



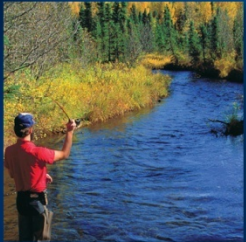
Island Park Reservoir Enlargement Project

Henry's Fork Watershed Council

May 12, 2015

Overview

- Background
 - IWRB/State Priorities
 - Henrys Fork Basin Study
- Project Concept
- Land Assessment
- Next Steps



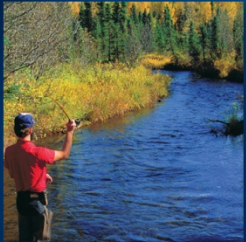
Idaho Dept. of Water
Resources (IDWR)
Director Appointed by Governor
& confirmed by Senate

- Water rights administration
- Delivery of water per water rights
- Other regulatory functions

Idaho Water Resource
Board (IWRB)
Members appointed by Governor
& confirmed by Senate

- Water planning
- Water projects and project financing
- "Problem solving"

Shared Staff



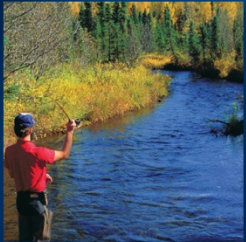
IWRB Authority for Proposed Project

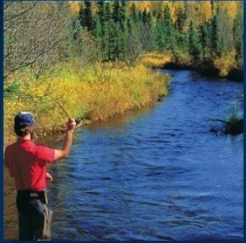
Idaho Constitution Article XV, Section 7: “There shall be constituted a Water Resource Agency, composed as the Legislature may now or hereafter prescribe, which shall have power to construct and operate water projects; to issue bonds, without state obligation, to be repaid from revenues of projects; to generate and wholesale hydroelectric power at the site of production; to appropriate public waters as trustee for Agency projects; to acquire, transfer and encumber title to real property for water projects and to have control and administrative authority over state lands required for water projects...”

IWRB Authority for Proposed Project

IWRB authorities further defined in Idaho Code 42-1734 to 42-1780

- Eminent domain
- Partnerships with federal, state, local governments and private enterprises
- Finance projects with such funds as available
- Acquire, purchase, lease or exchange land, rights, water rights, easements, franchises and any other property deemed necessary for the construction of projects
- Other facets necessary for projects and financing



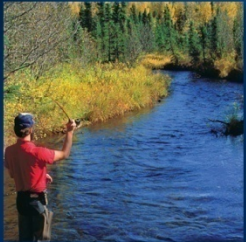


System-wide Water Management Issues

- Declining aquifer levels/storage in the Eastern Snake Plain
 - Average annual loss of aquifer storage (1952-2008) is 214,000 acre-feet
 - Causes: Increasingly efficient use of surface water, drought events, increased ground water pumping
- Decline in discharge from the Thousand Springs
- Conjunctive Administration
 - Hydrologically connected surface and ground water administered together
- Delivery Calls and Water Right Curtailment
 - Potential curtailments resulting in severe economic impacts to state
- Maintain Swan Falls minimum flows
- Challenges in other aquifers
 - Wood River Valley, Mountain Home, Treasure Valley, Palouse,

Other Pressures on Water Supplies

- Flow Augmentation:
 - Designed to aid ESA-listed anadromous fish downriver
 - Began in early '90's - formalized as part of 2004 Snake River Water Rights Agreement (Nez Perce Agreement) between Idaho, United States, and the Nez Perce Tribe
 - Requires best efforts to send 427,000 acre-feet/yr downriver from storage reservoirs above Hells Canyon + 60,000 acre-feet/yr (Bell Rapids) in addition to minimum flow at Snake@Weiser Gage (3,750 cfs)
- Population growth and economic development
- Climate change: projections indicate more winter rain & less winter snow; results in less snow water storage (additional storage may be necessary to stay even); already witnessing earlier average runoff



Legislative Direction/Actions

2008 - HJM8 and SB1511 (\$400,000 to investigate storage in the Henrys Fork/Teton)

- HB 428 and 644 (Statewide CAMP program and fund)

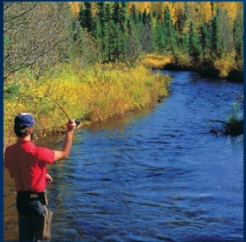
2012 - Idaho State Water Plan

2014 – HB 479 (Sustainability Initiative - \$15M one-time funds)

- Storage projects (\$2.5 M for Island Park enlargement)
- ESPA recharge infrastructure
- MHAFB surface water supplies
- North Idaho projects
- Water Supply Bank

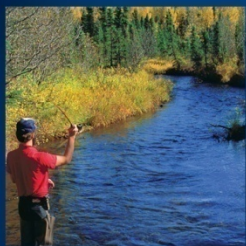
- HB 547 (\$5M ongoing cigarette tax)

- Statewide aquifer stabilization (ESPA first priority, other aquifers identified)



Statewide Actions

- Eastern Snake Plain Aquifer & Spring Stabilization Efforts
 - Managed Recharge
 - GW – SW Replacement Projects
 - Dem and Reduction
 - Cloud Seeding/Weather Modification
 - Measurement and monitoring efforts
- Other Activities
 - Mt Home – replacement water supplies for Air Force Base, water right acquisition by IWRB, aquifer stabilization
 - Wood River Valley – GW model under development, cloud seeding
 - Treasure valley – GW model under development, cloud seeding
 - Rathdrum Prairie – CAMP Implementation, Future needs studies
 - Others?
- Buy-outs and Buy-downs – remove water calls and increase river flows
- Water Supply Bank – policy and processing modifications, and database development to improve processing efficiency
- New surface water storage projects under study – additional water supply
 - Galloway, Arrowrock Enlargement, Island Park Enlargement



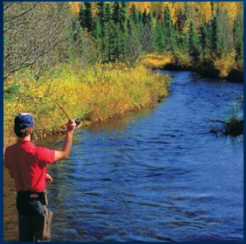
Henrys Fork Basin Study Outcome

- Evaluated potential new water supply options and provided the information necessary to prioritize projects based on costs, and physical, social and environmental characteristics.
- HFBS also identified water management options – the IWRB will continue to pursue existing programs and coordinate/support projects driven by stakeholder interest.
- Island Park Reservoir Enlargement concept most identified promising option for new surface water storage near-term.



Anticipated Uses of Water

- Offset ground water pumping in the ESPA
- Help maintain Swan Falls minimum flows
- Additional water supply for cities in areas where not issuing new water rights
- Uses within the Henry's Fork Basin



Existing Project

- Dam: zoned earthen embankment constructed between 1935 and 1938.
- Top of Dam Elevation: 6,312 feet (raised 3 feet in 1985)
- Structural/Hydraulic Height: 94 feet / 75 feet
- Length of Crest: 1,607-foot-long crest and 7,950-foot-long dike
- Hydropower: Existing plant added in 1994 – 20,000 megawatts per year Owned and operated by Fall River Rural Electric Cooperative



Existing Project

Existing Reservoir

- Full Pool Elevation: 6,303 feet with 1 ft inflatable bladder (otherwise 6,302 ft)
- Full Pool Capacity: 135,205 acre-feet
- Flood Surcharge: 6,306.6 feet elevation (29,610 acre-feet)
- Maximum Reservoir Surface Area: approx. 8,000 acres

Existing Spillways/Outlet

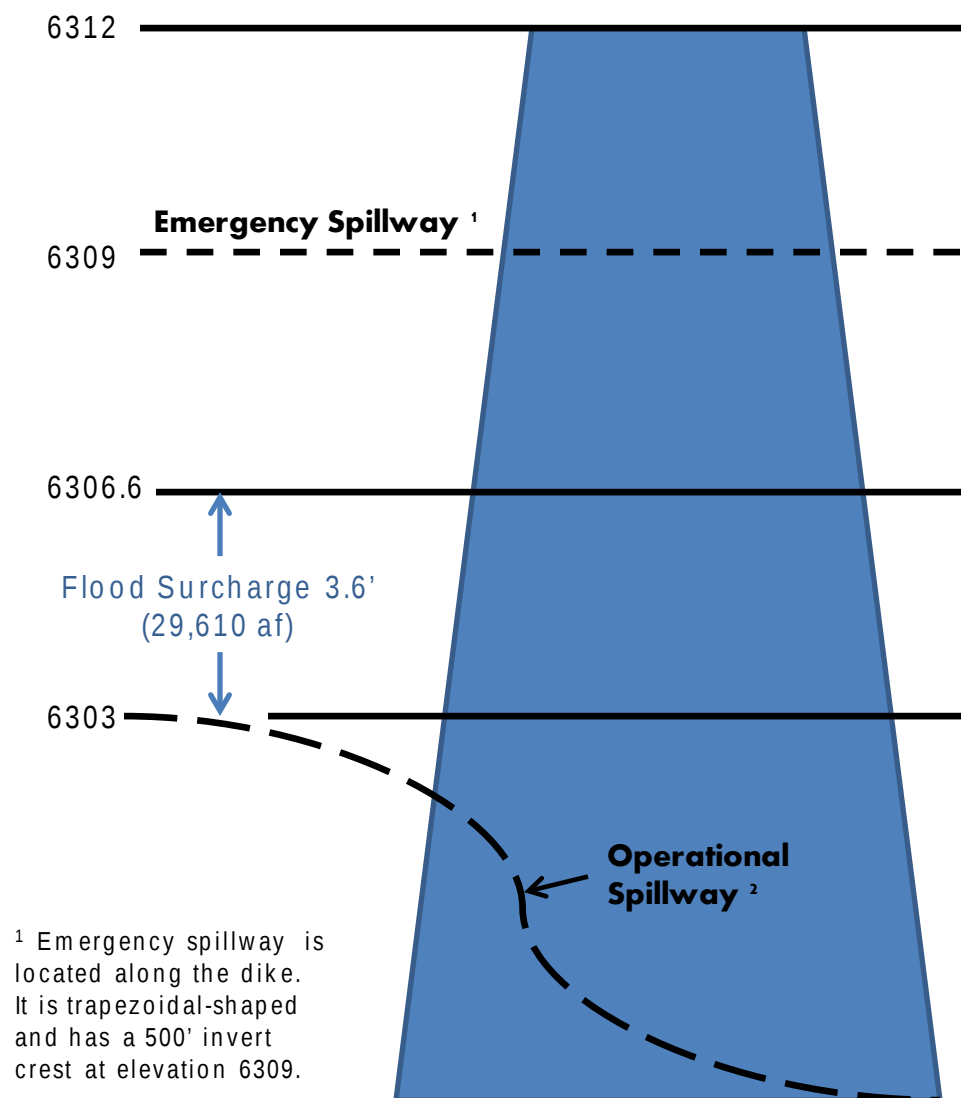
- Operational Spillway: 6,303 feet (top of concrete weir and bladder)
- Emergency Spillway: 6,309 feet



Reservoir Enlargement Concept

- Increase reservoir storage by converting existing surcharge space to storage space
- Raise water surface elevation by up to 4-ft (increase full pool elevation approx 6307ft)
- Additional pool capacity: 26,700 – 35,000 acre-feet (water year dependent)
- Potential modifications:
 - Assume limited change to dam embankment (verification required)
 - Potential increase of Emergency Spillway width from 500 to 1,130 ft to provide additional discharge capacity (offset current flood storage space in reservoir)
 - Replace existing 1 ft bladder with 5 ft bladder on Operational Spillway
 - Additional modifications to dike may be required
- Cost estimate as per Basin Study (4-ft enlargement)
 - 4-foot enlargement = \$240 per acre-foot
 - Total Relative Construction Cost: \$6,400,000

HENRYS FORK BASIN STUDY - ISLAND PARK DAM EXISTING CONFIGURATION SCHEMATIC (not to scale)



Elevation Structures (ft)	Description	Impacted
6312	Crest of Dam	169
6311		110
6310		92
6309	Emergency Spillway	37
6308		18
6307		2
6306.6	Top Flood Surge Space	0
6305		0
6304		0
6303	Operational Spillway (w/1' Bladder)	0
6302	Normal operating elevation	0

² Operational Spillway is an uncontrolled "bathtub" spillway with ogee shaped inlet to 30' long tunnel through the dam. A horseshoe shaped spillway crest includes a 62' long concrete weir in the center with two 99' long 1' diameter inflatable bladders on either side. Top of the weir and bladders elevation is 6303 ft.

Potential Island Park Reservoir Enlargement

- Full Pool with Enlargement
- Based on the National Elevation Data (10 meter Accuracy) 6,307 ft
- Approximate 4 ft increase in water surface elevation, Exclusive Flood Control Space elevation 6,306.6 ft

US Bureau of Reclamation Property

- Easement-Permanent
- Fee
- Withdrawal

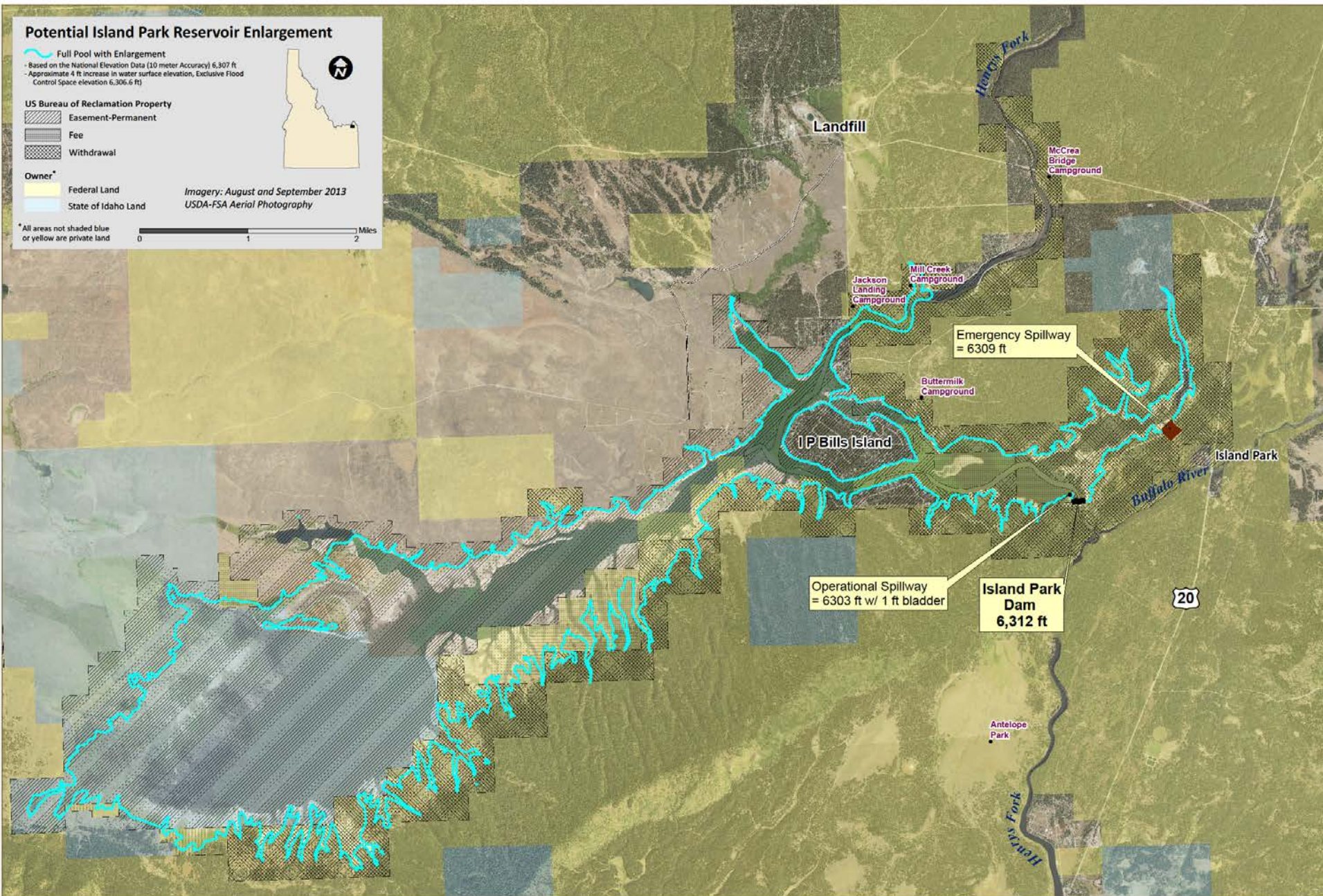
Owner*

- Federal Land
- State of Idaho Land

Imagery: August and September 2013
USDA-FSA Aerial Photography

* All areas not shaded blue or yellow are private land

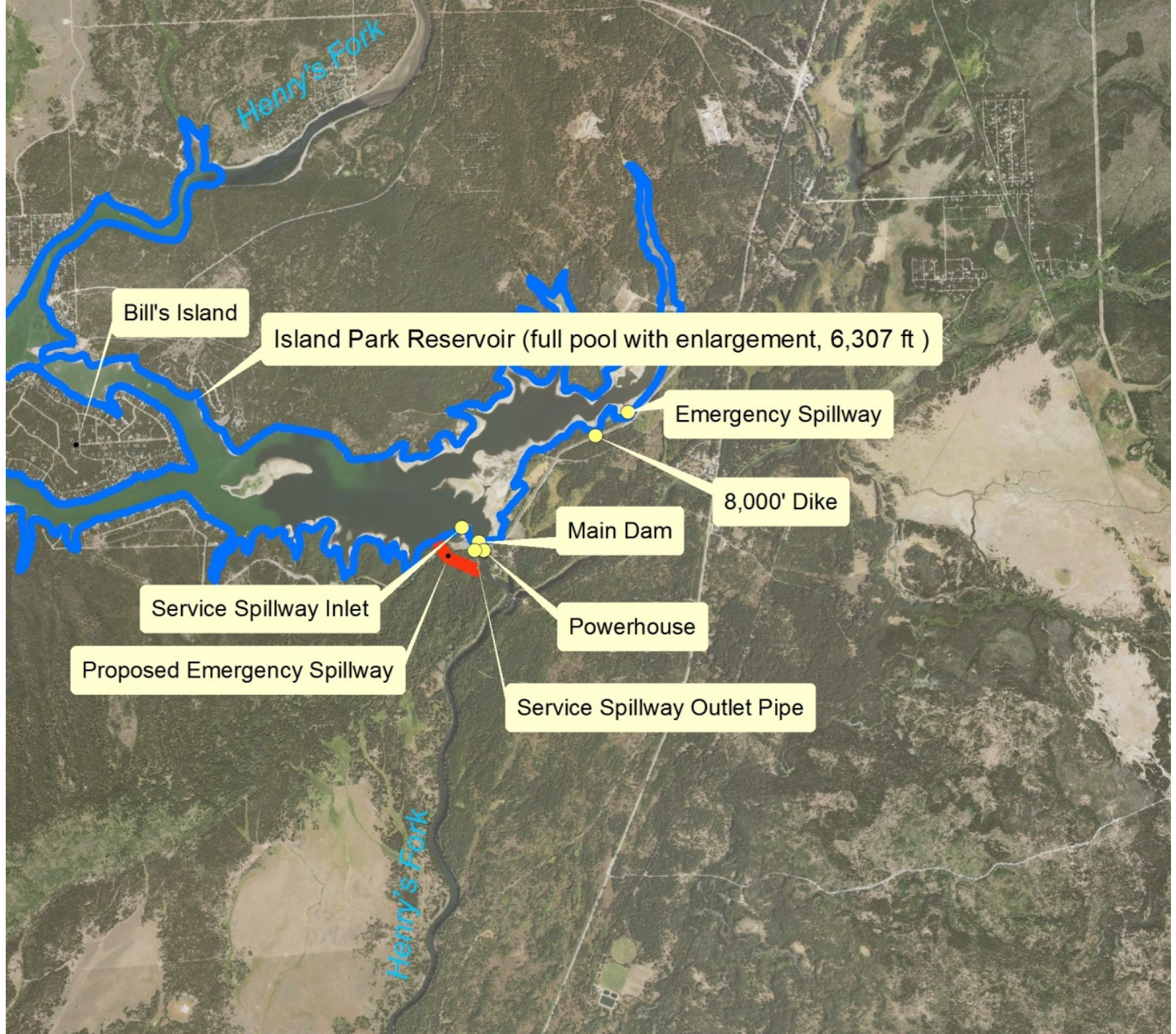
0 1 2 Miles



Land Assessment

- Purpose – identify potential impacts to land and property and determine whether they influence the viability of the proposed enlargement
- Scope -
 - Quantify impacts to public and private land, structures, access corridors, easements, shoreline features, public and private utilities, etc.
 - Evaluate severity of impacts and associated costs at 1-foot increments from normal operating pool elevation 6303 to 6307
 - Coordinate with federal, state and local jurisdictions as necessary
 - Collect LiDAR and perform ground survey as necessary
 - Coordinate w/ USBOR – survey controls, easement, Fee and Withdrawal land location verification, property access, etc.
 - Coordinate public information meetings and property owner





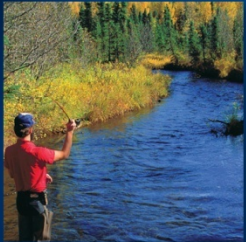
Land Assessment

- Schedule
 - RFQ Release May-June 2015
 - Complete study – Winter 2015/2016
- Public outreach
 - Public meeting(s) in Island Park, coordinate with community leadership
 - Notification correspondence to land owners for access
 - HFWC meetings
 - Webpage and other informational materials
- IWRB coordination with US Bureau of Reclamation



Other Key Issues and Next Steps

- Refine hydrology
- Updated flood routing and downstream flow assessment
- Engineering design and specifications
- NEPA environmental compliance studies
- Cultural and tribal resources
- Permitting requirements
- Reservoir operations
- Project ownership and water rights





Questions

Island Park Reservoir – Flood Routing

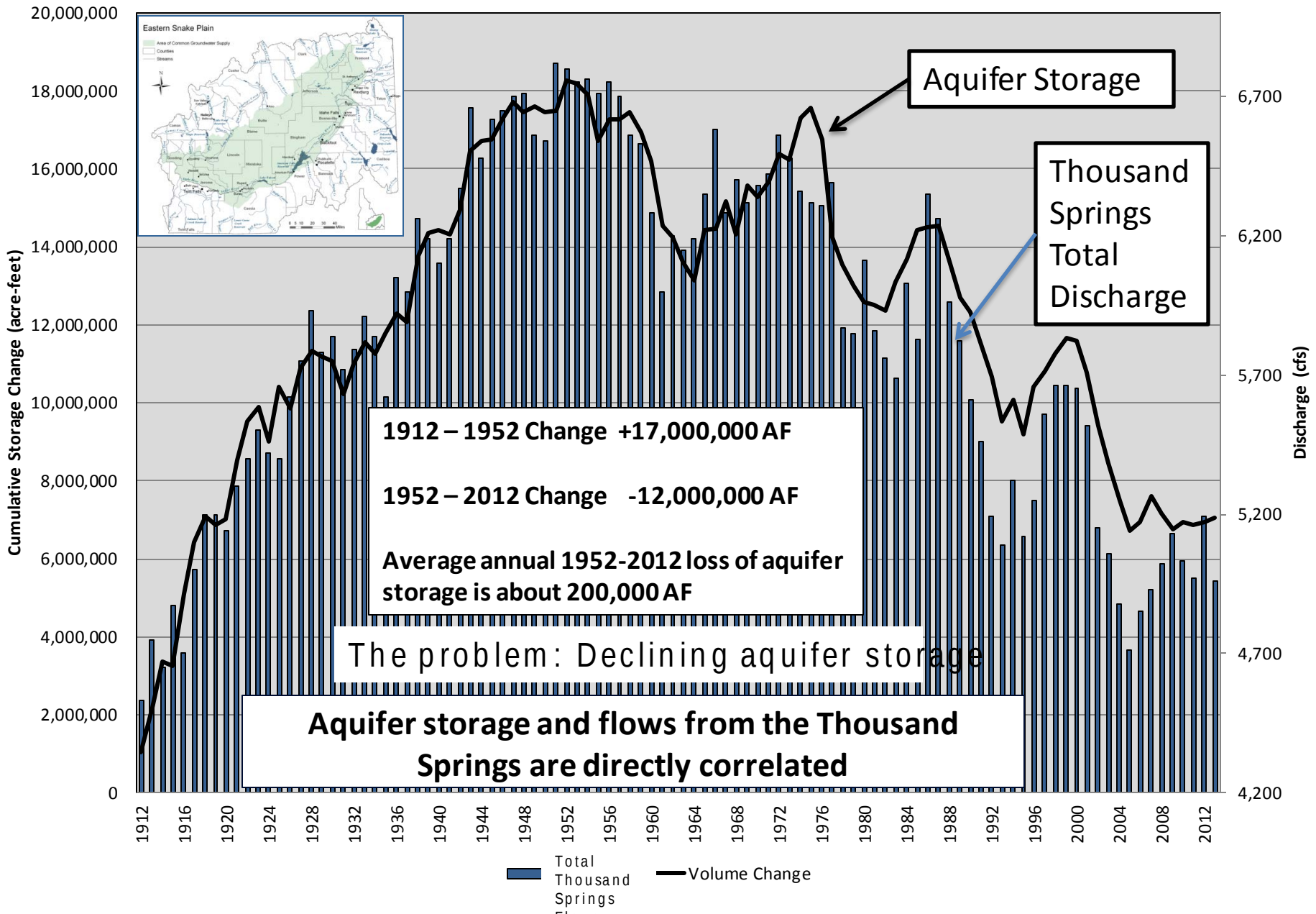
Bladder Raise
w/ 1,130 foot emergency spillway –
Normal Pool at 6307 feet – raise
normal pool 4'

¹Volumes are incremental
change due to WS raise

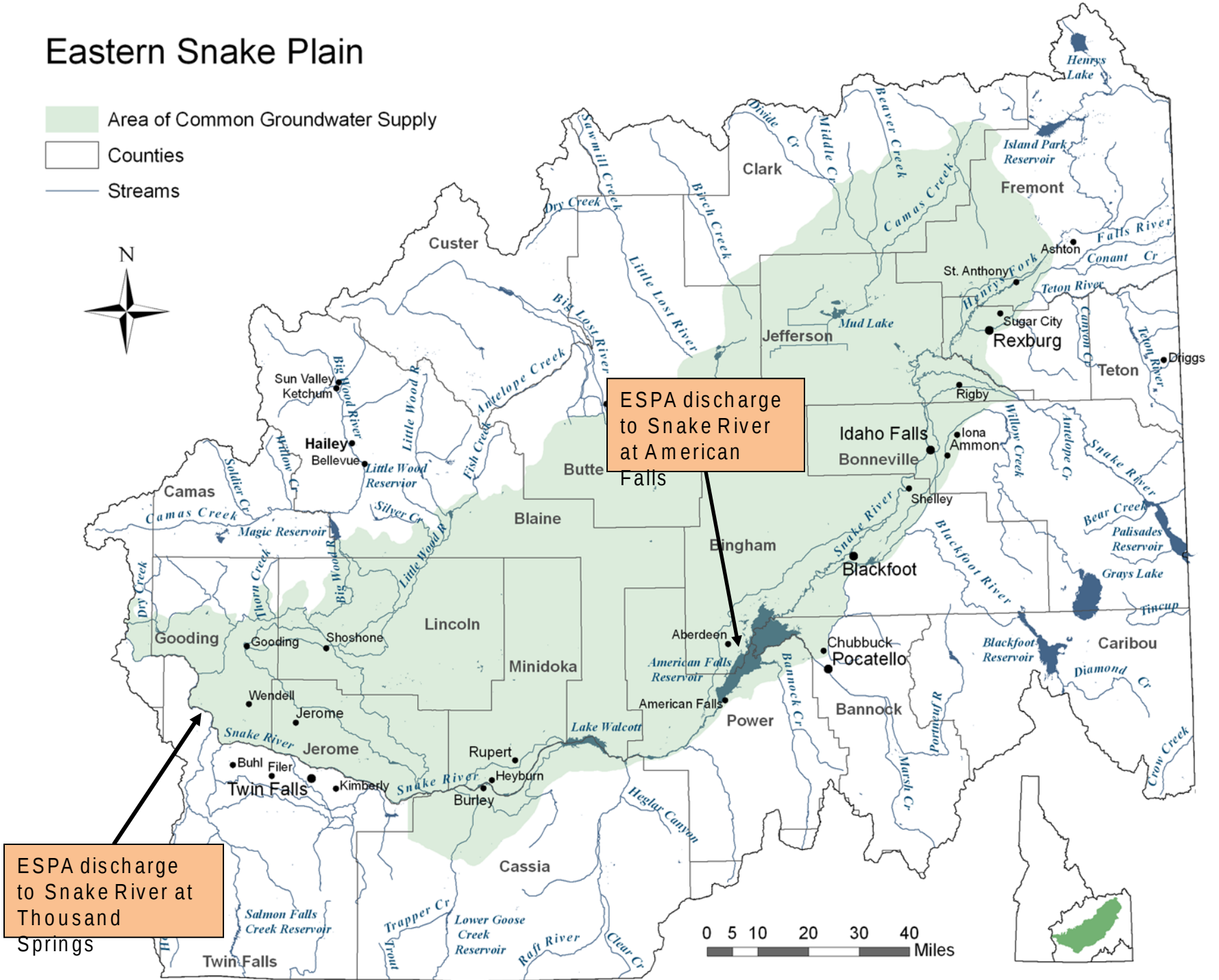
²Very preliminary cost
estimate

	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

Cumulative Volume Change of Water Stored Within ESPA and Thousand Springs Discharge



Eastern Snake Plain



Snake River System-wide Water Management Obligations



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

- Swan Falls Agreement

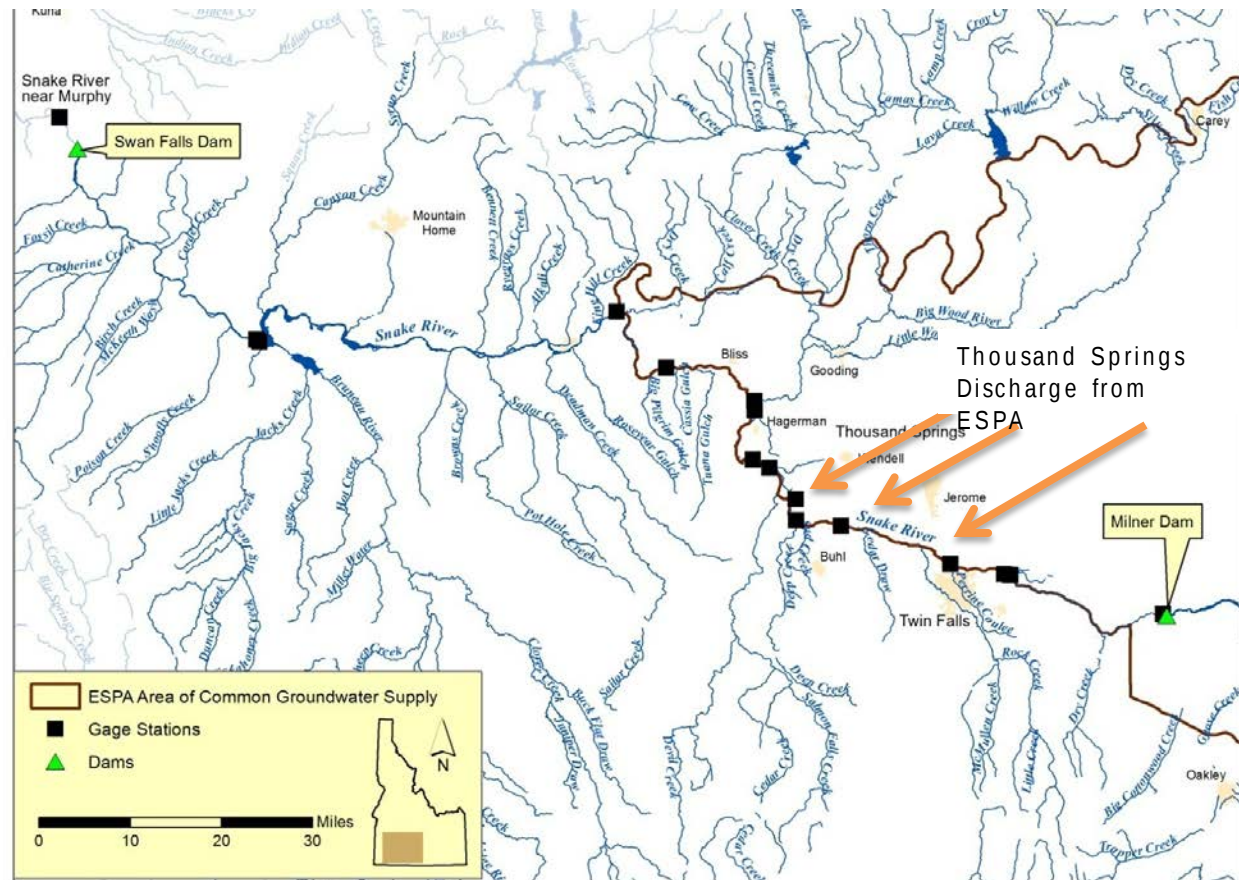
State obligation to ensure minimum flows at Murphy Gage just below Swan Falls Dam of:

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

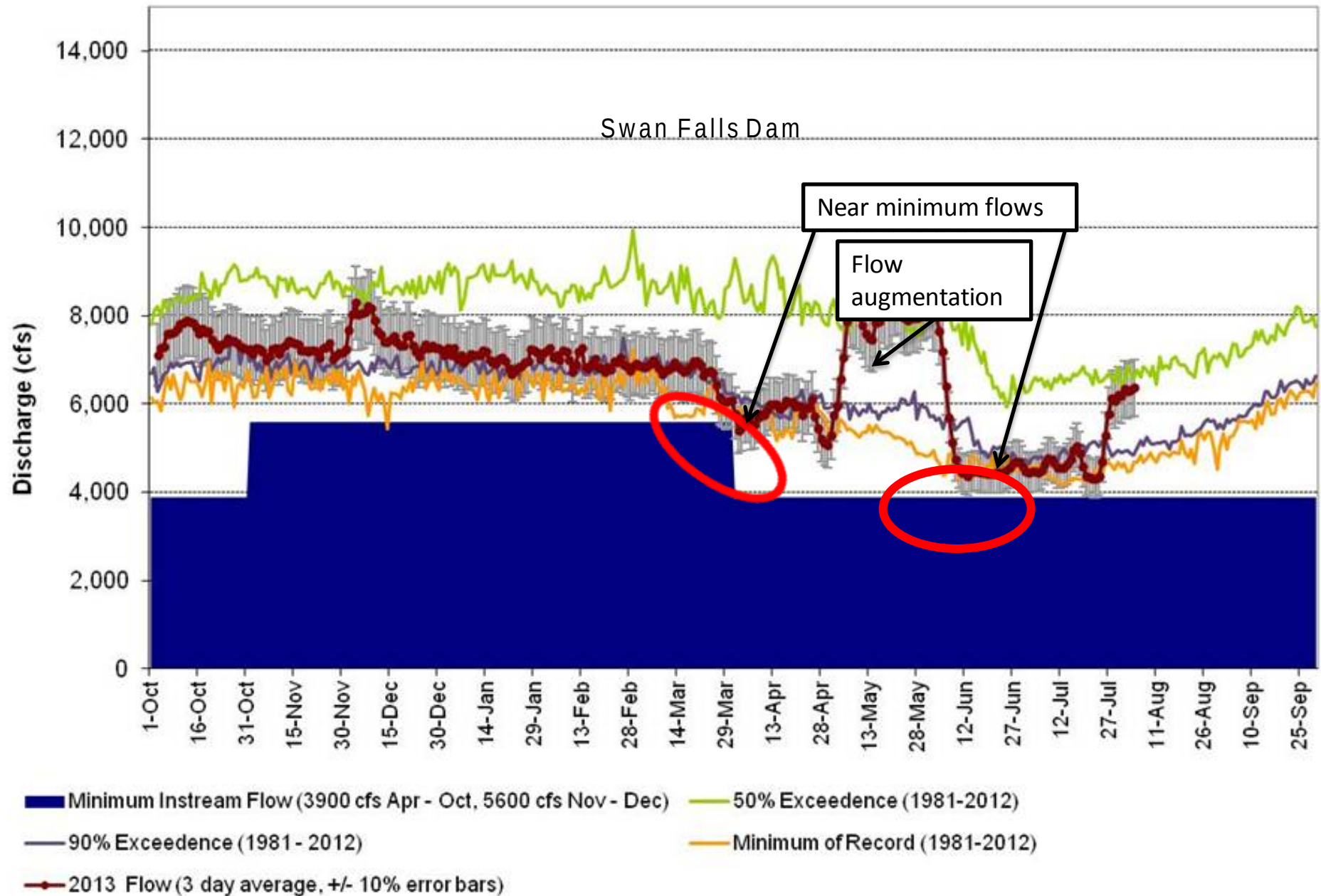


Implications of Swan Falls Agreement with Milner Zero Flow Policy

- When flow is zero at Milner, flow at Swan Falls Dam is made up almost entirely of spring flows from the ESPA
- Long-term: ESPA must be managed to sustain spring flows sufficient to meet Swan Falls minimum flows
- Curtailing water rights junior water rights not a good solution



SNAKE RIVER NEAR MURPHY



Alternative Prioritization

Non-Surface Water Storage Options

Near-term Completion (1-7 yrs)

- Support projects advanced/supported by other stakeholders (e.g. canal automation)

Continue existing programs

- Managed aquifer recharge
- Water Markets
- Piping of Irrigation Canals in North Fremont Area
- Demand Reduction
- Municipal & Industrial Water Conservation

Surface Water Storage Options

Near-Term Completion (1-7 yrs)

- Island Park Enlargement

Mid-term Completion (8-25 yrs)

- Ashton Reservoir Enlargement

Long-term Completion (beyond 25 yrs)

- Teton River Basin alternative