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Mr. Voss:

Thank you for the opportunity to comment on the Draft Bull Trout Recovery Plan. I have been leading a project for the past year or so focusing on analysis and development of guidelines for native trout restoration and recovery plans, so the release of the Draft Bull Trout Recovery Plan afforded an interesting opportunity to test the recommendations we and our scientific panel for that project have developed.

We consider the Recovery Plan to be a very important step for an important species in peril. Restoration and recovery of the bull trout and the ecosystems upon which it depends could benefit numerous other species and resources valued by The Pacific Rivers Council and its supporters. The recovery plan potentially affects an unusually wide swath of the Pacific Northwest, and an impressive list of rivers, streams, and lakes with broadly outstanding ecological and cultural value.

My comments focus on the overall content and emphasis of the Draft Plan. We do not delve into detail in specific areas, as tempting as it was to do so for the several areas I know quite well. Suffice it to say that the general criticisms discussed below are embodied and re-create themselves time and again in the geographically specific chapters of the Draft Plan. These comments are brief and to the point. We would be happy to discuss them at greater length at any time with you or any member of your staff or the Recovery Team, at our mutual convenience.

Recovery Goals and Delisting Criteria

This is the very heart and core element of the recovery plan, and if it isn't written with care and foresight the rest of the plan is likely to be ineffective and at best marginally

useful to anyone. The Draft Plan is remarkably devoid of any specific, measurable set of recovery goals and delisting criteria. The discussion of recovery goals shuns specifics, and puts most key assessments and recommendations off into the future, pending some ill-defined body of research or analysis. *Specific, measurable biological goals for the species across its range, for individual recovery units or major drainages, and for local population complexes or “core areas” should be the centerpiece of the Plan, qualified with criteria to protect the integrity of individual breeding populations (see below).*

There is plenty of professional and scientific experience showing that for native fish, measurable goals and criteria can be stated in terms of population trend, abundance, expression of life history diversity, estimated survival rates (though this has been rarely done for fish not targeted for commercial harvest) and spatial distribution of bull trout and of threats to bull trout. Recovery actions should be identified relative to those overall biological goals and criteria. The Draft Plan, because it is so vague in defining the recovery goal, can only be vaguely justify individual recovery actions, and lacks any capacity to rationally identify priorities.

There should be spatially nested recovery goals and delisting criteria at three levels: 1) species range, 2) recovery area or major river basin 3) core area or similar spatial aggregate of proximal breeding populations.

The failure to include specific, measurable recovery goals and delisting criteria is a major disappointment, and this failure undermines the entire Recovery Plan.

Link of Recovery Analysis and Measures to Critical Habitat

Ideally, from the standpoint of conservation and practical management, there should be rational linkage between critical habitat designation and recovery actions and priorities. Completion of the critical habitat determination simultaneous with the recovery plan was intended to foster that sort of logical and practical linkage, or so we were lead to believe by certain officers of the USDI and Fish and Wildlife Service. There is virtually no evidence of such linkage in the Draft Recovery Plan. Why not?

Establish Guidelines For Acceptable Land And Water Use In Sensitive Areas

Ample experience and guidelines are available now to identify conservation measures likely to be effective for conservation of bull trout (e.g., habitat protection from land use in floodplains and watersheds of spawning streams). Useful general guidelines, “rules of thumb,” and some specific criteria have been in use for some time now by the US Fish and Wildlife Service to facilitate federal agency consultations and place sideboards on management of public lands and waters where bull trout occur. Inexplicably, the recovery plan appears to be essentially devoid of all of this knowledge and the science and management experience that underlie it. Now all of a sudden we are expected to

believe that such guidelines cannot be developed without unspecified additional research and deliberation (or else that they have no place in a recovery plan).

We propose that a useful recovery plan should offer its reader a comprehensive and practical discussion of the full spectrum of actions that are considered to constitute threats to bull trout. Within each of several categories of land or water use, the typical slate of management activity could be classified as follows:

Actions posting minimal risk of take

Actions that may cause take in some circumstances (offer some description of the qualifications to guide managers).

Actions that may cause take but likely do not cause significantly reduce the ability of the species to recover (essentially no-jeopardy guidelines).

These should provide a handbook or at least an informal set of screens for both public agencies and private entities and managers to assess the relative likelihood their actions may harm bull trout. This in our view should be the second most critical component, and probably the largest body of information within the recovery plan itself (following the specific identification of recovery goals and delisting criteria).

Establish Guidelines for Passage and Movement

The Recovery Plan needs a specific section that discusses the many threats to bull trout movement, synthesizes the scientific and most useful management literature in these threats and how they might be alleviated, and finally identifies needed and feasible recovery measures. This section could be structured in the same way as recommended in the preceding section for land and water use, essentially as a handbook providing guidelines for planners and managers, organized around different kinds of management factors or features that block movement of fish.

The potential for breaching of artificial barriers to have unintended side effects by allowing nonnative species to invade previously inaccessible waters needs special attention. *Again, specific guidelines and decision criteria useful for such projects could be and ought to be provided in the Recovery Plan.*

Component Populations, Recovery Areas, and Recovery Criteria

Based on research on genetic differentiation among tributary-specific populations of bull trout (Kanda and Allendorf 1997, Spruell et al. 1999, Spruell et al. 2003) it is highly likely that recovery units such as the large Grande Ronde River Recovery Unit, and indeed each “core area” is comprised of several, or perhaps a multitude of breeding

populations that are genetically, demographically distinct, and spawn in spatially discrete areas of the basin. Recovery measures *at every level* should acknowledge this fine-scale demographic and genetic structure and diversity, and conservation goals and objectives and be based on its preservation and enhancement. Failure to recognize that conservation and recovery of a large and spatially complex area like the Grande Ronde system is based on recovery of numerous semi-independent or in fact independent populations could compromise recovery jeopardize the long-term future of the species. *The draft recovery plan utterly fails to describe the implications and consequences of fine-scale genetic diversity for conservation actions.*

Recovery measures that preferentially enhance abundance of, or reintroduce, one or a few such populations at the expense or neglect of other extant populations could have serious, likely irreversible genetic and demographic consequences. Erosion of genetic and spatial diversity of the species within recovery units is a direct and measurable threat to the persistence and recovery of the species. Recovery criteria should include a specific description and objective for protection and enhancement of the spatial distribution and interpopulation genetic diversity of putative populations within the recovery unit. This means both promoting the local demographic security of natural extant populations, and preventing homogenization of genetic structure through forced interbreeding, habitat disruption or migratory blockage, or via stock transfer or artificial propagation.

Artificial Propagation and Hatcheries

Artificial propagation and hatchery culture pose great operational and biological risk of harm to natural populations of salmonids. Disruption of natural behaviors, breeding systems, and possible risk of exposure to disease pose high costs on wild fish that are removed from the wild for translocation or captive rearing or breeding. In numerous published studies, hatchery fish show evidence of genetic alteration in the very first generation as a consequence of mating system disruption, artificial selection forced by captive conditions, relaxation of natural selection, and possibly other less-well-recognized mechanisms. There is also accumulating evidence that in most cases these genetic alterations are deleterious and the result is that translocated or stocked fish suffer high mortality or poor reproductive rates. If they displace natural, wild fish at any life stage, the effect may prove to be a net decline in collective fitness of the population, a clear threat to any endangered population or species.

There is a plethora of published science and a large body of management experience showing that artificial propagation and hatchery culture are as likely to be a source of further harm than a benefit to wild salmonids like bull trout, except possibly in the case of re-establishing populations where none remain (and even in this case the donor population pays the demographic cost of supplying the brood stock, a cost which must be very carefully considered). Why does the recovery plan virtually ignore this large body of science and management experience in Chapter 1? And even though Chapter 1 at least admits that such artificial cultural interventions are at best experimental, why does the Draft Plan entirely ignore this in subsequent chapters, where in numerous recovery areas,

artificial propagation is identified as a primary (and very expensive) strategy for recovery?

There is no specific biological justification given for reliance on hatchery measures instead of other recovery measures in the majority of these instances, and there is no general justification nor even considered disclosure of the risks anywhere in the Draft Plan. *The Draft Plan utterly and very obviously fails in its burden to justify allocation of scarce recovery resources to hatchery and artificial propagation projects.*

Adaptive Management.

The discussion of adaptive management does not acknowledge a large body of published work in this field by fisheries experts like Carl Walters and Randall Peterman (cites too numerous to mention here). The Draft Recovery Plan fails to recognize that an absolutely *critical component of any adaptive management system is that management actions be predicated on a clearly stated, measurable and falsifiable hypothesis*. The Draft Bull Trout Recovery plan lacks a testable hypothesis. Examples of hypotheses that might be measurable include some stated rate of progress toward attaining a measurable recovery objective, e.g., 5 percent increase per yr in redd count pop A for 5 consecutive yrs; a 20% increase in spatial distribution of rearing juveniles on Pop B over 5 years; 30% of stream network <3 % gradient with 7-day mean maximum attaining a water temp < 17 degrees C.

Of course, specific testable hypotheses depend on specific goals and criteria, as well as ancillary mechanistic assumptions about cause and effect. But if the recovery goals and delisting criteria are not specified, there is no defensible context for drafting specific, testable objectives and hypotheses that could be tested in a real adaptive management program. *If the operative or “key” hypotheses underlying the recovery actions are not specifically defined, then there is in fact no metric and no identifiable trigger for adaptive management to adapt. Moreover, there is no way to ascertain whether monitoring data are of the correct ilk and sufficient resolution and accuracy to provide biologically and managerially useful information.*

These deficiencies are unfortunately systematic and pervasive in the Draft Bull Trout Recovery Plan. We hope the Service will see its way to rectifying these shortcomings in the Final, allowing the plan to attain the potential that is evident in the Draft.

Respectfully,

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c: David Bayles, Executive Director, The Pacific Rivers Council, Eugene, Oregon

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