

# Dredging Sacred Waters

## Ernest Hemingway's Silver Creek Fishing Hole



# HOW A COLLABORATION OF WIDELY DIVERGENT VIEWS FOUND COMMON GROUND TO BENEFIT IDAHO TROUT

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# UNIMAGINABLE!



# Silver Creek

- Silver Creek is one of the great Blue Ribbon Trout Streams of America
- Premier destination fishery
- Iconic location and scenery
- Rehabilitation area owned by The Nature Conservancy and the Picabo Livestock Co
- TNC acquired 344 hectares (850 acres) and over 6,000 hectares (12,600 acres) of conservation easement

# The Problem

- Dam is silting in
- Fishery has been deteriorating
  - Catch is down
  - Fish numbers declining
  - Fish size diminishing
  - Species shift
  - **Water Temperature Rising**



# The Culprit

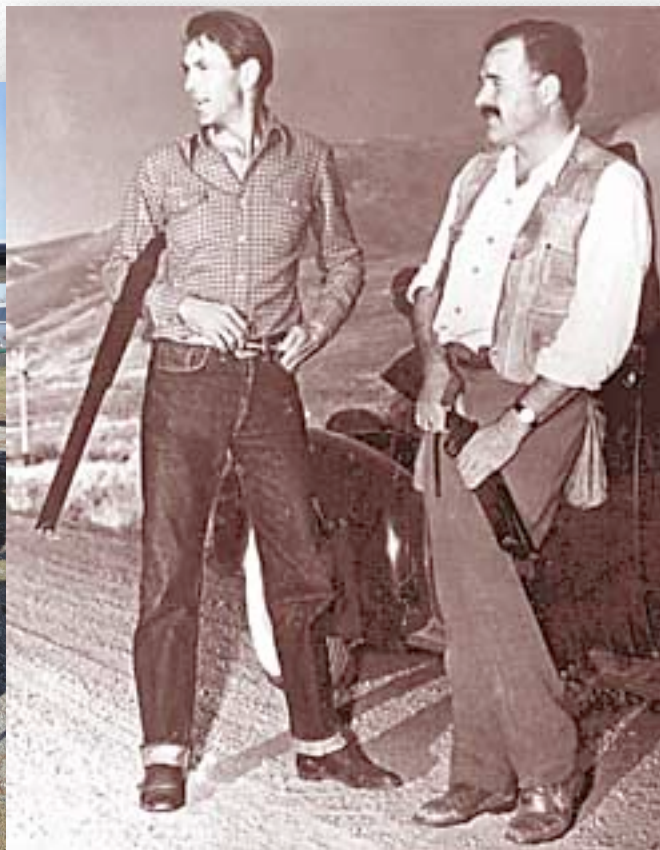
- Kilpatrick Pond
  - 100 year old stock dam
  - Sediment accumulation
    - Mud flat = heat sink
    - Silted in deep water habitat
    - Loss of gravel spawning beds
  - Overflow dam structure
    - Skims hot surface water off top into Silver Creek downstream
    - Blocks fish passage







Nick and Bud Purdy



Gary Cooper &  
Ernest Hemingway

# A Little Background

- 1883 – The Kilpatrick Brothers build a railroad and a stock dam on Silver Creek
- 1928 – Bud Purdy arrives in Picabo and starts a long ranching career
- 1939 – Ernest Hemingway moves to Sun Valley
- 1940 –1960 - Bud and Ernest go fishing
- 1993 – Purdys donate 3,500 acre conservation easement to The Nature Conservancy
- 2012 – Nick Purdy decides to dredge Silver Creek



# Silver Creek HydroGeology

- Silver Creek is a spring creek
- Not greatly affected by spring runoff
- Volcanic shield
- Snake River Aquifer filters the water
- Most of SRA spills out into Snake River at Thousand Springs in the Magic Valley

# Conditions for Raising Trout

- Clean water
- Gravel spawning beds
- Cover from predators
- Lots of insects
- Cool Temps – 15°C (57-59°F)
- Over 75% of commercial trout in US is raised in Magic Valley

# Creating the Recovery Plan

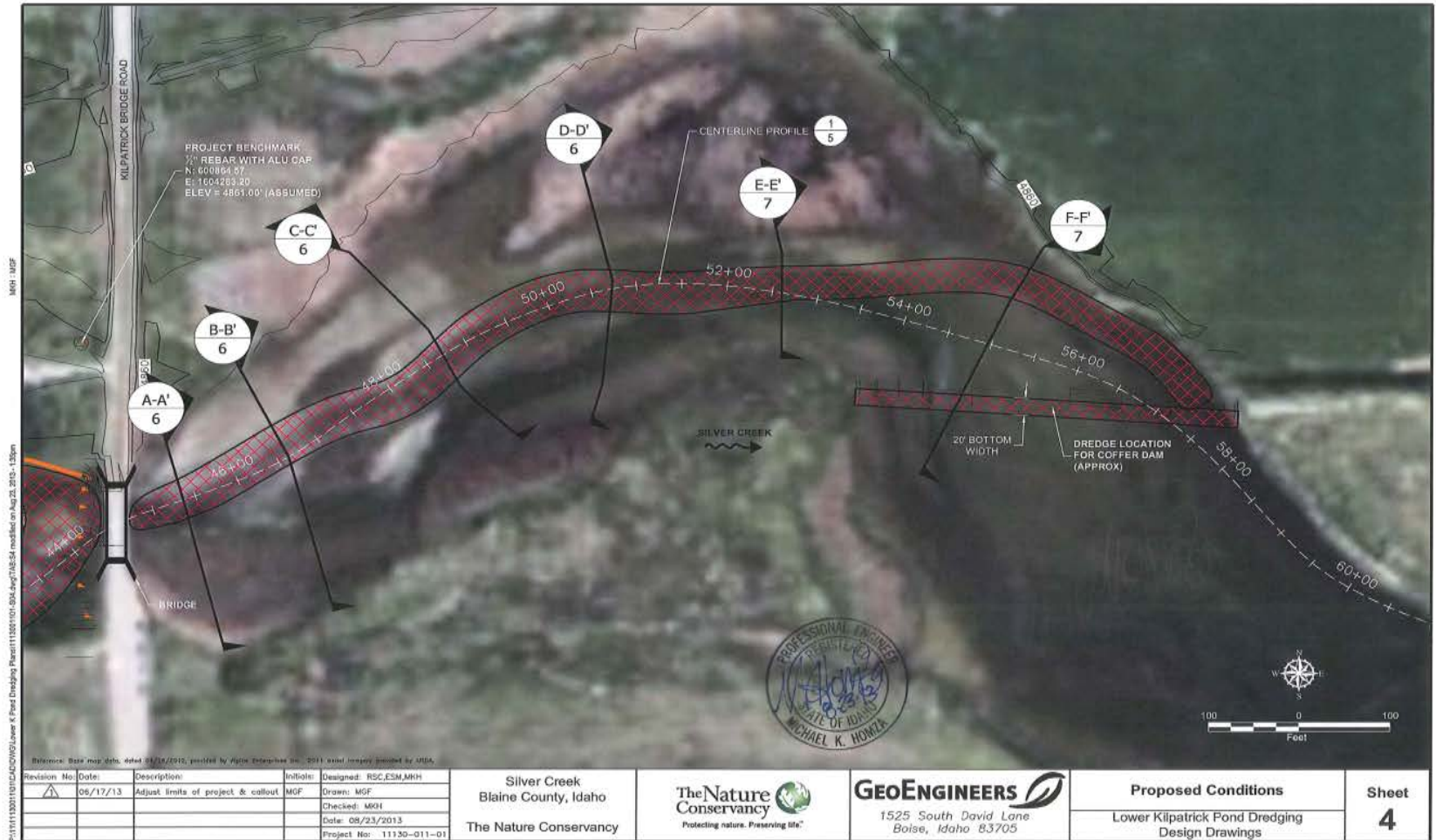
- Fishermen and Guides notice decline in fishing
- Greg Loomis and Savesilvercreek.org conduct extensive temperature monitoring
- University of Idaho conducts sediment flush study
- The Nature Conservancy recognizes problem
- Steve Fisher and GeoEngineers propose dredging plan
- Community Freaks Out!



# Plan Approval

- A plan is settled on but many reservations from old school fishermen and preservation/environmental groups
- Blaine County and TNC hold extensive scoping meetings with much community input
  - Very inclusive. All are welcome to comment
- Tony Hardesty and TNC and Purdys start fund raising and seeking permits from agencies

# The Plan



# It's a Go!

- Two phases – TNC and Purdy RR Ranch
- Purdy because of less bureaucratic structure able to proceed fast track
  - Late fall
  - Winter is coming quickly to the high country
  - Once the dam is breached the new dam has very little time for replacement
- TNC puts their side of project on hold
  - Very low water year. Done in the dry



# Ready, Set, DREDGE!



# Pre-Dredge Plan

- Serious environmental regulation and monitoring
- Dredge is rebuilt
  - New hydraulic system and pump wet end
  - Fresh paint
- Turbidity curtains deployed
  - Multiple stages of deployment in place if needed

# Public Impressions

- Ensure dredge is in excellent mechanical condition
  - No leaks of any kind
  - Environmentally friendly oils
- Dredge must look shiny and spotless
- Work site housekeeping – impeccable
- Spill Plan
  - Spill kits everywhere
  - Extra turbidity curtain and spill containment booms
- Safety, Safety, Safety
- Professional



# Turbidity

- Trout Unlimited and TNC monitoring turbidity
  - Water is gin clear
  - 50 ntu above background allowed
  - Max reading 27 ntu during curtain deploy
  - Max dredge reading = 7.23 ntu.
  - Normal = 0-4 ntu



# Dredging Operations

- Dredging of drain channel begins
- Spoils discharge to adjacent pasture 2,500' away
  - Picabo's newest, most popular duck pond and bird sanctuary
- Dredging continues up main channel
- Dredging reaches bridge
- Bonus dredging begins





# Dredging

- Special techniques
  - Slow cutterhead speed
  - Match expelled turbidity to suction intake zone
  - Submerged pump
  - Three part swing for wider channel
  - Slow is Smooth – Smooth is Fast
  - Thanks Bob Wetta, Jos Clement in Honolulu

# Dredge Channel









# Conclusions

- Expanding the Dredging World
- We know the benefits of dredging – They don't!
- Showcase Opportunity
  - Most folks have never seen dredging
  - Every project is a chance to overcome a poor historical image
    - Moving dirt on land = progress
    - Moving dirt in water = destruction!
  - Moving mud is same as moving dirt – NOT!
    - Super efficient compared to “muck and truck”

# Conclusions, cont.

- Feel Good Project
- Obvious results
- Skeptical environmental agencies now supporters
- Engineering community now more comfortable with dredging
- Fishing guides ecstatic
- Dredge crew enjoyed this project too
- RR Ranch and The Nature Conservancy thrilled

- Bud Purdy's last word when told the fish were climbing the ladder



• **GREAT!**

# Papa Hemingway's Inspiration

