426.88)**
CURRENT ACCOUNT BALANCE		**$121,242.57**

Committed Funds:		
Grants Obligated		
Cottonwood Point Water & Sewer Association	$0.00	
Preston - Whintey Irrigation Company	$7,500.00	
Water District No. 1 (Blackfoot Equalizing Reservoir Automation)	$35,000.00	
Legislative Directed Obligations		
Sugarloaf Aquifer Recharge Project (SB1239)	$4,046.31	
ESPA Settlement Water Rentals (HB 843, 2004)	$16,000.00	
ESPA Management Plan (SB 1496, 2006)	$0.00	
ESP Aquifer Management Plan (HB320, 2007)	$48,829.24	
TOTAL GRANTS & LOANS OBLIGATED & UNDISBURSED		**$111,375.55**

Loans Outstanding:	Amount Loaned	Principal Outstanding	
Arco, City of	$7,500	$0.00	
Butte City, City of	$7,425	$201.04	
Roberts, City of	$23,750	$0.00	
Victor, City of	$23,750	$0.00	
TOTAL LOANS OUTSTANDING			**$201.04**
Uncommitted Funds			**$9,665.98**
CURRENT ACCOUNT BALANCE			**$121,242.57**

Idaho Water Resource Board
Sources and Applications of Funds
as of November 30, 2013
SECONDARY AQUIFER PLANNING, MANAGEMENT, & IMPLEMENTATION FUND

Legislative Appropriation (HB 291, Sec 2)..	$2,465,300.00		
Legislative Appropriation (SB 1389, Sec 5).......................................	$1,232,000.00		
Legislative Appropriation (HB270, Sec 3)..	$716,000.00		
Interest Earned State Treasury (Transferred)..	$42,803.52		
Water Users Contributions..	$100.00		
Conversion project (AWEP) measurement device payments..	($16,455.21)		
Contribution from GWD's for 2011 ESPA Managed Recharge	$71,893.16		
Contribution from GWD's for Revenue Bond Prep Expenses.............................	$14,462.50		
American Falls Res. Dist#2 - MP31 Recharge Site Engineering......	($1,593.75)		
American Falls Res. Dist#2 - MP31 Recharge Site Construction......	($34,435.44)		
Bond issuer Fees...	($3,500.00)		
Payments for 2012 Recharge...	($260,031.02)		
Payments for 2013 Recharge...	($8,133.00)		
Payment for Recharge..	($80,000.00)		
Payment for High Country RC&D Cloud Seeding...........................	($12,264.62)		
Payment for Idaho Irrigation District..	($13,200.00)		
Committed Funds			
Measurement devices for AWEP conversion projects...........	$183,544.79		
High Country RC&D Cloud Seeding	$27,735.38		
American Falls Res. Dist#2 - MP31 Recharge Site Engineering	$4,406.25		
American Falls Res. Dist#2 - MP31 Recharge Site Construction	$564.56		
Magic Valley GWD and A&B Irrig. Dist. - Walcott Recharge Engineering	$85,644.00		
Five-Year Managed Recharge Pilot Program	$1,231,835.98		
Contribution from GWD's for 2011 ESPA Managed Recharge	($8,106.84)		
GWD Bond Prepatory Expenses....................................	$37,500.00		
Idaho Irrigation District Recharge Phase 1..........................	$0.00		
Fremont-Madison Irrigation District Egin Recharge...........	$40,000.00		
Total Committed Funds..	**$1,603,124.12**		
TOTAL UNCOMMITTED FUNDS..		**$2,509,822.02**	
CURRENT ACCOUNT BALANCE..			**$4,112,946.14**

MEMO

To: Idaho Water Resource Board
From: Brian Patton
Subject: Loan Interest Rates
Date: March 12, 2014

The Idaho Water Resource Board's Finance Committee will meet on March 20, immediately following the Board's Work Session meeting. In response to declining numbers of loan applications, a review of equivalent programs in other western states shows that the Board standard rates are very high.

The Committee will review loan interest rates and will likely have a proposal for modifying the Board's standard rates.

Memorandum

To: Idaho Water Resource Board

From: Remington Buyer

Date: March 10, 2014

Re: 2013 Report for the Board's Bank & Procedural Guidance Memo

Action Items: Consider Approval of Procedural Guidance Memo

This agenda item will cover three topics:

1. A summary of the 2013 Annual Report for the Board's Water Supply Bank,
2. Reviewing the Procedural Guidance Memo for staff in the Board's Bank.

The Board will hear a presentation by Water Supply Bank Coordinator Remington Buyer covering organizational changes to the Water Supply Bank, water right transaction activity and a financial summary of the Board's Bank in 2013, and a presentation on new initiatives for the Board's Bank in 2014, including a roadmap for developing a custom software application for the Water Supply Bank.

Following discussion of 2013 activity in the Board's Bank, the Board will receive a presentation on proposed updates to administrative policies in the Board's Bank and provide procedural guidance to the Bank via Water Supply Bank Memo No. 2. The procedural guidance memo covers three administrative policies: 1) establishing a timeframe for receiving rental applications and a process for prioritizing rental applications; 2) a policy on rental fee refund requests; and 3) a policy for considering Lease Contract release requests. On March 6, 2014, the Water Supply Bank Committee discussed the memo and recommended the memo be considered for approval by the full Board.

Details on the three policies are as follows:

1) Establishing a timeframe for receiving rental applications and prioritizing rental applications

Bank staff desire that rental applications be received only between November 1 through the end of the season of use authorized under a rented water right and that no rental applications will be accepted in advance of November 1 and no applications will be considered once the season of use has concluded. Additionally, Bank staff desire to prioritize processing rental applications based on a first come, first served basis, and prevent other factors, such as seeking to address water use violations or enlargements through a rental agreement, from superseding rental processing priorities. Neither administrative policy will impair the ability of Bank staff to continue processing companion applications.

2) Setting a policy on rental fee refund requests

Bank staff desire to affirm that once a rental fee is collected and the date to being beneficial use of water under a Rental Agreement has passed, no refunds of rental fees will occur.

3) Clarifying policy related to early release requests for water rights leased into the Board's Bank

Bank staff seek certainty that Lease Contracts will remain in force for the full duration of the contract and Bank staff will only consider contract release requests under extenuating circumstances.

Administrator's Memorandum

Water Supply Bank Memo No. 1

To: Idaho Department of Water Resources

From: Jeff Peppersack

Brian Patton

Re: **Organizational Structure of the Water Supply Bank**

Date: 3/12/2014

The Idaho Water Supply Bank is a temporary water marketing program operated by the Idaho Water Resource Board (IWRB or Board). Through the Water Supply Bank, water right holders who have temporarily ceased beneficial use of water can provide an opportunity for beneficial use by other users. There are two Water Supply Bank initiatives: distribution of natural flow and surface water storage rights in local rental pools, and a statewide water bank (the Board's Bank) for distribution of surface water and groundwater rights. Rental pools are administered by local committees established by the Board. The Department of Water Resources administers the statewide water bank for the Board. Within the Department, the Water Supply Bank program is coordinated by the Water Supply Bank Coordinator, a member of the Water Planning Bureau and day-to-day activities of the Board's Bank are administered by the Water Allocation Bureau.

Bank Background

Water banking in Idaho began with the formation of informal rental pools in Eastern Idaho along the Snake River. These rental pools allowed individuals with surplus surface water storage rights to make water available for users who needed additional water. The first recorded annual rental pool transfers occurred during the drought period of the 1930s.

In 1979 the Idaho Legislature formalized water banking activity through legislation authorizing the Idaho Water Resource Board to oversee and operate the Water Supply Bank. The Board has delegated administration of rental pools to local committees and administration of the Board's Bank to the Department of Water Resources. The Water Supply Bank Coordinator works with local committees and IDWR staff to coordinate the Water Supply Bank on behalf of the IWRB.

Water Supply Bank Personnel

The Water Supply Bank Coordinator is an IDWR employee and member of the Water Planning Bureau. The Water Planning Bureau works closely with the Water Resource Board to carry out its duties and initiatives, including developing and implementing policies, standards and guidelines for rental pools and the Board's Bank. The Coordinator researches, drafts and presents policies, rules, resolutions and reports on water banking for the Board and for the Idaho Legislature. The Coordinator collaborates with rental pool committees and IDWR staff administering the Board's Bank to ensure optimal operation of the Water Supply Bank.

Administrator's Memorandum

Within the Department, the Water Allocation Bureau is responsible for day-to-day processing of water right applications and water right record-keeping. Within the Water Allocation Bureau, members of the Water Rights Section process Water Supply Bank applications for lease and rental of water rights. Application processing is typically conducted by a Senior Water Resource Agent (Lead Agent) responsible for application processing within the Board's Bank but other Water Rights Section staff members also work on Bank items when the need arises. The Lead Agent serves as a primary point of contact for IDWR staff and members of the public regarding application processing for the Board's Bank. Additionally, the Lead Agent assists the Water Supply Bank Coordinator in monitoring Bank performance and tracking statistics, and communicates to Water Allocation Bureau leadership and to the Water Supply Bank Coordinator any issues associated with Bank program administration.

Local committees administer surface water rental pools. Local committees are comprised of different individuals and may consist of IDWR staff, members of the public and Water District Watermasters, Board Members, Secretaries and Treasurers. Rental Pool Committees are responsible for development of procedures and processing applications for water in rental pools, as well as for monitoring, tracking and reporting rental pool activities to the Water Supply Bank Coordinator. Rental Pool Committees serve as the primary point of contact for inquiries about local rental pool operational procedures.

Idaho Water Resource Board

2013 Annual Report for the Board's Water Supply Bank

Introduction & Background

The waters of Idaho are a public resource belonging to the people of Idaho and management of water is entrusted to the Idaho Water Resource Board (Board). A private right to appropriate and use water in Idaho is established through a water right. Through operation of a Water Supply Bank, the Board authorizes the temporary transfer of water rights between willing parties desiring to lease and rent water rights, to encourage the highest beneficial use of Idaho's water resources.

The Water Supply Bank is comprised of two parts: local rental pools and the Board's Water Supply Bank (Board's Bank). Six rental pools administer rental transactions of natural flow and surface water storage rights, whereas the Board's Bank is a statewide exchange market for surface water and groundwater rights. Presently, 700 water rights—approximately 256,000 acre feet of water—are leased into the Board's Water Supply Bank and the Bank administers 400 rental agreements, under which 75,000 acre feet of water is temporarily being rented throughout the state.

The Board's Bank is administered by the Idaho Department of Water Resources (IDWR). Property owners that have water rights can lease all or part of their water right into the Board's Bank. The cost to lease a right into the Bank is $250 and lease contracts range in duration from one to five years. When leasing a water right into the Bank, the water right holder (lessor) ceases to divert water under the right and the water is made available to a renter, for a new use and at a new location. Water is rented out from the Bank for $17/acre foot (AF) and lessors receive 90% of this rental payment. 10% of the rental fee is retained by IDWR to cover the cost of Bank operations. A water right is protected from forfeiture while it is in the Board's Bank.

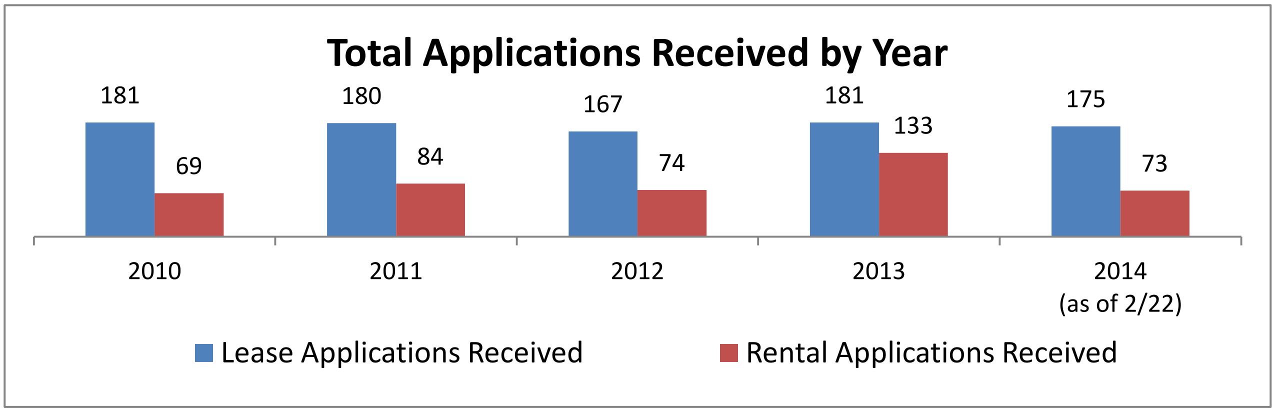
2013 Accomplishments

2013 was the most active year ever for the Bank. The Bank accepted 170 water rights for lease into the Bank and executed more than 100 rental transactions. The increase in rental activity led to increased revenue generated for water right lessors—half a million dollars was delivered to water right holders for Bank activity in 2013.

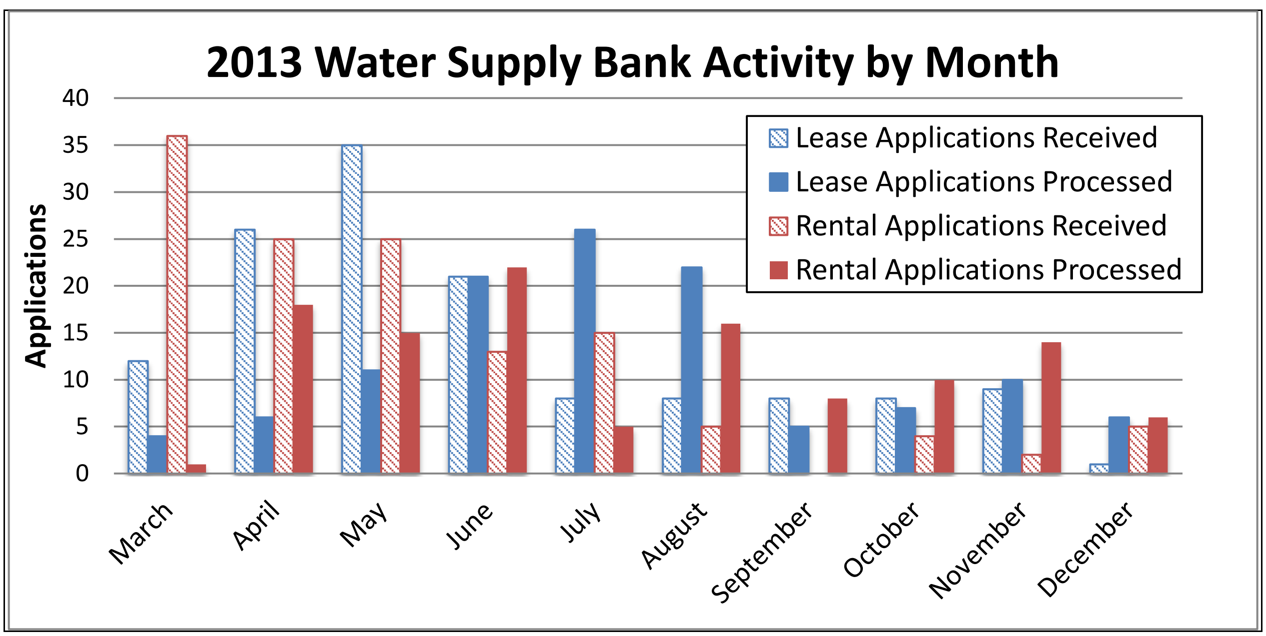
In addition to increased leasing and rental activity, the human resources of the Water Supply Bank grew as well. The Water Supply Bank Coordinator position has been moved into IDWR's Planning Bureau to assist the Board in managing the Water Supply Bank program and a Senior Water Resource Agent (Lead Agent) position has been created within the Water Rights Section of IDWR's Allocation Bureau to administer the Board's Bank. Beyond these two positions, many IDWR employees continue to assist with various administrative activities in the Board's Bank. The Board's Bank is well positioned to grow even more active in 2014.

2013 Activity Summary

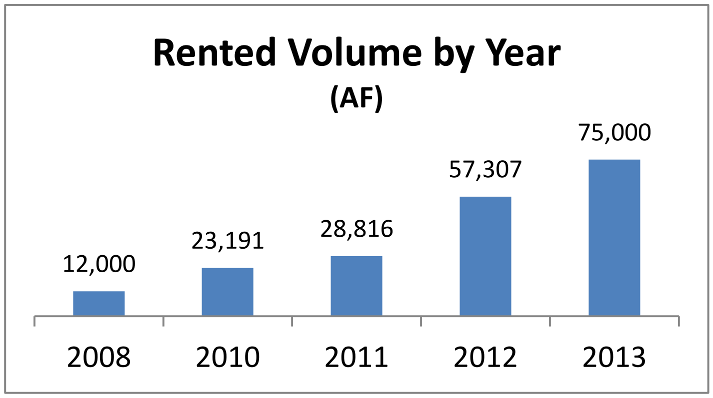
Increased interest in renting water from the Board's Bank is notable by the greater number of rental applications received in 2013. In total, 133 rental applications were received last year, an increase of 180% over the 74 received in 2012. Lease applications were up slightly as well. In all, 314 applications were received by the Bank in 2013, an increase of 73, or 30% from the 2012. Continuing this trend, as of February 22 2014, the Bank has already achieved the same level of activity for rentals and leases witnessed each year from 2010 through 2012.



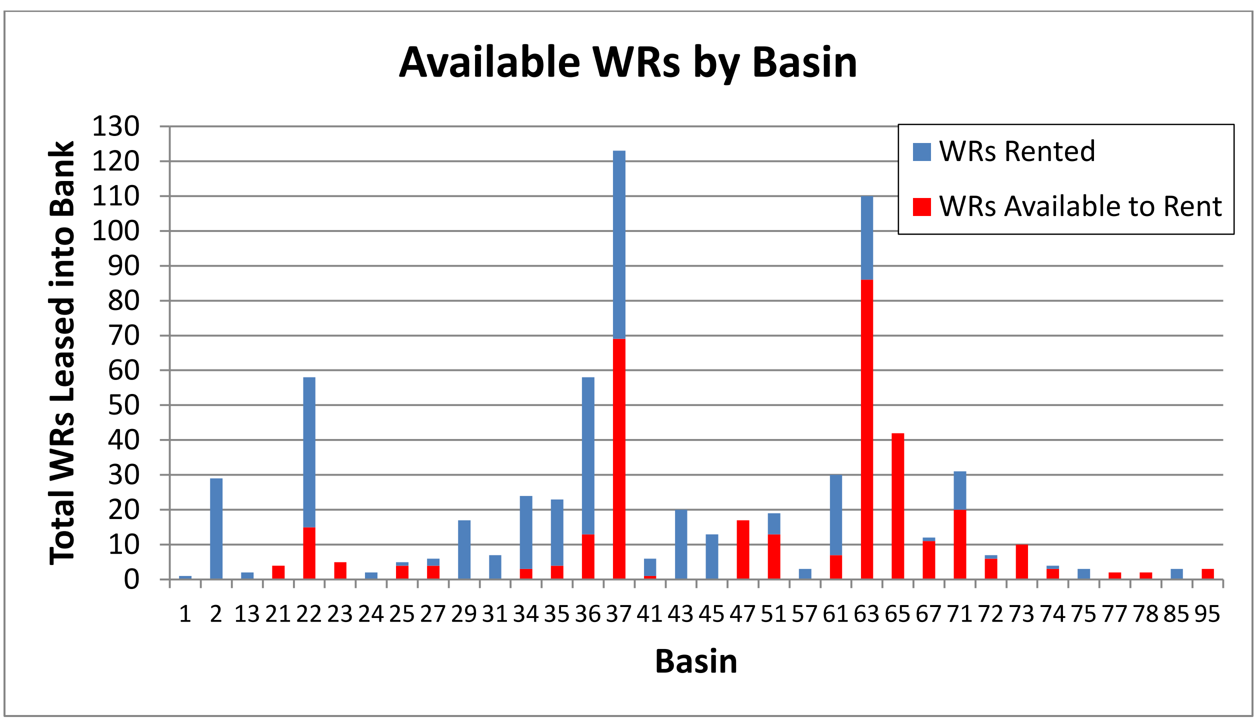
Considering 2013 applications, the time series graph below shows that spring was the busiest time for Bank staff, coinciding with prioritization for establishing summer rental agreements. Generally, administrative activity in the Bank closely matched application volumes.



Rental interest in the Board's Bank continued to grow last year and 2013 saw the most rentals ever for the Bank. More than 100 new water right rental agreements were executed last year and 75,000 AF were rented out on 30,000 acres, a gain of 18,000 AF (30%) over 2012 and an increase of 46,000 AF (159%) over the 29,000 AF rented out in 2011.

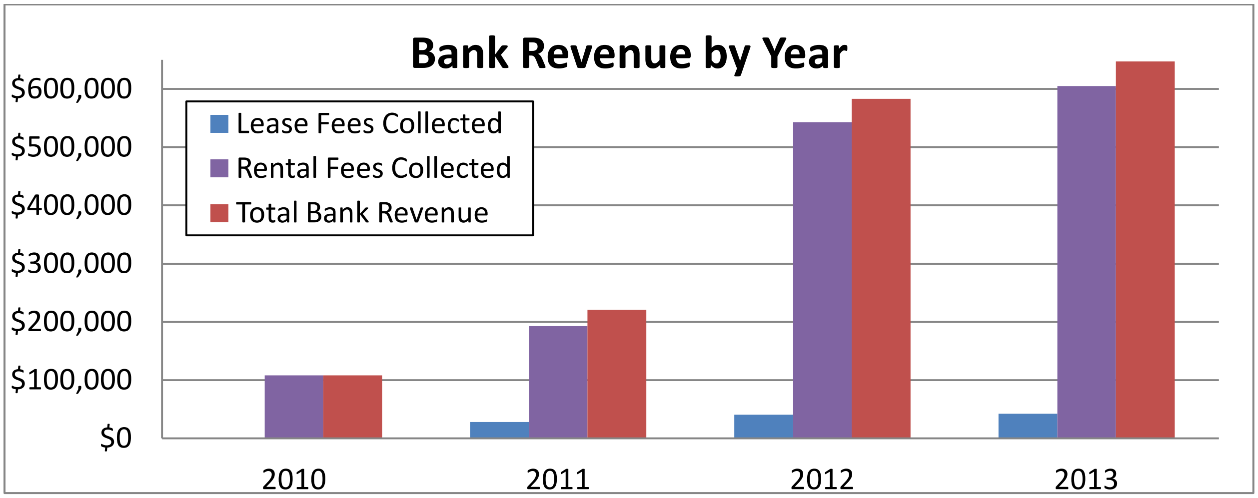


While the total volume of water rented through the Bank increased last year, it is worthwhile noting the location where rental transactions are most active. Some basins have little to no participation in the Water Supply Bank whereas others are highly active. Notably, Basins 22 (Teton County), 36 (Southern Idaho, north of the Snake River), 37 (Wood River Valley) and 63 (Boise River) feature the greatest number of water rights available for rental, however only 22 and 36 are heavily leased. Additionally, though Basins 2 (Eastern Snake River) and 43 (Cassia County) don't feature as many water rights as others, they are almost entirely rented out. Attention will be paid to lease and rental trends to encourage future leasing or renting through the Board's Bank in areas where it is clearly of benefit for local water uses.

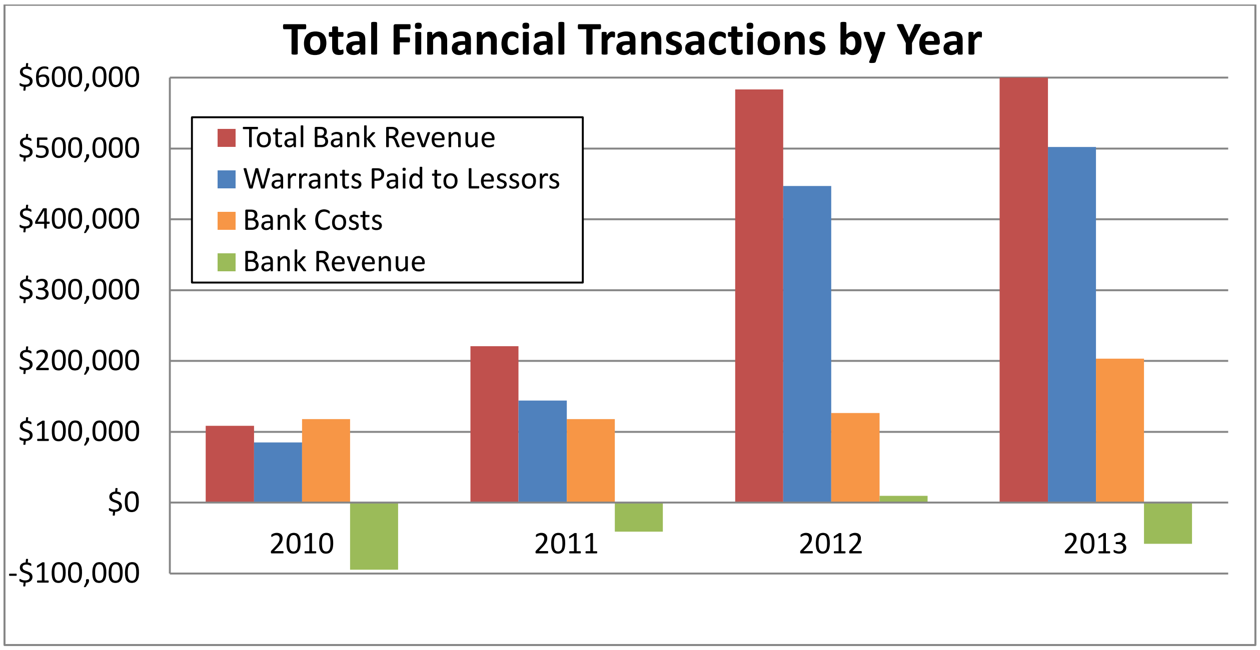


2013 Financial Summary

The Water Supply Bank generated more revenue than ever in 2013. Both lease and rental revenues were up, as were warrant payments, which payments made to lessors for the rental of their water rights. By far, the greatest source of revenue generation for the Bank continues to be rental fees charged on the volume of water rented through the Bank, however it is important to note that revenue generated by lease application fees, begun in 2011, continues to increase as well.



Though Bank revenue continues to increase, the majority of revenue continues to be allocated to lessors. Currently, the Bank is not capturing revenue enough to cover full operational costs and avenues need to be further explored to ensure Bank solvency.



Of note, three quarters of water rights currently leased into the Bank are for terms of five years or less, however 178 leases (25%) are grandfathered in on indefinite lease terms. As the Bank continues to receive additional lease applications, the share of indefinite leases in the Bank will continue to shrink.

Table 1 - Bank Finances

	2010	2011	2012	2013
Lease Application Revenue	$0.00	$27,500.00	$40,500.00	$42,500.00
Rental Fee Revenue	$108,283.00	$192,824.00	$542,700.03	$605,044.97
Total Revenue Generated	$108,283.00	$220,324.00	$583,200.03	$647,544.97
Payments to Lessors	$85,000.00	$145,000.00	$447,146.91	$502,120.77
Revenue Remaining	$24,000.00	$75,324.00	$136,053.12	$145,424.20
Bank Total Expenditures	$117,852.00	$117,852.00	$126,270.00	$203,435.00
Balance	-$93,852.00	-$42,528.00	$9,783.12	-$58,010.80

2014 Initiatives

The Bank will undertake the following initiatives to improve operations in 2014:

1. Updating public information (website update and Bank information products);
2. Updating lease and rental application forms;
3. Creating an application guide for submitting lease and rental applications;
4. Updating Scheduling for Administrative Activities (see table below);
5. Procedural guidance for staff through administrative memos; and
6. Bank IT infrastructure development

The Bank has already begun updating public information materials and we are working to complete our update to the rental application form as well as application guide next. As previously mentioned, the Bank is most active during the fall, winter and spring, and Bank staff is looking forward to dedicating time during summer 2014 to collaborating on the development of Bank IT infrastructure. Additionally, as per the schedule below, Bank staff will endeavor to initiate warrant payments earlier in the year, beginning at the end of the summer.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Processing Lease Applications											
Processing Rental Applications										Process Rental Apps	
								Warrant Payments			
									Review Bank		Close Contracts
Collect & process rental fees									Agreements		Rqst Rental Fees
				Special Projects							

Data Summary

	2010		2011		2012		2013	
Lease Applications Received	181		180		167		181	
Lease Applications Withdrawn/Released	22	(12%)	10	(6%)	8	(5%)	6	(3.3%)
Lease Applications Superseded							2	(1%)
Lease Applications Denied	30	(17%)	10	(6%)	30	(18%)	3	(2%)
Lease Contracts Executed	129	(71%)	160	(89%)	129	(77%)	170	(94%)
Lease Contracts Expiring/Closed	33		27		59		136	
Lease Balance	463		596		666		700	
Rental Applications Received	69		84		74		133	
Rental Applications Withdrawn	2	(3%)	3	(4%)	6	(8%)	18	(14%)
Rental Applications Denied	1	(1%)	1	(1%)	6	(8%)	1	(1 %)
Rental Agreements Executed	66	(96%)	80	(95%)	62	(84%)	104	(78%)
Rental Agreements Expiring/Closed	38		78		103		157	
	466		494		453		400	
	308		306		347			
Total Lease + Rental Applications Received	250		264		241		314	
Water Volume Rented (Acre Feet)	23,191 AF		28,816 AF		57,307 AF		75,000 AF	

Memorandum

Water Supply Bank Memo No. 2

To: Water Allocation Bureau

From: Remington Buyer

Re: Establishing Timeframes and Priorities for Receiving and Reviewing Rental Applications, Guidance on Rental Fee Refund Requests and Guidance on Requests to Release Lease Contracts from the Board's Bank.

Date: March 21, 2014

The following memo pertains to the processing of applications to lease or rent water through the Idaho Water Resource Board's Water Supply Bank (Board's Bank). The memo addresses three administrative topics: 1) the establishment of timeframes for submitting rental applications and prioritization of processing rental applications; 2) establishing a policy on the refunding of rental fees; and, 3) clarifying procedures for considering Lease Contract release requests. The Idaho Water Resource Board made a unanimous motion to approve this procedural guidance at Board Meeting 3-14 on March 21, 2014.

Establishing a Time and Date for Receiving Rental Applications and Priorities for Application Review

The greatest demand to rent water rights through the Board's Bank occurs November through April of every year and Bank personnel prioritize the processing of rental applications during this period. To sustain operational efficiencies, it is imperative that opportunities to improve application processing times be explored and instituted. Rental application processing can be improved by encouraging rental applications to come into the Bank during November through April, as well as by establishing a policy for prioritizing rental applications. It is thus desirable to establish a timeframe for receiving rental applications and a method for prioritizing the processing of rental applications.

Water Supply Bank rules are authorized under Idaho Code 42-1762 and Water Supply Bank Rule 30.01 establishes that the Bank may establish a time and date for receiving applications. Because it is desirable for achieving processing efficiencies, and because it authorized by Water Supply Bank rules, the Bank here and now establishes that applications to rent water from the Water Supply Bank will be accepted no earlier than November 1 in the year preceding the use of rental water and no application to rent water will be accepted if the season of use authorized under the rental water right has concluded. Furthermore, whereas Rule 30.07 establishes that water rights should be prioritized for rental from the Bank based on the order in which they have been leased into the Bank, the Bank will similarly prioritize the processing of rental applications based on the order in which they are received.

Water Supply Bank staff reserve the right to employ alternative metrics for prioritizing rental applications if such methods will further improve overall processing efficiencies, however extenuating circumstances such as the desire to resolve water use violations through Water Supply Bank Rental Agreements are not considered a valid reason for superseding processing priorities. Any and all such rental applications will be processed based on the application's priority, established by its place in the processing queue. Finally, rental processing priorities will not limit Bank staff from processing companion applications (joint applications to both lease in and rent out a specific water right) and companion applications can continue to be accepted and processed together, consistent with this policy, and all other rules governing the Bank.

Regarding Refunds of Rental Fees for Rental Applications

The Water Supply Bank transacts in a specific good: the right to divert water under Idaho law. Through Lease Contracts and Rental Agreements, Water Supply Bank staff authorize the temporary transfer of the right to divert the state's water resources as per the conditions of licensed and decreed water rights. Unlike access to a water right, which is easily accounted for and enforced through Bank agreements, the volume of water that might actually be diverted under a Bank agreement is variable and subject to ecosystem conditions beyond the control of Departmental staff.

If a renter decides the risk of renting a water right subject to potential curtailment is unacceptable, they can cancel their Rental Agreement in advance of the rental fee due date. There is currently no penalty for cancelation of a Rental Agreement. As such, it is hereby expressed that rental fees for a Water Supply Bank Rental Agreement are due on the date specified in the Rental Agreement and the Bank will consider that the beneficial use of water has occurred once rental fees have been paid and the date specified for commencement of the use of water has passed. No rental fees will be refunded once the fee is collected and the start date for a Rental Agreement has passed.

Policy on Accepting Requests to Release a Water Right from the Board's Water Supply Bank

A Water Supply Bank Lease Contract is a binding agreement between the owner of a water right and the Idaho Water Resource Board. Water Supply Bank Rule 25.08.c establishes that a water right, once accepted into the Board's Bank, shall remain in the Bank unless removed by a resolution of the Board. The Bank currently allows water right owners to petition the Board for early release of water rights from the Bank through submission of a Request to Release a Water Right from the Water Supply Bank form, however no Water Supply Bank rule or statute requires the Board consider early release requests.

Releasing a water right from the Bank alters the balance of water rights and water volume available for rental from the Bank. Releasing a water right prior to the culmination of a Lease Contract is problematic for Bank administration because it alters the water supply accounting of the Bank as a whole. Enforcing the terms of a Lease Contract provides Bank staff with the certainty needed to make a full account of all water rights available in the Bank and enables them to more efficiently approve rental applications. Releasing rights from the Bank alters water supply accounting and slows down rental applications.

In light of the aforementioned, the Bank hereby establishes that all Lease Contracts, indefinite or finite, are to remain in force for the full duration of the Lease Contract and requests to release a water right from the Board's Bank in advance of a contract's termination will only be considered by the Board's authorized representative after a justifiable need to release the right is demonstrated and it is determined that a release will not adversely impact application processing times or water supply accounting.

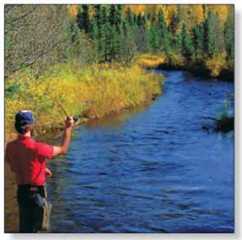
Water Supply Bank

Board Meeting 3-14

Remington Buyer
Water Supply Bank Coordinator
March 20, 2014

IDAHO Water Resource Board

IDWR

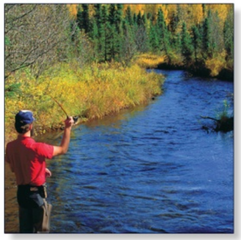


Water Supply Bank

1. Water Supply Bank Organizational Changes
    - A. Programmatic Changes
    - B. Water Supply Bank Memo No. 1

2. IWRB Water Supply Bank (Board's Bank)
    - A. Activity Summary
    - B. Financial Summary
    - C. 2014 Initiatives
        - A. Improved Communication Materials,
        - B. Application Form Improvements, Application Guide,
        - C. IT Infrastructure Development

3. Procedural Guidance for the Board's Bank
    - A. Clarifying Administrative Procedures
    - B. Water Supply Bank Memo No. 2



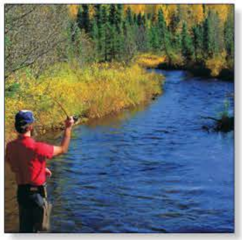
Bank Organizational Structure

Water Supply Bank Committee

Water Supply Bank Program

	Board's Bank	Rental Pools	
WSB Coordinator	Policy development, guidelines and program standards	Policy development, guidelines and program standards	
WSB Lead Agent	Program administration	Program administration	Local Rental Pool Committees

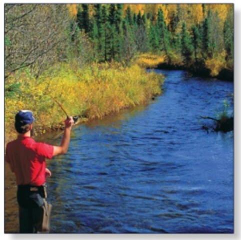
IDAHO Water Resource Board

Idaho Water Resource Board's Water Supply Bank (Board's Bank)

- Exchange market operated by the IWRB to facilitate marketing of water rights
- Authorizes temporary forfeiture protection and transferability of a water right
- Operated by IDWR for the Idaho Water Resource Board (IWRB)

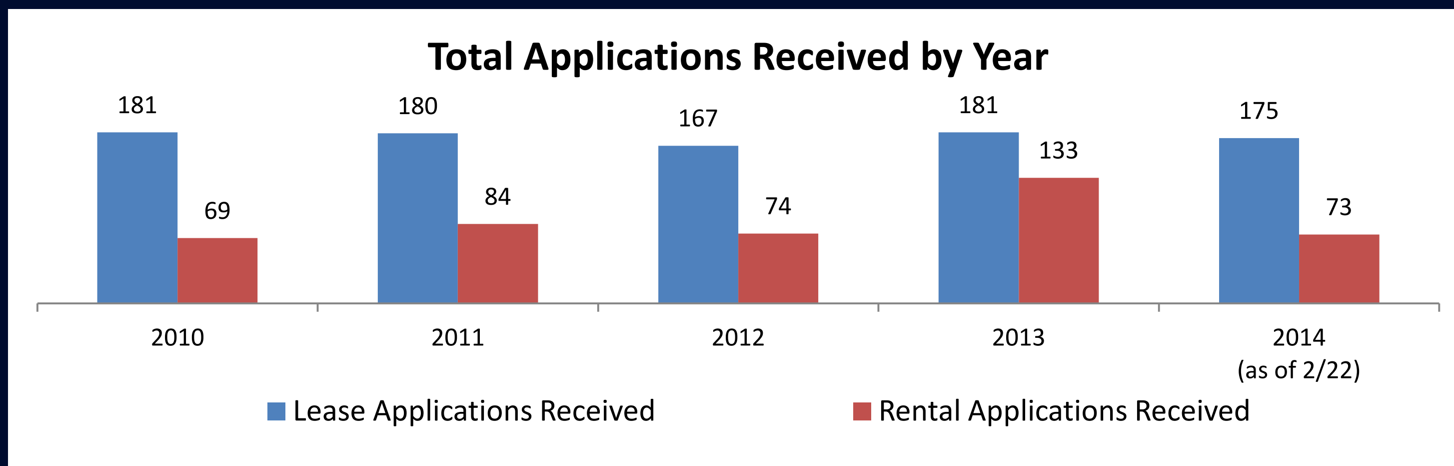
Source: IDAPA 37.02.03.01 and Idaho Code 42-1764



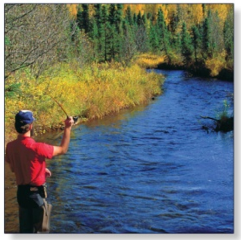
Board's Bank ≠ Rental Pool

- Surface Water & Groundwater
- Statewide Program

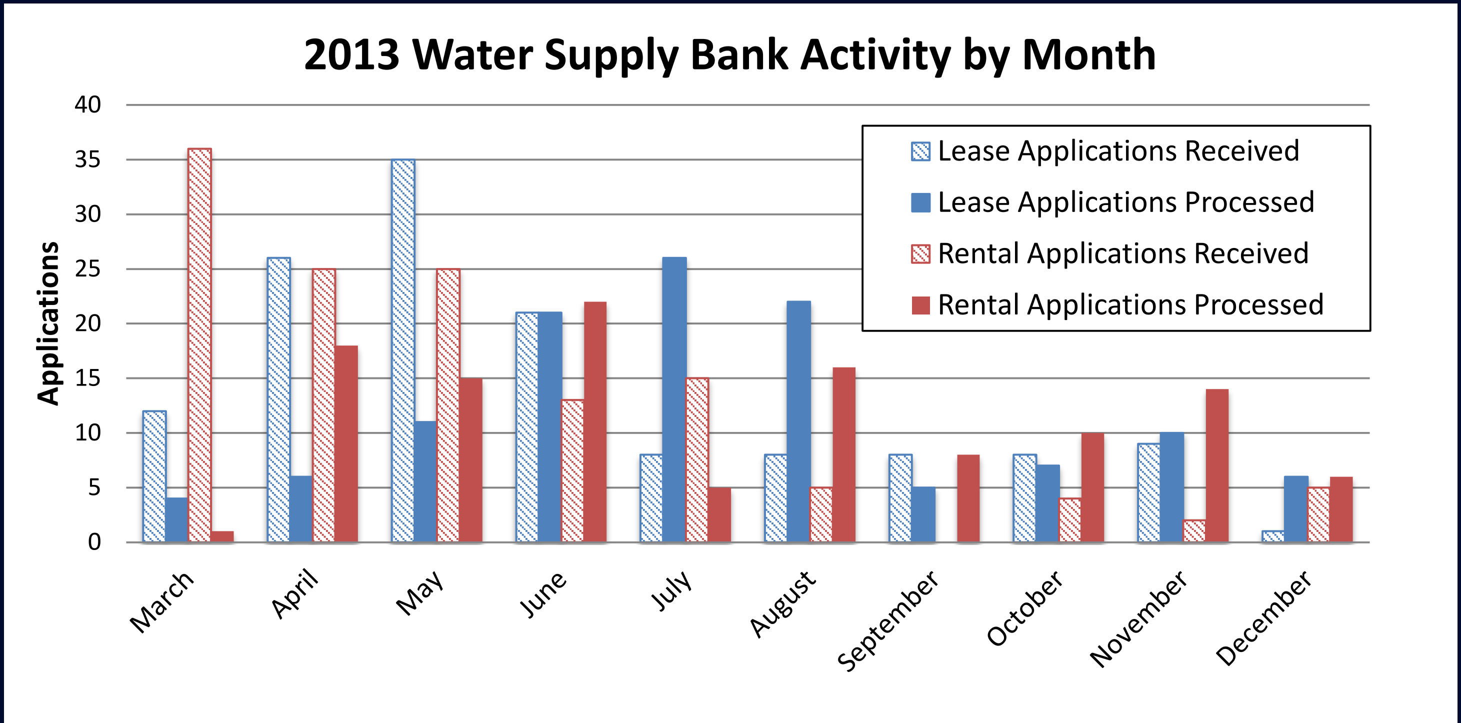
2013 Bank Activity



- 181 lease applications received, 170 executed
- 133 rental applications received, 104 executed

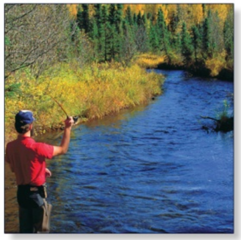


2013 Bank Activity

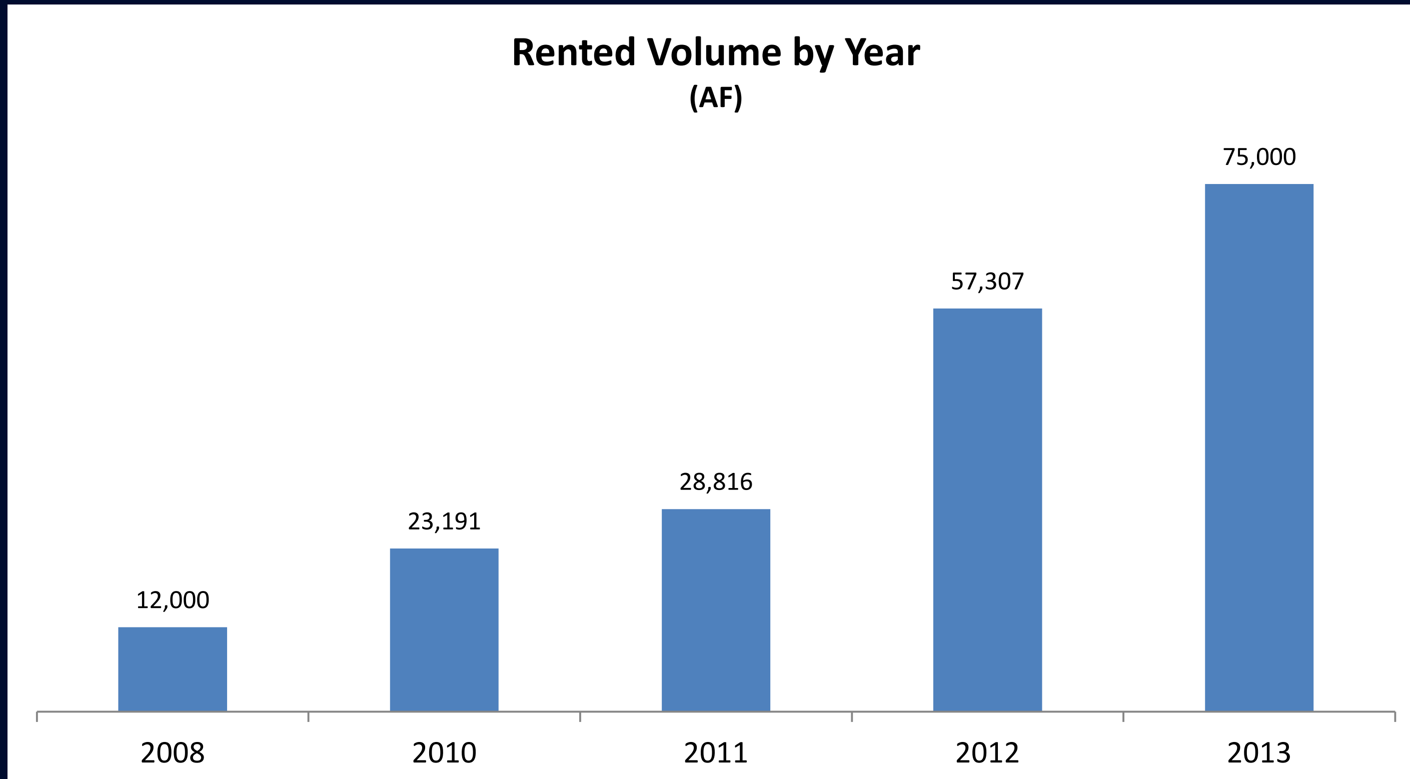


Application volume is highest in the Spring,
Processing activity mirrors application intake by a month

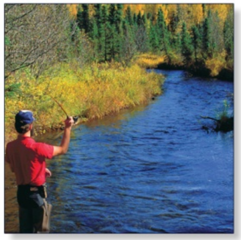
IDAHO Water Resource Board



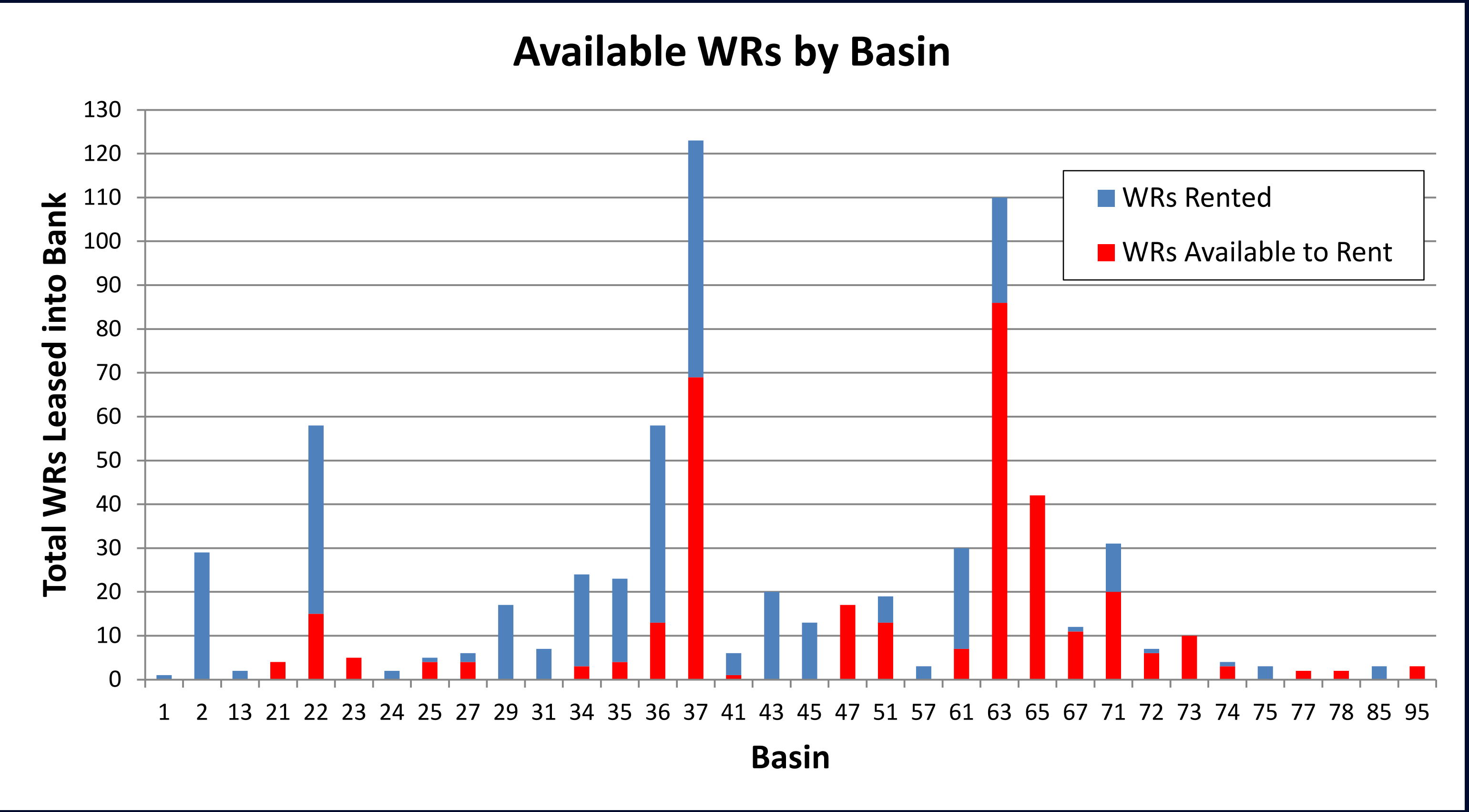
2013 Rental Activity

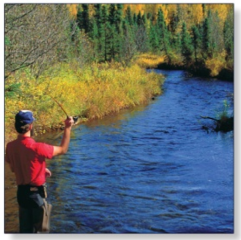


Water Resource Board

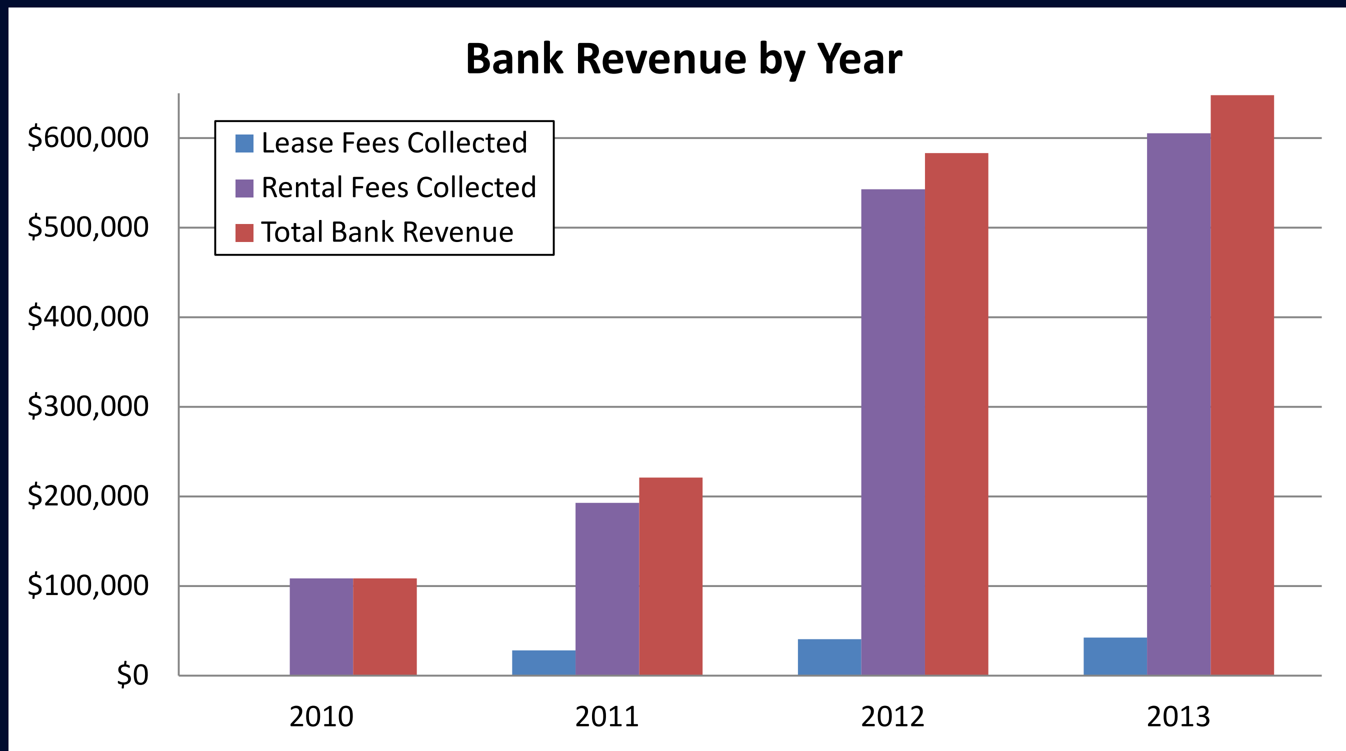



2013 Water Availability by Basin



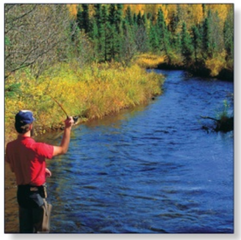



2013 Bank Financial Summary

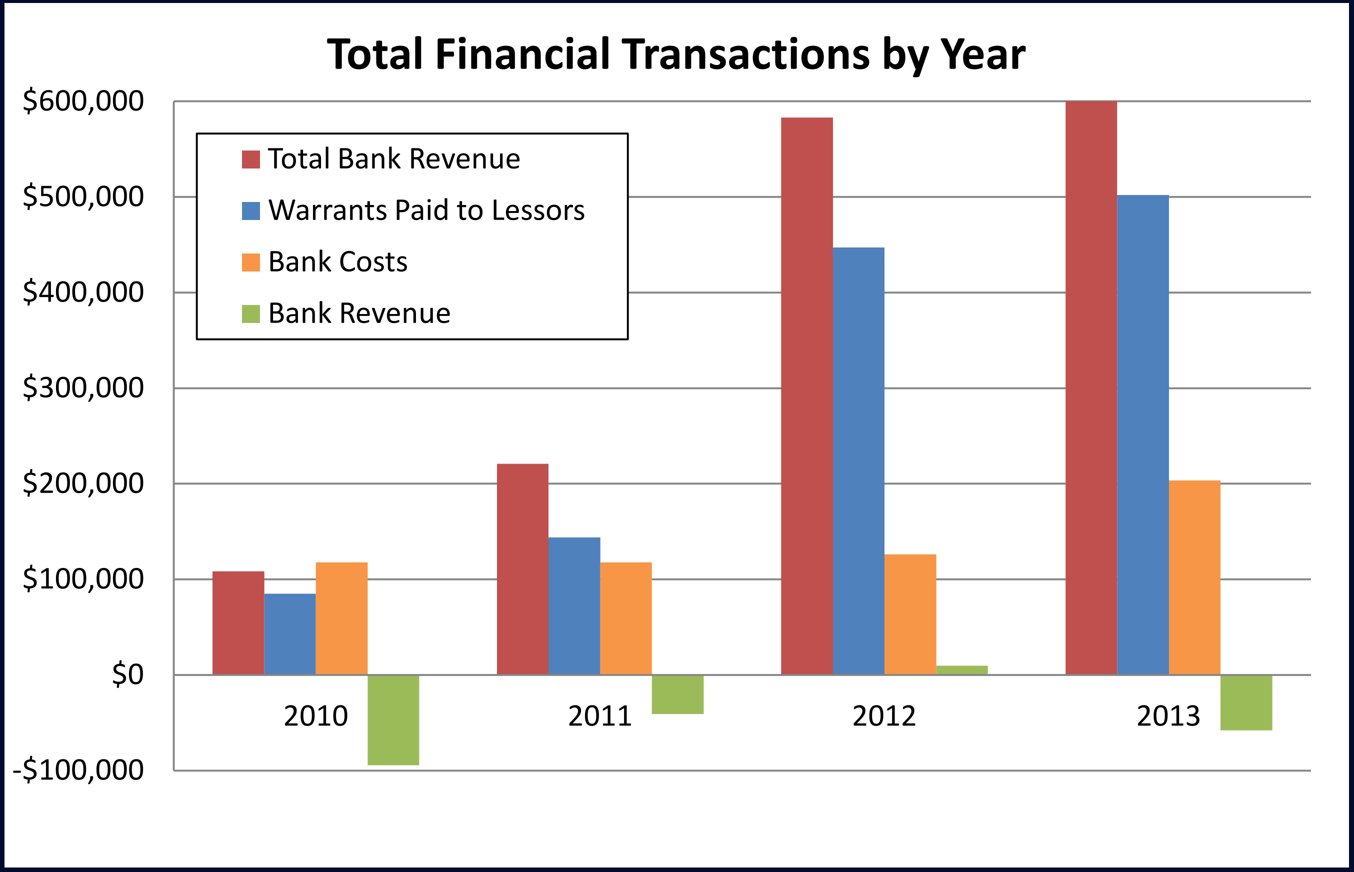


The Bank is generating significant revenue

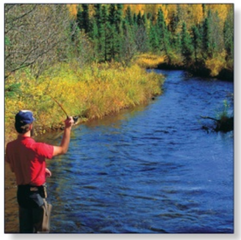
IDAHO Water Resource Board



2013 Bank Financial Summary



Bank rental revenue is primarily allocated to lessors

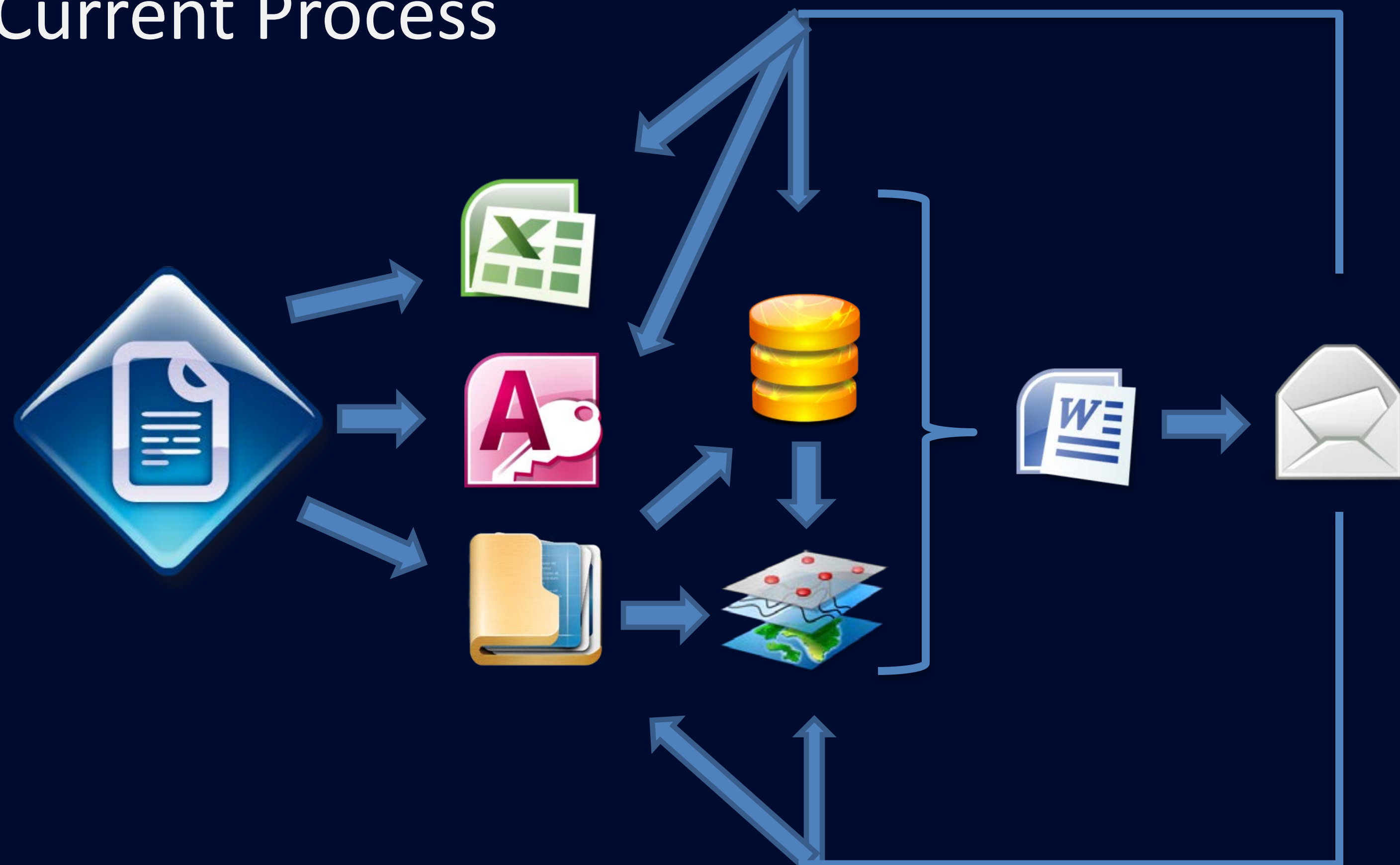


2014 Initiatives

- Updating the Bank website and communication materials for the public
- Updating lease and rental application forms
- Application Guide for the general public
- Prepared for potential water shortages
- Earlier warrant processing
- IT system development

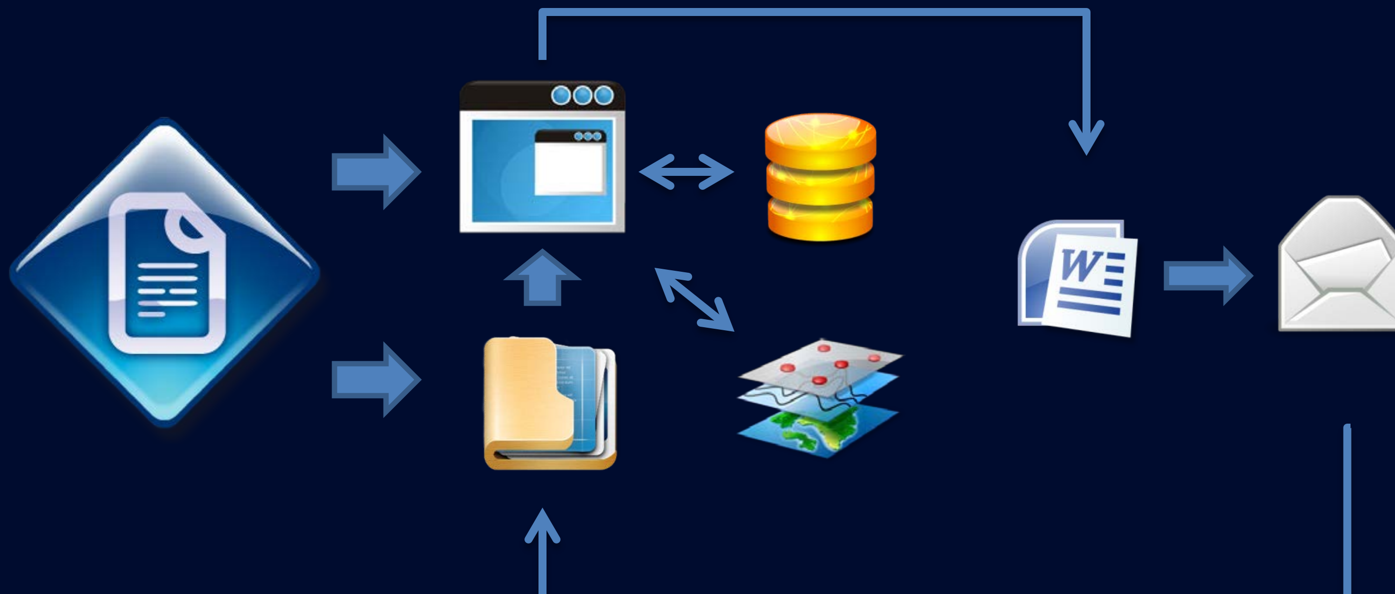
Bank IT Infrastructure

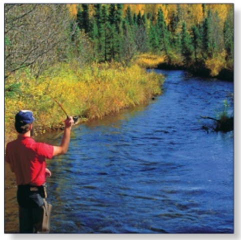
Current Process



Bank IT Infrastructure

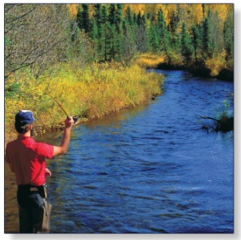
Current Process



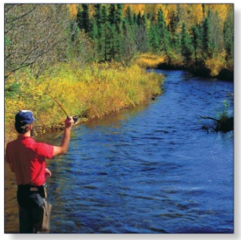


Bank IT Infrastructure

1. Internal Discussions & Workflow Modeling (Apr-Aug)
2. Software Development (Sep 2014 – Sep 2015)
3. Application Debugging & Beta-testing (Sep - Dec)
4. Program Launch (Jan 2016)

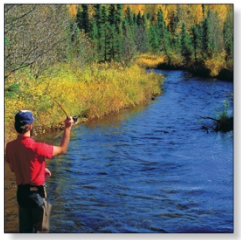
Questions on Annual Report

Procedural Guidance

Administrative guidance clarifying:

- Timeframes for Receiving Rental Applications and Procedures for Review,
- Clarifying a refund policy for rental payments,
- Clarifying processes for WR release requests



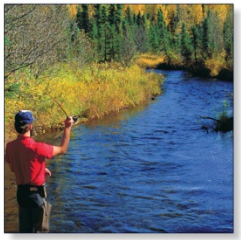
Timeframes for Receiving Rental Applications and Procedures for Review

WSB Rule 30.01:

"The Board may…authorize the Director to announce the availability of rights from the Board's Bank, establishing a time and date for receiving applications..."

Memo Language:

Rental applications will be accepted no earlier than November 1 in the year preceding the use of the water and no application to rent will be accepted after conclusion of the season of use.

Timeframes for Receiving Rental Applications and Procedures for Review

WSB Rule 30.07:

> *"When renting water from the bank, the Director and Board shall consider rental of water rights in the order the rights were leased to the bank, with first consideration for the rights which have continuously been in the bank the longest period of time.*

Memo Language:

Rental applications will be prioritized for processing based on the order in which they are received and extenuating circumstances, such as the desire to resolve water use violations through Rental Agreements, will not be cause for superseding processing priorities. Processing priorities will not limit Bank staff from accepting and processing companion applications, which can continue to be accepted and processed together, consistent with this policy, and all other rules governing the Bank.

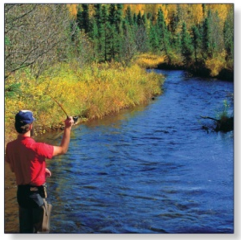
Clarifying a refund policy for rental payments

Memo Language:

Rental fees are due by the date specified in the Rental Agreement.

The Bank considers that beneficial use of water occurs once rental fees are paid and the date to commence the use of water has passed.

No rental fees will be refunded once the fee is collected and the start date for a Rental Agreement has passed.



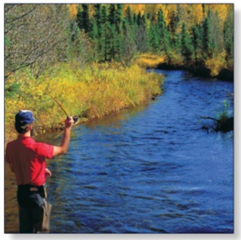
Clarifying processes for WR release requests

Rule 25.08.c:

"A water right which has been accepted shall remain in the Board's water supply bank for the period designated by the Board unless removed by resolution of the Board"

Memo Language:

"All Lease Contracts are to remain in full force for the duration of the Lease Contract and a request to release a water right from the Bank in advance of a contract's termination will only be considered by the Board's authorized representative under extenuating circumstance, when such a release will not adversely impact application processing times and/or water supply accounting."

Questions on Procedural Guidance

Memorandum

To: Idaho Water Resource Board

From: Remington Buyer

Date: March 10, 2014

Re: Updates to District 1 Rental Pool Procedures

The Board may approve the proposed updates to District 1 Rental Pool Procedures.

The 2014 Annual Meeting for Water District One was held March 4 in Idaho Falls, during which time members of the District approved updates to the 2014 Rental Pool Procedures. The 2014 Rental Pool Procedures are presented to the Idaho Water Resource Board for approval.

There are no financial amendments. The following are proposed changes for 2014 Rental Pool Procedures:

2.32 – Add "advisor" after Watermaster and Bureau

4.5 – Add "which includes the cost of Blackfoot River Equitable Adjustment Settlement Water, if any is required,"

5.2.101 – Change "February 1" to "March 14, 2014"

5.2.106 – Restate the language regarding Equitable Adjust Water to:
"Blackfoot River Equitable Adjust Settlement Agreement Water. Storage water not to exceed 20,000 acre-feet shall be made available in accordance with the terms of the Blackfoot River Equitable Adjustment Settlement Agreement. The source and funding of storage water shall be determined by the Committee at its June meeting. Administrative fees shall be paid by Water District 1"

5.2.107 – Cap the maximum amount of storage available for participants impacted by the prior year's rentals to 60,000 acre-feet

5.4.101(a) – Amend first priority procedures to remove reference to long term leases

5.4.106 – Remove references to prioritization for renting Equitable Adjustment Water

BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF APPROVAL OF THE LOCAL RENTAL POOL PROCEDURES FOR WATER DISTRICT NO.1, UPPER SNAKE RIVER	))))	RESOLUTION

WHEREAS, section 42-1761 of the Idaho Code authorizes the Idaho Water Resource Board (Board) to operate a Water Supply Bank; and

WHEREAS, the purposes of the Water Supply Bank are to encourage the highest beneficial use of water; provide a source of adequate water supplies to benefit new and supplemental uses; and provide a source of funding for improving water user facilities and efficiencies; and

WHEREAS, the Committee of Nine, the local committee has proposed changes to District No. 1 Rental Pool Procedures for 2014; and

WHEREAS, the Attorney General's office and the Water Supply Bank Coordinator have reviewed the proposed procedural changes; and

WHEREAS, the Idaho Water Resource Board may approve procedural changes;

NOW THEREFORE BE IT RESOLVED, the Idaho Water Resource Board approves the proposed changes to the 2014 District No. 1 Rental Pool Procedures.

Dated this 21st day of March, 2014.

____
ROGER W. CHASE
Chairman

Attest: ________________________________
BOB GRAHAM
Secretary

~~2013~~2014

WATER DISTRICT 1

PROPOSED RENTAL POOL PROCEDURES

TABLE OF CONTENTS

WATER DISTRICT 1

PROPOSED RENTAL POOL PROCEDURES

RULE 1.0 LEGAL AUTHORITY

1.1 These procedures have been adopted by the Water District 1 Committee of Nine pursuant to Idaho Code § 42-1765.

1.2 These procedures shall not be interpreted to limit the authority of the Idaho Department of Water Resources, the Idaho Water Resource Board, or the Watermaster of Water District 1 in discharging their duties as prescribed by statute or rule.

1.3 These procedures shall be interpreted consistent with Idaho Code, rules promulgated by the Idaho Water Resource Board, and relevant provisions of spaceholder contracts with the United States.

1.4 The operation of the rental pool shall in no way recognize any obligation to maintain flows below Milner or to assure minimum stream flows at the United States Geological Survey (USGS) gaging station on the Snake River near Murphy.

RULE 2.0 DEFINITIONS

2.1 **Accounting Year:** the Water District 1 accounting year that begins on November 1 and ends on October 31.

2.2 **Acre-foot:** a volume of water sufficient to cover one acre of land one foot deep and is equal to 43,560 cubic feet.

2.3 **Administrative Fee:** a fee of one dollar and five cents ($1.05) per acre-foot assessed on the total quantity of storage set forth in any rental or lease application, disbursed to the District at the end of the irrigation season.

2.4 **Allocation:** the amount of stored water, including carryover, that has accrued to a spaceholder's storage space on the date of allocation that is available for the spaceholder's use in the same accounting year.

2.5 **Applicant:** a person who files with the Watermaster an application, accompanied by the required fees, to rent or lease storage through the rental pool.

2.6 **Assignment:** storage provided by an assignor from the current year's storage allocation for rental through the common pool pursuant to Rule 5.3.

2.7 **Assignor:** a participant who assigns storage to the common pool pursuant to Rule 5.3 and subject to Rule 7.5.

2.8 **Board:** the Idaho Water Resource Board (IWRB).

2.9 **Board Surcharge:** a surcharge equal to ten percent (10%) of the rental price or lease price assessed on the total quantity of storage set forth in any rental or lease application, disbursed to the Board at the end of the irrigation season.

2.10 **Bureau:** the United States Bureau of Reclamation (USBR).

2.11 **Committee:** the Committee of Nine, which is the advisory committee selected by the members of Water District 1 at their annual meeting and appointed as the local committee by the Board pursuant to Idaho Code § 42-1765.

2.12 **Common Pool:** storage made available to the Committee through participant contributions and/or assignments for subsequent rental pursuant to Rule 5.

2.13 **Date of Allocation:** the date determined each year by the Watermaster on which the maximum accrual to reservoir spaceholders occurs.

2.14 **Date of Publication:** the date on which the Watermaster publishes on the District website the storage allocation for the current accounting year.

2.15 **Department:** the Idaho Department of Water Resources (IDWR).

2.16 **District:** Water District 1 of the state of Idaho.

2.17 **Impact Fund:** a fund maintained by the Watermaster for the mitigation of impacts to participants pursuant to Rule 7.3.

2.18 **Infrastructure Fee:** a fee of five dollars ($5.00) per acre-foot assessed on all storage rented through the common pool for purposes below Milner, excluding flow augmentation, disbursed to the Infrastructure Fund at the end of the irrigation season.

2.19 **Infrastructure Fund:** a fund maintained by the Watermaster for the purposes outlined in Rule 4.5.

2.20 **Lease:** a written agreement entered into between a lessor and lessee to lease storage through the rental pool pursuant to Rule 6.

2.21 **Lease Price:** a price per acre-foot negotiated between a lessor and lessee as set forth in a lease agreement.

2.22 **Lessee:** a person who leases storage from a participant under a lease.

2.23 **Lessor:** a participant who leases storage to a person under a lease pursuant to Rule 6 and subject to Rule 7.6.

2.24 **Milner:** Milner Dam on the Snake River.

2.25 **Net Price:** the average price per acre-foot of all rentals from the common pool, including flow augmentation, but excluding rentals of assigned storage.

2.26 **Net Proceeds:** the net price times the number of acre-feet rented from the common pool, excluding rentals of assigned storage.

2.27 **Participant:** a spaceholder who contributes storage to the common pool pursuant to Rule 5.2.

2.28 **Participant Contributions:** storage made available to the common pool by participants, with impacts accounted from next year's reservoir fill, which forms the supply for large rentals, small rentals, and flow augmentation, subject to the limitations in Rule 5.2.

2.29 **Person:** an individual, corporation, partnership, irrigation district, canal company, political subdivision, or governmental agency.

2.30 **Rent:** the rental of storage from the common pool.

2.31 **Rental Pool:** the processes established by these procedures for the rental and/or lease of storage, mitigation of associated impacts to spaceholders, and disposition of revenues.

2.32 **Rental Pool Subcommittee:** a subcommittee composed of the Watermaster (advisor), a designated representative from the Bureau (advisor), and three or more members or alternates of the Committee who have been appointed by the chairman of the Committee.

2.33 **Rental Price:** the price per acre-foot of storage rented from the common pool, as set forth in Rule 5.5, excluding the administrative fee, the Board surcharge, and the infrastructure fee.

2.34 **Renter:** a person who rents storage from the common pool.

2.35 **Reservoir System:** refers to American Falls, Grassy Lake, Henrys Lake, Island Park, Jackson Lake, Lake Walcott, Milner Pool, Palisades, and Ririe.

2.36 **Space:** the active capacity of a reservoir measured in acre-feet.

2.37 **Spaceholder:** the holder of the contractual right to the water stored in the space of a storage facility.

2.38 **Storage:** the portion of the available space that contains stored water.

2.39 **Watermaster:** the watermaster of Water District 1.

2.40 **Water Supply Forecast:** the forecasted unregulated runoff for April 1 to September 30 at the Heise USGS gaging station, referred to in Table 1.

RULE 3.0 PURPOSES

3.1 The primary purpose of the rental pool is to provide irrigation water to spaceholders within the District and to maintain a rental pool with sufficient incentives such that spaceholders supply, on a voluntary basis, an adequate quantity of storage for rental or lease pursuant to procedures established by the Committee. These procedures are intended to assure that participants have priority over non-participants and non-spaceholders in renting storage through the rental pool.

3.2 To maintain adequate controls, priorities, and safeguards to insure that existing water rights are not injured and that a spaceholder's allocation is not impacted without his or her consent. To compensate an impacted spaceholder to the extent the impact can be determined by the procedures developed by the District.

3.3 To generate revenue to offset the costs of the District to operate the rental pool and to fund projects that fall within the parameters of Rule 4.5.

RULE 4.0 MANAGEMENT

4.1 **Manager.** The Watermaster shall serve as the manager of the rental pool and shall take all reasonable actions necessary to administer the rental pool consistent with these procedures, which include, but are not limited to:

(a) Determining impacts pursuant to Rule 7;
(b) Calculating payments to participating spaceholders as prescribed by Rules 5.2 and 7.3;
(c) Accepting storage into the common pool and executing rental agreements on behalf of the Committee;
(d) Disbursing and investing rental pool monies with the advice and consent of the Rental Pool Subcommittee; and
(e) Taking such additional actions as may be directed by the Committee.

4.2 **Rental Pool Subcommittee.** The Rental Pool Subcommittee shall exercise the following general responsibilities:

(a) Review these procedures and, as appropriate, make recommendations to the Committee for needed changes;
(b) Review reports from the Watermaster regarding rental applications, storage assignments to the common pool, and leases of storage through private leases;
(c) Advise the Committee regarding rental pool activities;
(d) Develop recommendations for annual common pool storage supplies and rental rates;
(e) Assist the Watermaster in resolving disputes that may arise from the diversion of excess storage; and
(f) Assume such additional responsibilities as may be assigned by the Committee.

4.3 **Applications**

4.3.101 Applications to rent or lease storage through the rental pool shall be made upon forms approved by the Watermaster and shall include:

(a) The amount of storage sought to be rented or leased;
(b) The purpose(s) for which the storage will be put to beneficial use;
(c) The lease price (for private leases); and
(d) To the extent practicable at the time of filing the application, the point of diversion identified by legal description and common name; and a description of the place of use.

4.3.102 *Application Acceptance*. Applications are not deemed accepted until received by the Watermaster together with the appropriate fees required under Rules 5.5 (rentals) or 6.4 (leases).

4.3.103 *Application Approval.* An application accepted under Rule 4.3.102 shall be approved after the Watermaster has determined that the application is in compliance with these procedures and sufficient storage will be available from the common pool and/or lessor to provide the quantity requested in the application. Upon approval of the application, the Watermaster shall send notice to the renter/lessor/lessee and entity owning the point-of-diversion designated in the application of such approval and allocation of storage;

provided, however, no allocation of storage shall be made until the applicant designates the point of diversion and place of use of the rented and/or leased storage in the application or pursuant to Rule 4.3.106.

4.3.104 *Timeframe for having Rental Application Accepted to Preserve Rental Priority.* Applications to rent storage will not be accepted until April 5 of the year in which the storage will be used. Applications must be accepted by the Watermaster within 15 days following the date of publication to preserve the applicant's priority under Rule 5.4.101.

4.3.105 *Deadline for Accepting Applications to Rent or Lease Storage.* All applications to rent or lease storage must be accepted by the Watermaster pursuant to Rule 4.3.102 not later than December 1 in order for the storage identified in such applications to be accounted for as having been diverted prior to October 31 of the same year. Applications accepted after December 1 will be accounted for from storage supplies in the following calendar year, unless an exception is granted by the Rental Pool Subcommittee.

4.3.106 *Deadline to Designate Point of Diversion and Place of Use.* If the point of diversion and/or place of use of the rented and/or leased storage was not previously designated in the application, the renter and/or lessee must make such designation in writing to the Watermaster not later than December 1 of the same year, unless an extension is granted by the Rental Pool Subcommittee. Failure to comply with this provision shall cause any unused storage to automatically revert back to the common pool and/or lessor, respectively.

4.4 **Rental Pool Account**

4.4.101 All monies submitted by applicants shall be deposited in an interest-bearing account known as the "Rental Pool Account" and maintained by the Watermaster on behalf of the Committee. Monies in the Rental Pool Account will be disbursed to participants, the District, the Board, the Impact Fund, and the Infrastructure Fund in the proportions set forth in these Rules. Accrued interest to the Rental Pool Account shall be used to maintain the Impact Fund. Rental Pool Funds shall be considered public funds for investment purposes and subject to the Public Depository Law, Chapter 1, Title 57, Idaho Code.

4.4.102 Monies deposited in the Rental Pool Account are non-refundable to the extent the rental and/or lease application is approved pursuant to Rule 4.3.103, regardless of whether the storage is used.

4.5 **Infrastructure Fund**

4.5.101 Monies in the Infrastructure Fund may only be used to fund District costs of projects relating to improvements to the District's distribution, monitoring, and gaging facilities, and other District projects designed to assist in the adjudication, which includes the cost of Blackfoot River Equitable Adjustment Settlement Water, if any is required, conservation, or efficient distribution of water.

4.5.102 Disbursements from the Infrastructure Fund are subject to two-thirds (2/3) Committee approval.

4.5.103 If monies in the Infrastructure Fund accrue to one million dollars ($1,000,000.00), the infrastructure fee shall be waived and the same amount (five dollars ($5.00)) added to the rental price in Rule 5.5.105.

4.5.104 Monies in the Infrastructure Fund may be carried over from year to year.

RULE 5.0 COMMON POOL

5.1 **Scope.** The common pool consists of storage made available to the Committee through participant contributions and assignments. Participants make storage available to the common pool pursuant to the terms of Rule 5.2, with impacts accounted from next year's reservoir fill. Assignors provide storage to the common pool, pursuant to Rule 5.3, by assigning a portion of their current year's storage allocation. Rentals from the common pool are subject to the priorities and prices established under this Rule.

5.2 **Participant Contributions**

5.2.101 *Participants.* Any spaceholder may, upon submitting written notice to the Watermaster prior to ~~February 1~~March 14, 2014, elect to contribute storage to the common pool. Any spaceholder making such election shall be deemed a "participant" for the current year and every year thereafter until the spaceholder provides written notice to the Watermaster prior to ~~February 1~~March 14, 2014 rescinding its participation. Upon election to participate, a spaceholder is eligible for all the benefits of a participant set forth in these procedures, excluding monetary payment for rentals or impacts associated with rentals from the prior year. If after ~~February 1~~March 14, 2014, less than seventy-five percent (75%) of the contracted storage space is committed to the common pool by participants, the Committee shall revise the rental pool procedures as necessary prior to April 1.

5.2.102 *Non-Participants.* Spaceholders who are not participants shall not be entitled to supply storage to, or rent storage from, the common pool, or supply or lease storage through a private lease. Notwithstanding this restriction, the Bureau may rent water from the common pool for flow augmentation pursuant to Rule 5.2.105.

5.2.103 *Large Rentals.* The common pool will make available from participant contributions 50,000 acre-feet of storage for rentals, plus any assigned storage, subject to the priorities and limitations set forth in Rule 5.

5.2.104 *Small Rentals.* The common pool will make available from participant contributions 5,000 acre-feet for rentals of less than 100 acre-feet per point of diversion, subject to the priorities and limitations set forth in Rule 5. The Committee may approve on a case-by-case basis the additional rental of storage under this provision to exceed the 100 acre-feet limitation.

5.2.105 *Flow Augmentation*

(a) *Table 1.* The amount of storage, from participant contributions to the common pool, available for rental for flow augmentation shall be determined by Table 1.

(b) *Extraordinary Circumstances.* A greater amount of storage may be made available by the Committee, if it determines on or before July 1 that extraordinary circumstances justify a change in the amount of storage made available for flow augmentation.

5.2.106 *Blackfoot River Equitable Adjustment Settlement Agreement Water.* Storage water not to exceed 20,000 acre-feet shall be made available in accordance with the terms of the Blackfoot River Equitable Adjustment Settlement Agreement. The source and funding of the storage water shall be determined by the Committee at its June meeting. Administrative fees shall be paid by Water District 1. ~~The amount of storage, from participant contributions to the common pool, available at no cost to the Shoshone Bannock Tribe, pursuant to administrative fees paid by Water District 1, shall be determined as follows:~~

~~(a) Equitable adjustment water shall only be available in accordance to the terms of the Blackfoot River Equitable Adjustment Settlement Agreement and subject to approval by the SRBA court and implementation thereof,~~
~~(b) The equitable adjustment water account shall begin in 2013 with a balance of 5,000 acre feet.~~
~~(c) The equitable adjustment water account shall be replenished at a fixed rate of 1,000 acre feet per year.~~
~~(d) The equitable adjustment water account shall have a maximum balance of 10,000 acre feet.~~
~~(e)(a) Any utilization of the equitable adjustment water by the Tribe shall be subtracted from the equitable adjustment water account balance.~~

5.2.107 *Additional Quantities.* For the 2014 irrigation season, i~~I~~n the event rental requests from participants impacted from the prior year's rentals exceed 50,000 acre-feet and insufficient storage has been assigned to the common pool to meet such additional requests, the ~~minimum~~ maximum amount of storage that will be available through the common pool will be ~~the amount of storage necessary~~60,000 acre-feet to meet the demand of those shown to have been impacted from the prior year's rentals. ~~If additional storage is deemed necessary, any participant may elect not to participate in contributing such additional storage.~~

(a) *Distribution of Storage.* If, following the deadline for receipt of request from participants impacted from the prior year's rentals, the Watermaster determines that the total quantity of storage sought to be rented through the common pool exceeds the quantity limitation established under this Rule, then the Watermaster shall reduce the quantity of each impacted common pool rental contract to a pro rata share of 60,000 acre-feet limitation based on the amount of storage sought to be rented by each impacted spaceholder. The Watermaster shall amend the impacted common pool rental contract(s) to reflect any reduced quantity required by this provision.

5.2.108 *Participant Payments.* Monies collected through the rental of the participant contribution portion of the common pool, including flow augmentation, shall be disbursed as follows:
(a) seventy percent (70%) of the Net Proceeds disbursed to participants; and
(b) thirty percent (30%) of the Net Proceeds disbursed to the Impact Fund.

5.2.109 *Participant Payment Formula.* Participants will receive payment for storage rented from the participant contribution portion of the common pool pursuant to the following payment formulas:

1st Installment	= (R x SP/TSP) / 2
2nd Installment	= (R x ST/TST) / 2

R	=	70% of net proceeds
SP	=	Space of participants
ST	=	Storage of participants based on the preliminary storage allocation for the following year
TSP	=	Total participating space in system
TST	=	Total participating storage in system based on the preliminary storage allocation for the following year

If a specific reservoir's allocation has been reduced as a result of flood-control operations, the ST and TST values in the above formula for those reservoir spaceholders will reflect the values that otherwise would have occurred without any reductions for flood-control.

5.2.110 *Timing of Payments.* Payments to participants will be made in two installments. The first installment will be paid to participants immediately following the irrigation season in which the proceeds were collected. The second installment will be paid to participants within two weeks of the date of publication for the following irrigation season.

5.3 Assignments

5.3.101 *Assignors.* Any participant may assign storage to the common pool. An assignment of storage shall be made in writing on forms approved by the Watermaster.

5.3.102 *Purposes.* Storage assigned to the common pool may be rented only for purposes above Milner.

5.3.103 *Limitations.* Storage assigned to the common pool may be rented only after the participant contributions to the common pool have been rented. A participant may not assign storage and rent storage in the same accounting year unless an exception is granted by the Rental Pool Subcommittee.

5.3.104 *Assignor Payment.* The assignor shall receive one-hundred percent (100%) of the rental price per acre-foot of the assigned storage that is rented.

5.3.105 *Distribution of Assigned Storage.* Assignments can only be made between April 5 and 15 days after the date of publication in the year in which the storage is to be rented. Assignments shall initially be distributed on a pro-rata basis, with each pro-rata share based on the amount of storage assigned or 10% of the assignor's storage space, whichever is less. If, after this initial distribution, additional rental requests exist, the remaining assigned storage shall be distributed on a pro-rata basis.

5.4 Priorities for Renting Storage

5.4.101 *Priorities.* Storage rented from the common pool shall be pursuant to the following priorities:

(a) *First Priority.* Rentals by participants whose storage is determined to have been impacted by the prior year's rental from the common pool not to exceed the amount of the impact. ~~Rentals pursuant to existing long term leases with the Committee, provided that such rentals be supplied first from any balance of the 5,000 acre-feet reserved for small rentals, then from any assigned water, and then from the 50,000 acre-feet reserved for large rentals~~.
(b) *Second Priority.* Rentals by participants for agricultural purposes up to the amount of their unfilled space.
(c) *Third Priority.* Rentals by participants for any purposes above Milner in excess of their unfilled space. Applications for such rentals will be reviewed by the Committee and may be approved on a case-by-case basis.
(d) *Fourth Priority.* Rentals by non-spaceholders for any purposes above Milner.
(e) *Fifth Priority.* Rentals for purposes below Milner, excluding flow augmentation; provided, however, such rentals are limited to 50,000 acre-feet per year or a lesser amount as set by the Committee. Rentals for purposes below Milner can only be filled with storage from the 50,000 acre-feet of participant contributions described in Rule 5.2. To the extent that storage is assigned to the Common Pool, assigned storage will be used to fill the rentals of the First, Second, Third, and Fourth Priorities, allowing that portion of the participant contributions to be used for rentals below Milner. Rentals for purposes below Milner will only be approved to the extent the renter provides written certification from the Bureau stating either 1) that the Bureau has sufficient flow augmentation supplies for the year, or 2) that the storage to be released past Milner will count towards the Bureau's flow augmentation total.

5.4.102 *Priority for Late Applications.* Applications received after the deadline set forth in Rule 4.3.104 will be deemed last in priority and will be filled in the order they are received, only after all timely applications have been filled.

5.4.103 *Distribution Within Priority Classes.* If rental supplies are not sufficient to satisfy all of the timely applications within a priority class (those received within 15 days of the date of publication), the available rental supplies will be distributed to the applicants within that priority class on a pro-rata basis.

5.4.104 *Priority for Small Rentals.* Small rentals made pursuant to Rule 5.2.104 are not subject to the priorities set forth in Rule 5.4.101 and will be approved in the same order in which the rental applications are received by the Watermaster, so long as the total amount of all such applications does not exceed 5,000 acre-feet.

5.4.105 *Priority for Flow Augmentation.* Rentals for flow augmentation are not subject to the priorities set forth in Rule 5.4.101 and shall be determined pursuant to Rule 5.2.105.

~~5.4.106 *Priority for Equitable Adjustment Water.* Equitable adjustment water is not subject to the priorities set forth in Rule 5.4.101 and shall be determined pursuant to Rule 5.2.106.~~

5.5 **Rental Prices**

5.5.101 *Tier 1*: If the storage system fills, the rental price for purposes above Milner shall be $6.00 per acre-foot.

5.5.102 *Tier 2:* If the storage system does not fill but storage is provided for flow augmentation pursuant to Rule 5.2.105(a), the rental price for purposes above Milner shall be $14.50 per acre-foot.

5.5.103 *Tier 3:* If the storage system does not fill and no flow augmentation water is provided pursuant to Rule 5.2.105(a), the rental price for purposes above Milner shall be $22.00 per acre-foot.

5.5.104 *Determination of Tier1, 2 or 3 Rental Price*: Unless the storage system has filled, the Watermaster shall designate on or before April 5 either Tier 2 or Tier 3 as the rental price for above-Milner rentals. If at any time during the same accounting year, the storage system should subsequently fill, the Watermaster shall designate Tier 1 as the rental price for above-Milner rentals and refund any excess rental fees within 30 days after the date of publication.

5.5.105 *Tier 4:* The rental price for storage rented for flow augmentation shall be $14.50 per acre-foot.

5.5.106 *Tier 5:* The rental price for storage rented for purposes below Milner, excluding flow augmentation, shall be negotiated between the applicant and the rental pool sub-committee.

5.5.107 *Fees & Surcharges*. There shall be added to the rental price for all rentals the administrative fee and Board surcharge. There shall also be added to the rental price for rentals below Milner, excluding flow augmentation, the infrastructure fee.

5.5.108 *Storage System Fill*. For purposes of Rule 5.5 only, the storage system is considered full when all storage rights are filled in Jackson Lake, Palisades, American Falls, and Island Park.

RULE 6.0 PRIVATE LEASES

6.1 **General**. All leases must be transacted through the rental pool. Only participants may lease storage to a Lessee subject to the provisions of these rules.

6.2 **Purposes.** Storage may be leased through the rental pool only for beneficial use purposes above Milner. A lessor may not lease storage to a lessee and rent storage from the common pool in the same accounting year unless an exception is granted by the Rental Pool Subcommittee.

6.3 **Payment to Lessor.** The lessor shall receive one-hundred percent (100%) of the lease price.

6.4 **Fees & Surcharges.** There shall be added to the lease price the administrative fee and the Board surcharge.

6.5 **Non-Applicability to Common Pool.** Storage leased pursuant to this rule does not count against the participant contribution volumes set forth in Rule 5.2.

6.6 **Recharge.** All storage used for the purpose of recharge must be transacted through the rental pool. Unless storage is rented pursuant to Rule 5.0, storage used for recharge, whether diverted by the storage spaceholder or another person, will be treated as a lease of storage.

RULE 7.0 IMPACTS

7.1 **Determination.** In any year in which the storage rights in the reservoir system do not fill, the Watermaster will determine the impacts to spaceholders, if any, associated with the prior year's rentals and leases. In making this determination, the Watermaster will use a procedure which identifies the following:

(a) What each reservoir fill would have been had the previous year's rentals and leases not taken place;

(b) The storage space from which rented or leased storage was actually supplied for the previous year's rental or lease; and

(c) The amount of storage each spaceholder's current allocation was reduced by the previous year's rental or lease activities.

7.2 **Flood Control.** There are no impacts resulting from the previous year's rentals or leases for a specific reservoir when that reservoir's storage is released as a result of flood-control operations and water is spilled past Milner in the current year.

7.3 **Impacts to Participants due to Rentals from the Common Pool (excluding assignments)**

7.3.101 *Impact Payment Formula.* Participants whose storage allocation is impacted from the prior year's rental of storage from the common pool, excluding assignments, will receive payment from the Impact Fund according the following formula:

Impact Payment = (Isp*RP) or ½ IF*(Isp/Ispt) (whichever sum is less)

Isp = Participant's impacted space in acre-feet
RP = Rental Price
IF = Impact Fund
Ispt = Total of all Participants' impacted space in acre-feet

7.3.102 *Timing of Payment.* Impact payments, which will be based on preliminary data, will be made to participants on or before July 15.

7.4 **Impacts to Non-Participants due to Rentals from the Common Pool (excluding assignments).** If the rental of storage from the common pool, excluding assignments, caused impacts to non-participants, as determined by the Watermaster, the participants' storage allocation shall be limited to the storage available after such impacts have been mitigated.

7.5 **Impacts to Spaceholders due to Rental of Assigned Storage.** If the rental of assigned storage caused impacts, as determined by the Watermaster, the assignor's storage allocation shall be reduced by an amount equal to such impacts, not to exceed the quantity of storage assigned by the assignor, and reallocated to mitigate impacts to affected spaceholders. This reallocation will only occur in the year following the rental of assigned storage.

7.6 **Impacts to Spaceholders due to Private Leases.** If the lease of storage pursuant to a private lease caused impacts, as determined by the Watermaster, the lessor's storage allocation shall be reduced by an amount equal to such impacts, not to exceed the quantity of storage leased by the Lessor, and reallocated to mitigate impacts to affected spaceholders. This reallocation will only occur in the year following the lease of storage.

RULE 8.0. SUPPLEMENTAL POOL

8.1 **Purpose.** To provide a voluntary mechanism for the lease of storage water below Milner for hydropower generation within the state of Idaho when storage water supplies, as a result of hydrologic, climate and other conditions, are sufficient to satisfy above Milner uses and flow augmentation. A supplemental pool shall be created in order to mitigate for impacts associated with leases below Milner, consistent with the Idaho Water Resource Board's policy to establish an effective water marketing system consistent with state law and assuring the protection of existing water rights while accommodating the purchase, lease or conveyance of water for use at Idaho Power's hydroelectric facilities, including below Milner Dam.

8.2 **Annual Authorization Required**. No storage may be leased through the supplemental pool until the Committee on or after April 1 of each year authorizes use of the pool and the Bureau certifies that it has sufficient flow augmentation supplies for the year or that storage to be released past Milner will count toward flow augmentation.

8.3 **Quantity and Price Determinations.**

8.3.101 *Quantity Determination*. The maximum quantity of storage authorized to be leased through the supplemental pool shall be determined annually by the Committee taking into account the advice and recommendation of the Rental Pool Subcommittee, together with current and forecasted hydrological conditions and estimated demand on the rental pool for above Milner uses.

8.3.102 *Price Determination*. The Committee shall authorize the leasing of water, including price pursuant to Rule 8 after taking into account spaceholder needs and current market conditions for power generation. There shall be added to the lease price the board surcharge and not to exceed a $1.80 per acre-foot administrative fee associated with the development and implementation of the supplemental pool, assessed on the total quantity of storage set forth in any lease application approved or conditionally approved under Rule 8.4.

8.3.103 *Subsequent Quantity and Price Determinations*. If within the same accounting year, the Committee subsequently determines based on the criteria set forth in Rule 8.3.101 that additional opportunities exist for utilizing the use of water within Idaho through the supplemental pool consistent with Rule 8.1.it shall designate such additional maximum quantity authorized to be leased through the supplemental pool and identify a separate lease price for such additional quantity pursuant to Rule 8.3.102.

8.4 **Application to Lease Storage from the Supplemental Pool.**

8.4.101 Applications to lease storage from the supplemental pool for hydropower purposes shall be made upon forms approved by the Watermaster and shall include:

(a) The amount of storage sought to be leased;

(b) The lease price with associated fees as identified by the Committee under Rule 8.3.102;

(c) The point of diversion identified by legal description and common name; and

(d) A description of the place of use.

8.4.102 *Application Acceptance.* Applications are not deemed accepted until received by the Watermaster together with the appropriate fees required under Rule 8.3.102.

8.4.103 *Application Approval.* An application accepted under Rule 8.4.102 shall be approved after the Watermaster has determined that the application is in compliance with these procedures and sufficient storage will be available from the supplemental pool to provide the quantity requested in the application; provided, however, if the date of publication has not yet occurred, approval of the application shall be conditioned on the ability of spaceholders who have contracted to lease storage through the supplemental pool to have a sufficient storage allocation during the accounting year to satisfy their contracts approved under Rule 8.5.104. Upon approval or conditional approval of the application, the fees collected from the applicant shall be non-refundable to the extent of the total quantity of storage approved or conditionally approved in supplemental pool lease contract(s) under Rule 8.5.104. The Watermaster shall provide notice of such approval.

8.4.104 *Deadline for Accepting Applications.* All applications to lease storage from the supplemental pool must be accepted by the Watermaster pursuant to Rule 8.4.102 not later than October 31 in order for the storage identified in such applications to be accounted for as having been diverted as of October 31 of the same year. Applications accepted after October 31 will be accounted for from storage supplies in the following calendar year, unless an exception is granted by the Rental Pool Subcommittee.

8.5 **Supplemental Pool Supply.**

8.5.101 *Notice to Spaceholders of Opportunity to Lease Storage through the Supplemental Pool.* The Watermaster shall provide notice of the supplemental pool on the Water District 1 website, which shall include the following information:

(a) The maximum quantity of storage authorized to be leased through the supplemental pool;

(b) The lease process, including price and deadlines as authorized by the Committee;

(c) Instructions for spaceholders interested in leasing storage through the supplemental pool, including instructions for executing a standardized supplemental pool lease contract; and

(d) The deadline, as set by the Committee, for the Watermaster to receive supplemental pool lease contracts from spaceholders interested in leasing storage through the supplemental pool.

8.5.102 *Supplemental Pool Lease Contracts.* Spaceholders interested in leasing storage through the supplemental pool shall execute a standardized supplemental pool lease contract, which shall be provided by the Watermaster and include provisions for the following:

(a) Limit eligibility to lease storage through the supplemental pool only to spaceholders who qualify as participants under Rule 2.27;

(b) The quantity sought to be leased by the spaceholder may be any amount, except that the total amount of storage leased pursuant to Rule 8 may not exceed either the maximum quantity set by the Committee under Rule 8.3.101 or 10% of the spaceholder's total reservoir system space, unless an exception is approved by the Rental Pool Subcommittee;

(c) The quantity actually leased by the spaceholder may be reduced depending upon the number of spaceholders who elect to lease storage through the supplemental pool as provided in Rule 8.5.103;

(d) That, in the event the spaceholder elects to sign a standard pool lease contract before the date of publication, the spaceholder assumes the risk that its storage allocation may be less than the spaceholder anticipated; and

(e) Notice to the spaceholder that if the spaceholder's lease through the supplemental pool causes impacts, the mitigation required under Rule 8.7 will result in an amount of the spaceholder's space, not to exceed the quantity of storage leased by the spaceholder, being assigned a junior priority which may not fill for multiple consecutive years, an accounting commonly referred to as "last to fill."

8.5.103 *Distribution of Storage to the Supplemental Pool.* If, following the deadline for receipt of executed supplemental pool lease contracts, the Watermaster determines that the total quantity of storage sought to be leased through the supplemental pool exceeds the quantity limitation established under Rule 8.3, then the Watermaster shall reduce the quantity of each supplemental pool lease contract to a pro rata share based on the amount of storage sought to be leased by each spaceholder. The Watermaster shall amend the supplemental pool lease contract(s) to reflect any reduced quantity required by this provision.

8.5.104 *Lease Contract Approval.* Following receipt of a supplemental pool lease contract, the Watermaster shall determine whether the contract is in compliance with these procedures, and, if so, shall approve the same; provided, however, if the date of publication has not yet occurred, approval of the contract shall be conditioned on the spaceholder having a sufficient storage allocation during the accounting year to satisfy the contract.

8.6 **Notice of Contract Approval and Payment to Lessors**. The lessors shall receive one-hundred percent (100%) of the lease price apportioned according to the quantity of storage each lessor leased through the supplemental pool. The Watermaster shall notify spaceholder(s) who submitted supplemental pool lease contracts of the approved amount and distribute the funds to the lessors within 30 days following approval or conditional approval of an application under Rule 8.4.103.

8.7 **Mitigation of Impacts.** If a lease of storage through the supplemental pool caused impacts, as determined by the Watermaster, the lessor's storage allocation shall be reduced by an amount equal to such impacts, not to exceed the quantity of storage leased by the lessor, and reallocated to mitigate impacts to affected spaceholders until the lessor's affected space fills under a priority junior to that required to fill Palisades powerhead space.

8.8 **November 1 Carryover Unaffected**. For purposes of determining the amount of storage available for flow augmentation under Rule 5.2.105(a), storage leased through the supplemental pool shall not affect the November 1 carryover quantity on Table 1.

BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF THE FEDERAL ENERGY REGULATORY COMMISSION APPLICATION FOR PRELIMINARY PERMIT FOR THE WEISER-GALLOWAY HYDROELECTRIC AND WATER STORAGE PROJECT	)))))))	RESOLUTION TO FILE APPLICATION

WHEREAS, House Joint Memorial No. 8 passed and approved by the 2008 Idaho legislature encouraged the Idaho Water Resource Board (IWRB), in coordination with other public and private entities, to initiate and complete the study of additional water storage projects in the state of Idaho including, but not limited to, the study of the potential benefits of a dam and reservoir at the Galloway Damsite (Galloway project); and

WHEREAS, the IWRB and the U.S. Army Corps of Engineers (Corps) completed the *Weiser-Galloway Gap Analysis, Economic Evaluation and Risk-Based Cost Analysis Project* (Gap analysis), a reexamination of the previously identified Galloway project intended to identify gaps in earlier studies, address changed conditions and determine whether to move forward with comprehensive feasibility studies; and

WHEREAS, two primary gaps were identified that required resolution prior to initiation of feasibility studies: 1) Determine the safety, suitability and integrity of geologic structures at the potential dam and reservoir site; 2) Evaluate whether basin and regional benefits would be realized by analyzing a series of system operating scenarios with new storage on the Weiser River; and

WHEREAS, the IWRB and the Corps completed the *Foundation Investigation and Evaluation, Weiser-Galloway Potential Damsite* and is currently performing the *Snake River System Operational Analysis Project* (Operations analysis); and

WHEREAS, the Operations analysis includes evaluation of a 40-60MW hydropower plant as part of the potential dam and reservoir project which could contribute to regional energy needs; and

WHEREAS, the IWRB is in the position, under the Municipal Preference, to pursue study and development of the project on behalf of the state of Idaho if the project is determined to be feasible, cost effective and in the public interest; and

WHEREAS, filing an application for preliminary permit with the Federal Energy Regulatory Commission is required in order to secure and maintain priority of application for a license for the project under Part I of the Federal Power Act while obtaining the data and performing the acts required to determine feasibility of the project and to support an application for license.

NOW THEREFORE BE IT RESOLVED that the IWRB hereby approves the filing of the application for preliminary permit with the Federal Energy Regulatory Commission as prepared.

Dated this 21st day of March, 2014.

ROGER W. CHASE
Chairman

Attest:

BOB GRAHAM
Secretary

MATERIALS FOR THIS SECTION WILL BE PROVIDED AT THE MEETING.