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DEPARTMENT of
NATURAL RESOURCES

Administration



CONFEDERATED TRIBES
of the

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Umatilla Indian Reservation

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26 May 1995

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DOE-RL / DCC

David Maughn
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Subject: PRELIMINARY CTUIR SCOPING OF SPECIES OF CONCERN FOR
COLUMBIA RIVER COMPREHENSIVE IMPACT ASSESSMENT

Dear Columbia River Ecological Risk Assessors:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) appreciate the opportunity to provide lists of species of concern for inclusion into the evaluations for the Columbia River Comprehensive Impact Assessment. This letter provides the species lists as an attachment, outlines guiding principles and general criteria that CTUIR staff used in developing the lists, and describes an appropriate ecological framework for the risk assessment(s).

THE SPECIES LISTS

The attached lists contain selected "indicator species" identified by CTUIR staff to be evaluated in the risk assessments planned for the Columbia River Comprehensive Impact Assessment. It should be noted that all species are considered cultural resources by tribal people, and each is recognized to serve a unique and valuable role in an interdependent ecosystem. Although some species are used more commonly than others as food sources or for other cultural purposes, none are considered inherently more important or valuable than any others. Based on thousands of years of experience, tribal culture respects and proactively protects the land, the waters, and all the life forms that inhabit the physical environment.

These lists are by no means exhaustive or complete listings. They do not necessarily represent the most culturally significant plants and animals to tribal members or communities. They do, however, represent some of the trust resources protected under the Treaty of 1855 between the CTUIR and the U.S. government. Moreover, they also represent some of the natural resources for which the CTUIR--as well as the U.S. Department of Energy--are Natural Resource Trustees, under CERCLA Section 107.

The attached species lists provide a starting point for identifying appropriate receptors, endpoints, or midpoints for the ecological risk assessments. Traditional ecological and human health risk assessments generally evaluate featured species only, such as those listed as Threatened or Endangered, or those species currently in the cultural (whose culture?) limelight. Such a skewed focus raises legitimate questions about "representativeness" and whether a few selected species can adequately characterize the diversity and complexity of interdependent ecosystems. In most cases, CTUIR staff did not identify specific species, but rather identified various taxa representative of the complex food web associated with aquatic and terrestrial systems in the mid-Columbia basin. Individual species will be identified in consultation with CTUIR staff.

ECOLOGICAL GUIDANCE PRINCIPLES

Species were selected to represent several different trophic levels in the mid-Columbia River ecosystem. *As core or critical elements of this ecosystem, the identified species should comprise central evaluation elements of a comprehensive assessment process geared to examine the past, current, and future impacts and direct, indirect, cumulative, and synergistic/antagonistic effects of contaminants on land, air, water, and biota within the Hanford Reach, its environs, and downgradient areas.* In the context of comprehensively evaluating contaminated environments, trust resources such as land, air, water, and biota must not, and indeed cannot, be evaluated in a credible and technically defensible manner independent of the web of life and the interdependent function and structure of the ecosystem of which they are integral parts.

In addition, traditional risk assessment methods tend to focus exclusively and narrowly on single species/single contaminant/single pathway, suburban-based, ecotoxicity evaluations. Critical but inherently difficult-to-quantify issues such as overall habitat quality for all resident and migratory species cannot be ignored in any truly comprehensive assessment process. A process based largely or entirely on a strictly reductionist approach is likely to ignore the fundamental law of the natural sciences, namely that "everything is related to everything else," and too easily lose sight of the forest for all the trees.

Moreover, a truly comprehensive Columbia River Assessment must necessarily include the element of time. The context of current conditions can only be assessed through understanding the past conditions and history that have resulted directly, indirectly, or cumulatively in currently observed and measured conditions. History is the sum of a uniquely ordered succession of events which cannot be comprehensively understood by designating some arbitrarily chosen, very

recent date from which to begin that significantly postdates the beginnings of Hanford activities and impacts. Furthermore, a one-time snapshot of current conditions is only a start. Current conditions--and the past conditions and history that have led to them--are a stepping stone to begin to understand what measures are needed to *effectively mitigate* future impacts. This must be recognized to comprise the true goal of a credible, comprehensive Columbia River Assessment--and of DOE's mission at Hanford.

But assessing current conditions alone cannot tell us the true benefits of remediating existing contamination compared to the impacts of doing nothing--it is this essential debate that the Columbia River Assessment must enlighten. Ultimately, it comes down to defining appropriate perspectives. For example, carbon tetrachloride contamination currently comprises a spreading, 7-square mile plume centered on the 200 West area, slowly moving toward the Columbia, about 10 subsurface miles away. Because current exposure pathways are highly limited, the attendant risk is therefore very low. But modeling results show that within 100 years, if no remedial measures are taken, this known carcinogen will be discharging directly into the Columbia River at levels hundreds of times the drinking water standard.

Hence a risk assessment based only on current conditions fails to capture or even recognize the inevitable deterioration of river and ecosystem conditions over time caused by failure to control the now areally restricted carbon tetrachloride plume and permitting its inevitable, uncontrolled spread and migration through the subsurface and into the Columbia River over time. This future risk is very high. The consequences of continued inaction will fundamentally impact both the nature and magnitude of future human health and ecological risks posed over long time periods and the demonstrable adverse impacts to ecosystem integrity and human health that will necessarily occur if no control measures are taken now. The nature and extent of contamination, the conditions that result from contamination, and the risks and impacts such contamination poses to humans and ecosystems are not static through either time or space. In a credible Columbia River Comprehensive Impact Assessment, they cannot be treated or modeled as such.

Taking a more intuitive and scientifically credible approach to assessing the influence of stressors on an ecosystem or the organisms within it requires a thorough evaluation of each element and function of the system. Such an approach will better permit a comprehensive understanding of stressor effects and changes at each level of the system and on the system as a whole. Multiple endpoints may be necessary in some or many cases in order to credibly model a complex, multi-layered ecosystem with multiple, overlapping pathways.

In defining the scope of species and habitats that should be included in the analysis and that is reflected in the attached lists, CTUIR staff have focused largely on successive trophic levels of aquatic, riparian, and upland habitats most closely associated with the Columbia River itself. Although distal terrestrial environments are no less a part of the Columbia River ecosystem as a whole, our species lists deliberately focus on those organisms most dependent on the river and river margin habitats. CTUIR staff recognize this selectivity, which has provided some basis to limit and focus the lists of species. Those terrestrial species included depend significantly on the

riparian ecotone, a diffuse zone of influence of varying width from the river margin, but extending well into the terrestrial upland/shrub-steppe. Contaminants affect both aquatic and terrestrial habitats, but many contaminant discharge areas and exposure pathways are concentrated disproportionately in riparian corridors and near-shore river environments--and these same areas also are disproportionately populated or utilized by many organisms including humans.

SUMMARY

Traditional American Indians and traditional tribal ways of knowing do not artificially separate humans from the environment, as is so common throughout the dominant society. This arbitrary separation is epitomized in the equally arbitrary distinction between human health and ecological risk assessments or by the application of different human and ecological protection standards. To traditional American Indians, humans are an integral and interdependent part of a larger ecocultural system that includes the earth, all the natural resources in, upon, or above it, and all living things, including humans and the culture they have evolved to respectfully, harmoniously, protectively, and sustainably live within this system.

This way of thinking is different than that of the dominant society, and thus has been difficult to incorporate into much more narrowly framed and scoped conventional risk assessment methods. Moreover, risk assessment is a linear process, whereas both tribal concepts of humans and their environment and the concept of food webs themselves are circular. Conventional risk assessment methods must recognize and overcome this inherent dichotomy by incorporating the values and perspectives of those being risk assessed. Risk assessment should not be a "black box" where the internal parts and workings are invisible; the process must be made as open and transparent as possible. In a credible risk assessment, critical assumptions, data limitations, and sources of uncertainty are thoroughly and explicitly identified and discussed. Only in this way will credible, technically defensible, and politically acceptable decisions result.

The species identified in the attached lists constitute a starting point for the Columbia River ecological risk assessments. By informal mutual agreement, these lists have been developed independent of simultaneous activities being conducted by PNL staff. CTUIR staff developed these lists based largely upon the general ecological considerations outlined in this letter. CTUIR staff understand that PNL has developed an informal set of criteria that it is using to screen species; we have neither received nor reviewed PNL's screening criteria during the development of our own independent lists. The next step will be to compare the CTUIR and PNL lists, in addition to the screening criteria, in order to see how well they mesh, how well they can be combined, and how to resolve differences. A meeting of CTUIR and PNL staff should be scheduled to discuss similarities, differences, and where to go from here once exchanged lists are reviewed.

Confederated Tribes of the Umatilla Indian Reservation
Letter to Randy Brich/DOE and David Maughan/PNL
26 May 1995

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Thank you very much for the opportunity to provide CTUIR input on the species of concern to be included in the Columbia River Comprehensive Impact Assessment. CTUIR staff believe that the guiding principles and ecological framework outlined in this letter begin to define an appropriate purpose and scope for a credible and truly comprehensive Columbia River Assessment. We look forward to continued dialogue with DOE, its contractors, and regulators concerning the completion of this assessment. Please contact either me, or Tom Gilmore of my staff, at 503-276-0105 (phone) or 503-276-0540 (fax) to schedule further discussions.

Sincerely,



James R. Wilkinson

Special Sciences and Resources Program Manager
CTUIR Department of Natural Resources

cc: William Burke, Treasurer, CTUIR Board of Trustees
Michael Farrow, Director, CTUIR Department of Natural Resources
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Paul Esslinger, PNL

Fish

fall chinook salmon
 sockeye salmon
 steelhead
 rainbow trout
 white sturgeon
 mountain whitefish
 Pacific lamprey
 carp
 catfish
 bighead minnow
 bass

Shellfish

freshwater mussels
 crustaceans
 crawfish

Amphibians

Great Basin spadefoot

Reptiles

Western painted turtle
 rattlesnake
 whip snake
 bull snake
 lizards

Macroinvertebrates

stonefly
 caddisfly
 mayfly
 dragonfly
 lepidopterans
 polychaete worms

Mammals

coyote
 black-tailed jackrabbit
 cottontail rabbit
 mouse (pocket, deer, harvest)
 mule deer
 raccoon
 weasel
 badger
 bats
 humans

Waterfowl/Shorebirds

Canada goose
 mallard
 common merganser
 great blue heron
 cormorant
 avocet
 grebe
 kingfisher
 coot
 pelican

Raptors

bald eagle
 burrowing owl
 hawk spp.
 osprey

Ecotone/Upland Birds

crow/raven
 vulture
 magpie
 ring-neck pheasant
 quail
 cliff swallow

Riparian/Wetland Plants

dogbane
 black cottonwood
 black locust
 coyote willow
 weeping willow
 crack willow
 cattail
 tule
 bulrush
 sedges
 rushes
 reed canary grass
 common witchgrass
 large barnyard grass

Ecotone/Upland Plants

cheatgrass
 Russian thistle
 tumble mustard
 rabbit brush
 big sage
 wild onions (Allium)
 yellow bells

Aquatic Vascular Plants

waterweed
 duckweed
 pondweed
 Columbia yellow cress
 watercress

Decomposers

fungi
 beetles
 ants
 millipedes
 sowbugs
 earthworms

Other

macrophytes
 photopelagic plankton
 zooplankton
 diatoms
 algae spp.

feces- coyote
 rabbit
 mouse
 eagle
 coot/cormorant
 Canada goose
 owl

eggshells