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The Pacific Rivers Council
Western Native Trout Campaign

Comments of Critical Habitat Designation for Bull Trout, *Salvelinus confluentus*

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The overall purpose of the Endangered Species Act ("ESA") is "to provide a means whereby the ecosystem upon which endangered and threatened species depend may be conserved". ESA § 2 (b). Conservation is defined by the ESA as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the Act] are no longer necessary." ESA § 3 (3). Regarding critical habitat, the Code of Federal Regulations ("CFR") requires designation based on the conservation of the species in question and may include both occupied and unoccupied areas. CFR 424.02. Based on these legal duties, we urge the Service to broadly designate critical habitat for bull trout pursuant to the following arguments.

ESA 3(5)(A)(i) & (ii)

(i) *the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and*
(ii) *specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.*

Our recommendations are based on the ESA language cited above, interpreted in the context of best available science pertaining to the 1) ecology of bull trout; 2) the

ecosystem relationships of streams, rivers and lakes with the connected terrestrial landscape, and 3) the conservation biology of salmonid fishes.

1) ***Critical habitat should include all streams within which extant populations of bull trout complete spawning and early rearing life stages, and should include as special management areas lands comprising the contributing catchment area to those stream reaches.***

Rationale:

a) Recent genetic studies indicate that in most cases, each spawning tributary supports a bull trout spawning population that is genetically unlike other populations (Kanda and Allendorf 2001, Spruell et al. 1999). Populations in adjacent streams also show evidence of demographic independence (Baxter et al. 2000, Rieman and McIntyre 1996). These studies tend to refute previous hypotheses that bull trout may be organized as dynamic metapopulations (Reiman and McIntyre 1993), characterized by frequent local extinction and recolonization events, or demographic rescue effects in which immigration from strong to weak populations stays extinction. The conservative assumption justified by the available science is that all breeding populations are discrete, independent units, and that most are small and occupy highly altered habitats, and thus are at high risk of extinction without replacement. Founding or re-founding of populations is apparently an infrequent event, and may not occur at all under prevailing climate and habitat conditions. Moreover, founding of conservation populations of bull trout through artificial translocation has not been demonstrated to be feasible. Therefore the loss of any single bull trout population, however small and regardless of its status, presents a proportional and likely irreversible loss of genetic diversity, and also constitutes an irretrievable loss of geographic opportunity for recovery of the species and listed Distinct Population Segment.

b) Genetic independence and uniqueness of stream-specific populations strongly implies, as has been substantiated repeatedly for other salmonid species, that individuals from each population possess a high level of local adaptation to the spatial configuration, temporal dynamics, and quality of the locally available habitats. Carnefix (2002), for example, showed that adult bull trout from different spawning populations varied in rate and timing of upstream migration, and some individuals from a subset of tributaries showed stereotyped, directed migrations to nonnatal tributaries, perhaps for feeding purposes.

c) The dependence of habitat conditions in bull trout spawning and rearing streams on riparian and upland land use and management actions is a well-recognized biophysical fact (e.g., see Rhodes et al. 1994, Spence et al. 1996). Baxter et al. (2000), for example, established strong correlative relationships

between road density of tributary catchments and the status and trend of bull trout spawning populations residing within them.

2) ***Critical Habitat should include the stream and river corridors, lakes, and estuarine and nearshore marine habitats historically, presently, or potentially occupied by migratory life stages of bull trout, as these are necessary to allow fluvial and adfluvial life histories to remain or be restored in all extant bull trout populations. Floodplains, channel migration zones, riparian areas, zones of hyporheic or extensive groundwater exchange with surface waters, and tributaries contributing cold water directly to these reaches should be designated as special management areas necessary for sustaining growth, survival, and health of migratory bull trout in these habitats.***

Rationale:

a) The migratory, fluvial, adfluvial, or anadromous life history confers crucial demographic and ecological resilience to bull trout populations. Migratory fish tend to be larger in size and longer-lived; therefore they are more fecund than nonmigratory fish and may reproduce more times before death, boosting demographic viability of their natal populations far more per capita than a nonmigratory (resident) adult. Moreover, by maintaining a portion of the population outside of the natal tributary, the risk of catastrophic loss of the tributary population by natural or manmade events is substantially reduced. Migratory individuals can return to re-found populations in their natal streams when the resident population has been lost, potentially for many years after the catastrophe, in the case of long-lived migrants. This is crucial because it may be not until several years following a catastrophe that tributary streams are suitable for re-occupation by bull trout. Loss of migratory life history is probably the single greatest threat to population viability of bull trout, exceeding in importance the decline in abundance of numbers of adults, particularly when most adults counted are nomigratory individuals. Restoration of migratory life histories is co-equal in importance with protection of natal spawning and early rearing streams for bull trout conservation.

b) Protection of lake, river, and estuarine habitats requires protection of their water quality and ecological processes that maintain water quality and habitat complexity and quality. This means designation and protection or restoration of all connected elements of the adjacent terrestrial and wetland ecosystem, including floodplains, channel migration zones, riparian areas, zones of hyporheic or extensive groundwater exchange with surface waters, and tributaries contributing cold water directly to these reaches. These should be designated as special management areas necessary for sustaining growth, survival, and health of migratory bull trout in these migratory habitat corridors. The

Montana Bull Trout Scientific Group (1998) provides one possible ecological and regulatory framework for delineating and protecting this special management zone where influence on aquatic habitat are especially acute or direct.

3) **Critical habitat should include as special management areas all dams and reservoirs located upstream of habitat designated for migratory life stages, where the ecological effects and operations of those systems influence the growth and survival of migratory or other life stages of bull trout occurring in downstream-connected river segments, lakes, reservoirs and estuaries.**

Rationale:

a) Mainstem river, lake and reservoir, estuarine and nearshore habitats are affected by the downstream flux of water, sediment, debris, and chemicals from contributing sources. The quality , quantity, and and timing of streamflow can also influence the proliferation and impact of introduced species that adversely affect bull trout in various ways. Management and of dams and other water projects thus impacts the survival and growth of migratory bull trout in downstream waters, regardless of the presence of individual bull trout at the site of the operation or facility. Such facilities should be identified and designated as special management areas because how they are operated or managed can be essential to the conservation of the species.

Literature Cited:

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Please feel free to contact me directly with questions or for further information.

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