

# Technical memorandum prepared by HFF Staff

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## ***The Henry's Fork Mission – How we operate***

A scientific description of the river's current condition is easy for HFF to produce. For decades, HFF has devoted itself to using science and facts to drive our restoration and stewardship actions. Over the years, our diverse, 22-member Board of Directors has thoroughly studied and considered the legal and political landscape in which we work in the State of Idaho, frequently debated the best approach to achieve our mission, and repeatedly directed staff to base its work on facts and data, even when the facts are tough to swallow. We understand that science doesn't have all of the answers and that simply reciting facts doesn't make us very popular at times. However, state and federal agencies with responsibilities and mandates to manage water, fish and other natural resources base decisions on legal and scientific facts—even ones we and they may not like.

## ***What's Happening to the River?***

The three main factors that affect the quality of fishing on the river between Island Park Dam and Riverside are size of the fish population, water quantity (streamflows) and water quality.

## **Current Fish Populations**

The fish population in the river reach downstream of Island Park Dam is currently 25% lower than its long-term average and lower than it has been since 2009. We all know that the key to recruitment of young trout into the fishery is winter flow, and winter flows have been very low in recent years. Recruitment to the population was lower in 2015 and then again in 2016 than in any year since Idaho Department of Fish and Game began using its modern population-sampling methodology in 1994.

## **Streamflows**

Idaho water law is based on the prior appropriation doctrine, which states that the user that is first in time is first in right. This doctrine is clearly spelled out in the Idaho Constitution and has been the law since statehood. In 2014, the State of Idaho completed a 27-year process of adjudicating every water right in the Snake River Basin—over 150,000 individual water rights in all, including those held by the federal government and Native American tribes. Although many rights were nullified or modified, the end result was a decree that validated every remaining water right in the basin and the right of its holder to store or divert the specified amount of water, under the historic priority system. Our job is not to pass judgment on whether this system is good, bad, archaic, or relevant but rather to understand it as the legal basis of water management in the State of Idaho.

As of July 21, irrigators are diverting 2,988 cfs of water throughout the Henry's Fork watershed—water that they have a legal and recently reaffirmed right to divert. Spread over 250,000 acres of land, this amounts to 0.28 inches per day, not even meeting the current crop requirement of 0.37 inches per day. An additional 500 cfs is needed to maintain even a minimal

amount of streamflow for fish and wildlife in the lower Henry's Fork. This is a total need of 3,488 cfs in the Henry's Fork watershed.

Natural flow in the watershed is 1,413 cfs in the Henry's Fork, 570 cfs in Fall River, and 572 cfs in the Teton River, for a total natural flow supply of 2,555 cfs. That leaves a shortfall of 933 cfs that must be made up by delivering water from storage. Grassy Lake is supplying 50 cfs of this, leaving 883 cfs to come from the upper Henry's Fork. That flow is coming from Island Park Reservoir. Adding 883 cfs to the river's natural flow of 543 cfs results in the current outflow of around 1,420 cfs from Island Park Reservoir, above average for this time of year as you all know.

Natural streamflow in the watershed in late July averages 3,500 cfs—nearly 1,000 cfs more than is currently available. If we had average natural flows right now, much less water would need to be released from Island Park Reservoir, with plenty of water leftover to maintain fisheries in the lower watershed. Lower water delivery from the reservoir during the summer means less volume to fill during the winter, leading to better winter flows and higher trout recruitment in future years.

## **Water Quality**

Our intensive monitoring program confirms scientifically what you already know—that high summer-time delivery of water out of Island Park Reservoir increases the amount of suspended material in the river. Although only about half of this suspended material is mineral sediment, we know that turbidity and export of sediment are higher downstream of the dam when outflows are higher, and this gets worse as the reservoir gets lower. The recent cyanobacteria (aka “blue-green algae”) bloom in the reservoir was the product of extremely warm reservoir temperatures (9 degrees higher this June than in 2014), an extended period of sunny weather, and high reservoir outflows. The distinct blue-gray pigment exported into the river by this bloom is not harmful to fish, but it lowered visibility in the river and detracted greatly from the fishing experience. We know from our 2014 survey of anglers in the Ranch that out of seven different aspects of the Ranch fishing experience, by far the most important factor is aesthetics, ranking 9.5 in importance on a 10-point scale. Therefore, we know that maintaining water clarity and suitable flows is extremely important to providing the angling experience you expect.

## **Summary**

Although we acknowledge that there are other factors out there right now that are reducing the quality of fishing on the Ranch and adjacent reaches, the three mentioned here—trout population size, streamflows, and water quality—are all direct functions of the amount of water stored in and delivered from Island Park Reservoir. Reducing the amount delivered in the summer—and hence increasing the amount that can be released in the winter—is the fundamental key to maintaining the fishery as we have known it since the 1970s. Better winter flows and better summer-time water quality contribute to a healthy, resilient fish population that is capable of withstanding additional stressors such as gill lice.

## ***What is the Henry's Fork Foundation Doing?***

The overall objectives, for long-term health of the Henry's Fork and its fishery are focused on reducing the amount of water delivered from Island Park Reservoir during the summer and increasing the amount released during the winter. What are our options?

### **Status Quo**

It is obvious that the status quo is not acceptable to you, to us, or to the river. In the 1970s and 1980s, dry years were always followed by wet years that allowed the fish population to recover and water quality to improve. But we can no longer simply wait for the next wet year. Climate models predict that the current situation is likely to be the one we face regularly in the future—low snowpack, early melt, and longer hotter summers. For example, snowmelt was a full three weeks earlier this spring than the long-term average. Although past HFF actions have resulted in improved winter flows, water-quality requirements at the Island Park hydroelectric project, and fish passage at the Buffalo River, it is clear that these actions alone are not enough to maintain the fishery that you expect. For example, through our drought management planning process, outflow from Island Park Dam averaged 120 cfs last winter—better than the 0 cfs it would have been back in the 1950s and the 100 cfs it would have been under similar conditions in the 1970s. However, 120 cfs year after year is not sufficient to maintain even an average trout population—we need to do better.

### **Legal, legislative, and regulatory action**

The HFF works within state and federal legal and regulatory frameworks to maintain water quality and quantity. The governing principles of Idaho State water law are in the Idaho constitution, and water rights in the Henry's Fork watershed have been reaffirmed by adjudication in Idaho courts. Irrigated agriculture is the state's largest economic driver, and our state legislators know this. Pursuing legislative action to change water law would not be an effective allocation of HFF's resources. One of the few federal laws that can affect streamflow management in Idaho is the Endangered Species Act, but we do not have an ESA-listed aquatic species downstream of Island Park Dam.

However, where legal and regulatory processes are available, we use them. For example, earlier this summer HFF held Fall River Rural Electric responsible for meeting the conditions of its operating license. As a result, the Island Park Hydroelectric Project is now meeting its dissolved oxygen requirements, and abrupt flow changes have ceased. HFF is also a formal protestant on several new water rights applications that could affect streamflow in the Henry's Fork. This gives us a legal seat at the table to voice our concerns and negotiate conditions for approval of these water rights.

### **Market-based solutions**

There is currently not a fully open water market in Idaho—HFF can't just go to a water exchange and buy 10,000 acre-feet of water for winter flow. However, there are ways to move water around in the system differently using economic incentives. HFF and our conservation partners can identify these procedures and help facilitate the transactions. For example, groundwater users on the Snake River Plain agreed to a 12% decrease in usage as part of a legal settlement with surface-water users and are currently looking for water to mitigate their loss. One possible way

to do so would be for surface water users to use their water rights to recharge the aquifer. Aquifer recharge using existing canals works best in the winter when the canals are not being used to deliver irrigation water. Thus, managed recharge programs have the potential to increase winter flows in certain river reaches. Most cities and towns on the Eastern Snake Plain Aquifer are also looking for water to sustain population growth and economic activity. Market-based mechanisms could be used to move water currently used for irrigation at certain times and places to water for these cities.

Changing agricultural practices would also use water differently in the system. Some farm operators and conservation groups such as HFF, Friends of the Teton River, and the Teton Regional Land Trust are pursuing ways to managing existing farmland differently as a way to reduce irrigation demand, maintain open space, and preserve wildlife habitat.

### **Infrastructure and operational improvements**

Creating more storage, improving canal headgate operation, and increasing managed aquifer recharge could also change irrigation delivery out of Island Park Reservoir. New off-stream storage in the Teton and/or Fall River drainages could help take pressure off of Island Park Reservoir and allow more operational flexibility. Automated canal headgates would increase operational efficiency, reducing the total amount needed for delivery and diminishing flow fluctuations. When water is available, managed aquifer recharge would recharge the aquifer, improving stream baseflows. Higher baseflows lead to decreased reliance on storage water during irrigation season.

### **In summary**

Market-based solutions and infrastructure and operational improvements are alternatives that were identified in the Henry's Fork Basin Study, which was fully vetted by the Henry's Fork Watershed Council. The Basin Study was completed in 2014 at the local level and approved in 2015 at the national level by the U.S. Bureau of Reclamation. The Idaho Department of Water Resources began to move forward with some of the alternatives developed in the Basin Study, but more pressing priorities in other parts of the state have diverted attention from the Henry's Fork. Earlier this year the Henry's Fork Foundation took the initiative to renew the effort to implement actions already identified in the Basin Study. A subcommittee of the Henry's Fork Watershed Council has been formed, and HFF has recently facilitated two meetings of this subcommittee to move these alternatives forward.

It is important to note that any one project listed above may only change water demand on Island Park Reservoir by 10 cfs. But 20 of these projects would yield 200 cfs. Over the course of the irrigation season, these 20 projects could result in 50,000 acre-feet, or 37% of Island Park Reservoir's capacity, that would not need to be released. These summer water savings would add 250 cfs to flows during the critical mid-winter period. During the winter of 2015-2016, this would have increased winter flows by a factor of three—from 120 cfs to 370 cfs.

Change will not be immediate. We do not have a mechanism to lower outflow from Island Park Reservoir tomorrow, but we are in this for the long haul. Changing flows to improve trout recruitment, fishing conditions, and water quality is achievable, and we are actively pursuing all options.