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February 3, 2010

Mr. Mark Stopher
Acting Regional Manager
Department of Fish and Game
601 Locust Street
Redding, CA 96001

Re: Letter of December 10, 2009 to Ms. Bose, Secretary of FERC, from the Redding office of the California Department of Fish and Game (CDFG)
FERC Accession No. 20091228-0038 filed on P-606-000

Dear Mr. Stopher:

We start by addressing the third paragraph of page 2 which discusses CDFG's concerns with the Davis Hydro (DH) Alternative. CDFG's concerns are as follows:

1. DH Alternative is experimental and untested,
2. does not use proven fish management practices,
3. does not offer support from the literature,
4. is unlike successful fish culture or other restoration projects, and
5. does not provide Minimum Instream Flow (MIF).

We concur with all of CDFG's issues. We respect these five concerns. It is also clear that your interests and those of NMFS in fish restoration are the same as Davis Hydro's and therefore at the outset it is natural that we would have little disagreement on concerns.

We acknowledge that the idea of using a headrace as a complex of spawning beds is new and untested (concerns 1&2). We recognize that we will have to learn as we go about how to best use this resource. We recognize and design into our plans the measurement of production and see the facility as a dynamic laboratory wherein we can all learn and teach how to build the best spawning beds. There is absolutely no intent to "put in some beds, release a bunch of breeders and leave". The Davis Hydro proposal is to explore fish issues such as local *O. mykiss* genetics, spawning bed matrix emission and all processes that occur within the spawning beds. There is a need for better tools to measure egg survival and its determinants. DH sees this facility as one that will have an extensive, funded research facility that we will support to assist adaptive fish genetic production and ongoing research into the indefinite future.

CDFG is aware, and CDFG staff have brought to our attention on several occasions, the high failure rate of artificial spawning beds (concern 3). This concern directs us and the reader to the reality that many, if not most, efforts to create spawning beds fail. We concur, and find no better mandate for our efforts to do better. In doing better we will be able to use this

knowledge at other sites around the world. There is a need for small productive spawning beds to support local genotypes. The best way to learn how to create them is to try harder – not quit because others have failed. The headrace, with the long-term associated support from the hydropower, provides a unique laboratory/production facility that will enable research in the very areas about which we know the least:

- ≈ Why is egg and alevin mortality so high in the gravel?
- ≈ Why are so many forced out too early?
- ≈ What exactly is the best spawning bedding and environment we can create for steelhead?
- ≈ How can in-gravel predation and morbidity be controlled?

We emphasize here the very phrase that disturbs the Agency reviewers: “we can create”. The phrase is intentional. In order to restore ancestral genotypes and possibly steelhead to the upper Sacramento, we collectively need many factors, among which is a wide variety of good “local” spawning grounds. In some streams these are plentiful – Battle Creek, South Cow, main stem of the Cow - but in many others, spawning ground is rare and in need of restoration or creation.

One of the outcomes of the research and production experience suggested for the Kilarc facility will be exactly the information needed – describing what are the characteristics of the best bedding and environment we can create for spawning steelhead. We are emphasizing research on what we can control, from genetics to spawning gravel matrix, to help these fish reproduce naturally. Our desire is to create a production, research, and educational facility that operates under the direction of a trust that has as its mission the very goals motivating the fish resource agencies’ concerns.

Evidence Needed

While we concur that the concerns CDFG expressed are valid, we cannot yet agree with the implicit statement of the agencies that they have a better solution. In the various statements by the agencies, CDFG included, they clearly state their concerns about our efforts at fish protection and restoration, but give no evidence that tearing down this sustainable green power facility will provide a better solution. The mantra “natural conditions are best” may in some global sense be generally true, but may easily be not true in many local situations. We suggest that there is little evidence that restoration of flows in this bypass (concern 4) will produce significantly more, or even any, anadromous fish. Simply tearing down sustainable power sources will have pervasive environmental consequences locally, nationally, and globally.

We at Davis Hydro recognize that concerns 1 and 2 are valid and they are our concerns also. Concerns 3 and 4 set the stage for doing research on spawning enhancement. Concern 3 shows a rich literature of failed sites, and many issues to explore. A literature exists about the failings of hatcheries, but there are few articles on the smaller nature-like spawning facilities that will be needed if we are to obtain desired geographic-genotype diversity.

Genetic Drift

We continue to raise the possibility that the local ancestral genotype, even if restored, may not have any anadromous tendencies. Consider the opposite idea supported by CDFG and NMFS. If the area were to somehow repopulate from the existing local fish, since it is saturated with hatchery fish from elsewhere, these exotics are unlikely to increase either diversity (due to the homogeneity of the hatchery stock), anadromy (due to lack of genetic relation to the local habitat), or accurate ancestral genetics (desirable under the ESA mandate).

Given the physics of the bypassed region it is unlikely that anadromy is, or can be, significantly expressed. If this lack of anadromous return is shown to constitute selection pressure (via genetic drift out of the area) against anadromy, improving habitat in this area may only increase non-anadromous phenotypes to be derived from the remaining alleles. Thus removing the facility might constitute a clear move against establishment of this component of the DPS.

Concern 4 is that our proposal is unlike successful fish culture, or other restoration projects. This is true and differentiates us from large mass hatchery and artificial spawning facilities that have failed (or helped to cause our current genetic problems). We fully intend to concentrate on smaller, nature-like conditions using natural feeding, flows, setting and materials that are commonly available, and modify these as necessary to produce good fish production. They will be useful for reestablishing smaller (possibly ancestral, possibly anadromous) populations under the model that there are differences between various geographic fish population segments. It is very unclear at this point which is the best population to promote in this area. This is discussed in our research and fish restoration discussion. A copy of a recent version is attached for your reference.

Scope

CDFG should consider a California-wide perspective when evaluating the Alternatives. In this project, it is unclear if the CDFG has looked at the effects of acid rain, NO_x and other pathogens across the state and country that will result from the destruction of this sustainable resource and the *de facto* substitution of fossil-generated electricity. This has not yet been discussed. These important statewide issues appear to a local-decision maker, such as the Redding CDFG office, as externalities and remote consequences of concern to others. However, DH is equally concerned about the current destruction of our state and national fisheries through small separate actions such as this one, as we are about local alleles of rainbow trout. Making local decisions to destroy renewable energy sources has global consequences – not only for downwind fish populations but for all of us on the planet. To evaluate a local project using local goals while ignoring larger consequences is a form of thinking locally and, as an agency, acting globally.

Summarizing Davis Hydro's Concerns

We recognize and accept CDFG's concerns, but one missing concern is the consequences of a policy of destroying renewable generation. We also have concerns that the fish that might repopulate the bypass may lack any significant anadromous potential, or on a more detailed level may not represent the ancestral genetic suite that would be the core of a Distinct Population Segment ESA imperative.

Specifically, we have concerns that only a modest increase in fish will occur and these will have a poor statistical expression of anadromy. We have concerns that if we do not invest information and money in ranchers, screening will not come for many years given cost and budget constraints. We have concerns that if "forced" on one generation of ranchers the screens will not be maintained, and that the revenues dedicated by the Kilarc Trust will not be available for fish habitat improvement and research.

We are concerned that even if all "genetic", "impassable barrier", "limited gravel" issues are invalid, the natural conditions in this V-shaped narrow valley of the Cow Creek will not produce as many anadromous fish moving downstream as the proposed Kilarc Project spawning beds.

We are also concerned, as discussed briefly above, that for an agency to evaluate this project locally is a kind of NIMBYism that is insensitive to the larger statewide and global environmental ramifications of this incremental action. Finally, we have concerns that if we lose this facility - this small, nature-like spawning ground - we will lose a real opportunity to do the research needed on the physics of the spawning beds, as we address on the genetic reconstruction of the area.

A Way Forward

If successful with spawning, we intend to use what we learn to see if we can improve the genetics and spawning conditions at a spectrum of small sites where restoration of spawning is needed. The primary emphasis will be the understanding and dissemination of information on how to inseminate a small area from a limited preferred stock, assist in the reinvigoration of a stream that has been denuded of anadromous fish, or one that has a degraded population such as the South Cow. This is key, in that the probability of a steelhead anadromy is far greater if that fish has genes indigenous to the area - not just its area's scent.

We believe that the intimacy created by having local people see and help populate streams with fish will induce many of them to want to take care of the habitat and fish produced. We have witnessed this behavior in ranchers who initially opposed all agency efforts, but once they understood, saw, and felt the spawning of the fish on their land they became the fishes' guardian and protector. The Kilarc spawning facility and spawning events will be as public as possible, connecting many people to the fish in their community. This too is part of our intent. We believe it is also the most cost effective way to obtain rancher cooperation - far better than bulldozing their family fishing hole.

In conclusion, we respect and agree with CDFG's concerns. We continue to request cooperation and help from CDFG and NMFS in building a solid local genetic stock, in so far as possible, from isolated ancestral fish. We request help and support in research on not only what are the best bed and mechanics of small spawning beds and informal screens, but how we can build the most robust population possible with the potential for anadromy.

Respectfully,
Davis Hydro LLC

A handwritten signature in black ink, appearing to read "Richard D. Ely". The signature is fluid and cursive, with a large initial "R" and a stylized "D" and "E".

Richard D. Ely, Principal

Cc: FERC eLibrary, P-606 e-mail service list and concerned parties

Enclosure