



IDAHO DEPARTMENT OF FISH AND GAME

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DEPARTMENT OF
WATER RESOURCES

Dirk Kempthorne/Governor
Steven M. Huffaker/Director

May 16, 2006

Mr. Shelley Keen
Water Rights Supervisor
Idaho Department of Water Resources
322 E. Front Street
Boise, ID 83712

RE: Application no. 85-15653

Dear Mr. Keen:

I have reviewed the email to Greg Taylor from Ray Hennekey regarding the above-referenced application and have spoken to Ray as well. Ray's initial assessment is that the use of 0.2 cfs from Ferren Creek would not likely negatively impact fish and wildlife values as long as adequate water is left in the stream to protect those values. Because IDFG does not have any site-specific studies to recommend how much water is necessary to protect instream values, our initial proposal was that the applicant leave 50% of the instantaneous flow of the stream as a conservative recommendation intended to protect instream habitat. We made this request in lieu of asking the applicant to conduct a site-specific assessment of the instream flow needs for the hydro project. Apparently, the applicant believes leaving half the flow in the stream would not allow him to adequately develop his project. We are not aware of any design or stream flow data to support or refute this assertion.

As an alternative to conducting a site-specific study, I reviewed the scientific literature regarding instream flow needs recommendations and I found, I believe, several relevant studies that might help us arrive at a reasonable estimate of flows needed to adequately protect aquatic resources in Ferren Creek. For example, Jowett (1994) reported that for a large number of streams in New Zealand, the recommended minimum flows necessary to maintain suitable habitat for fish food production varied between 20% and 400% of the mean annual flow, with small streams requiring a greater proportion of the mean annual flow than large rivers.

In another example, Flannery et al. (2002) proposed using a "percent-of-flow method" to determine allowable water withdrawals from tidal river systems in southwest Florida. The method addresses changes in aquatic habitat based on a percent reduction in flow

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from a stream's natural hydrograph; the natural hydrograph is considered representative of the ecological baseline of a stream. The method is based on studies of impacts to various chemical and biological components of tidal river estuaries resulting from incremental changes in freshwater inflow to the estuary. Using this approach, and data collected from subsequent site-specific studies, the Southwest Florida Water Management District (SWFWMD 2005) restricts the daily withdrawal of water from the Peace River such that no more than a 15% reduction in aquatic habitat is allowed, as compared to the amount of habitat available under natural flow conditions. Withdrawals from 5% to 13% reduction from the previous day's flow were demonstrated to cause a 15% reduction in various aquatic habitat components and the District currently limits new withdrawals to 10% of the previous day's flow value (Kelly et al. 2005). The Management District selected a 15% change in available habitat as the threshold for defining "significant harm" to the stream. The use of the 15% threshold is supported by a Scientific Peer Review Panel evaluation of the data, assumptions, and methodologies used by the SWFWMD in development of their proposed MFL (minimum flow or level) recommendations for the Peace River (Gore et al. 2002). The panel noted that the percent change in habitat from other studies designed to prevent significant harm have ranged from 10-33% (e.g., Dunbar et al. 1998; Jowett 1998). The consensus of the peer review panel was that selecting a 15% reduction in habitat as a threshold for preventing significant harm to the aquatic environment was "appropriate and prudent".

In a third example, Alberta Department of Sustainable Resources, as part of their water management planning process, conducted an evaluation of the instream flow needs (IFN) of various rivers systems within the South Saskatchewan River Basin. The IFN evaluations resulted in flow recommendations that generally mimicked the seasonal and interannual variability of a natural hydrograph and typically retained 80% of the available habitat relative to natural conditions. The recommended allowable withdrawal was the greatest constant flow reduction from natural that did not exceed any of the following fish habitat thresholds:

- a 10% loss in average habitat from natural
- a 15% maximum weekly loss of average habitat from natural
- a 25% maximum instantaneous habitat loss from natural

In general, the above habitat retention recommendations resulted in flow recommendations that varied from 15% to 55% flow reduction from natural (Clipperton et al. 2003) and generally were a 20% reduction or less (Allan Locke, Alberta Sustainable Resource Department, personal communication).

I believe the river systems described above, while not in Idaho or neighboring states, are similar to many of the river systems in Idaho, in that most are streams with snow-melt driven hydrology, and coldwater biota. The exception is the Peace River in Florida, which is a spring-fed system tributary to an estuary. However, I believe that in general, the ecological processes and stream responses to changes in flow would be similar, irrespective of the geographic location and perhaps irrespective of hydrology as well.

I would summarize the flow recommendation results from the studies above as follows: 1) the biological threshold above which documented significant changes occur in freshwater aquatic environments is variable (ranges from 10% to 33%), but seems to coalesce between a 15% and 25% reduction in habitat; 2) the amount of water that can be withdrawn from natural stream systems before we begin to approach this habitat threshold is variable (ranges from 5% to 55% reductions from natural flow) across stream types and size, but a 20% reduction might be a reasonable starting point; 3) the amount of water that can be withdrawn without causing significant harm to aquatic habitat and stream function likely also varies within and between years and that mimicking the general shape of the natural hydrograph under different water year conditions provides the greatest opportunity to protect aquatic ecosystems.

Given the above review, I believe our initial request for leaving 50% of the instantaneous flow is a conservative recommendation that should adequately protect instream habitat at the site and is justifiable based upon the relevant literature I have reviewed and the lack of any site-specific data. However, considering the small size and scope of Mr. Chai's proposed project, and our expectation that Ferren Creek is not likely utilized by anadromous fish or other listed fish species such as bull trout, we expect the likelihood of significant impacts from his water withdrawal on the fish and wildlife resources and associated habitats to be minimal. While we maintain it is not appropriate to allow him to entirely dry up the stream, as a compromise recommendation, we suggest that a condition be placed on his water right requiring flows above his diversion be monitored and that no more than two-thirds of the flow be withdrawn from the stream at any time, leaving one-third of the flow in the stream to protect the existing instream uses. If Mr. Chai can provide us with site-specific information on hydrology, channel morphology, and details of his project that demonstrate more water could be withdrawn without adverse impacts, we could be re-evaluate our recommendation.

Thank you for the opportunity to comment.

Sincerely,



Cindy Robertson
Program Coordinator

cc: Ray Hennekey, Clearwater Region
Marti Bridges, IDEQ, Boise
Bill Graham, IDWR, Boise
Roxanne Brown, IDWR, Boise

References

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- Jowett, I.G. 1994. Minimum flows for native fish in the Waipara River. National Institute of Water and Atmospheric Research, Christchurch miscellaneous report 180. Christchurch, New Zealand. 15 pp.
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