

**Save The Poudre Coalition
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Comments on NISP DEIS Treatment of Fish

Summary

The Save the Poudre coalition has relied on a number of area fisheries biologists and aquatic ecologists to analyze the NISP DEIS treatment of fish. We hereby sign on to the NISP DEIS comments of Professor of Ecology LeRoy Poff (Colorado State University), Professor Kurt Fausch (Fisheries Biology, Colorado State University) and Professor Emeritus James Rose (Department of Zoology and Physiology, University of Wyoming). (Professor Rose's analysis is attached to this document.)

Professors Poff, Fausch and Rose document that the NISP DEIS's treatment of NISP's potential impacts on fish in the Cache la Poudre River is grossly deficient, due to two failures. First, the failure to fully consider the likely impacts on fish of dewatering the river and reducing flushing flows. Second, the failure to incorporate recent scientific research into the DEIS's analysis of likely fisheries impacts.

Simply put: according to Poff, Fausch and Rose, the NISP DEIS is scientifically illiterate when it comes to the likely impacts of NISP on fish.

For our own part, we believe the DEIS grossly insufficient due to its failure to analyze key issues. For example, the failure to evaluate the risk to brown trout posed by warmer water temperatures and reduced flows is a key issue that the DEIS ignores.

Given these analytic failures; given the importance of the trout fishery through Fort Collins to Fort Collins residents (see Rose's comments on this topic, with which we thoroughly agree); given the huge potential negative impacts of NISP on many native fish species in the Cache la Poudre River; and given NISP proponents' and the Army Corps of Engineers' legal responsibilities under NEPA and the Clean Water Act to conduct a thorough EIS; given all this, we ask the Corps to require a supplemental EIS to thoroughly and honestly address the likely impacts of NISP on fish.

Some Comments to Emphasize

We would like to emphasize the importance of several important points made by Dr. Poff and Dr. Rose in their comments. We quote here from earlier drafts of their comments that they have shared with us; neither Poff nor Rose should be held to the exact wording of these statements. We include them here because we agree with them, based on our own analysis of the DEIS, and because we believe they make important points.

Poff makes the following criticism regarding the main failure of the NISP DEIS's overall framework for analyzing impacts to fish:

In response to [NISP's likely] hydrologic alterations [of the Cache la Poudre River], the DEIS concludes that the environmental impacts would be as follows for the following sections:

Upstream of Fort Collins – “minor beneficial effect” due to reduced peak flows,
Near Fort Collins – “minor adverse effect” due to reduced winter flows and reduced peak flows,
Fort Collins to I25 – “minor to moderate beneficial effect” due to increased winter flows and reduced peak flows,
I25 to South Platte River – “minor adverse effect” due to reductions in peak flows counterbalancing degraded water quality.

In every case, the imputed environmental impact is based on the assumption that removal of peak flows is a benefit. This is scientifically untenable.

Basically, the argument put forth is that removal of peak flows is a benefit and reduction of low flows is only minimally harmful by reducing water quality.

There is a vast literature documenting the critical role of floods (disturbance) for maintaining habitat diversity, aquatic insect diversity, native fish species, and overall system productivity. To not recognize this is to reveal a complete lack of familiarity with the tenets of modern stream/river ecology. I believe it is fair to say that by categorically describing the removal of peak flows as a “benefit” to the aquatic ecosystem, the DEIS fails a key science credibility test.

Poff comments on the flawed methodology used to argue that reducing flows in the Cache la Poudre River will actually benefit fish:

The primary tool used to bolster the “benefit” of reduced flow volumes during snowmelt runoff is PHABSIM; however, this tool is NOT designed to evaluate the benefits of bed-forming flows (floods), which are several. It assumes a static channel; therefore, it would have to be redone after every flood that reconfigures the stream channel of the Poudre. It can say nothing about how high flows reconfigure the channel (often for the benefit of species) and create new habitat opportunities to benefit many species. In short, PHABSIM is a tool for analysis of *static* habitat characteristics and it is often successfully applied to human-controlled river reaches below dams. It does not capture the *dynamics* of river ecosystems, which is a central tenet of modern [scientific] understanding. Further, PHABSIM does *not* capture other, potentially critical environmental factors, such as water temperature or water quality that can independently regulate fish species' success.

Poff criticizes the DEIS for selective emphasis and unjustified optimism:

The conclusions are essentially a compilation of “best-case” assumptions and conclusion by assertion. There is no consideration of any potential “worst-case” scenario. For example, one might consider the risk of the complete loss of a trout fishery in Fort Collins due to combined reductions of summer low flows coupled with increased water temperatures and reduced dissolved oxygen levels, combined with siltation of spawning habitats and possible winter freezing of trout redds, and the loss of a high quality aquatic insect food base.

Poff concludes with this general assessment of the DEIS:

In summary, my analysis of the DEIS and supporting technical documents leads me to the conclusion that the science is weak and improperly and selectively portrayed. There is an extensive literature showing that reductions in peak flows and low flows have serious negative consequences for rivers. This literature has not been incorporated into the philosophy of the DEIS. In my judgment, this document does not provide an adequate scientific foundation for confidently inferring minimal adverse impact.

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Professor Rose, on pages 2 and 3 of his comments, makes the following comments on the Cache la Poudre River as a resource for local anglers, with which we heartily concur:

The recreation technical report presents a mistaken characterization of the Poudre from Laporte through Fort Collins as a recreational resource for angling. The report states “the section of the Poudre River from the Poudre Valley Canal outtake to Lee Martinez Park in Fort Collins receives moderate fishing usage for brief periods during early spring and late fall and the CDOW manages the Poudre River from College Avenue in Fort Collins downstream to the South Platte River for native, nongame fish species.” Both of these statements are misleading.

This section of the Poudre River receives considerable angling use during all times that it is ice free for the simple reason that the fishing there is of remarkably high quality. I make this statement on the basis of personal experience and on the basis of many reliable reports from other anglers. A 20+ inch trout is generally regarded as a trophy in any water. I and many other anglers have caught fish of this size in the Poudre from Laporte past the Lincoln Street Bridge, even in March. The value of this fishery as a recreational resource is magnified by its location in and near the city of Fort Collins. In fact, I have often elected to fish in this stretch of the river as opposed to the upper canyon stretch because I had a better chance of catching large trout, didn’t need to drive 20 miles to fish, or because I could fish when the upper river was frozen. The fact that a fishery of this quality exists under presently adverse flows and often poor water quality is truly amazing, but is a strong argument for its preservation and enhancement. A

resource like the Poudre River in and near Fort Collins would be impossible to build but is very easy to destroy. Its ready availability to visitors and residents of Fort Collins makes it a priceless asset.

On pages 6 and 7 of his comments, Rose corrects the DEIS's rosy scenarios regarding the benefits of channel narrowing on the river:

The technical reports appear to regard river channel narrowing as of minor significance. A familiarity with the river suggests much more adverse consequences of the predicted flow reductions. The existing river channel has been shaped by annually high early summer flows and is very wide with steep relief along embankments. The adverse effects of low flows in the late summer, fall and winter would be amplified by further flow reductions. Presently, at high or moderate flows, the entire width of the river channel has sufficient depth to provide widespread holding and feeding stations for trout. Due to the channel width, however, flow reductions, such as those that may occur in a single day, result in abrupt reductions in depth. Consequently, the proportion of the river channel with adequate depth for holding and feeding stations suddenly becomes markedly smaller. This unfavorable condition reaches extreme proportions during the low flows that commonly occur annually, especially during river icing in winter, forcing trout into occupancy of the small proportion of the river channel with adequate depth. It is these extremely adverse conditions that determine the viability of habitat. These adverse conditions would be realized more often, possibly to a more extreme degree and for longer periods of time with reduced flows predicted for the operation of Glade Reservoir.

Regarding the DEIS "Aquatics Technical Report," on pages 10 and following, Rose explains why "fish population data for the Poudre and South Platte were obtained inconsistently in methodology and inadequately in scope."

On pages 1 and 2 of his comments, Rose states the following general conclusions, with which we agree:

1. These documents greatly underestimate the value and quality of the Poudre River west of and through Fort Collins as a trout fishery.
2. In spite of the quality of this fishery it is probably highly vulnerable to seemingly small declines in water quality that would likely result from reservoir diversions.
3. The overall impact of the flow reductions due to reservoir construction is very uncertain in spite of the abundance of data presented in technical reports.

4. Many aspects of water quality, such as effects on ponds in Fort Collins, increased metals, reduced oxygen and effects of vegetation encroachment on the river are inadequately evaluated or not evaluated at all.
5. No consideration was given to the presence of steroid hormones, especially estrogens, in the Poudre from the canyon through Fort Collins, a potential health threat to humans and wildlife alike.
6. There remains a high level of uncertainty regarding the actual impact of the proposed Poudre River diversions due to Glade Reservoir construction and operation, but the risks of significant damage to the wildlife and esthetic quality of the river in and near Fort Collins seems much greater than these documents suggest.
7. The DEIS, while acknowledging the broader environmental impact of population increases, housing, commercial development and support facilities, fails to give adequate consideration to what is this broader, yet direct environmental impact of NISP reservoir construction.

For the rest, we encourage the Corps to take seriously the many scientific errors and omissions in the NISP DEIS documented by Professors Poff, Fausch and Rose.

Conclusion

The science in the NISP DEIS is flawed and selective. For this reason, the NISP DEIS is grossly insufficient as an analysis of the impacts to fish on the Cache la Poudre River below the Poudre Canyon. The Corps must require a supplemental EIS to adequately address these issues, or fail in its statutory obligations under NEPA and the Clean Water Act.

Addenda

We hereby enter into the record a report by a scientific advisory group, consisting of half a dozen scientists eminent in their fields, convened by the city of Fort Collins to help assess the likely impacts of NISP on the Cache la Poudre River through the city (attached).

Two passages from the report are especially relevant to the issue of NISP's likely impacts to fish:

The profile of fish species has also changed considerably since pre-European settlement. Trout and carp often make up substantial portions of the river's fish biomass, however, the variety of species is dominated by tolerant native minnows and suckers able to withstand the impacted conditions. Daily fluctuations in water levels throughout the summer months likely hinder the success of spawning and

larvae survival of many fish. Warmer water temperatures negatively impact the survival of trout. Overall, fish biologists conclude that native, coldwater fishes currently inhabiting the river's transition zone in Fort Collins may be sustained in the future only in reaches farther upstream where there is adequate flow and cooler temperatures. (p. 7)

At the microscopic level, higher nutrient and fine sediment concentrations are likely to increase the dominance of filamentous algae, which support less diverse insect communities. Similarly, fish depend on minimum water levels, the presence of pools for feeding and reproducing, compatible water temperatures, nutrients, and oxygen levels conducive to providing abundant food supply and a nourishing environment for hatching fish eggs. Low flows anticipated by NISP are likely to impact essential environmental factors and further limit fish diversity to mostly non-natives and tolerant native species that can persist under impacted conditions. Under the NISP flow regime it is unlikely that the urban reach will support trout. (p.10)

Full cite: City of Fort Collins. 2008. "Characterizing the Cache la Poudre River: Past, Present, and Future: A Summary of Key Findings by the Poudre Technical Advisory Group."

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We hereby register our disagreement with the following comments and analyses in the NISP DEIS, regarding NISP's likely impacts on fish:

(DEIS p. 4-59) "Beneficial and adverse effects could vary in intensity from minor to moderate and major. A minor effect, either beneficial or adverse, would be detectable only through repeated sampling of fish or invertebrates. A minor effect would be the gain or loss of a few species of fish or invertebrates and a slight long-term change in abundance."

We disagree. If we lose even one native species, that would be a major negative environmental impact. If we lose the (non-native) brown trout or rainbow trout fisheries, that would be a major negative environmental effect.

(DEIS p. 4-60) "It was assumed that further decreasing low flows or further increasing high flows could have adverse effects on aquatic resources. Increasing low flows or decreasing high flows could have beneficial effects on aquatic resources."

This is flawed logic because low flows and high flows have independent functions, yet here they are linked to promote a bogus argument. Basically, on the Cache la Poudre River, low flows need to be increased because they have been depleted by humans to the point of degraded ecosystem function. High flows maintain important functions and if we reduce those flows the system will decline. Decreasing high flows will have the same negative ecological impact as has already occurred from decreasing low flows.

(DEIS p. 4-61) “Reductions in maximum flows during runoff in May, June, and July under the action alternatives would tend to increase habitat availability for brown and rainbow trout more than reductions in winter flows would decrease habitat availability. The reductions in peak flows also would tend to reduce movement and scouring of the substrate, which would tend to benefit benthic invertebrates that live in the substrate and also tend to benefit longnose dace, a common minnow species in the substrate in this segment. The benthic species of invertebrates and fish would probably tolerate the reduced winter flows and benefit from the reduced runoff flows. Therefore, the information on hydrology and habitat availability for fish and invertebrates indicates that the action alternatives would result in a minor beneficial effect to fish and invertebrate communities in this segment of the Poudre River (Table 4-11). There would be increases in abundance of fish and invertebrates and possibly increased number of species of invertebrates.”

For the section of the river from the canyon mouth to Fort Collins, the claim is that NISP would improve conditions for fish by getting rid of those pesky high flows. This claim is not supported by the scientific evidence.

Bed scour is beneficial to rejuvenate habitat (remove fines) for invertebrates. Likewise for fish spawning habitat. Reducing summer peaks could increase habitat for trout in short term, but loss of peak flows will degrade habitat.

This assertion misses the fundamental ecological understanding of the importance of habitat rejuvenation. A healthy habitat can support more adult fish which can recruit enough babies to maintain the population. By saying that the habitat “produced” by flood reduction outweighs the habitat lost from winter low flow, the DEIS misses the point about ecological bottlenecks. Peaks and lows function in different ways. Winter habitat loss may be a bottleneck on the trout population size. If so then “increasing” habitat in summer will not increase the total population size!

Loss of peak flows is much more likely to reduce number of invert species than to increase it. The “minor beneficial effect” based on this logic is absurd.

(DEIS p.4-63) “The information from both hydrology and PHABSIM simulation indicates that the action alternatives would provide substantially more habitat for fish and invertebrates than baseline flow conditions. The action alternatives would have a minor to moderate beneficial effect to the fish and invertebrate communities in this segment of the river [College Avenue to I-25] (Table 4-11). This would result in increased abundance and number of species of fish and invertebrates. However, the beneficial effect would be lessened by the adverse effects of slightly degraded water quality, channel narrowing, and sedimentation.”

Here the DEIS fails to understand the ecological role of floods. The DEIS does not give any reason for why it says that invertebrates will increase under NISP. PHABSIM cannot be used to justify this, since PHABSIM only looks at depth-velocity relations and

whether fish “prefer” these and thus the “quantity” of habitat (and even there it’s highly disputed). PHABSIM does not account for water quality (water temperature) and cannot capture key role of floods in improving habitat quality (e.g., flushing fines).

All this is a real weakness of the DEIS treatment of fish, insofar as you can’t base a finding on a tool that only partially evaluates the range of key environmental constraints.

(DEIS p. 4-64) States that NISP will benefit the South Platte River below its confluence with the Cache la Poudre River.

We see no evidence for this conclusion in the DEIS.

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We hereby register our disagreement with the following comments and analyses in the NISP DEIS “Aquatic Biological Resources Technical Report” (GEI Consultants 2008), regarding NISP’s likely impacts on fish:

(GEI Consultants 2008, p.52) “Of the native species collected, black bullheads, brook sticklebacks, creek chubs, red shiners, and walleyes were collected in such low numbers that determining if they are reproducing in the Cache la Poudre River was not possible. All other native species had multiple size classes present.”

The native species mentioned above might be in trouble. Perhaps they will be pushed to local extirpation by NISP. We believe the NISP DEIS should consider this. Some kind of risk assessment based on their needs (habitat, temperature) relative to the proposed action should be considered.

(53) “Several other species have not been collected in the study area for over 10 years, and are unlikely to still inhabit this section of the Cache la Poudre River. Brassy minnows, a threatened species in Colorado, have not been collected since the spring of 1994, when a single minnow was collected by Bestgen (CDOW 2006). Over the 1984 to 1992 surveys conducted by Bestgen and Fausch (1993), they collected only two brassy minnows at their most downstream site (Appendix E), and state that brassy minnows collected before 1984 were probably misidentified.

“Common shiners, another species listed as threatened in Colorado, have not been collected since a single one was found at a site downstream of Fort Collins in 1989 (Bestgen and Fausch 1993; CDOW 2006). They were collected more frequently and at higher abundances up through 1981, but were only collected during a few surveys between 1981 and 1989 (Appendix E). Iowa darters, a state species of concern, have been collected from the Cache la Poudre River within the project area as recently as 2001, but only a single darter was collected at that time. They were also collected at very low abundances in fall 1993, spring 1994, and fall 1994 (CDOW 2006; Nesler *et al.* 1997).”

The data are sparse, but we wonder: Could the species mentioned above be salvageable in the Cache la Poudre drainage? Would NISP make this impossible? If these species have been extirpated, does that mean that river flows are already too low, or erratic, or poorly timed, and the river should not be pushed further in this direction? The NISP DEIS should consider these questions—but does not.

(p. 57) [Along the South Platte below the confluence with the Cache la Poudre River], “Brassy minnow, a species that is threatened in the state of Colorado, has not been collected since 1980, when two were collected by Propst (1982). Based on this, they may no longer inhabit this portion of the South Platte River. Iowa darter is a state species of concern in Colorado, and was collected in low numbers in 2002 and 2003. The data suggests that a small population may exist within the study area. However, as they were not collected in either of the 2004 surveys or any survey conducted prior to 2002, the darters collected in those years could have been washed downstream during a high flow event from an upstream or tributary population rather than being resident fish from this segment of the South Platte River.”

Again, we wonder: should we be concerned about these species on the South Platte? How would they be affected by NISP? THE NISP DEIS does not try to answer these questions.

(pp. 59-62) Here the “Aquatic Biological Resources Technical Report” tries to argue that high flushing flows are bad for brown trout.

This conclusion is highly dubious, however. High flows are “bad” for trout babies in that they get washed away. However, if there are enough adult trout to saturate available habitat, then it’s OK to have young mortality because this prevents overpopulation and stunting of adult fish. So if adult habitat is limiting, then young mortality is probably not so important.

Big floods over the course of its history have not eliminated trout from the Cache la Poudre River!

In addition, backwaters created during floods (along shoreline, floodplain, etc.) allow babies to stay in system. Fish may be limited by water quality (temperature) or quality of habitat for insects or spawning habitat (floods important here). All this paints a picture of complexity that the NISP DEIS studiously avoids.